PUBLIC NOTICE

Notice is hereby given that the Tooele City Council will meet in a Work Meeting, on Wednesday, March 20, 2024, at 5:30 p.m. The meeting will be held in the Tooele City Hall Council Chambers, located at 90 North Main Street, Tooele, Utah. The complete public notice is posted on the Utah Public Notice Website www.utah.gov, the Tooele City Website www.tooelecity.gov, and at Tooele City Hall. To request a copy of the public notice or for additional inquiries please contact Michelle Pitt, City Recorder at (435)843-2111 or michellep@tooelecity.gov.

We encourage you to join the City Council meeting electronically by visiting the ***Tooele City YouTube Channel****, at* ***https://www.youtube.com/@tooelecity*** *or by going to YouTube.com and searching "Tooele City Channel".*

AGENDA

1. **Open City Council Meeting**
2. **Roll Call**
3. **Mayor's Report**
4. **Council Members' Report**
5. **Discussion Items**
   a. **Sewer Master Plan**
      Presented by Jamie Grandpre, Public Works Director
   b. **Water and Sewer Fees Discussion**
      Presented by Jamie Grandpre, Public Works Director
   c. **Resolution 2024-22** A Resolution of the City Council (The "Council") of Tooele City, Utah (The "City"), Providing for the Creation of 10th and Main Public Infrastructure District (The "District") as an Independent District, Authorizing and Approving a Governing Document and an Interlocal Agreement; Appointing a Board of Trustees; Authorizing Other Documents in Connection Therewith; and Related Matters
      Presented by Jared Stewart, Economic Development Director
   d. **Tooele City Active Transportation Plan**
      Presented by Jared Stewart, Economic Development Director
   e. **Tooele City Main Street Implementation Plan**
      Presented by Jared Stewart, Economic Development Director
6. **Closed Meeting**
   ~ Litigation, Property Acquisition, and/or Personnel
7. **Adjourn**

_____
Michelle Y. Pitt, Tooele City Recorder

Pursuant to the Americans with Disabilities Act, individuals needing special accommodations should notify Michelle Y. Pitt, Tooele City Recorder, at 435-843-2111 or Michellep@Tooelecity.gov, prior to the meeting.

Tooele Water Reclamation Facility Master Plan

March 2024

Prepared By:

J·U·B ENGINEERS, INC.

392 E Winchester St, Suite 300
Salt Lake City, UT 84107

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J·U·B ENGINEERS, INC.

CHAPTER 1
EXISTING AND FUTURE CONDITIONS

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Chapter 1

1.0 Existing and Future Conditions

1.1 Introduction

The Tooele Water Reclamation Facility (Tooele WRF) treats wastewater from industrial, commercial, and residential dischargers within the Tooele municipal boundary. For wastewater treatment, Tooele WRF treats an average flow of 2.1 million gallons per day (MGD) with an activated sludge system, consisting of a headworks, two oxidation ditches, three secondary clarifiers, UV disinfection, mechanical dewatering, and three solar dryer bays. Wastewater in the collection system is conveyed to the plant through three interceptors A, B, and C. The original treatment facility was constructed at an alternate location in 1956. The current facility was relocated to and constructed at the existing site in the late 1990s. In April 2000, the original facility was abandoned and decommissioned when the existing plant was placed into operation.

The city has hired J-U-B Engineers, Inc. (J-U-B) to prepare a Water Reclamation Facility Master Plan to evaluate the existing system's ability to handle current and future flows and loads and suggest appropriate measures to accommodate growth and improve treatment performance. The specific objectives of this Water Reclamation Facility Master Plan are as follows:

- Quantify existing flows and loads to the treatment facility.
- Project future flows and nutrient loads over a 20-year planning period based on current wastewater characteristics and population growth rates.
- Identify current and future hydraulic limitations, treatment performance, and operations.
- Forecast future regulations.
- Evaluate the feasibility of treatment technology alternatives including costs and non-monetary considerations.
- Recommend preferred treatment alternatives and implementation schedule.
- Develop capital improvements plan and project phasing plan for 2025-, 2030-, and 2045-year planning horizons.
- Evaluate compatibility of the preferred treatment alternative with current and future Tooele WRF projects.

1.2 Background

Tooele City is located on the western slopes of the Oquirrh Mountains in the Tooele Valley, west of Salt Lake City, Utah. The Tooele WRF service area is shown in **Figure 1**. Agricultural fields surround the facility to the north and the west. The Overlake Golf Course is located adjacent to the plant, where Tooele can dispose of treated effluent through Type 1 reuse (see **Chapter 2**). In the past, Tooele has been characterized as a rural community, but has morphed into a suburban city on the outskirts of the greater Salt Lake City metropolitan area. Tooele has experienced rapid population growth in recent years due to its desirable location near the Great Salt Lake and abundance of outdoor recreational

activities. Therefore, population growth and aging infrastructure have accelerated the timeline for providing upgrades to the facility.

The original design of the plant was based on a population of 22,612 at 100 gallons per capita per day, to meet a flow condition of 2.26 MGD. The 2008 upgrades to the facility were intended to bring the entire plant capacity up to 3.4 MGD, but DWQ considers the plant to be rated at 2.25 per Tooele's UPDES permit. Over the years, the plant has been upgraded as follows:

- 2004: Belt filter press feed pumps replaced with rotary lobe, positive displacement type pumps.
- 2007: Traveling bridge filter rehabilitation and switch from anthracite sand mix to just sand.
- 2008 (Phase 1A):
    - Screens replaced with new mechanical step screens
    - New washpactor and conveyor system
    - Aeration diffusers installed in oxidation ditch
    - New blower building
    - New 60 ft diameter secondary clarifier
    - New RAS/WAS pumps for clarifier
    - Replacement of two scum pumps
- 2011 (Phase 1B):
    - Replacement of chlorine disinfection with UV
    - New sludge storage tank
    - New solar biosolids drying facility
    - Belt filter press replaced with screw presses
- 2021:
    - Headworks building grating upgraded to solid FRP grating
    - Replaced oxidation ditch and sludge storage tank diffusers
    - Replaced Clarifier No. 1 internal mechanism
    - Polymer injection system replaced, redundant unit provided
    - Plant water pump station skid plate replaced
- 2023:
    - Sand filters replaced with disk filters
- 2024 (anticipated completion):
    - New headworks facility with coarse screening and grit removal

The latest site plan is shown in **Figure 1-2**.

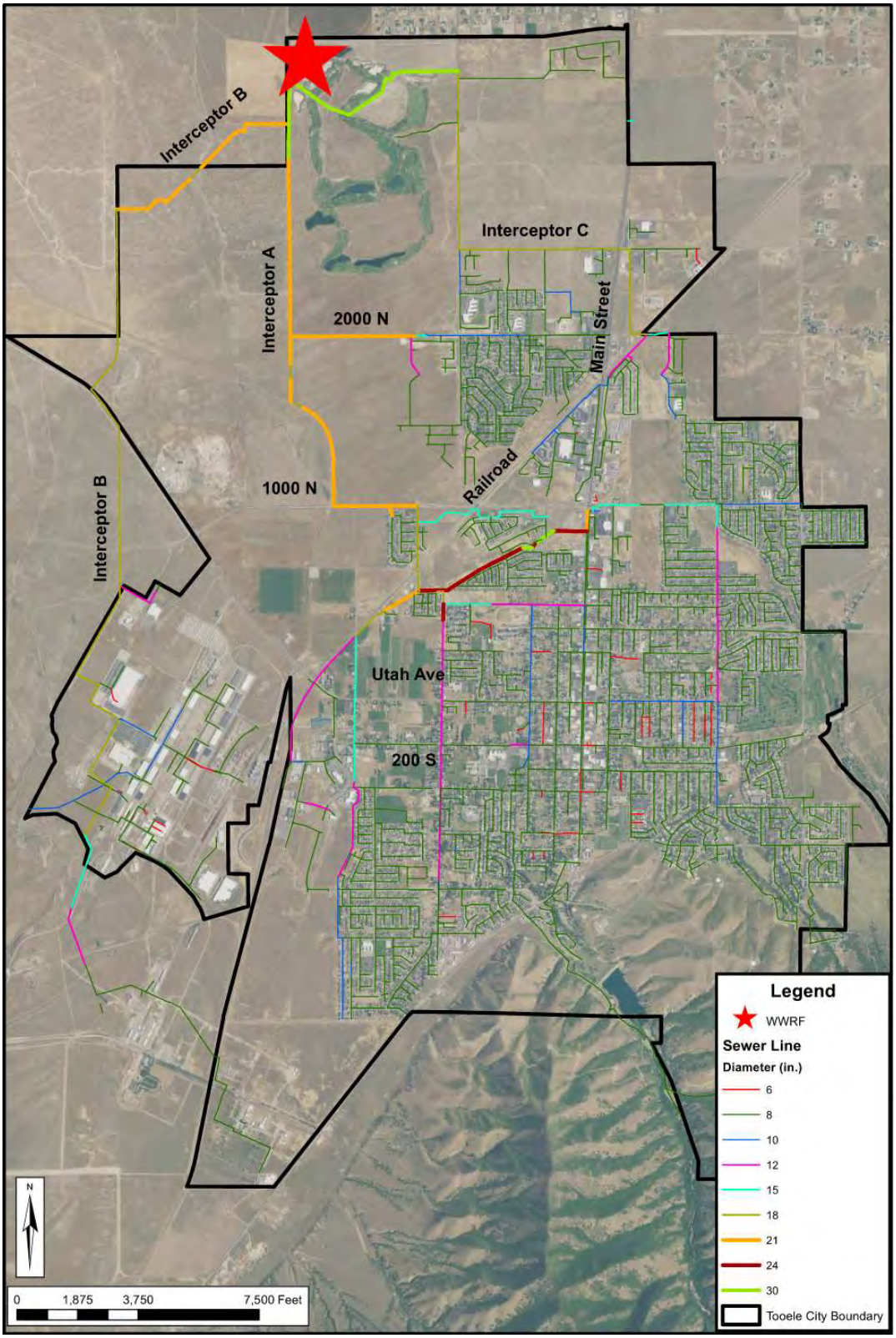

Figure 1-1: Existing Service Area

Source: Tooele City Wastewater Collection System Master Plan. Hansen, Allen, & Luce April 2022.

Figure 1-2: Existing Site Plan

1.3 Population Projection

Utah Division of Water Quality requires that a 20-year treatment solution be developed during the facility planning process. Therefore, an essential aspect of treatment master planning is future population projections. The most recent City population estimate was 35,742 from the 2020 U.S. Census Bureau. The trend of rapid to moderate growth is expected to continue through 2045, with an average annual growth rate of 2.83% predicted from 2020 to 2045, using the Kem C. Gardner Policy Institute demographic and economic planning projections for Tooele County. **Table 1-1** shows the estimated population within Tooele WRF's service area through 2075. Data from **Table 1-1** is illustrated graphically in **Figure 1-3** to show the projected population trend**.** The red line in the figure shows the population using the Kem C. Gardner Institute growth rate projections.

Table 1-1: Historic and Future Population

Year	Population	AARC[(d)]
2000[(a)]	22,502	-
2010[(a)]	31,605	4.0%
2020[(a)]	35,742	2.6%
2025[(b)]	43,567	4.4%
2035[(b)]	53,633	2.3%
2045[(b)]	63,039	1.8%
2055[(b)]	71,532	1.8%
2065[(c)]	79,306	1.1%
2075[(c)]	87,603	1.0%

(a) *Population data from 2000-2020 census data.*
(b) *Population projection using data from Kem C. Gardner Institute State and County Projections for Tooele County.*
(c) *Population projection extrapolated from previous data.*
(d) *Annual Average Rate of Change (AARC)*

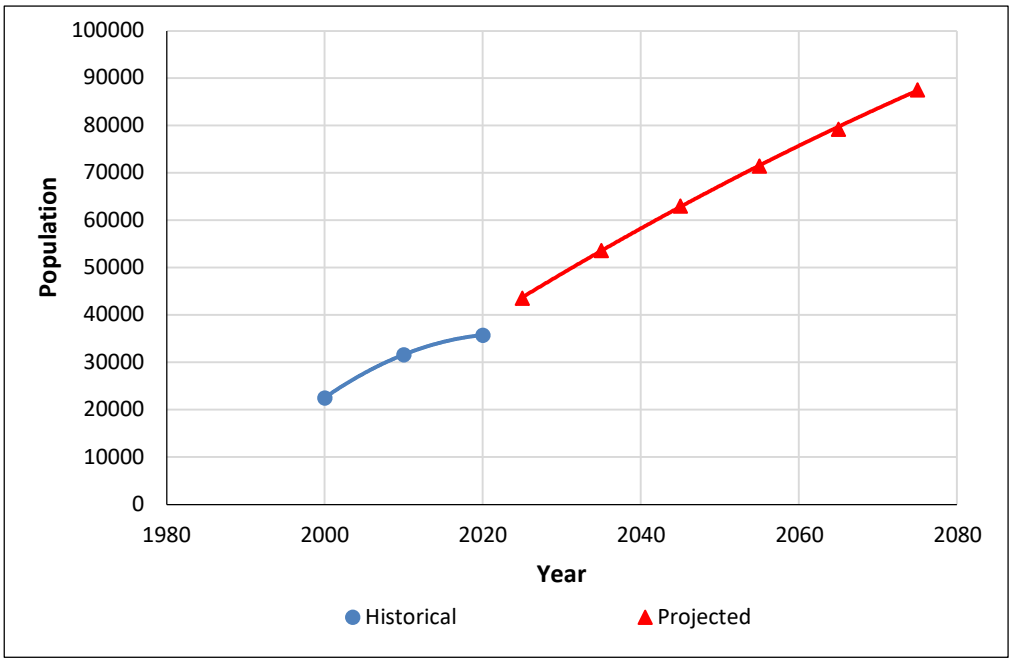

Figure 1-3: Tooele City Population Projection

1.4 Existing Flow Conditions

The Tooele WRF currently receives an average daily flow of about 2.1 MGD. Reviewing existing and historic flow records provides a snapshot of average annual flows and peak flow events and informs baseline values used for future projections. The flow characteristics of interest are as follows:

- **Average Daily Flow (ADF)**: The average flow rate occurring over a 24-hour period. ADF rate is used in evaluating treatment plant capacity and developing the flow ratios used for design. The ADF rate is also used to estimate pumping and chemical costs, solids production, and organic loading rates.
- **Maximum Month Flow (MMF)**: The expected flow for the peak month in the year. This flow factor is typically used to design unit processes for permit compliance.
- **Peak Daily Flow (PDF)**: The expected flow for the peak day in the year. The PDF is also used to size processes for permit compliance and peak events.
- **Peak Hourly Flow (PHF)**: The peak 1-hour flow rate occurring during a 24-hour period. PHF is used to establish the hydraulic capacity of the process.

1.4.1 Historical Flow Records

Tooele WRF provided daily influent flow data for 2017 to 2022. A summary of the past six years of flow is provided in **Table 1-2** below. The influent flows have been relatively stable, averaging 2.135 MGD.

Table 1-2: Influent Flow Rates

Year	Average Day (MGD)	Maximum Month (MGD)	Peak Day (MGD)	Peak Hour (MGD)[(a)]
2017	2.129	2.432	3.773	4.991
2018	2.155	2.367	2.572	4.989
2019	2.170	2.390	2.893	4.704
2020	2.156	2.346	3.760	4.957
2021	2.226	2.607	2.912	4.969
2022	1.972	2.232	2.419	4.957
Average	**2.135**	**2.396**	**3.055**	**4.928**

[(a)] *Peak hour flow data is from the City's influent flume as measured by a Flo-Dar unit. It appears from the data that this flow measurement may be capped at 5.0 MGD and further investigation by the City is recommended.*

The average daily influent and rolling 30-day monthly average flows are shown in **Figure 1-4**. Influent flows have only experienced a slight increase over the last six years, as indicated by the mostly linear trend line.

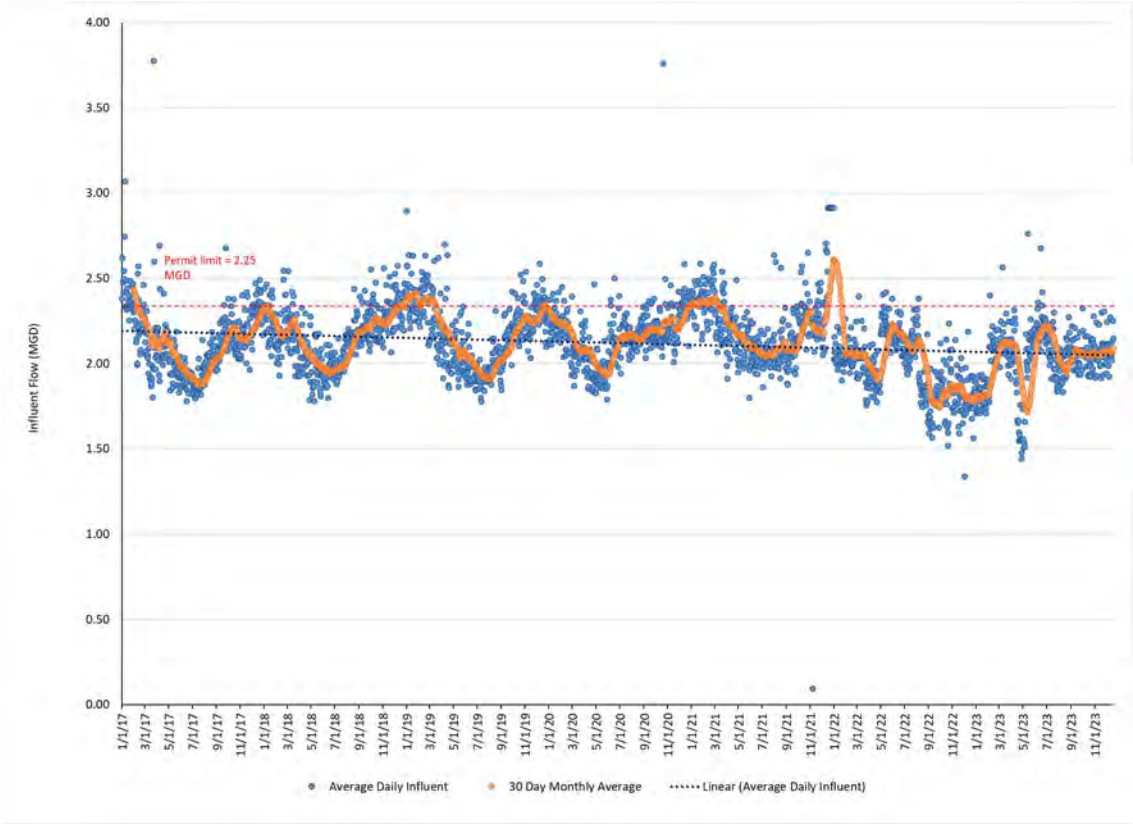

Figure 1-4: Daily Influent Flow Rate

1.4.2 Peaking Factors

Maximum month and peak hour flow are critical in facility design since these flows establish the required hydraulic capacity of the process and therefore dictate the sizing of the system. **Table 1-3** shows a summary of the flow data with observed peaking factors for the years 2017 – 2022.

Table 1-3: Influent Flow Peaking Factors

Flow Parameter	Influent Flow Rate (MGD)	Observed Peaking Factor	Basis
Average Day	2.135	--	Average day flow rate (2017-2022)
Maximum Month	2.396	1.12	Average of maximum month flow rates (2017-2022)
Peak Day	3.055	1.43	Average of peak day flow rates (2017-2022)
Peak Hour	4.928	2.31	Average of peak hour flow rates (2017-2022)

Note that if the peaking factors are too low, there is a risk that the capacity of the systems could be exceeded prior to the end of the 20-year planning horizon. The calculated maximum month peaking factor was 1.12. However, as new growth occurs and more families move to Tooele (increasing the number of residents per ERU), it is anticipated the flow rates will continue to increase. Peak flow events in Tooele are also influenced by infiltration and inflow. *Source: Tooele City Wastewater Collection System Master Plan. Hansen, Allen, & Luce April 2022.*

Figure 1-5 illustrates the impact of heavy precipitation on wastewater flow rates. City staff also report that flows to the WRF increase during significant snow melt events. The Hansen, Allen & Luce Wastewater Master Plan corroborates this by indicating that infiltration into the system is limited but surface water inflow can be issue during rain events and snowmelt.

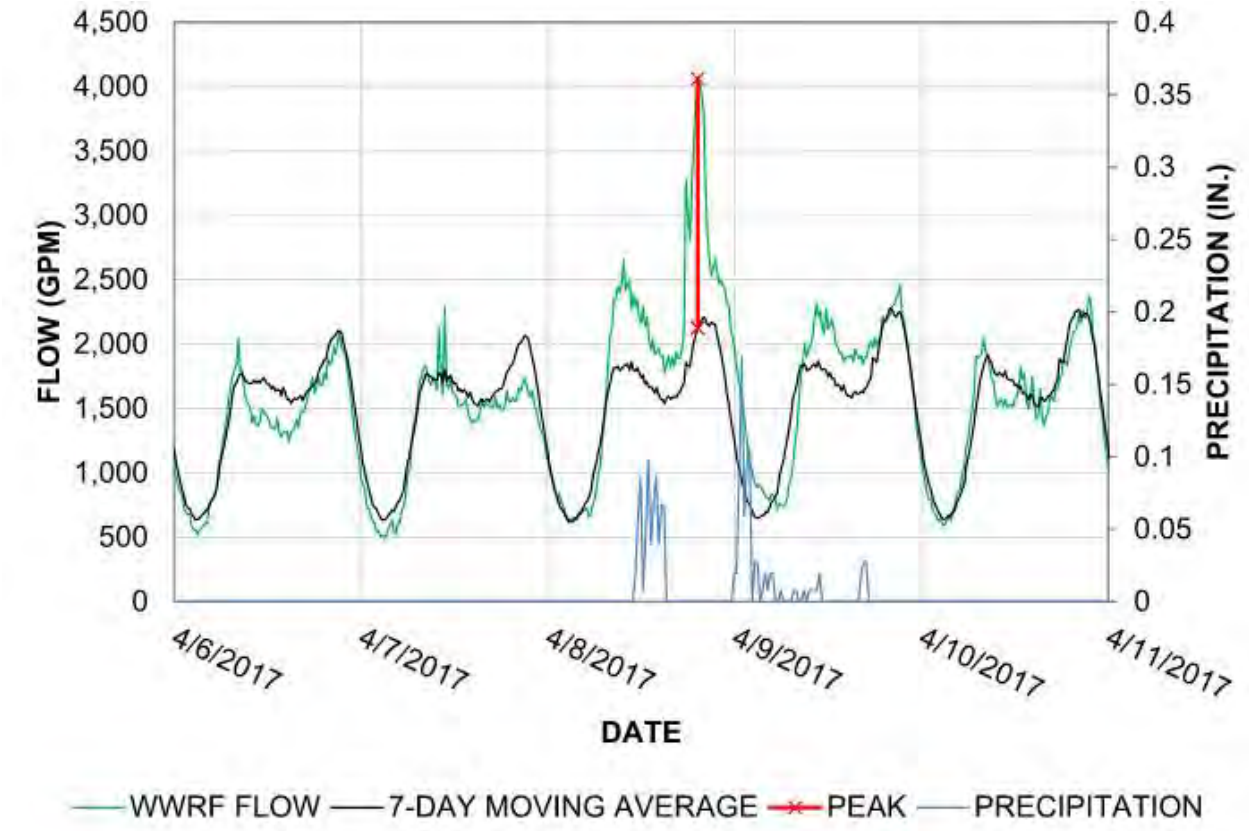

Figure 1-5: Effect of Precipitation on Flow

Source: Tooele City Wastewater Collection System Master Plan. Hansen, Allen, & Luce April 2022.

To remain conservative and ensure the proposed improvements are designed for additional or unexpected growth, the maximum month peaking factor was raised to 1.25. This peaking factor is more consistent with other northern Utah communities.

Sewage flows will increase as the city grows, but infiltration and inflow are anticipated to remain constant or even decrease due to proactive collection system repairs and new collection system extensions. It is anticipated inflow will be addressed moving forward through site grading improvements

directing surface water away from manholes, solid manhole lids, prevention of sump pumps tying into the system, etc. As such, it is anticipated that the peak hour factor of 2.31 calculated from the last six years of flow data will decrease over time. Additionally, larger wastewater treatment plants generally have lower peaking factors. The decrease in the peak hour peaking factor as flows increase is consistent with the recommendations included in the Hansen, Allen & Luce Wastewater Master Plan.

The design peaking factors for wastewater treatment are shown below in **Table 1-4**. Due to the unreliability of the influent flow meter to measure peak events, the ratio of peak hourly flow to design average flow equation in *10 States Standards – Recommended Standards for Wastewater Facilities* was used:

$$\frac{Q_{PHF}}{Q_{AVE}} = \frac{18 + \sqrt{P}}{4 + \sqrt{P}}$$

where P = population in thousands

The equation resulted in a peak hour peaking factor of 2.31 in 2025 and 2.18 in 2045.

Table 1-4: Proposed Peaking Factors

Year	Max Month Peaking Factor	Peak Hour Peaking Factor[(a)]
2025 (existing)	1.25	2.31
2045 (20-yr equipment life)	1.25	2.18

[(a)] *Peak Hour Peaking Factor calculated using the ratio of peak hourly flow to design average flow equation in 10 States Standards – Recommended Standards for Wastewater Facilities.*

The proposed peaking factors are based on a review of the flow data and are consistent with surrounding wastewater treatment plants of similar size, as shown in **Table 1-5**. Based on the above information, the 20-yr peaking factors of 1.25x (Max Month) and 2.18x (Peak Hour) will be used to size the equipment for this Master Plan.

Table 1-5: Peaking Factors of Local WRFs

Flow Factor	Provo	Santaquin	Spanish Fork	Tooele
Max Month	1.20	1.11	1.26	1.25
Peak Hour	2.40	2.28	2.50	2.31

In addition to influent flows from the city's collection system, the headworks receives internal return flow from two different on-site lift stations: the plant drain lift station and the reject return lift station. Plant return flows enter the headworks upstream of the screens.

The plant drain lift station pumps site sewer flows collected from wash water and other process returns, including screw press filtrate, back to the headworks building. Based on magnetic flow meter readings

over the years, the plant drain lift station averages approximately 150 gpm of return flow. However, occasional peaks of up to 1,200 gpm (1.7 MGD) have been documented.

The reject return lift station is used to send off-spec water from the reject pond back through the plant for treatment. This lift station is only used during and after process upsets. The size of the reject pond gives the operator flexibility to meter flow back to the head of the plant instead of returning higher flow rates in a short amount of time. Although the pumps are capable of pumping additional flow, they typically operate on a setpoint of 400 gpm (0.58 MGD) so as not to overwhelm the headworks facility.

For future return flow sizing, it is assumed that the plant drain and reject lift stations are adequate for future needs and the 1,600 gpm (1,200 gpm PDLS plus 400 gpm Reject LS) peak flow will be held constant over the planning horizon.

1.4.3 Baseline Unit Flow Per Capita

Annual average daily flow was compared to population data from each associated year to estimate a per capita residential unit flow value. **Table 1-6** below displays the gallons per capita per day (GPCD) over the last decade, which averaged 64.6 GPCD. The Tooele City Collection System Master Plan calculated 65.2 GPCD (Hansen, Allen, and Luce, 2022). The 2009 Wastewater Facilities Master Plan (Aqua Engineering, 2009) calculated a GPCD between 60-65, but used a basis of 75 GPCD to allow for future commercial and industrial growth, as well as including an allowance for infiltration and inflow. For detailed discussion on flow sources and split between commercial, industrial, and residential, refer to the Tooele City Wastewater Collection System Master Plan by Hansen, Allen, & Luce in April 2022. To be consistent with prior planning efforts and to provide a conservative design, 75 GPCD will be utilized as the basis of design for future flow projections.

Table 1-6: Historical Per Capita Flow

Year	AADF (MGD)	Population	GPCD
2011	1.95	31,605	61.7
2012	1.99	32,065	62.1
2013	1.87	32,524	57.5
2014	2.30	32,984	69.7
2015	2.64	33,444	78.9
2016	2.09	33,903	61.6
2017	2.13	34,363	62.0
2018	2.16	34,823	62.0
2019	2.17	35,282	61.5
2020	2.16	35,742	60.4
2021	2.23	38,600	57.8
2022	1.97	39,789	49.5
		Calculated Average GPCD	62.1
		Basis of Design GPCD	75.0

1.5 Existing Loads

Table 1-7 shows influent BOD and TSS for the past six years. BOD and TSS data is collected weekly via composite sampler. Additionally, since the plant is not permitted for nitrogen and phosphorus removal (see **Chapter 2**), Tooele does not actively sample for nitrogen or phosphorus per the reporting limits for Outfall 001R Reuse. Therefore, typical influent wastewater concentrations are assumed for Total Kjeldahl Nitrogen (TKN) and Total Phosphorus (TP) for this master plan. For future design projects, it is recommended a comprehensive sampling plan be initiated to determine nutrient loads and to resolve variability within other parameters.

Table 1-7: Influent Concentrations and Loadings

Year	Ave Influent BOD (mg/L)	Ave BOD Loading (lb/d)	Ave Influent TSS (mg/L)	Ave TSS Loading (lb/d)
2017	269	4,769	264	4,692
2018	242	4,356	234	4,202
2019	173	3,127	135	2,452
2020	269	4,832	210	3,770
2021	205	3,807	192	3,566
2022	236	3,886	186	3,069
Average	**232**	**4,128**	**204**	**3,624**

Influent wastewater, with respect to BOD and TSS, is considered to have a medium strength as indicated in **Table 1-8**.

Table 1-8: Influent Wastewater Strength

Wastewater Influent	Influent BOD (mg/L)	Influent TSS (mg/L)	Influent TKN (mg/L)	Influent TP (mg/L)
Low Strength[a]	110	120	20	4
Medium Strength[a]	190	210	40	7
High Strength[a]	350	400	70	12
Tooele City	**232**	**204**	**40**[b]	**8**[b]

[a] *As defined by Metcalf and Eddy, Wastewater Engineering (2003), Table 3-15.*

[b] *Assumed. No influent nitrogen or phosphorous data available.*

BOD and TSS influent concentrations and loads over time are shown in **Figure 1-6** through **Figure 1-9**.

Peaking factors for the waste loads have also been developed. The factors are shown in **Table 1-9** and will be used to determine the future loading values through 2045 (see **Section 1.7**).

Table 1-9: Influent Loading Peaking Factors

Parameter	Maximum Month Peaking Factor	Basis
BOD	1.43	Average of maximum month loads from 2017, 2018, 2019, 2020, 2021, and 2022 divided by 4128 lbs/day
TSS	1.48	Average of maximum month loads from 2017, 2018, 2019, 2020, 2021, and 2022 divided by 3624 lbs/day
TKN	1.50	Assumed typical value of 1.50 as defined by Metcalf and Eddy, *Wastewater Engineering* (2003), Figure 3-8.
TP	1.50	Assumed typical value of 1.50 as defined by Metcalf and Eddy, *Wastewater Engineering* (2003), Figure 3-8.

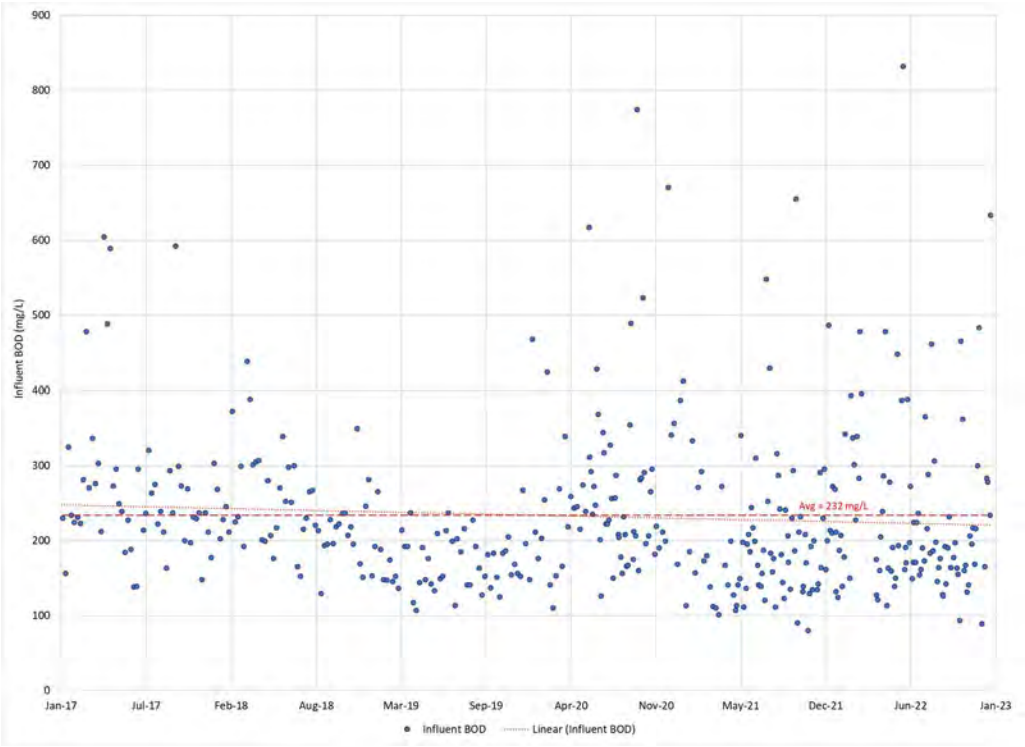

Figure 1-6: Influent BOD Concentration

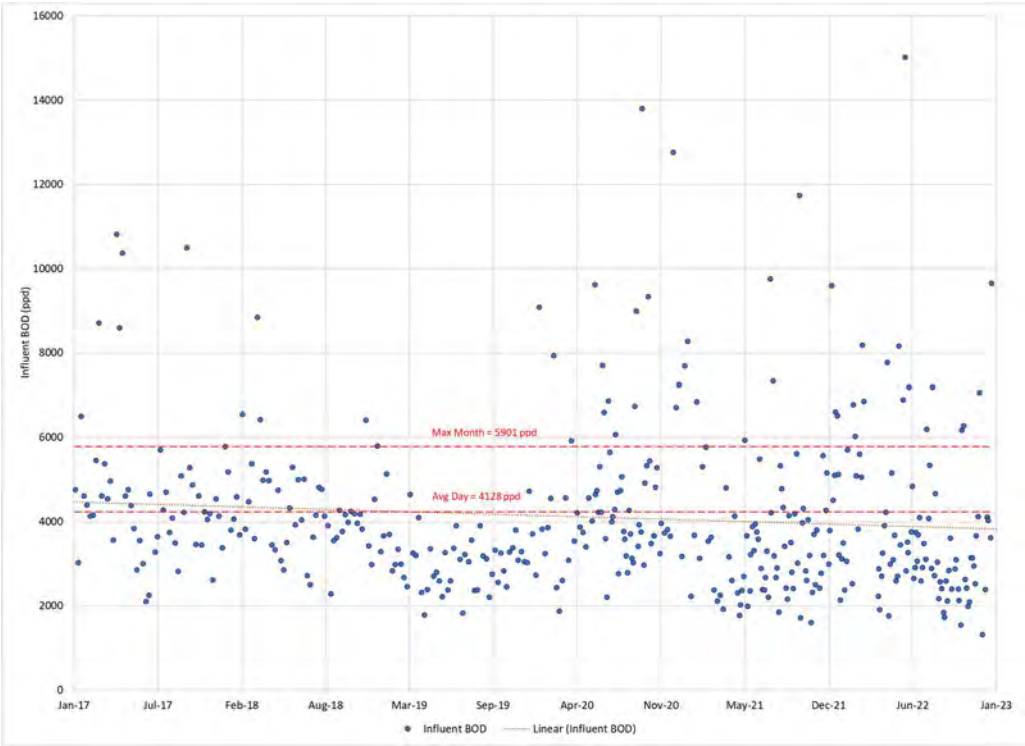

Figure 1-7: Influent BOD Loading

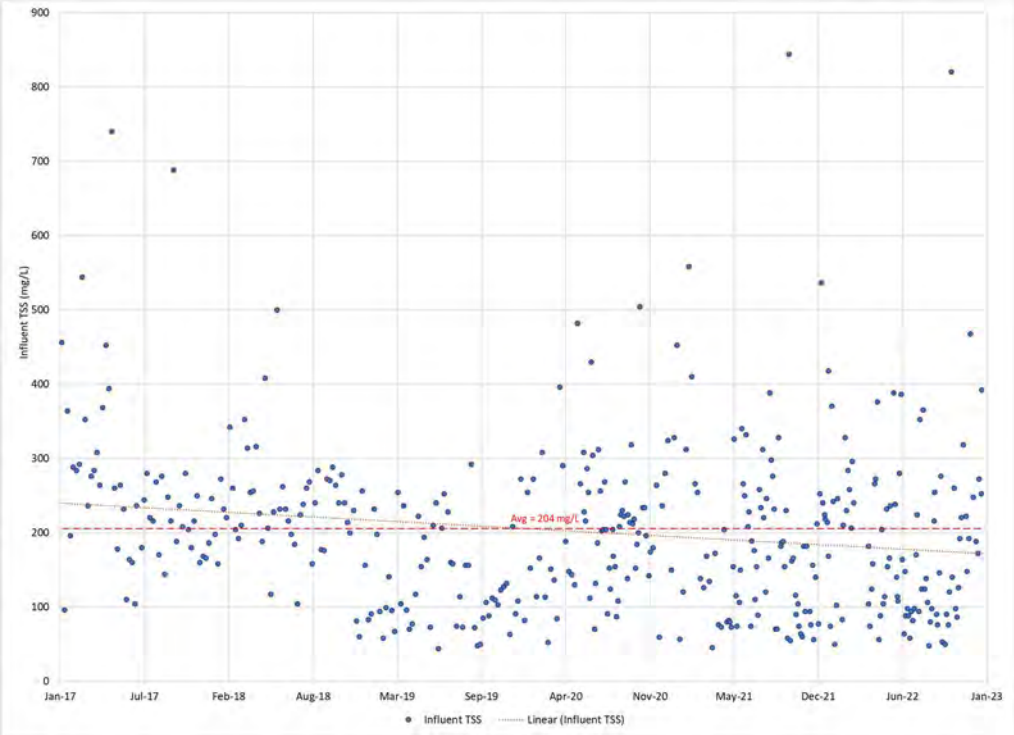

Figure 1-8: Influent TSS Concentration

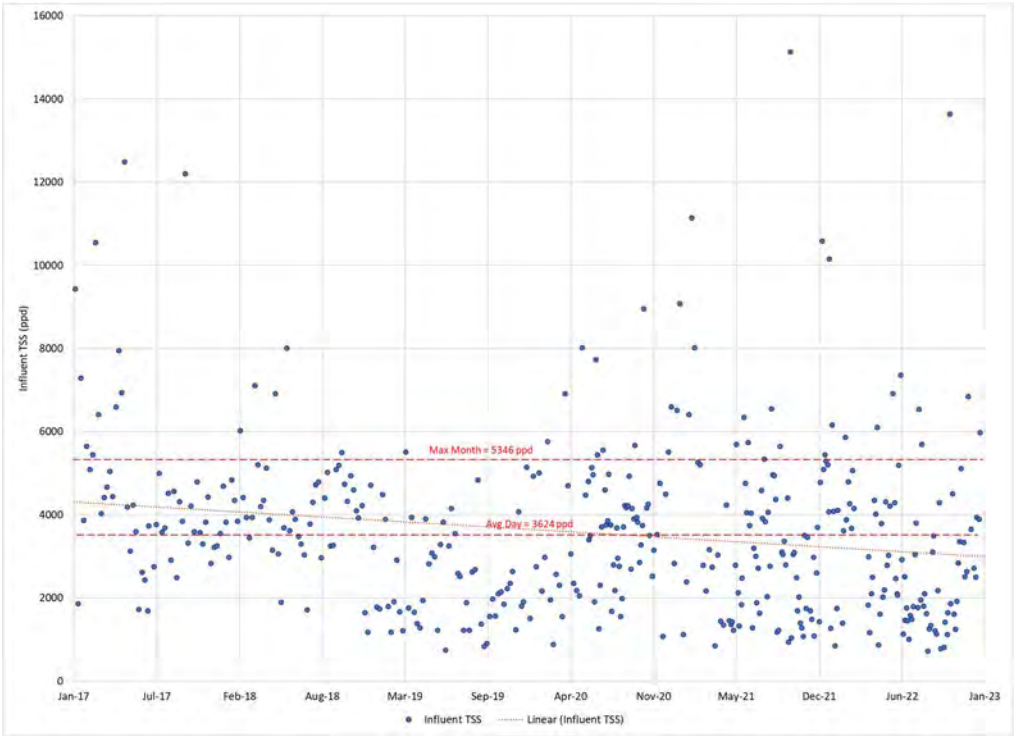

Figure 1-9: Influent TSS Loading

1.6 ERU Analysis

The existing collection system equivalent residential units (ERUs) was estimated as 14,400 ERUs in 2020 in the Tooele City Wastewater Collection System Master Plan (Hansen, Allen, and Luce April 2022). The estimate was determined by reviewing several years of City billing records to determine the average indoor water use for an ERU in the City during the winter months. Using the projected population growth rates from **Section 1.3** and the 2020 ERU estimate of 14,400, the total project ERUs from 2020 to 2045 were projected. The 2022 ERU value of 15,454 was used to determine the existing influent flow and loads per ERU, shown in **Table 1-10**.

Table 1-10: Influent Flows and Loads Summary per ERU

Parameter	Load Condition	Existing Value	Units
Flow	Average Day	2.135	MGD
		138	gal/ERU/d
	Maximum Month[1]	2.396	MGD
BOD	Average Day	232	mg/L
		4,128	lbs/d
		0.267	lbs/ERU/d
	Maximum Month[1]	5,901	lbs/d
TSS	Average Day	204	mg/L
		3,624	lbs/d
		0.235	lbs/ERU/d
	Maximum Month[1]	5,346	lbs/d
TKN	Average Day	40	mg/L
		712	lbs/d
		0.046	lbs/ERU/d
	Maximum Month[2]	1,068	lbs/d
TP	Average Day	8	mg/L
		142	lbs/d
		0.009	lbs/ERU/d
	Maximum Month[2]	214	lbs/d

[1]Average of maximum month flows/loadings 2017-2022

[2]Maximum month loadings based on assumed peaking factor of 1.50.

As mentioned previously in **Section 1.4.3**, a minimum of 75 GPCD will be used a design basis to project future flows and loads. The observed value of 138 gal/ERU/d is lower than expected for a community like Tooele as it equates to a per capita flow under 60 gpcd. As larger family homes continue to be constructed, it is anticipated the flow/ERU will increase in the future. In the absence of flow data, Utah DWQ recommends that flows be projected at 100 gal/person/day. Assuming 2.57 people per ERU, this would result in 257 gal/ERU/d. Based on the flow data evaluation, 257 gal/ERU/d appears to be too conservative and it is recommended that future projections be based on 200 gal/ERU/d, which is consistent with other Northern Utah communities. 200 gal/ERU/d generally aligns with the previously discussed 75 gal/person/day wastewater generation rate and accounts for extreme I&I events that could occur and unforeseen industrial growth.

1.7 Projected Flows and Loads

It is projected that there are 41,042 people currently living in Tooele City as of 2023 (see **Appendix A**). Using the Kem C. Gardner Policy Institute demographic and economic planning projections for Tooele County, a residential population of 63,039 is projected in the year 2045. This equates to 24,484 total ERUs, a resulting increase of 9,315 ERUs over existing. Using the design peaking factors discussed in **Section 1.4.2**, the ADF, MMF, and PHF were projected through the year 2045, as shown in **Table 1-11,** with the assumption that some areas will not be fully developed to maximum density. The complete set of ERU and flow projections is provided in **Appendix A**.

Table 1-11: ERU and Flow Projections

Year	Total ERUs	gal/ERU/d	Average Day MGD	Maximum Month MGD	Peak Hour MGD
2025	16,921	200	3.38[1]	4.23	7.85
2045	24,484	200	4.90	6.12	10.64

[1]There is a jump in the average day flow projection in 2025 compared to existing. This is due to the actual calculated flow being 138 gal/ERU/d but the projected flow is at 200 gal/ERU/d to accommodate flow measurement uncertainties, infiltration and inflow, and potential industrial growth. The State of Utah typically requires planning documents to project flows at a minimum of 200 gal/ERU/d or greater.

The State requires that the treatment facilities be evaluated over a 20-year planning horizon. Therefore, the facilities need to be sized to accommodate an average day flow of 4.90 MGD and a maximum month flow of 6.12 MGD, as indicated in **Table 1-11.** The flows in **Table 1-11** are consistent with the Tooele Headworks Project Basis of Design Report, completed in 2022. The flows listed in the above table also correspond to a 78 GPCD value, meeting the 75 GPCD minimum for basis of design.

Using the average concentrations in **Table 1-7,** maximum month peaking factors in **Table 1-9**, and projected flows in **Table 1-11**, the future loading projections were determined for BOD and TSS, displayed in **Table 1-12**. As previously discussed, no data for nitrogen or phosphorus was available but literature values were used to project the future loads.

Table 1-12: Load Projections

Year	Total ERUs	Influent BOD		Influent TSS		Influent TKN		Influent TP	
		Ave Day lb/d	Max Month lb/d	Ave Day lb/d	Max Month lb/d	Ave Day lb/d	Max Month lb/d	Ave Day lb/d	Max Month lb/d
2025	16,921	6,540	9,352	5,751	8,511	778	1,168	59	89
2045	24,484	9,481	13,558	8,337	12,338	1,126	1,689	85	128

Table 1-13 summarizes the design influent flows. Note that the final peak hour flow projection includes 2.3 MGD from return flows. The peak hour flow rate of 12.94 MGD will be used to design the new headworks building, upsize existing pump stations, and design upgrades to the UV disinfection process.

Table 1-13: Design Influent Flows (MGD)

Condition	Average Day	Maximum Month	Peak Hour[a]
Existing (2025)	3.38	4.23	10.15
20-Year Design Basis (2045)[b]	4.90	6.12	12.94

a. 2.3 MGD return flows added to each peak hour value, after peak hour peaking factor was applied.

b. 50-year buildout flows are estimated at 6.80 MGD ADF, 8.51 MGD MMF, and 13.94 MGD PHF.

J-U-B ENGINEERS, INC.

CHAPTER 2
PERMIT CONDITIONS

Contents

Tables

Chapter 2

2.0 Permit Conditions

2.1 Current UPDES Permit

The Tooele WRF normally disposes of effluent by pumping it to a series of holding ponds at the Overlake Golf Course, Outfall 001R in its Utah Pollution Discharge Elimination System (UPDES) Permit No. UT0025445. The Type 1 reclaimed water is used for irrigation of the golf course. The effluent is stored in the holding ponds during the winter months when irrigation water is not needed. The City is addressing winter storage and reclaimed water use in a separate planning document. The reuse discharge limits are based off Utah Administrative Code Type 1 discharge requirements and include the following parameters:

- Turbidity
- BOD_5
- E. coli
- pH

The effluent limitations of the current reuse permit are summarized in **Table 2-1**.

Table 2-1: Current Reuse Effluent Limitations (Outfall 001R)

Parameter	Effluent Limitations				
	Maximum Monthly Avg	Maximum Weekly Median	Maximum Daily Average	Minimum	Maximum
Turbidity, NTU	-	-	2	-	5
BOD_5, mg/L	10	-	-	-	-
E. coli, No./100 mL	-	ND	-	-	9
pH, Standard Units	-	-	-	6.0	9.0

On rare occurrences, a process upset may occur that results in the effluent not complying with Type 1 reuse requirements. In this scenario, the effluent is diverted to the Reject Pond. The Reject Pond has several days of storage and the off-spec water can be pumped back to the headworks facility for treatment. If the upset occurs for a longer time period and the Reject Pond is full, the facility can discharge to an unnamed irrigation ditch (Outfall 001) that collects runoff from local roads and fields. The ditch does not enter any other waterway or the Great Salt Lake.

The UPDES discharge permit (Outfall 001) places limits on discharge to the unnamed irrigation ditch for the following parameters:

- Flow
- BOD_5

- TSS
- E. coli
- Oil and Grease
- pH

Other parameters, including orthophosphate (OP), total phosphorous (TP), total Kjeldahl nitrogen (TKN), nitrate, nitrite, metals, and organic toxics are self-monitored and reported, but do not have discharge limitations. These parameters only need to be sampled and reported when the facility is discharging to the unnamed irrigation ditch, which is infrequent. The current permit discharge limits for this outfall are summarized in **Table 2-2**.

Table 2-2: Current Discharge Limitations (Outfall 001)

Parameter	Effluent Limitations				
	Maximum Monthly Avg	Maximum Weekly Avg	Yearly Average	Daily Minimum	Daily Maximum
Total Flow, MGD	2.25	-	-	-	-
BOD_5, mg/L	25	35	-	-	-
BOD_5 Min. % Removal	85	-	-	-	-
TSS, mg/L	25	35	-	-	-
TSS Min. % Removal	85	-	-	-	-
E. coli, No./100 mL	126	157	-	-	-
Oil & Grease, mg/L	-	-	-	-	10.0
pH, Standard Units	-	-	-	6.5	9.0

Biosolids are regulated under Permit No. UTL025445. The permits have been in effect since October 1, 2018 and expired as of September 30, 2023. The City submitted the permit application for renewal to DWQ in July 2023, but it is still undergoing review and a new permit has not been issued. In the interim, the previous permit limits remain in effect as the permit is considered "administratively continued".

2.2 Additional Permit Monitoring

The UPDES permit has several additional requirements that are typical for recently issued permits. Some of the more important requirements are discussed below.

2.2.1 WET Testing

The permit includes a section on acute/chronic Whole Effluent Toxicity (WET) testing, as biomonitoring requirements are included in all major and minor permits. However, Tooele discharges nearly all its effluent through a reuse program so biomonitoring of the effluent is not required. The permit does include a WET reopener provision if the toxicity of Tooele's discharge changes in the future.

2.2.2 Industrial Pretreatment Program

The City and State are not authorized to issue pretreatment permits described as "Pretreatment of Industrial Wastewaters", since non-domestic industrial dischargers are regulated by the Environmental Protection Agency (EPA) and the facility is less than 5 MGD. The City must work with those in charge to ensure that all commercial and industrial users of the publicly owned treatment works (POTW) comply with the pretreatment regulations. However, the Permittee is able to provide oversight of all non-domestic users subject to federal categorical standards which discharge regulated process wastewater to the facility. The Permittee shall sample and analyze both the influent and effluent at least quarterly. The results of the analyses of metals, cyanide, and toxic organics shall be submitted along with the Discharge Monitoring Report (DMR). A plan for monitoring, reporting, and enforcing is further detailed in the permit provided in **Appendix B.**

2.2.3 Biosolids Requirements

The biosolids generated by the facility that are sold or given away to the public should be monitored for arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc to meet 40 CFR 503. The facility typically generates between 500 and 600 metric tons of biosolids per year. Class A biosolids are achieved using the solar dryers during the warm weather months. These Class A biosolids are land applied on nearby agricultural land. During the shoulder seasons, Class B biosolids are typically achieved and during the winter months the biosolids are unclassified. When the metal and/or pathogen limitations are not met, the biosolids must be landfilled. The monitoring frequencies for chemical pollutants, pathogens, and applicable vector attraction reduction requirements are listed in **Table 2-3**.

Table 2-3: Monitoring Frequencies for Dry Biosolids

Dry Biosolids Disposal Rate (metric tons/yr)	Monitoring Frequency
>0 to < 290	Each year
> 290 to < 1,500	Once a quarter
> 1,500 to < 15,000	Once every two months
> 16,500	Once a month

2.3 Future Permit Conditions

The City is currently in the process of renewing their UPDES permit for the next permitting cycle. All constituents of concern will be investigated to determine if new or more stringent effluent limits are warranted as part of DWQ's review for renewing the permit. As of now, there is no indication from DWQ that the new permit limits will be more stringent than the current permit limits. However, nutrient limits, including nitrogen and phosphorus (specifically TP < 1 mg/L), are being added to the discharge permit for many facilities in the state. Tooele does not currently treat for nutrients because it is a total reuse facility and reuse permits do not include nutrient limits. The potential for future nutrient limits will

be considered when discussing alternatives in **Chapter 4**. DWQ has never indicated that total reuse facilities may be subject to future nutrient limits, but the facility plan may be revisited at any time to update alternatives as permit conditions change.

CHAPTER 3
EXISTING SYSTEM

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Chapter 3

3.0 Existing System

3.1 Facility Overview

The Tooele WRF serves all of Tooele City. The original WRF was constructed in 1956 and treatment was relocated to the existing location in 2000 and the original facility was abandoned. Major upgrades were performed on the plant in 2008 including new headworks equipment. The most significant modification was the installation of blowers and aeration diffusers at the oxidation ditch and the addition of a third clarifier to increase the ditch's total treatment capacity. In 2011, the city replaced chlorine disinfection with UV and installed solids handling upgrades – new sludge storage tank, new dewatering building, and new solar biosolids drying facility. Additional minor upgrades were completed in 2022, cloth disc filters were installed in 2023, and a new headworks building is currently under construction with an estimated completion of 2024. Other minor upgrades and additions have been incorporated throughout the years to reportedly bring the hydraulic design capacity of the WRF to 3.4 MGD. However, plant staff has indicated that performance suffers at 3.0 MGD or less. The current average inflow to the WRF is 2.1 MGD with a permit limit of 2.25 MGD max monthly average to the ditch outfall. The existing WRF site layout is shown in **Figure 3-1**.

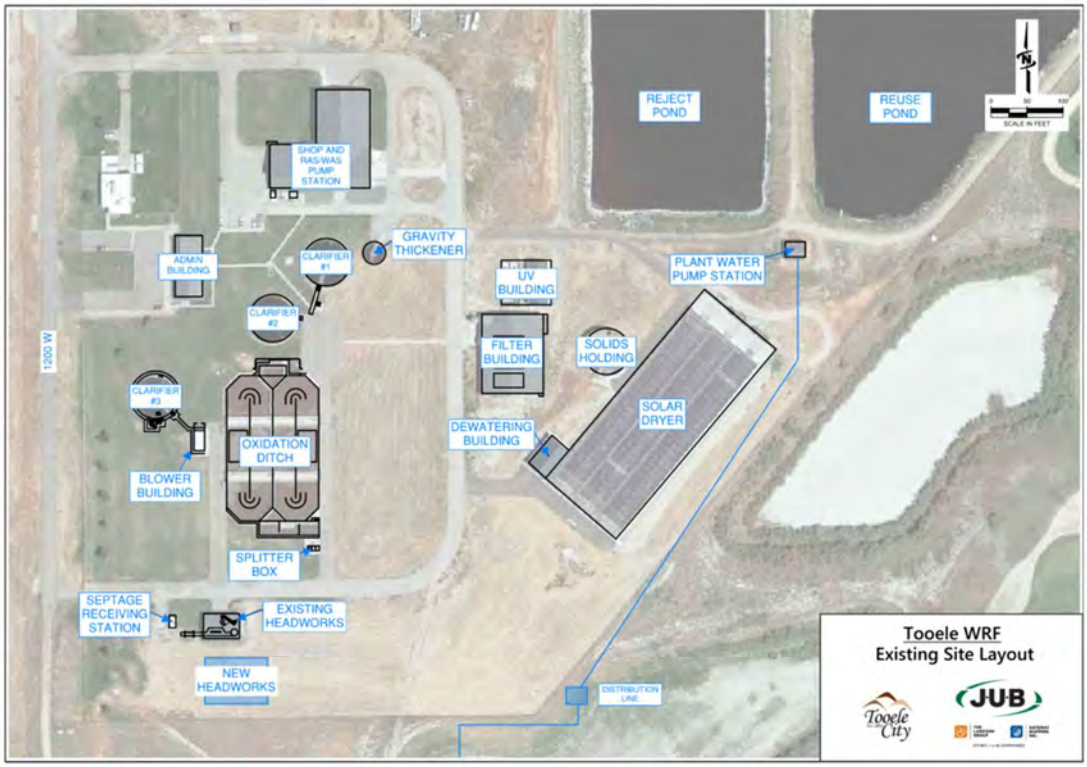

Figure 3-1: Tooele WRF Existing Site Layout

Although upgrades have been made over the years, after nearly 25 years of service the facility is in need of improvements. Much of the equipment is over 20 years old and should be proactively monitored for performance deficiencies and should be scheduled for replacement due to aging infrastructure.

3.2 Preliminary Treatment

3.2.1 Septage Receiving

Septage is received multiple times per week and is dumped into the septage receiving station upstream of the existing headworks building (see **Figure 3-2**). Septage is dumped directly into the concrete bay, where septage passes through grating to exclude large debris and enters the sewer system through an orifice plate to control flow. Excess septage is diverted to an off-line holding tank and passed into the sewer line when flows decrease. The existing station is old and deficient and in need of an upgrade or replacement. The concrete pad requires consistent washdown to maintain cleanliness and reduce odors.

Figure 3-2: Septage Receiving Station

3.2.2 Screening, Grit Removal, and Influent Flow Measurement

The first step in the treatment process is screening and grit removal of the raw wastewater at the headworks building. The existing building is located on the south end of the facility downstream of the septage receiving station. A new headworks building is currently under construction, located just south of the existing building, and consists of the following items:

- Influent sampling
- Two 1/4-inch coarse screens. Influent flow may be diverted to one or both channels during normal operation. A bypass channel with a manual bar rack will serve as a future third screening channel. Provisions were designed for a future coarse screen and washer compactor for that channel also. The screens will be cleaned with automatic rakes that are operated by variable frequency drives. The bar screens include dedicated washer compactor units.
- Vortex grit chamber downstream of the screening equipment. Accumulated grit is pumped to a grit washer. The grit chambers include dedicated grit pumps and grit washer units.
- Debris from the coarse screening and grit removal equipment will be collected in a solids haul trailer located in the headworks building. Operators dispose of the solids at the landfill.
- Influent flow measurement for the facility is provided with a magnetic flow meter downstream of grit removal (immediately upstream of the splitter box).

The operating conditions for major components of the new headworks are summarized in **Table 3-1**. The upgrades to the headworks will provide a significant increase in capacity, sufficient for current and future needs up to 2045, especially with the addition of a third channel for future coarse screening.

Provisions for future odor control were included in the design of the new headworks. A dedicated odor control fan will be installed and integrated with the HVAC system to remove odors and corrosive gasses from the screenings room.

Table 3-1: Headworks Operating Conditions

Parameter	Design Value
Automatic Screens	
Quantity	1 Duty / 1 Standby
Type	Mechanical Bar Screen
Capacity, each (mgd)	12
Clear Opening (inch)	¼
Washer/Compactor	
Quantity	1 Duty / 1 Standby
Capacity, each (cf/hr)	70
Vortex Grit Chamber	
Quantity	1 Duty / 1 Standby
Type	Vortex
Capacity, each (mgd)	12
Grit Pumping	
Quantity	1 Duty / 1 Standby
Type	Vacuum Prime
Capacity, each (gpm)	250
TDH (ft)	60
Grit Dewatering	
Washer Type	Cyclone
Classifier Type	Integrated
Quantity	1 Duty / 1 Standby
Capacity, each (gpm)	250

3.3 Secondary Treatment

3.3.1 Splitter Box No.1

The pipeline to the splitter box from the headworks building is new and sized to accommodate 50-yr flows. The purpose of the splitter box downstream of the headworks is to equally distribute flow between the two biological trains/ditches. The splitter box contains two four-foot adjustable weir gates to control flow. During high flows, these weirs are operating under submerged conditions reducing operational control. Therefore, the splitter box has insufficient capacity for future flows and is unable to split flow for a future oxidation ditch.

3.3.2 Oxidation Ditch

The current facility employs the activated sludge process to provide biological treatment including nutrient removal. Specifically, an oxidation ditch process is used, and two parallel ditches of equal capacity are provided. Each ditch is preceded by an anaerobic selector to aid in sludge settling and nutrient removal. The selector zone is unaerated and mechanical mixing is provided to mix the contents and keep solids in suspension. Return activated sludge (RAS) and raw influent are combined in the selector. The mixers in the selectors are over 20 years old and have reached the end of their design life. On a few occasions, a mixer has fallen off of its mount and it is difficult to isolate the selector zone for retrieval.

Flow exits the selectors by gravity and enters the south end each of the ditches. The ditches are configured in the traditional "racetrack" layout and were originally installed with four surface brush aerators. To increase aeration capacity, fine bubble diffusers, high speed turbo blowers, and submersible mixers were added to the ditches in 2008. According to the design, these improvements increased the capacity of the ditches from 2.3 MGD to 3.4 MGD. However, operations staff have indicated they have trouble maintaining treatment at higher flow rates approaching 3.0 MGD. A summary of the oxidation ditch design criteria is shown in **Table 3-2**.

Dissolved oxygen (D.O.) residual within each ditch is measured at two locations. The D.O. analyzer readings are used to provide D.O. setpoint control, which is typically accomplished by varying the air flow to the diffusers to avoid short cycling the brush aerators. The ditch runs in extended aeration mode, which sends raw wastewater to the west ditch directly. It then travels from the west ditch (AIT_0242) to the east ditch (AIT_0241). The D.O. data from SCADA shows the west ditch D.O. is constant around 1 mg/L year-round (**Figure 3-3**), while the east ditch fluctuates from 4 to 0.5 mg/L depending on the time of year (**Figure 3-4**).

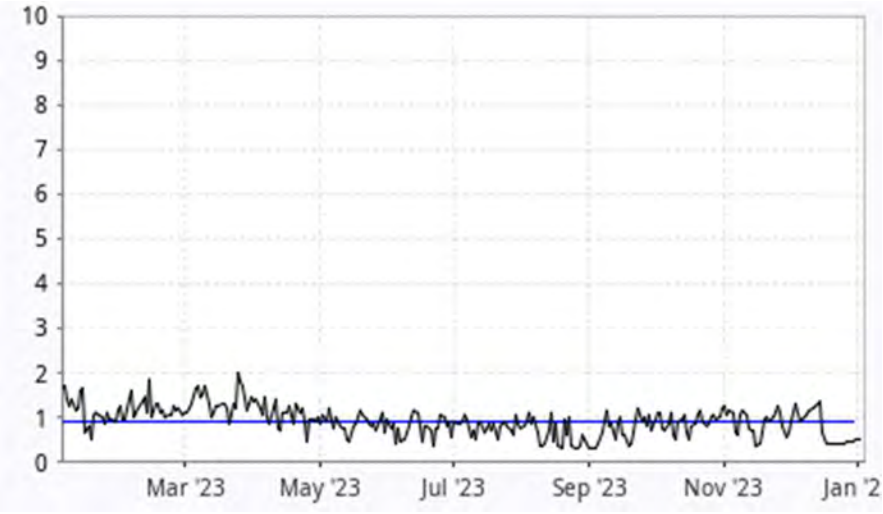

Figure 3-3: West Ditch D.O. Residual

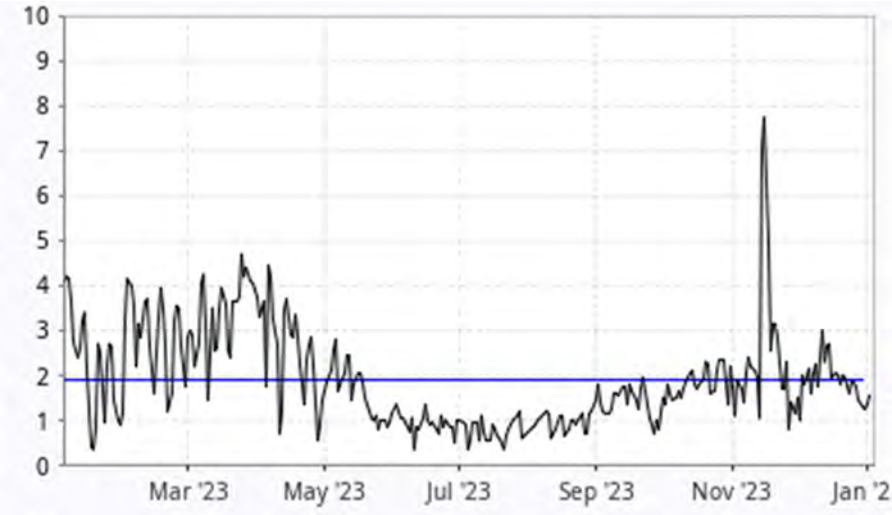

Figure 3-4: East Ditch D.O. Residual

It is important to note that two of the three turbo blowers run at 85% and the system struggles at summer flows to maintain its D.O. setpoint, indicating the blowers are running at or over capacity. As a result of fixed speed, the D.O. probe reading at AIT_0241 indicates reduced D.O. during summer months. Increasing the blower speed to 100% may improve summer D.O. performance, however, the plant operators are concerned about running the system to 100% since the blowers are aging, originally installed in 2007. It is recommended to use flow paced D.O. control rather than the current fixed speed set point of 85%. Flow pacing is expected to help correct the wide annual swings in the east ditch.

The four brush aerators are original equipment for the ditches and were installed in 2000. They have been well maintained and the gearboxes on three of the units were replaced in 2022. Submersible mixers were installed in the ditches with the diffused air upgrade in 2008. Each ditch includes two mixers, which were added to enhance mixing and to maintain velocity through the ditch.

Each ditch is also equipped with two level sensors. The level of the oxidation ditch is controlled using telescoping valves to the clarifiers and flows can be isolated using adjustable influent and effluent weir gates. Careful control of the water level is critical to maximize performance and oxygen transfer. Operations staff have experienced issues with the actuated gates, specifically with the actuators not working as designed. When the actuators are inoperable, any issue with the ditch becomes more difficult to work on for maintenance in terms of flow isolation. The existing actuators either need to be repaired or a new gate design should be implemented including a manual override.

Table 3-2: Oxidation Ditch Design Criteria

Parameter	Design Value
Oxidation Ditch	
No. of Trains	2
HRT at 3.4 MGD, hr	14.9
SRT at MLSS of 3,500 mg/L and 3.4 MGD, days	11.7
Selector Zone	
Volume, MG	0.135
Zone Mixer Motor Drive, hp	2.4
Surface Aerators	
Quantity	4 (2 per train)
Manufacturer	Kruger 7.5 M Maxi - Rotors
Drive Motor, hp	50
Submerged Mixers	
Quantity	4 (2 per train)
Mixer Drive Motor, hp	12.2
Fine Bubble Diffusers	
No. of Diffuser Grids	4 (2 per train)
Total No. of Diffusers	360
Diffuser Manufacturer	EDI
Total Air Requirements, scfm	2,622
Total Air Delivered, lb O_2/hr	232.1

The fine bubble diffusers in the existing oxidation ditch recently reached the end of their service life and needed replacement. In 2022, the existing oxidation ditch was drained and the fine bubble diffusers were replaced with in kind from EDI, seen in **Figure 3-5**.

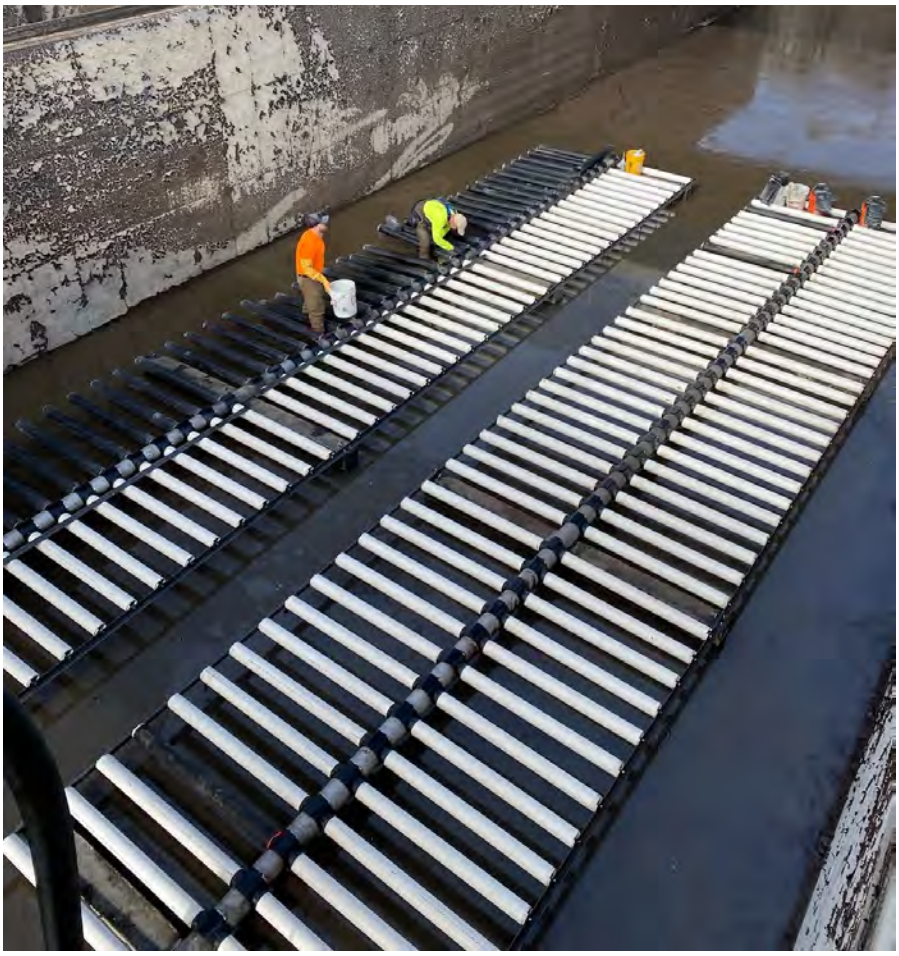

Figure 3-5: Diffuser Replacement in Oxidation Ditch

In periods of high MLSS concentration, the oxidation ditch experiences issues with foaming. It can be difficult to waste and reduce the MLSS due to inadequate solids dewatering capacity (bottleneck at screw press dewatering and solar dryer). The visual difference in the MLSS concentration in the ditch is shown in **Figure 3-6** and **Figure 3-7**. The ditches also don't have an effective means to remove and control foam.

Figure 3-6: Oxidation Ditch Foaming – High MLSS

Figure 3-7: Oxidation Ditch – Normal MLSS

Air for the diffuser grid is supplied by three turbo blowers located in the blower building, shown in **Figure 3-8**. Each blower is designed to produce up to 2,660 scfm. Additional blower design criteria is shown in **Table 3-3**. Operations staff have indicated the existing blowers are working well and do not need replacement. However, as previously mentioned, they were originally installed in 2007 and do need to be monitored for performance deficiencies due to aging infrastructure. The current blowers will also be able to supply an additional 360 diffuser sleeves in the future and still provide one standby blower. If new diffusers were installed in both the existing oxidation ditches and a new oxidation ditch, the blower building would require an expansion to accommodate. Adding more diffused air to the existing ditch will only moderately improve performance due to the relatively shallow sidewater depth.

Figure 3-8: Existing Neuros Blowers in Blower Building

Table 3-3: Blower Design Criteria

Parameter	Design Value
Oxidation Ditch	
Manufacturer	Neuros
Model	Turbo Blower NX75
Quantity	2 duty / 1 standby
Pressure at diffusers	5.25 psig
Total airflow required	2,622 scfm
Maximum airflow, each blower	2,660 scfm

3.3.3 Splitter Box No.2

The purpose of the splitter box downstream of the oxidation ditch is to evenly distribute flows between the secondary clarifiers. The splitter box has the capacity to supply the three current secondary clarifiers and is designed for one additional clarifier, for a total of four. The system was upgraded in 2008 during Phase 1A to address weir submergence.

3.3.4 Secondary Clarification

The objective of the secondary clarifier is for liquid/solids separation by gravity settling of MLSS from the ditches. Currently the plant has three spiral blade 60-foot clarifiers, summarized in **Table 3-4**. The older two clarifiers (Clarifier #1 and Clarifier #2) are manufactured by WesTech and the newest clarifier (Clarifier #3) is from Envirodyne. The clarifiers typically run continuously with manual start and stop mechanisms. The clarifiers are also equipped with over torque relays to help protect the system. The surface overflow rate for the secondary clarifiers is shown in **Figure 3-9** and the solids loading rate is shown in **Figure 3-10.** As indicated in the figures, all units are required to be online during a peak flow event. Average day and maximum month flow require two clarifiers in operation. If two or more units are offline, performance would be compromised.

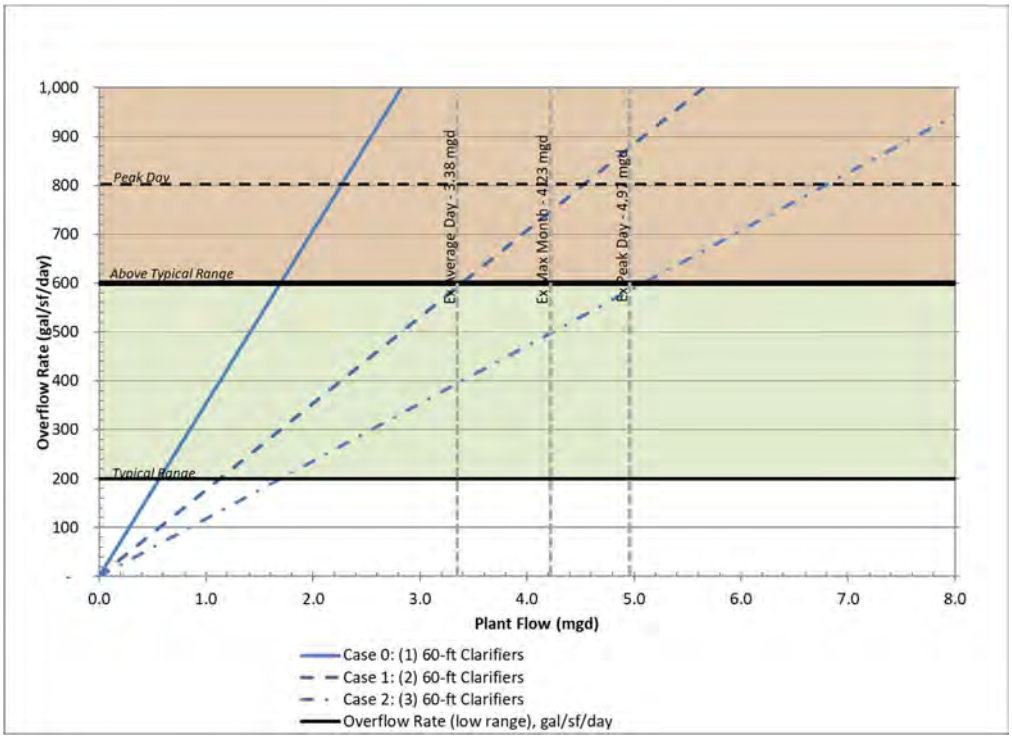

Figure 3-9: Secondary Clarifier Overflow Rate

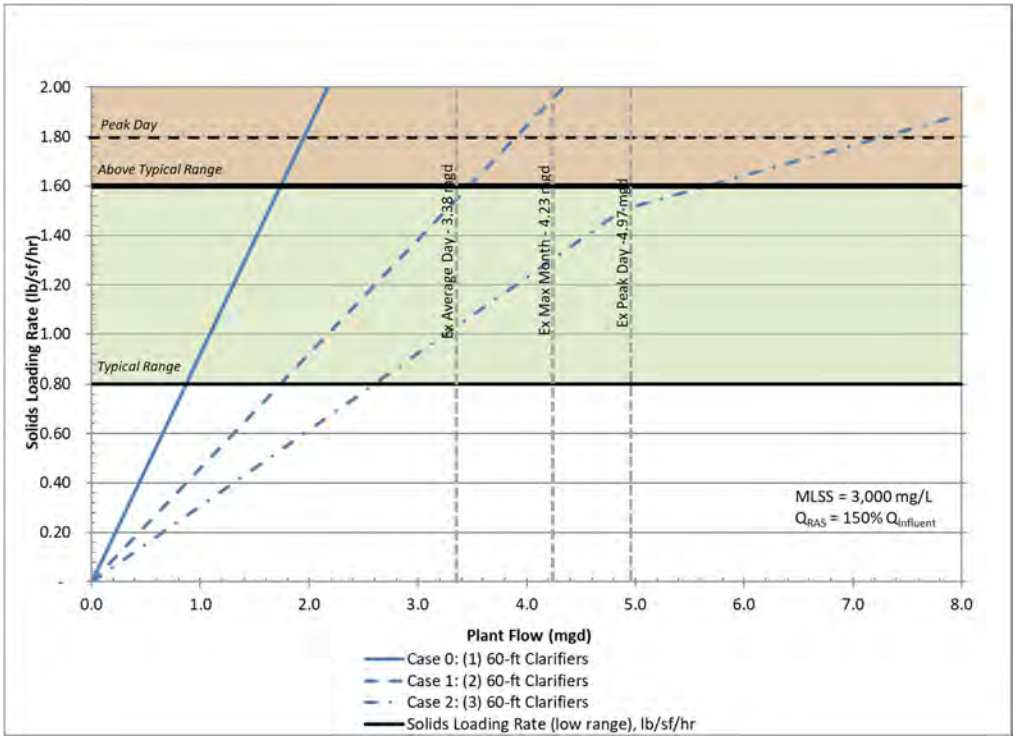

Figure 3-10: Secondary Clarifier Solids Loading Rate

Table 3-4: Secondary Clarifier Operating Conditions

Parameter	Design Value
Clarifier #1	
Diameter (ft)	60
Side water depth (ft)	12
Capacity, each (mgd)	1.13
Drive type	Cage
Drive motor (hp)	1
Manufacturer	WesTech
Clarifier #2	
Diameter (ft)	60
Side water depth (ft)	12
Capacity, each (mgd)	1.13
Drive type	Cage
Drive motor (hp)	1
Manufacturer	WesTech
Clarifier #3	
Diameter (ft)	60
Side water depth (ft)	14
Capacity, each (mgd)	1.13
Drive type	Cage
Drive motor (hp)	0.5
Manufacturer	Envirodyne

In 2022, the internal equipment of Clarifier #1 was replaced, including a new motor drive assembly, launder cover, density current baffle, energy dissipation inlet, cage truss and rake arms (seen in **Figure 3-11**), spiral blades, flocculating feedwell, and new scum box and skimmer. Since rehabilitation, the clarifier performance has significantly improved. The only remaining improvement needed for Clarifier #1 is a coating and crack repair to the exterior concrete. Due to cost constraints, these aesthetic repairs were not completed at the same time as the other improvements to the clarifier.

Figure 3-11: New Internal Mechanism in Clarifier #1

Clarifier #2 is also in need of an internal mechanism replacement. The existing drive assembly and feedwell are shown in **Figure 3-12**. The replacement would include the same improvements done to Clarifier #1, including a new motor drive assembly, launder cover, density current baffle, energy dissipation inlet, cage truss and rake arms, spiral blades, flocculating feedwell, and new scum box and skimmer.

Figure 3-12: Drive Assembly and Feedwell of Clarifier #2

Operators are not as satisfied with the operation of the newest clarifier by Envirodyne and prefer the setup of the WesTech model. The deep launders result in high attached growth. However, as it is still fairly new (installed in 2008 in Phase 1A), Clarifier #3 is working well and does not require improvements at this time. Clarifier #3 is shown in **Figure 3-13**.

Figure 3-13: Envirodyne Clarifier #3

3.3.5 RAS/WAS Pumping

Sludge is pumped from the bottom of the clarifiers by the RAS/WAS pumps. There are currently seven RAS/WAS pumps. Two RAS pumps were installed in the Clarifier #3 drywell as part of the Phase 1A upgrades, to bring the number of RAS pumps to five total**.** These two pumps utilize a separate RAS line to return flow to the existing oxidation ditch influent splitter box. These RAS pumps frequently have issues and need to be repaired, which impacts Clarifier #3 performance.

The three original RAS pumps and two WAS pumps are located in the biosolids building. At a RAS flow rate of 150% of ADF and assuming one pump is out of service, the pumps are operating near capacity. Also, the RAS/WAS pumps are over 20 years old and should be proactively monitored for performance deficiencies due to aging infrastructure. The biosolids building has reached capacity in terms of space for additional RAS/WAS pumps, shown in **Figure 3-14**. A retrofit of the existing building is not possible, so a new RAS/WAS building or vault should be explored for future expansion.

Figure 3-14: RAS/WAS Pump Station in Biosolids Building

Two new scum pumps were also installed at the same time in Phase 1A in the clarifier dry pit well. The new pumps join into the existing scum line, which feeds directly into the gravity thickener. The older scum pumps in the biosolids building were replaced with the same model as the new scum pumps in Phase 1A. Design criteria for the pumps is provided in **Table 3-5**. Each set of scum pumps run on a

duty/standby basis. Scum is removed from the top of the clarifiers and pumped to the solids holding tank using the scum pumps.

Operators have reported insufficient scum removal and deficiencies related to the clarifier drain valves for Clarifier #1 and #2. The valves are stuck closed and do not drain the clarifiers completely. The City has also indicated a preference for rotary lobe pumps for any future pumps installed.

Table 3-5: RAS/WAS Pumping Design Criteria

Parameter	Design Value
RAS Pumps #1, 2, 3	
Pump Type	Centrifugal
Quantity	3
Capacity, each (gpm)	1,340
TDH	38
Drive motor (hp)	30
Manufacturer	Hayward Gordon
RAS Pumps #4, 5	
Pump Type	Centrifugal
Quantity	2
Capacity, each (gpm)	680
TDH	38
Drive motor (hp)	15
Manufacturer	Hayward Gordon
WAS Pumps #1, #2	
Quantity	2
Type	Rotary lobe
Capacity, gpm	150
TDH, ft	40
Drive motor, hp	7.5, VFD
WAS Pump #3	
Quantity	1
Type	Positive displacement
Capacity, gpm	-
TDH, ft	-
Drive motor, hp	2, VFD
Scum Pumps	
Pump Type	Submersible
Quantity	4
Capacity, each (gpm)	170
TDH	20
Drive motor (hp)	3.4
Manufacturer	KSB Model KRT F 80-200-170

3.4 Filtration

The purpose of the tertiary filtration system is to reduce particulates in the secondary clarifier effluent. The original sand filter basins were retrofitted with new WesTech cloth disc filters in 2023. Each filter has a capacity of 8.7 MGD, with space for a third disc filter in the future. The clarified water from Clarifier #1, #2, and #3 is combined and fed into the filters. The filtered water proceeds to UV disinfection before entering the effluent distribution pond. Plant return water may also be fed through the filters. The current system is summarized in **Table 3-6**. The disc filters are housed inside the filtration building, with the interior pictured in **Figure 3-15**. Turbidity is continuously measured downstream of the filters and off-spec water is diverted to the reject pond if a spike occurs.

Table 3-6: Filtration Design Summary

Parameter	Design Value
Disc Filters	
Type	Cloth Disc
Quantity	1 duty / 1 standby
Nominal pore size, micron	10
Filter material	Polyester fiber FRP frame
Average flow rate, each (MGD)	5.1
Peak flow rate, each (MGD)	8.7
Manufacturer	WesTech
Model	SuperDisc CD2430-26
Backwash Pumps	
Type	Centrifugal
Quantity	2 (1 per filter)
Drive, hp	2.5
Capacity, gpm	218

Figure 3-15: Tertiary Filters

3.5 Disinfection

Following tertiary filtration and prior to reuse, the filtered effluent gravity flows to ultraviolet radiation (UV) disinfection for virus and pathogen inactivation. The UV system is manufactured by Suez (formerly Ozonia) and was installed in 2013. The system is contained in a below ground channel, operates under gravity flow, and consists of a single channel with 5 banks. A second channel is available in the building but was not populated with disinfection equipment. The UV disinfection building was a former chlorination facility that was retrofit for UV in 2012-2013. Operating characteristics of the UV system are summarized in **Table 3-7.**

Table 3-7: UV Design Criteria

Parameter	Design Value
UV Disinfection	
UV Technology	Open Channel Vertical Lamp Array
No. of Channels	1 duty + 1 future
Modules, each channel	4 duty, 1 standby
Lamps per module	36
Capacity, each channel (MGD)	5.85
Dose Capacity, mJ/cm^3	100,000
Disinfection Goal, no./mL	ND
Design Minimum UVT, %	65
Manufacturer	Suez (formerly Ozonia)

Channel 1 houses five UV vertical modules, four duty and one standby, four of which are shown in **Figure 3-16**. The nominal capacity of each module is 1.17 mgd; therefore, each channel can theoretically treat 5.85 mgd of secondary effluent for a buildout system capacity of 11.7 mgd. To comply with the reuse permit limit, the effluent must have a weekly median *E. coli* concentration of non-detect (ND).

The five UV vertical modules in channel 1 are in satisfactory condition, but they run constantly and are not flow paced. Several operation and maintenance issues with the UV system have been identified by plant staff:

- The bulbs are manually cleaned on a weekly basis but the vertical array modules are difficult to transport to the soaking basin for cleaning.
- The mechanical wiper system is failing.
- The electronics are outdated and the existing ballasts have been discontinued.
- The bulbs need new intensity sensors, which are difficult to source.
- There is no SCADA archiving of data.
- Several electrical equipment items fail constantly, including the control and communication cards and ballasts.
- Challenges with ordering spare parts and replacement items.

Figure 3-16: UV Channels 1 (outfitted) and 2 (future)

3.6 Utility and Reuse Water

The utility water pumps are located in the depressed section of the filtration building, shown in **Figure 3-17**. The system utilizes treated effluent to provide irrigation water for both landscaping and wash water demands throughout the plant, including yard hydrants, water fluidization for grit in the grit trap, spray water at the clarifiers, and wash water for the headworks and dewatering equipment. The pump skid has three pumps in total: two larger pumps and one jockey pump, with the design criteria summarized in **Table 3-8**. Plant staff have indicated that the utility water system has adequate capacity when all of the pumps are functioning to meet utility water demands. However, only one of the pumps is in working condition, with one pump out of service and the jockey pump is undersized. The City plans to replace all three pumps and upsize the jockey pump in the next year or two as part of their maintenance plan. It is recommended the discharge header be upsized to at least 6-inches diameter to match the utility water piping in the yard. In the interim they are installing an air gap / cross-connection system with the culinary water supply to provide a backup to the utility water system.

Figure 3-17: Utility Water Pumps

Table 3-8: Utility Water System

Parameter	Design Value
Pump #1, #2	
Pump type	Centrifugal
Quantity	2
Capacity, each (gpm)	350 gpm
TDH, ft	193-217
Drive motor, hp	40
Manufacturer	Hayward Gordon
Model	A70-10
Pump #3	
Pump type	Centrifugal
Quantity	1
Capacity, each (gpm)	50 gpm
TDH, ft	183-195
Drive motor, hp	10
Manufacturer	Hayward Gordon
Model	AA8

3.7 Reuse and Return Pumping

The reuse pumps are located in the plant water pump station building on the northeast end of the site. The system is comprised of three parallel pumps, with two larger capacity pumps and one smaller pump, shown in **Figure 3-18**. The reuse pumping system conveys effluent to the golf course storage ponds. The two large pumps may pump water to the upper off-site storage ponds, while the smaller pump can only pump to lake 1. The pump skid plate underneath the reuse pumps was replaced in 2022 as part of the miscellaneous improvements project. Plant staff have indicated that the reuse pumps have sufficient capacity to service the plant. The pumps are in good condition and run times show that a redundant pump should still be available during a peak flow event. That said, the pumps are aging and should be monitored for performance deficiencies and eventual replacement due to aging infrastructure.

Figure 3-18: Reuse Pumping System

The reuse pond is in good condition and capable of servicing the facility. The storage capacity of the reuse pond is 7.9 MG, which is more than two days of the 2025 average day flow. The reuse pond may also serve as an emergency storage pond if needed. The plant can also divert flow to the designated emergency storage pond in the event of an emergency or if the plant effluent does not meet reuse requirements. The emergency storage pond also has a storage capacity of 7.9 MG.

The return pumps are housed adjacent to the reuse pumps in the plant water pump station. The two pumps send reject flow from the emergency storage ponds to the channel upstream of the screens in the headworks. The pumps are in good condition, but run times show that a redundant pump is not available in the event of increased return flows. That said, the City has control over how fast they want to pump back to the headworks for treatment of the reject water. It is recommended to send flow back at a slower rate using a single pump to ensure a redundant pump is available and also to avoid overwhelming the existing headworks equipment. The pump base plate, shown in **Figure 3-19**

underneath the pumps is in poor condition and in need of replacement. Design criteria for the pumps is shown in **Table 3-9**.

Table 3-9: Reuse and Return Pumping Design Criteria

Parameter	Design Value
Reuse Pumps #1, #2	
Pump Type	Vertical Turbine
Model	14DKH
Capacity, each (gpm)	2,000
TDH	220
Stages	3
Drive motor (hp)	150
Manufacturer	FloWay
Reuse Pump #3	
Pump Type	Vertical Turbine
Model	14DKL
Capacity, each (gpm)	1,600
TDH	43
Stages	2
Drive motor (hp)	25
Manufacturer	FloWay
Return Pumps	
Pump Type	Vertical Turbine
Model	11JKH
Quantity	2
Capacity, each (gpm)	800
TDH	63
Drive motor (hp)	20
Manufacturer	FloWay

Figure 3-19: Return Pump Skid

3.8 Effluent Disposal

The Tooele WRF is a total reuse facility where Type 1 reclaimed water is disposed of at the adjacent golf course. The City owns and operates the 17 winter storage / reuse ponds and has a long-term agreement with the golf course for effluent disposal. Additionally, the City plans to develop a secondary water system in the northwest quadrant of the city. There is already some existing infrastructure already in place including a pump station and secondary water lines. Effluent disposal will be evaluated in more detail in a separate Pressure Irrigation Master Plan.

3.9 Solids Dewatering and Disposal

3.9.1 Thickening

The plant has an existing 30 ft diameter gravity thickener. The gravity thickener is used to thicken WAS prior to the sludge holding tank and eventual dewatering using the screw presses. Gravity thickeners are an older technology that have fallen out of favor for WAS due to poor settleability. The thickener is also undersized to meet current plant flows. In recent years, mechanical thickeners (belt or drum) have been more commonly installed for WAS thickening applications. The gravity thickener is summarized in **Table 3-10.**

Table 3-10: Gravity Thickener Design Criteria

Parameter	Design Value
Gravity Thickener	
Quantity	1
Diameter, ft	30
Side water depth, ft	10
Surface area, ft^2	707
Solids loading rate @ 3.4 MGD, $lbs/ft^2/day$	9.0
Drive motor, hp	1
Manufacturer	WesTech

3.9.2 Solids Holding

A solids holding tank, summarized in **Table 3-11**, was constructed as part of the Phase 1B upgrades project in 2011. Sludge is thickened and pumped to the tank by the RAS/WAS pumps. The tank is aerated by EDI fine bubble diffusers that are fed by two 100 hp high speed blowers located in dewatering building. The diffusers were replaced in 2022 as part of the miscellaneous improvements project. Utah Administrative Code requires that the tank meet a minimum sludge storage of 7 days. The solids holding tank is adequately sized to meet this requirement, with a sludge storage of 9-10 days under average day conditions.

Table 3-11: Solids Holding Design Criteria

Parameter	Design Value
Solids Holding Tank	
Quantity	1
Diameter, ft	65
Operating depth, ft	12
Tank depth, ft	17
Volume, gal	420,000
Sludge storage, days	9-10
Mixing cap	30 scfm/1000 ft^3
Mixing/aeration	Fine bubble diffusers
Manufacturer	EDI
Blowers	
Type	High speed turbo
Quantity	2 duty / 1 standby
Capacity, each, scfm	1,692
Drive motor, hp	100, VFD
Manufacturer	Aerzen
Model	2012 TB100-0.8S

3.9.3 Dewatering

Sludge is pumped from the Solids Holding Tank using rotary lobe dewatering pumps to two HUBER screw presses located in the Dewatering Building, as shown in **Figure 3-20**. Each screw press operates on average about 15 hours per day, seven days a week. Operations staff have indicated it is difficult to manage the MLSS/solids in the ditches due to limited screw press capacity. Additionally, the screw presses have been experiencing issues with struvite, but there are no major concerns at this time. Operators perform weekly washdowns on the screw press baskets to manage existing struvite accumulation and periodic citric acid deep cleans when necessary. No long-term performance issues have been observed in the dewatering system due to struvite. The screw presses deposit solids in a series of four conveyors. The design criteria for the dewatering and conveyance equipment is included in **Table 3-12**.

Figure 3-20: HUBER Screw Presses

Table 3-12: Solids Treatment Design Criteria

Parameter	Design Value
Solids Feed Pumps	
Type	Rotary lobe
Quantity	1 duty + 1 standby
Capacity, gpm	120 gpm
TDH, ft	60
Drive motor, hp	7.5
Manufacturer	Vogelsang
Solids Dewatering	
Type	Screw press
Quantity	2 duty
Capacity, each, lb/hr	600
Typical operating capacity, each, gpm	35
Drive motor, hp	2
Manufacturer	HUBER
Model	Rotomat RoS3
Sludge Conveying	
Type	Screw auger
Quantity	4 CV1 – horizontal CV2 – vertical CV3 – vertical CV4 - vertical
Capacity, each, lb/hr	1,000
TDH, ft	183-195
Drive motor, hp	CV1 – 3 CV2 – 5 CV3 – 3 CV4 – 3
Manufacturer	HUBER

The polymer system was replaced in 2022 as part of the miscellaneous improvements project. Two new Velodyne polymer injection units were installed, replacing the existing unit while also providing a second redundant polymer skid. Operations staff are pleased with the operation of the new units, which are working well. The new skids and their containment units are shown in **Figure 3-21**.

Figure 3-21: New Polymer Injection System

3.9.4 Solar Dryer

The solar dryer is located in the greenhouse, adjacent to the dewatering building on the southeast side of the site. There are three bays equipped with the HUBER solar dryer. Design criteria is provided in **Table 3-13**. The interior of the greenhouse is shown in **Figure 3-22**.

Table 3-13: Solar Drying Design Criteria

Parameter	Design Value
Solar Drying Beds	
Quantity	3
Type	Greenhouse, concrete floor
Motor, hp	1 ea, drive: 3 hp, VFD 2 ea, paddle: 3 hp, VFD scraper, 1 hp
Manufacturer	HUBER SRT 11

Figure 3-22: Solar Dryer Greenhouse

The solar dryer system can produce Class A biosolids in the summer, but produces unclassified biosolids in the winter while running constantly. The plant produces about 600-700 tons of biosolids per year. The design goal was to achieve Class A biosolids year-round but this has not been realized. The existing dryer system is underperforming in colder portions of the year supported by climatology data trends as it relates to change in performance. During the winter months, the relative humidity increases and the temperature, global radiation, and evaporation decreases, thereby lowering the dryer's efficiency. A

new heating system was installed to keep the greenhouse above freezing in the wintertime, but it did not improve the biosolids classification. Unclassified biosolids are disposed of at the landfill.

Operations staff have indicated the following condition and operations related items at the solar dryer process:

- Some mechanical and control systems are difficult to maintain and may be approaching the end of their life.
- Screen on solar dryer turner #2 PLC is often frozen.
- Solar dryer turner #2 drive errors with minimal sludge.
- Floors are not heated.
- Unloading area of bays lack drainage and concrete support of back pad and loading area.
- Greenhouse is not aligned west-to-east or vice versa to use full effect from the sun on the product.
- Scraper plate adjustment is difficult to operate.
- Building doors are not large enough to bring a front-end loader inside.

J-U-B has completed a full evaluation of the existing solar dryer. The tech memo with climatic data and additional information is included in **Appendix C**.

3.10 Existing Facility Capacity Summary

3.10.1 Hydraulic Capacity Assessment

Throughout the WRF's history, various equipment has been upgraded to increase the capacity of the plant. The treatment facility was originally constructed with a design capacity of 2.26 MGD. As previously mentioned, the most recent capacity upgrade project was completed in 2008, increasing the WRF capacity to 3.4 MGD (max month flow). Each process at the existing WRF has varying capacities and the current capacity evaluation of each process is listed in **Table 3-14**. Some processes, such as the headworks and UV disinfection, are typically sized at peak hour flow rates. Other areas, such as the biological process (oxidation ditch) and secondary clarifiers are typically sized at maximum month flow rates. Components highlighted in orange indicate an immediate need, while those highlighted in yellow indicate an upgrade is required in the relatively near future. Utah R317 rules recommend beginning design for improvements when unit processes approach 80% of their design capacity. The percent capacities for each system are presented in **Figure 3-23**.

Table 3-14: Capacity Analysis / Condition Assessment

Parameter	Capacity Evaluation	80% Capacity / Upgrades Required
Septage Receiving	The septage receiving station is over 20 years old and in need of an upgrade or replacement. The concrete pad requires consistent washdown to maintain cleanliness and reduce odors.	A new septage receiving station should be installed due to aging infrastructure, operations, and odor control issues.
Coarse Screening / Grit Removal	Improvements currently under construction. No major upgrades anticipated for the 20-year planning period.	No major upgrades anticipated for the 20-year planning period.
Influent Flow Metering	Improvements currently under construction. No major upgrades anticipated for the 20-year planning period.	No major upgrades anticipated for the 20-year planning period.
Oxidation Ditch	Maximum month flows exceed the oxidation ditch capacity. The ditch cannot meet the required HRT of 24 hours at maximum month flow. The existing ditch also has no redundancy during high flow events.	A new oxidation ditch should be installed to meet maximum month flow conditions and provide redundancy.
Secondary Clarification	The combined flow rating of the three secondary clarifiers is adequate under existing maximum month and peak day flow conditions. Clarifier No. 2 and No. 3 also needs an internal mechanism replacement.	New secondary clarifiers should be installed when the new oxidation ditch is installed to meet maximum month and peak day flow conditions. The internals of Clarifier No. 2 and No. 3 should be replaced due to aging infrastructure.
RAS / WAS Pumping	The RAS / WAS Pump Station in the solids building has reached capacity with no additional space for new pumps. When the new clarifiers are installed, additional RAS / WAS pumps will be required to pump the higher solids flow rates.	A new RAS / WAS Pump Station should be installed adjacent to the new clarifiers for additional pumping capacity. The existing pumps should be monitored for performance deficiencies due to aging infrastructure.
Filtration	Improvements were completed in 2023.	The third filter should be installed when flows surpass 8.7 MGD and a redundant filter is no longer available.
Disinfection	The existing UV disinfection system in channel 1 is undersized to meet the peak hour flow condition and has no redundancy. The ballasts in channel 1 are outdated and discontinued with minimal inventory available for	Channel 1 ballasts should be upgraded. Channel 2 should be outfitted with a new UV system to meet peak hour flow and provide system redundancy. Channel 1 modules should be replaced to match the Channel 2 design capacity.

	replacement.	
Plant Drain Lift Station	No major upgrades anticipated for the 20-year planning period.	No major upgrades anticipated for the 20-year planning period. The existing pumps should be monitored for performance deficiencies due to aging infrastructure.
Utility Water Pumping	No major upgrades anticipated for the 20-year planning period.	No major upgrades anticipated for the 20-year planning period. The existing pumps should be monitored for performance deficiencies due to aging infrastructure.
Reuse Pumping	The reuse pumps are adequately sized to meet existing reuse flows.	No major upgrades anticipated for the 20-year planning period. The existing pumps should be monitored for performance deficiencies due to aging infrastructure.
Return Pumping	The skid plate supporting the return pumps is deteriorating and needs replacement.	The skid plate on the return pumps should be replaced. The existing pumps should be monitored for performance deficiencies due to aging infrastructure.
Solar Dryer	The solar dryer system is not performing as intended and is experiencing issues with drying capacity, especially during the winter months.	The existing solar dryer should be retrofit to provide the plant with adequate solids drying capacity and performance. A new solar dryer and greenhouse should also be installed to address the need for expansion.
Thickening	The gravity thickener is undersized to meet current plant flows.	A new mechanical gravity thickener should be installed when the new solar dryer is constructed.
Solids Holding	The solids holding tank currently meets the UAC requirement of 7 days of solids storage.	A new solids holding tank should be installed when the new solar dryer is constructed.
Dewatering	The two screw presses are running almost full time with no system redundancy.	A new screw press should be added to provide sufficient dewatering capacity and system redundancy when the solar dryer is retrofit. A new dewatering building and accompanying equipment should be installed when the new solar dryer is constructed.

Figure 3-23: Existing System Capacity Assessment

CHAPTER 4

ALTERNATIVES DEVELOPMENT AND SELECTION

Contents

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Chapter 4

4.0 Alternative Development and Selection

4.1 Introduction

Processes within the Tooele WRF have various operational and capacity issues at today's flows and loads, as noted in **Chapter 3**. This chapter explores the impact additional flows and loads will have on the facility based on the expected permit conditions. This chapter is broken into the following subsections:

- **Section 4.2 No Action Alternative** – discusses the impacts to the facility if no upgrades are made to the facility during the 20-year planning period.
- **Section 4.3 Recommended Facility Improvements** – identifies improvements to existing processes to provide sufficient capacity during the 20-year planning period.
    - Section 4.3.1 - Preliminary Treatment
    - Section 4.3.2 - Biological Treatment
    - Section 4.3.3 - Splitter Box
    - Section 4.3.4 - Secondary Clarifiers
    - Section 4.3.5 - RAS/WAS Pump Station
    - Section 4.3.6 - Tertiary Filtration
    - Section 4.3.7 - Disinfection
    - Section 4.3.8 - Utility and Reuse Water
    - Section 4.3.9 - Reuse and Return Pumping
    - Section 4.3.10 - Solids Dewatering and Disposal
    - Section 4.3.11 - Collections
- **Section 4.4 Summary** – integrates recommendations from **Section 4.3**.

4.2 No Action Alternative

The projected impacts to the facility if no capacity improvements are made – and all available units are in service – are shown in **Figure 4-1**. The increased hydraulic loading will result in overloading the secondary clarifiers, RAS/WAS pumps, and solids holding tank. The increased flows will significantly exceed the capacity of the UV disinfection system and severely overload the oxidation ditch. It will not be possible to remove items or processes from service for maintenance and repairs and maintain treatment.

The No Action Alternative is not considered viable.

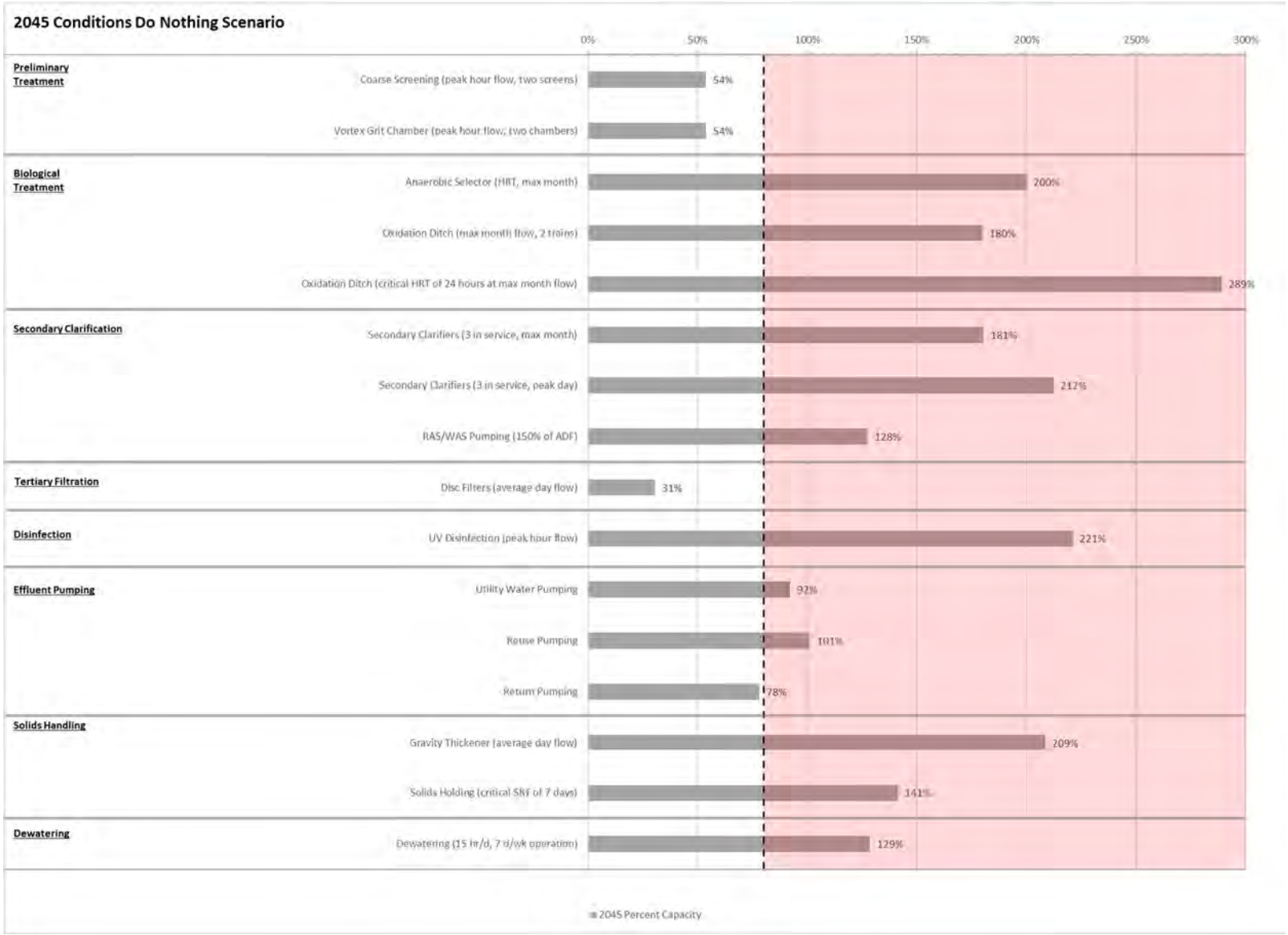

Figure 4-1: Existing System Estimated Capacity at Projected 2045 Conditions

4.3 Recommended Facility Improvements

General facility improvements required to maintain the current level of treatment at projected future flows and loads are discussed in the following subsections. The improvements developed herein generally target a capacity level of 80 percent at the 2045 projected flows and loads.

4.3.1 Preliminary Treatment

4.3.1.1 Septage Receiving

The septage receiving station is over 20 years old and in need of an upgrade or replacement. The concrete pad requires consistent washdown to maintain cleanliness and reduce odors. A new septage receiving station should be installed to address aging infrastructure, operations, and odor control issues.

Many septage receiving systems include a cam-lock receiving connection, pH monitoring, grinder, rock trap, heat tracing/insulation, and spill containment/drainage. An example package septage system is presented below in **Figure 4-2**; this system is located just upstream of the treatment facility's screens.

Figure 4-2: Example Package Septage Receiving System (Blackfoot, ID)

The above example represents a package system provided by an equipment vendor. This is a clean/functional design. Alternatively, a simplified septage receiving station could be designed at a lower cost, which would be similar to the existing system. The opinion of probable construction cost (OPCC) for the septage receiving station is shown in **Table 4-1**.

Table 4-1: Preliminary Treatment OPCC

ENGINEER'S OPINION OF PROBABLE COST - CAPITAL COSTS					
					Master Plan
PROJECT:				**DATE:**	12/21/2023
	Tooele WRF Master Plan				
PROJECT DESCRIPTION:					
	Preliminary Treatment - Septage Receiving Station				
CLIENT:					
	Tooele City				
P/N:	55-22-138				
ITEM		**SCHEDULE OF VALUES**			
NO.	**DESCRIPTION**	**QNTY**	**UNIT**	**UNIT PRICE**	**TOTAL COST**
1	Septage Receiving Station				-
2	Site demolition/clearing/grubbing	1	LS	$5,000	$5,000
3	Tie into sewer system	1	LS	$7,500	$7,500
4	Site concrete	20	CY	$850	$17,000
5	Packaged septage receiving station including grinder	1	LS	$150,000	$150,000
6	Installation			25%	$37,500
7					-
8					-
9					-
10	Additional Elements (estimated % of above)				
11	Contractor mobilization and administration			10.0%	$22,000
12	Yard Piping			15.0%	$33,000
13	Site Civil			10.0%	$22,000
14	Electrical and instrumentation			25.0%	$54,000
15	Bonding			3.0%	$7,000
16	Contractor overhead and profit			10.0%	$22,000
				SUBTOTAL	**$ 377,000**
				Construction Contingency: 30%	$ 113,000
				Geotechnical/Site Stabilization: N/A	-
				Prevailing Wages / AIS Compliance: N/A	-
				Local Bid Market Conditions10%	$ 49,000
				TOTAL PROBABLE CONSTRUCTION COST (2023 DOLLARS)	**$ 539,000**
				Design / CMS: 15%	$ 81,000
				Legal and Administrative:1%	$ 5,000
				Escalation Allowance:N/A	
				TOTAL PROBABLE PROJECT COST (2023 DOLLARS)	**$ 625,000**

4.3.1.2 Screening and Grit Removal

The new headworks building addresses hydraulic capacity limitations that the existing plant is experiencing with preliminary treatment. Following construction and start-up of the new coarse screening and grit removal equipment in 2024, no major improvements are required to maintain the current level of treatment until beyond 2045. The new headworks will also have a bypass channel, which acts as a future channel for a third screen to provide additional capacity.

4.3.2 Biological Treatment

The oxidation ditches will exceed their rated capacity before the end of the planning period. To maintain the current level of treatment at projected future flows and loads, additional biological treatment capacity will be required. As directed by city staff, the biological process design is based on meeting BOD and TSS permit requirements with limited nutrient removal, since as a total reuse facility, the City does not have permit limitations for nitrogen or phosphorus. DWQ has not indicated they will enforce nutrient limits on future reuse permits, and the city does not want to spend additional money on nutrient removal if it is not required.

4.3.2.1 Biological Treatment Alternatives

The future maximum month flows greatly exceed the capacity of the existing oxidation ditch. The ditch cannot meet the required HRT of 24 hours at maximum month flow. There is also no redundancy for biological treatment in the event the ditches need to be taken down for maintenance. According to plant staff, the ditch is not providing adequate treatment at the stated design capacity of 3.4 MGD and performance begins to deteriorate around 2.3 MGD.

Various concept treatment options were presented to City staff at the Project Kickoff Meeting for potential investigation as part of this Master Plan, including customized activated sludge for nutrient removal, membrane bioreactor, and other process alternatives. However, the City expressed a desire to maintain similar operation to existing, with a strong preference for oxidation ditches based on their operations experience and low probability of stringent nutrient removal requirements in anticipated future permit limits. Various oxidation ditch technologies as well as process intensification to the existing ditch were investigated to determine viable alternatives to address the capacity limitations at the facility.

Veolia Oxidation Ditch – Match Existing

The existing oxidation ditches are a Veolia-manufactured ditch, constructed in 2000. The original design consisted of two trains, each train equipped with two surface aerators, but was upgraded in 2008 to add blowers and fine bubble diffusers to increase the treatment capacity.

Veolia provided a proposal to match the footprint of the existing oxidation ditch, while maximizing hydraulic capacity in the available space by increasing the operating depth (20 ft vs 12 ft for the existing ditch). The new Veolia ditches would be rated for 6.0 MGD design flow, with the design criteria summarized in **Table 4-2**. The complete vendor proposal is provided in **Appendix D**. Anticipated costs for the Veolia – Match Existing alternative are shown in **Table 4-3**.

Table 4-2: Veolia 20-Year Design Criteria - Match Existing

Parameter	Design Value
Oxidation Ditch	
Influent Design Flow, MGD	6.0
No. of Trains	2
Internal Length, per ditch, ft	200
Internal Width, per ditch, ft	31
Side Water Depth, ft	20
Total System Volume, MG	3.5
HRT, hr	20.0
SRT, days	12.5
F:M ratio, day^{-1}	0.12
MLSS at 10 deg C, mg/L	3,500
Mixer Quantity	8 (4 per train)
Mixer Model	TR221 Submersible Mixer
Selector Zone	
Number of tanks	3
Length/Width, per tank, ft	20/28
Side Water Depth, ft	20.7
Total Anaerobic Volume, MG	0.27
HRT, hr	1.5
Mixer Quantity	3 (1 per tank)
Mixer Model	TR60 Submersible Mixer
Fine Bubble Diffusers	
No. of Diffuser Grids	2
Blower Quantity	3 duty / 1 standby
Blower hp, each	150
Total Air Delivered, lb O_2/day, average	13,685
Total Air Delivered, lb O_2/day, peak	17,790

Table 4-3: Veolia - Match Existing Oxidation Ditch OPCC

ENGINEER'S OPINION OF PROBABLE COST - CAPITAL COSTS					
					Master Plan
PROJECT:				**DATE:**	12/21/2023
	Tooele WRF Master Plan				
PROJECT DESCRIPTION:					
	Oxidation Ditch Alternative 1: Veolia Match Existing				
CLIENT:					
	Tooele City				
P/N:	55-22-138				
ITEM		**SCHEDULE OF VALUES**			
NO.	**DESCRIPTION**	**QNTY**	**UNIT**	**UNIT PRICE**	**TOTAL COST**
1	New Oxidation Ditch				-
2	Site Work				-
3	Excavation	32,889	CY	$30	$986,667
4	Structural fill	1,809	CY	$40	$72,356
5	Clearing and grubbing	1	LS	$25,000	$25,000
6					-
7	Concrete				-
8	Base Slab	2,193	CY	$600	$1,315,556
9	Walls	1,111	CY	$750	$833,333
10	Elevated Slab/Walkway	79	CY	$1,200	$94,862
11	Grout Floor	1	LS	$25,000	$25,000
12					-
13	Vendor Equipment (scope of supply listed below)	1	LS	$2,399,500	$2,399,500
14	Mixers	7	EA		-
15	Positive displacement blowers (2 duty + 1 standby)	3	EA		-
16	Fine bubble aeration system	2	EA		-
17	Modulating airflow control valves	2	EA		-
18	Influent flow distributors	1	EA		-
19	Effluent flow control weirs	2	EA		-
20	Process air flow meter	2	EA		-
21	Dissolved oxygen probe	2	EA		-
22	PLC control cabinet	1	EA		-
23	Installation			25%	$599,900
24					-
25	Piping & Valves				-
26	SS Air Piping	250	LF	$250	$62,500
27	SS Iso Valves	2	EA	$5,000	$10,000
28	SS Control Valves	2	EA	$20,000	$40,000
29	Weir Gates	1	EA	$15,000	$15,000
30	Slide Gates	2	EA	$10,000	$20,000
31					-
32	Misc Metals				-
33	Stairs	1	LS	$50,000	$50,000
34	Aluminum Handrail	1	LS	$75,000	$75,000
35					-
36	Blower Building	2625	SF	$330	$866,250
37					-
38					
39	Additional Elements (estimated % of above)				
40	Contractor mobilization and administration			10.0%	$749,000
41	Yard Piping			20.0%	$1,498,000
42	Site Civil			15.0%	$1,124,000
43	Electrical and instrumentation			35.0%	$2,622,000
44	Bonding			3.0%	$225,000
45	Contractor overhead and profit			10.0%	$749,000
				SUBTOTAL	**$ 14,458,000**
				Construction Contingency: 30%	$ 4,337,000
				Geotechnical/Site Stabilization: N/A	-
				Prevailing Wages / AIS Compliance: N/A	-
				Local Bid Market Conditions10%	$ 1,880,000
				TOTAL PROBABLE CONSTRUCTION COST (2023 DOLLARS)	**$ 20,675,000**
				Design / CMS: 15%	$ 2,819,000
				Legal and Administrative:1%	$ 188,000
				Escalation Allowance:N/A	-
				TOTAL PROBABLE PROJECT COST (2023 DOLLARS)	**$ 23,682,000**

WesTech Oxidation Ditch – Surface Aeration

WesTech provided a proposal for a new oxidation ditch, which would comprise of two straight trains, but with a deeper basin depth than existing (18 ft vs. 12 ft). The WesTech ditch would be rated for 6.5 MGD maximum month design flow. Aeration would be provided by four surface aerators. These aerators are accessible from the surface, so the ditches would not need to be drained for maintenance activities as is the case for diffused air. The design criteria for this option is presented in **Table 4-4**. The full proposal and preliminary design drawings are provided in **Appendix D**. Costs for the new WesTech Surface Aeration alternative are shown in **Table 4-5**.

Table 4-4: WesTech 20-Year Design Criteria - Surface Aeration

Parameter	Design Value
Oxidation Ditch	
Average Flow, MGD	4.9
Design Flow, MGD	6.5
Peak Flow, MGD	13.7
Internal Length, ft	175
Internal Width, ft	71
Basin Depth, ft	18
Surface Aerators	
Quantity	4
Model	Landy7
Drive Motor, hp	200
Manufacturer Details	
Manufacturer	WesTech
Ditch Type	OxyStream Biological Nutrient Removal Systems
Ditch Model	AES2A3

Table 4-5: WesTech Surface Aeration Oxidation Ditch OPCC

ENGINEER'S OPINION OF PROBABLE COST - CAPITAL COSTS					
					Master Plan
PROJECT:				**DATE:**	12/21/2023
	Tooele WRF Master Plan				
PROJECT DESCRIPTION:					
	Oxidation Ditch Alternative 2: WesTech Surface Aeration				
CLIENT:					
	Tooele City				
P/N:	55-22-138				
ITEM		**SCHEDULE OF VALUES**			
NO.	**DESCRIPTION**	**QNTY**	**UNIT**	**UNIT PRICE**	**TOTAL COST**
1	New Oxidation Ditch				-
2	Site Work				-
3	Excavation	40,069	CY	$30	$1,202,000
4	Structural fill	2,671	CY	$40	$107,000
5	Clearing and grubbing	1	LS	$25,000	$25,000
6					
7	Concrete				
8	Base Slab	2,671	CY	$600	$1,603,000
9	Walls	1,700	CY	$750	$1,275,000
10	Elevated Slab	716	CY	$1,200	$859,000
11	Grout Floor	1	LS	$25,000	$25,000
12					
13	Vendor Equipment (scope of supply listed below)	1	LS	$1,276,000	$1,276,000
14	Surface aerators	4	EA		
15	VFD	4	EA		
16	Dissolved oxygen probes and controllers	4	EA		
17	PLC control cabinet	1	EA		
18	Installation			25%	$319,000
19					
20	Piping & Valves				
21	Weir Gates	2	EA	$15,000	$30,000
22	Slide Gates	2	EA	$10,000	$20,000
23					
24	Misc Metals				
25	Stairs	1	LS	$50,000	$50,000
26	Aluminum Handrail	1	LS	$75,000	$75,000
27					
28	Contractor mobilization and administration			10.0%	$687,000
29	Yard Piping			20.0%	$1,373,000
30	Site Civil			15.0%	$1,030,000
31	Electrical and instrumentation			35.0%	$2,403,000
32	Bonding			3.0%	$206,000
33	Contractor overhead and profit			10.0%	$687,000
				SUBTOTAL	**$ 13,252,000**
				Construction Contingency: 30%	$ 3,976,000
				Geotechnical/Site Stabilization: N/A	-
				Prevailing Wages / AIS Compliance: N/A	-
				Local Bid Market Conditions10%	$ 1,723,000
				TOTAL PROBABLE CONSTRUCTION COST (2023 DOLLARS)	**$ 18,951,000**
				Design / CMS: 15%	$ 2,584,000
				Legal and Administrative:1%	$ 172,000
				Escalation Allowance:N/A	-
				TOTAL PROBABLE PROJECT COST (2023 DOLLARS)	**$ 21,707,000**

Process Intensification

Another alternative to constructing a new oxidation ditch is introducing a process intensification option to the existing ditch to increase treatment capacity. Three vendors were consulted for their input on pros and cons of their process. In all cases, not constructing a new ditch results in a lack of redundancy for the city. The feedback is summarized in the following sections.

BioMag Retrofit

The BioMag system is a patented technology that uses magnetite, fine particles of iron ore, to enhance the settleability of the sludge. This would allow the ditches to operate at a much higher MLSS concentration, thus increasing their capacity. Magnetite is a very dense material with a specific gravity of 5.2 and when combined with either a chemical or biological floc, increases the specific gravity and thus the settling rate of the floc. The high rate settling enables capacity increases without new tank volume as the system can handle greater loads, flows, or both. It also allows operators greater control of the sludge blanket, as well as improves flow and load management. Magnetite powder is added to the activated sludge process and then reclaimed from the waste activated solids prior to dewatering. **Table 4-6** summarizes the pros and cons of the BioMag process. Costs for the Biomag Retrofit are included in **Table 4-7**. The Biomag process would require an additional clarifier, which is accounted for in the secondary clarification costs, discussed in the next section. The addition of a BioMag system to the existing ditch would increase the rated maximum month flow of the ditch to 6.12 MGD.

Table 4-6: BioMag Process Pros and Cons

Pros	Cons
• Double throughput for existing infrastructure	• High capital cost for new equipment (magnetite recovery equipment and piping, silo and feed system, retrofit of WAS/RAS pumps to handle magnetite, and additional mixing capacity to keep magnetite suspend in the ditch)
• Improved sludge settleability	• High O&M - regular purchases and shipping costs for non-recovered magnetite, locked into a contract with BioMag
• Biological process operation remains unchanged	• New technology with few installations
	• Additional oxygen will be required to increase capacity/loading and oxygen transfer has already been maximized at the ditch; due to shallow depth it will be difficult and inefficient to transfer additional oxygen. If this option is selected, further evaluation of vendor-stated capacity increases is recommended.
	• Increased operational complexity

Table 4-7: Biomag Retrofit OPCC

ENGINEER'S OPINION OF PROBABLE COST - CAPITAL COSTS					
					Master Plan
PROJECT:				**DATE:**	12/21/2023
	Tooele WRF Master Plan				
PROJECT DESCRIPTION:					
	Oxidation Ditch BioMag Retrofit				
CLIENT:					
	Tooele City				
P/N:	55-22-138				
ITEM		**SCHEDULE OF VALUES**			
NO.	**DESCRIPTION**	**QNTY**	**UNIT**	**UNIT PRICE**	**TOTAL COST**
1	Retrofit of existing ditch				-
2	Vendor Supplied BioMag System (scope of supply listed below)	1	LS	$2,800,000	$2,800,000
3	Ballast storage & feed system	1	LS		-
4	Ballast recovery system	1	LS		-
5	Control system hardware	1	LS		-
6	Engineering support and training	1	LS		-
7	Spare parts	1	LS	$90,000	$90,000
8	Installation			40%	$1,120,000
9	Equipment support building CMU - 30 ft x 45 ft	1,350	SF	$300	$405,000
10	Horizontal mixers	6	EA	$40,000	$240,000
11	Initial magnetite supply	100	ton	$680	$68,000
12	Blower Building Extension	1,200	SF	$300	$360,000
13	Blowers	3	EA	$100,000	$300,000
14	Piping	1	LS	$150,000	$150,000
15	Additional Elements (estimated % of above)				
16	Contractor mobilization and administration			10.0%	$538,000
17	Yard Piping			20.0%	$1,077,000
18	Site Civil			15.0%	$807,000
19	Electrical and instrumentation			35.0%	$1,884,000
20	Bonding			3.0%	$161,000
21	Contractor overhead and profit			10.0%	$538,000
				SUBTOTAL	**$ 10,538,000**
				Construction Contingency: 30%	$ 3,161,000
				Geotechnical/Site Stabilization: N/A	-
				Prevailing Wages / AIS Compliance: N/A	-
				Local Bid Market Conditions10%	$ 1,370,000
				TOTAL PROBABLE CONSTRUCTION COST (2023 DOLLARS)	**$ 15,069,000**
				Design / CMS: 15%	$ 2,055,000
				Legal and Administrative:1%	$ 137,000
				Escalation Allowance:N/A	-
				TOTAL PROBABLE PROJECT COST (2023 DOLLARS)	**$ 17,261,000**

IFAS Retrofit

The integrated fixed film activated sludge (IFAS) process is a patented technology that provides biological wastewater treatment by adding an attached growth media to an activated sludge tank to increase biomass within existing tanks. In an IFAS system, biomass carriers are introduced to the system in select zones within the activated sludge process so two different biological populations act together. Dispersed media is spread throughout the aeration basin and fixed media is fixed in place in the aeration basin. Examples of dispersed media are polypropylene finned cylinders or sponges and examples of fixed

media include PVC structured sheet media and fabric web-type media. The major differences between IFAS and conventional activated sludge are the combination of aerobic, anerobic, and anoxic zones and increased sludge retention time in IFAS. **Table 4-8** summarizes the pros and cons of the IFAS process.

Table 4-8: IFAS Process Pros and Cons

Pros	Cons
• Increase in the effective mixed-liquor concentration as high as 8,000 mg/L	• Potential upgrade required of preliminary treatment equipment to prevent accumulation of inert material on the media and in the ditch
• Increased capacity by adding media to existing infrastructure	• High O&M for regular purchases and shipping costs for media
• More stable nitrification community due to high attached growth inventory	• Increased operational complexity

A preliminary design for retrofitting Tooele's existing ditch with IFAS was investigated. The low side water depth of 12 ft (and potentially lower as least 2 ft of freeboard is required) will limit the hydraulic capacity as well as result in a higher O&M cost on aeration. The high air to volume ratio further limits the organic load to the system that IFAS would be able to treat. Therefore, the IFAS team does not recommend converting the existing ditch to an IFAS system.

AquaNereda Retrofit

The AquaNereda Aerobic Granular Sludge Technology is a patented technology that provides biological wastewater treatment, including enhanced nutrient removal, using aerobic granular biomass. Potential advantages of aerobic granular sludge include smaller footprint, less energy, and reduced chemical consumption compared to conventional activated sludge systems. Also, in contrast to conventional activated sludge systems, no secondary clarifiers or return sludge pumping stations are needed. The unique characteristics of the granular biomass allow for an optimized batch cycle process. There are three main phases to the cycle: simultaneous fill/draw, react, and fast settling. The duration of these phases depends on the specific wastewater characteristics, flow, and effluent standards. There are aerobic, anoxic, and anaerobic zones in the granules that allow for nitrification, denitrification, and VFA uptake/phosphorus release, respectively. These granules have excellent settling properties, thus a separate decant phase, as utilized for conventional sequencing batch reactors, is not required. Also, less chemicals are needed for nutrient removal due to the structure of the granules. **Table 4-9** summarizes the pros and cons of the AquaNereda process.

Table 4-9: AquaNereda Process Pros and Cons

Pros	Cons
• Granular sludge formed in the process is hardy and can withstand fluctuations in chemical spikes, loads, salt, pH, and toxic shocks	• Recommended minimum ditch depth of 16 ft. Can operate system in ditches with depths as low as 12 ft, but will not achieve the same throughput
• Better sludge settling	• Batch process, therefore pre and post equalization basins required for upset conditions
• Low to moderate O&M	• New technology with few installations
• Excellent technical support from the manufacturer for clients	• Some type of chemical phosphorous removal is required

Due to significant operational changes as a batch process with equalization basins, this process intensification option was not investigated further.

4.3.2.2 Recommended Biological Treatment Process Alternative

The two alternatives from Veolia and WesTech and the idea of process intensification were presented to the City at the Alternatives Workshop. At this workshop, the City determined that the process intensification option on its own without constructing a new ditch was not considered viable due to lack of redundancy. However, the existing ditch can be retrofitted for Biomag or similar process intensification in Phase 3 (after construction of the new ditch) to provide the City with additional treatment capacity in the limited footprint. Alternatively, due to concerns with the relatively shallow depth of the existing ditch and related difficulty to squeeze additional capacity out of it, it may be recommended to demo and replace the ditch entirely with a new 20 ft deep ditch within the same footprint. These options will be evaluated further in approximately 20 years when redundant oxidation ditch improvements may be needed after the new ditch is constructed.

Based on a discussion of the pros and cons for each new ditch option, the City selected the **Veolia Oxidation Ditch – Match Existing** option to address biological treatment process deficiencies. A significant benefit of this alternative is that operation of the new ditch would be identical to existing, which was an important reason for the City to prefer the Veolia ditch with blowers/diffused aeration over WesTech surface aeration. Since the new ditch will be optimally designed for diffused aeration at 20 ft deep vs the existing 12 ft deep ditch, the capacity of the proposed ditch will be greatly increased over existing.

4.3.3 Splitter Box

A new splitter box No. 1 is recommended as the existing splitter box has been experiencing issues with the adjustable weirs and hydraulic capacity.

The existing splitter box No. 2 was sized to supply four secondary clarifiers. It is expected that at least two new secondary clarifiers will be needed to support the selected oxidation ditch, resulting in a total of five or six units. Since splitter two is designed as a four-way splitter, a new splitter box is anticipated.

4.3.4 Secondary Clarification

The facility has three existing 60-ft clarifiers. Two additional secondary clarifiers are required to maintain an acceptable hydraulic and solid loading rate on the clarifiers during peak conditions. It is anticipated these will be installed at the same time as the new oxidation ditch. Footprint on the site is not available to install three new 60-ft clarifiers. Instead, two new 90-ft clarifiers are recommended. The overflow rate with four and five clarifiers in service is shown in **Figure 4-3** and the solids loading rate is shown in **Figure 4-4.** A minimum of four clarifiers will be required for the design average day flow and all five clarifiers will be required at the design maximum month flow. The scenarios presented in the figures represent the following:

- Case 3: (3) 60-ft Clarifiers and (1) 90-ft Clarifier (one 90-ft Clarifier out of service)
- Case 4: (2) 60-ft Clarifiers and (2) 90-ft Clarifiers (one 60-ft Clarifier out of service)
- Case 5: (3) 60-ft Clarifiers and (2) 90-ft Clarifiers (all units online)

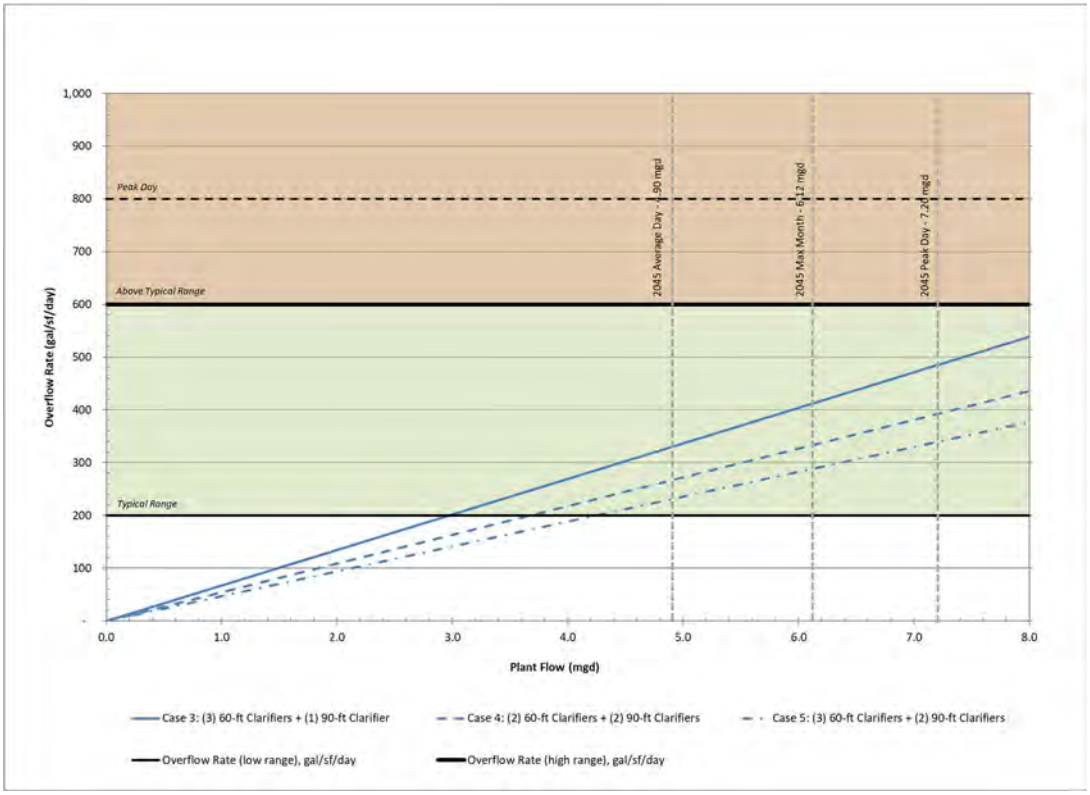

Figure 4-3: Clarifier Overflow Rate with Additional Units

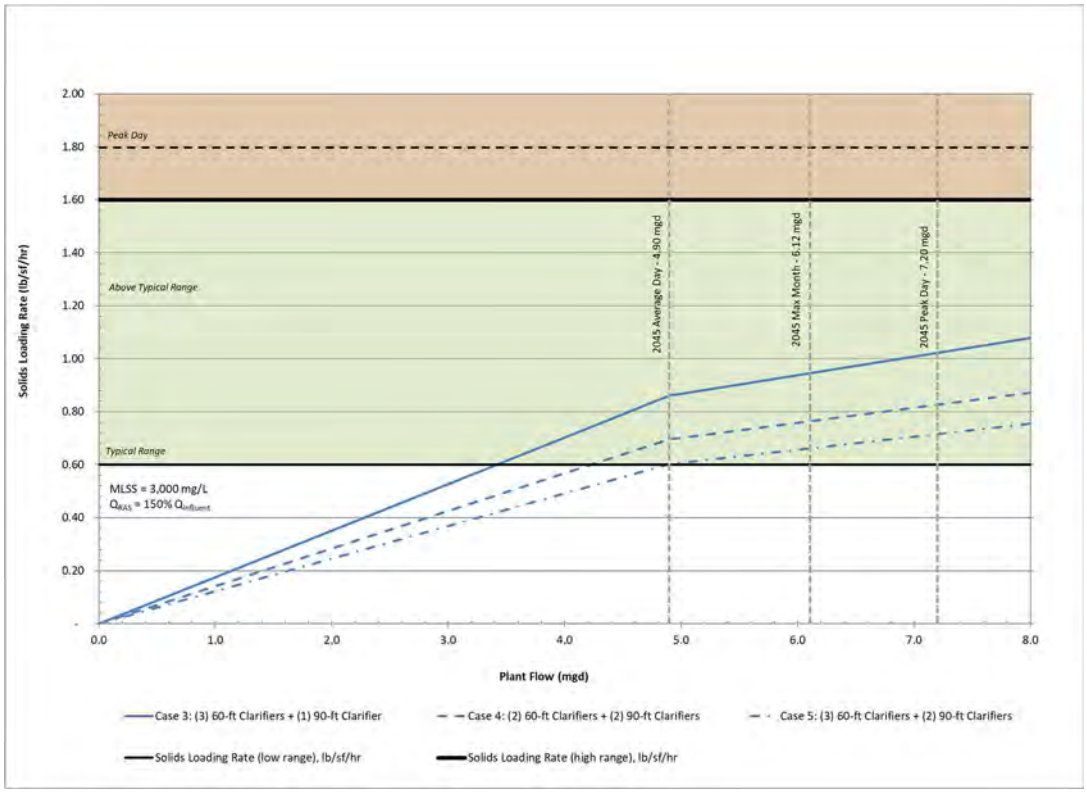

Figure 4-4: Clarifier Solids Loading Rate with Additional Units

Design criteria for the new clarifiers are shown in **Table 4-10.** The City's preference is to sole source future clarifiers from WesTech to match their existing Clarifiers No. 1 and 2. Additionally, the drain valves for Clarifiers #1 and #2 located in the clarifier valve vault should be replaced.

Table 4-10: Secondary Clarification Design Criteria

Parameter	Units	Design Value
Secondary Clarifiers - No. 4, No. 5		
Diameter	ft	90
Sidewater depth	ft	14
Capacity, each	MGD	2.93
Floor Slope	-	0.5:12
Rake Configuration	-	Spiral Rake Arm
Manufacturer	-	WesTech
Overflow Rate, 5 Clarifiers in Operation		
Average Day, 2045	gpd/sf	231
Max Month, 2045	gpd/sf	289
Peak Day, 2045	gpd/sf	340
Solids Loading Rate, 5 Clarifiers in Operation (RAS Flow at 150% of Influent)		
Average Day, 2045	pph/sf	1.00
Max Month, 2045	pph/sf	1.10
Peak Day, 2045	pph/sf	1.19

Detailed costs for the new clarifiers are shown on the next page in **Table 4-11.**

Table 4-11: Secondary Clarification OPCC

ENGINEER'S OPINION OF PROBABLE COST - CAPITAL COSTS					
					Master Plan
PROJECT:				**DATE:**	12/21/2023
	Tooele WRF Master Plan				
PROJECT DESCRIPTION:					
	Secondary Clarification - Rehab #2 and #3, New #4 and #5				
CLIENT:					
	Tooele City				
P/N:	55-22-138				
ITEM		**SCHEDULE OF VALUES**			
NO.	**DESCRIPTION**	**QNTY**	**UNIT**	**UNIT PRICE**	**TOTAL COST**
1	New Splitter Box No. 1	1	LS	$250,000	$250,000
2	New Splitter Box No. 2	1	LS	$250,000	$250,000
3					
4	Clarifier Valve Vault				-
5	Clarifier #1 drain valve replacement	1	EA	$25,000	$25,000
6	Clarifier #2 drain valve replacement	1	EA	$25,000	$25,000
7					
8	Secondary Clarifier #2 Upgrades				-
9	Internal mechanism replacement	1	LS	$357,000	$357,000
10	Launder covers	1	LS	$40,000	$40,000
11					
12	Secondary Clarifier #3 Upgrades				-
13	Internal mechanism replacement	1	LS	$357,000	$357,000
14	Launder covers	1	LS	$40,000	$40,000
15					
16	Secondary Clarifier #4 - NEW				-
17	Excavation	6,345	LS	$30	$190,000
18	Shoring	1	LS	$50,000	$50,000
19	Backfill	2,575	CY	$20	$51,000
20	Concrete				
21	Floor	64	CY	$650	$42,000
22	Walls	225	CY	$1,250	$281,000
23	Launder floor	32	CY	$1,250	$40,000
24	Launder wall	65	CY	$1,250	$82,000
25	Grout floor	10	CY	$1,250	$12,000
26	Clarifier mechanism	1	LS	$395,700	$396,000
27	FRP effluent weirs and baffles	1	LS	$16,550	$17,000
28	FRP density current baffles	1	LS	$78,500	$79,000
29	Prime coat	1	LS	$25,000	$25,000
30	Launder covers	1	LS	$40,000	$40,000
31	Mechanism coating	1	LS	$50,000	$50,000
32	MLSS feed piping	180	LF	$500	$90,000
33	Effluent piping	150	LF	$500	$75,000
34	RAS to RAS/WAS pump station	135	LF	$500	$68,000
35	WAS to existing drain line	135	LF	$300	$41,000
36	Scum piping to existing drain line	135	LF	$300	$41,000
37					-
38	Secondary Clarifier #5 - NEW	1	LS	$1,670,000	$1,670,000
39					-
40	Biomag Secondary Clarifier #6 - NEW	1	LS	$1,670,000	$1,670,000
41					-
42	Additional Elements (estimated % of above)				
43	Contractor mobilization and administration			10.0%	$635,000
44	Yard Piping			10.0%	$635,000
45	Site Civil			5.0%	$318,000
46	Electrical and instrumentation			15.0%	$953,000
47	Bonding			3.0%	$191,000
48	Contractor overhead and profit			10.0%	$635,000
				SUBTOTAL	**$ 9,721,000**
				Construction Contingency: 30%	$ 2,916,000
				Geotechnical/Site Stabilization: N/A	-
				Prevailing Wages / AIS Compliance: N/A	-
				Local Bid Market Conditions10%	$ 1,264,000
				TOTAL PROBABLE CONSTRUCTION COST (2023 DOLLARS)	**$ 13,901,000**
				Design / CMS: 15%	$ 1,896,000
				Legal and Administrative:1%	$ 126,000
				Escalation Allowance:N/A	-
				TOTAL PROBABLE PROJECT COST (2023 DOLLARS)	**$ 15,923,000**

4.3.5 RAS/WAS Pump Station

With the addition of new clarifiers, a new RAS / WAS pump station will be required. A RAS and WAS pump are required for each clarifier plus one standby pump for a total of three new RAS pumps and two new WAS pumps. The new building is recommended for installation between the new clarifiers.

Table 4-12: RAS/WAS Pumping OPCC

ENGINEER'S OPINION OF PROBABLE COST - CAPITAL COSTS					
					Master Plan
PROJECT:				**DATE:**	12/21/2023
	Tooele WRF Master Plan				
PROJECT DESCRIPTION:					
	RAS/WAS Pumping				
CLIENT:					
	Tooele City				
P/N:	55-22-138				
ITEM		**SCHEDULE OF VALUES**			
NO.	**DESCRIPTION**	**QNTY**	**UNIT**	**UNIT PRICE**	**TOTAL COST**
1	RAS / WAS Pump Station				-
2	Structure (assuming 200 SF per pump and some excavation for improved suction conditions)	1,800	SF	$325	$585,000
3	RAS Pump - 1 per clarifier plus 1 standby	3	EA	$50,000	$150,000
4	Installation			15%	$22,500
5	WAS Pump - 1 per clarifier plus 1 standby	2	EA	$35,000	$70,000
6	Installation			15%	$10,500
7	Valves (suction & discharge per pump)	10	EA	$10,000	$100,000
8	Piping	1	LS	$125,000	$125,000
9					
10	Additional Elements (estimated % of above)				
11	Contractor mobilization and administration			10.0%	$106,000
12	Yard Piping			20.0%	$213,000
13	Site Civil			20.0%	$213,000
14	Electrical and instrumentation			35.0%	$372,000
15	Bonding			3.0%	$32,000
16	Contractor overhead and profit			10.0%	$106,000
				SUBTOTAL	**$ 2,105,000**
				Construction Contingency: 30%	$ 632,000
				Geotechnical/Site Stabilization: N/A	-
				Prevailing Wages / AIS Compliance: N/A	-
				Local Bid Market Conditions10%	$ 274,000
				TOTAL PROBABLE CONSTRUCTION COST (2023 DOLLARS)	**$ 3,011,000**
				Design / CMS: 15%	$ 411,000
				Legal and Administrative:1%	$ 27,000
				Escalation Allowance:N/A	-
				TOTAL PROBABLE PROJECT COST (2023 DOLLARS)	**$ 3,449,000**

4.3.6 Filtration

No major improvements to the existing filtration system are required to maintain the current level of treatment in 2045. Each filter has a hydraulic capacity of 8.7 MGD, which will handle peak day flows. The filtration building has an additional channel that will be populated with the third filter once peak day flows surpass 8.7 MGD and a fully redundant unit is no longer available. The cost for furnishing and installing the third filter is provided in **Table 4-13**.

Table 4-13: Filtration OPCC

ENGINEER'S OPINION OF PROBABLE COST - CAPITAL COSTS					
					Master Plan
PROJECT:				**DATE:**	12/21/2023
	Tooele WRF Master Plan				
PROJECT DESCRIPTION:					
	Filtration - New Third Filter				
CLIENT:					
	Tooele City				
P/N:	55-22-138				
ITEM		**SCHEDULE OF VALUES**			
NO.	**DESCRIPTION**	**QNTY**	**UNIT**	**UNIT PRICE**	**TOTAL COST**
1	Furnish and install third filter	1	LS	$700,000	$700,000
2					-
3					-
4					-
5	Additional Elements (estimated % of above)				-
6	Contractor mobilization and administration			10.0%	$70,000
7	Yard Piping			0.0%	$0
8	Site Civil			0.0%	$0
9	Electrical and instrumentation			25.0%	$175,000
10	Bonding			3.0%	$21,000
11	Contractor overhead and profit			10.0%	$70,000
				SUBTOTAL	**$ 1,036,000**
				Construction Contingency: 30%	$ 311,000
				Geotechnical/Site Stabilization: N/A	-
				Prevailing Wages / AIS Compliance: N/A	-
				Local Bid Market Conditions10%	$ 135,000
				TOTAL PROBABLE CONSTRUCTION COST (2023 DOLLARS)	**$ 1,748,000**
				Design / CMS: 15%	$ 202,000
				Legal and Administrative:1%	$ 13,000
				Escalation Allowance:N/A	-
				TOTAL PROBABLE PROJECT COST (2023 DOLLARS)	**$ 1,963,000**

4.3.7 Disinfection

One of the more pressing limitations of the existing facility is the feed into the UV disinfection modules. The current channel 1 has a maximum capacity of 5.85 MGD with 4.5 banks, leaving a half bank on standby. The 2045 peak hour flow of 12.9 MGD surpasses the limit of the existing UV system. To meet the 20-year flows, an additional UV disinfection system is required in channel 2. The existing channel 1 has vertical banks, which are difficult to remove for proper cleaning of the bulbs. It is recommended to install vertically inclined banks in channel 2 to address operator concerns and meet peak hour flow rates. For ultimate flexibility and to achieve proper disinfection doses for Type I reuse, channel 2 would need to be extended to fit six banks. Both channels 1 and 2 currently have space for five banks. With six banks, channel 2 could treat up to 12.9 MGD treating to standard disinfection limits (surface water discharge) and up to 7.5 MGD treating to Type I reuse limits at a recommended dose for reuse at 80 mJ/cm^2. It is recommended during pre-design that testing be conducted on the plant's water quality to determine the optimal disinfection dose. If verified through testing, the 80 mJ dose can be decreased. A lower dose could eliminate the effort and cost associated with demoing and extending the channel length.

Additionally, the existing ballasts in channel 1 by UV Technik are outdated and have been discontinued, with minimal inventory available for replacement. It is recommended to replace the ballasts for channel 1 with the new version manufactured by ZED. The electrical equipment has also been failing regularly and operators have experienced challenges with ordering spare parts and replacement items. The electrical equipment should be replaced for channel 1 as soon as possible.

After channel 2 is outfitted, it is recommended to return to channel 1 for a retrofit. As mentioned, the existing channel 1 has vertical banks, which are not conducive for proper and easy cleaning. Spare parts availability is also becoming more challenging, including the Suez scraper system. For the cleanest design and to ensure the plant has reliable equipment, channel 1 modules should be upgraded with vertically inclined banks to match channel 2, increasing the total hydraulic capacity of the system to 25.8 MGD treating to standard disinfection limits and 15.0 MGD for Type I reuse.

A summary of the new UV design criteria is provided in **Table 4-14**. The complete vendor proposal is included in **Appendix D**. Costs for the upgraded UV System are in **Table 4-15**.

Table 4-14: Disinfection Design Criteria

Parameter	Design Value
UV Disinfection	
UV Technology	Open Channel Vertically Inclined Lamp Array
No. of Channels	2
Banks, each channel	6
Lamps per bank	8
Standard Capacity, each channel (MGD)	12.9
Reuse Capacity, each channel (MGD)	7.5
Standard Disinfection Goal, no./mL	126/100
Reuse Disinfection Goal, no./mL	0/100
Assumed Reuse Dose, mJ/cm^2	80
Design Minimum UVT, %	65
Manufacturer	TrojanUVSigna

Table 4-15: UV Disinfection OPCC

ENGINEER'S OPINION OF PROBABLE COST - CAPITAL COSTS					
					Master Plan
PROJECT:				**DATE:**	12/21/2023
	Tooele WRF Master Plan				
PROJECT DESCRIPTION:					
	Disinfection - Rehab Existing and New Channel				
CLIENT:					
	Tooele City				
P/N:	55-22-138				
ITEM		**SCHEDULE OF VALUES**			
NO.	**DESCRIPTION**	**QNTY**	**UNIT**	**UNIT PRICE**	**TOTAL COST**
1	Channel #1 Upgrades				-
2	Ballast replacement (includes install)	1	LS	$76,000	$76,000
3	Electrical equipment replacement	1	LS	$100,000	$100,000
4	Channel #2 UV Modules	1	LS	$570,000	$570,000
5	Installation			25%	$143,000
6	Channel extension	1	LS	$75,000	$75,000
7	Channel #1 UV Modules Replacement	1	LS	$570,000	$570,000
8	Installation			25%	$143,000
9	Channel extension	1	LS	$30,000	$30,000
10					
11	Additional Elements (estimated % of above)				
12	Contractor mobilization and administration			10.0%	$171,000
13	Yard Piping			20.0%	$341,000
14	Site Civil			10.0%	$171,000
15	Electrical and instrumentation			35.0%	$597,000
16	Bonding			3.0%	$51,000
17	Contractor overhead and profit			10.0%	$171,000
				SUBTOTAL	**$ 3,209,000**
				Construction Contingency: 30%	$ 963,000
				Geotechnical/Site Stabilization: N/A	-
				Prevailing Wages / AIS Compliance: N/A	-
				Local Bid Market Conditions10%	$ 417,000
				TOTAL PROBABLE CONSTRUCTION COST (2023 DOLLARS)	**$ 4,589,000**
				Design / CMS: 15%	$ 626,000
				Legal and Administrative:1%	$ 42,000
				Escalation Allowance:N/A	-
				TOTAL PROBABLE PROJECT COST (2023 DOLLARS)	**$ 5,257,000**

4.3.8 Utility and Reuse Water

The peak utility water demand is estimated at 645 gpm in 2045. At 645 gpm, both duty utility water pumps (350 gpm each) would be on with the jockey pump (50 gpm) on standby. The demand of 645 gpm is conservative, and the current utility water system is sufficient at peak flows. However, only one of the pumps is in working condition, with one pump out of service and the jockey pump undersized. The City plans to replace all three pumps and upsize the jockey pump in the near future as part of their routine maintenance plan. Therefore, these costs are not included in this Master Plan.

Utility water flow rates should be reevaluated during design of the new dewatering and solar dryer facilities. If spray bars are installed at the new oxidation ditch or used at the existing ditch, the utility water flow estimate will need to be adjusted.

4.3.9 Reuse and Return Pumping

The return demand in 2045 is estimated at 2.3 MGD, which was determined in the Tooele Headworks Basis of Design Report by analyzing the plant drain lift station and reject return lift station flow rates. There are no issues with the Plant Drain Lift Station capacity, but this should be reevaluated with the new solar dryer and associated dewatering building is installed. At this time, it may make sense to construct a dedicated Plant Drain Lift Station for these new facilities. There are also no concerns regarding the Reject Lift Station capacity. The City can turn on both pumps simultaneously and they also have the option to pump the return flows at a lower flow rate, keeping one pump on standby. Overall, all the return pumps are in good condition, so no upgrades to the pumps is foreseen in the planning period. However, the pumps should be monitored for performance deficiencies as related to aging infrastructure.

The base plate supporting the return pumps needs to be replaced as the existing plate is old and deteriorating.

Table 4-16: Reuse and Return Pumping OPCC

ENGINEER'S OPINION OF PROBABLE COST - CAPITAL COSTS					
					Master Plan
PROJECT:				**DATE:**	12/21/2023
	Tooele WRF Master Plan				
PROJECT DESCRIPTION:					
	Reuse and Return Pumping				
CLIENT:					
	Tooele City				
P/N:	55-22-138				
ITEM		**SCHEDULE OF VALUES**			
NO.	**DESCRIPTION**	**QNTY**	**UNIT**	**UNIT PRICE**	**TOTAL COST**
1	New pump skid plate	1	LS	$60,000	$60,000
2					-
3					-
4					-
5					
6	Additional Elements (estimated % of above)				
7	Contractor mobilization and administration			10.0%	$6,000
8	Yard Piping			0.0%	$0
9	Site Civil			0.0%	$0
10	Electrical and instrumentation			5.0%	$3,000
11	Bonding			3.0%	$2,000
12	Contractor overhead and profit			10.0%	$6,000
				SUBTOTAL	**$ 77,000**
				Construction Contingency: 30%	$ 23,000
				Geotechnical/Site Stabilization: N/A	-
				Prevailing Wages / AIS Compliance: N/A	-
				Local Bid Market Conditions10%	$ 10,000
				TOTAL PROBABLE CONSTRUCTION COST (2023 DOLLARS)	**$ 110,000**
				Design / CMS: 15%	$ 15,000
				Legal and Administrative:1%	$ 1,000
				Escalation Allowance:N/A	-
				TOTAL PROBABLE PROJECT COST (2023 DOLLARS)	**$ 126,000**

The Reuse Pumps also have adequate capacity and are in good condition. However, these pumps are more than 20 years old and need to be monitored for reduced performance due to aging infrastructure.

Detailed analysis of these critical effluent disposal pumps will be provided in a separate Pressure Irrigation Master Plan.

4.3.10 Solids Dewatering and Disposal

The greatest needs in the solids process stream are the bottlenecks in screw press dewatering capacity and solar dryer throughput. The design and installation of the new solar dryer will trigger the other solids process upgrades, including a new thickener, new solids holding tank, and new dewatering building.

4.3.10.1 Thickening

The gravity thickener is undersized for the current facility flows and has not performed well. The City has therefore opted to consider mechanical thickening for future upgrades.

At the Alternatives Workshop, the City elected to locate a new mechanical thickener inside the new dewatering building. It is recommended to install the new thickener in the same phase as the new solar dryer. A technology selection (drum thickener vs gravity belt thickener) was not performed as part of this study but will be further evaluated during the design phase.

4.3.10.2 Solids Holding

In 20 years, the existing solids holding tank will no longer meet the UAC requirement of a minimum sludge storage of 7 days. A new solids holding tank with accompanying diffusers and blowers is recommended for installation in tandem with the new solar dryer. Space is allotted on the southeast area of the site for the new tank and equipment.

4.3.10.3 Dewatering

The dewatering equipment is not adequately sized to meet the projected flows and loads for the 20-year planning period. The two screw presses have significant run times. The existing dewatering building is plumbed for installation of a future third screw press. For the most economical solution, it is recommended to retrofit the existing dewatering building by installing the third screw press and its accompanying equipment. However, when the new solar dryer system is installed, a new dewatering building is recommended for installation adjacent to the new dryer. The costs for the retrofit of the existing dewatering building and construction of the new solids facilities are shown in **Table 4-17**.

Table 4-17: Solids Dewatering OPCC

ENGINEER'S OPINION OF PROBABLE COST - CAPITAL COSTS					
					Master Plan
PROJECT:				**DATE:**	12/21/2023
	Tooele WRF Master Plan				
PROJECT DESCRIPTION:					
	Solids Dewatering - Retrofit Existing, New Dewatering Building, Sludge Holding Tank, and Mechanical Thickener				
CLIENT:					
	Tooele City				
P/N:	55-22-138				
ITEM		**SCHEDULE OF VALUES**			
NO.	**DESCRIPTION**	**QNTY**	**UNIT**	**UNIT PRICE**	**TOTAL COST**
1	Existing dewatering building RETROFIT				
2	Screw press	1	EA	$400,000	$400,000
3	Feed piping	1	LS	$25,000	$25,000
4	Solids feed pump	1	EA	$50,000	$50,000
5	Horizontal sludge conveyor	50	FT	$2,500	$125,000
6	Installation			15%	$71,000
7					
8	New dewatering building				-
9	Site demolition, clearing/grubbing	1	LS	$5,000	$5,000
10	Building concrete	140	CY	$500	$70,000
11	CMU building - 100 ft x 50 ft	5,000	SF	$250	$1,250,000
12	Rolling access doors for equipment	3	EA	$15,000	$45,000
13	HVAC	1	LS	$35,000	$35,000
14	Odor control	1	LS	$75,000	$75,000
15	Equipment				-
16	Polymer system	2	EA	$35,000	$70,000
17	Solids feed pumps	2	EA	$50,000	$100,000
18	Feed piping	1	LS	$100,000	$100,000
19	Screw press	2	EA	$400,000	$800,000
20	Horizontal sludge conveyor	50	FT	$2,500	$125,000
21	Inclined sludge conveyor	40	FT	$2,500	$100,000
22	Installation			15%	$194,000
23					-
24	New solids holding tank				-
25	Excavation	4,273	LS	$30	$128,000
26	Shoring and dewatering	1	LS	$75,000	$75,000
27	Backfill	2,183	CY	$20	$44,000
28	Concrete				
29	Floor	35	CY	$650	$23,000
30	Walls	195	CY	$1,250	$244,000
31	Interior walls	23	CY	$1,250	$29,000
32	Grout floor	48	CY	$1,000	$48,000
33	Equipment				-
34	Solids holding feed pumps	3	EA	$35,000	$105,000
35	Blowers (1 duty + 1 standby)	2	EA	$70,000	$140,000
36	Coarse bubble diffusers	1	LS	$50,000	$50,000
37	FRP floating decanter	1	LS	$60,000	$60,000
38	Installation			15%	$53,000
39	Prime coat	1	LS	$25,000	$25,000
40	Stainless steel air piping	200	FT	$250	$50,000
41	Stairs	1	LS	$25,000	$25,000
42	Aluminum handrail	1	LS	$50,000	$50,000
43	Miscellaneous valves	1	LS	$50,000	$50,000
44					-
45	New mechanical thickener	1	EA	$250,000	$250,000
46	Installaton	1	LS	$37,500	$38,000
47	Piping	1	LS	$30,000	$30,000
48	Polymer system	1	LS	$35,000	$35,000
49					-
50	Additional Elements (estimated % of above)				
51	Contractor mobilization and administration			10.0%	$519,000
52	Yard Piping			20.0%	$1,038,000
53	Site Civil			10.0%	$519,000
54	Electrical and instrumentation			35.0%	$1,817,000
55	Bonding			3.0%	$156,000
56	Contractor overhead and profit			10.0%	$519,000
				SUBTOTAL	**$ 9,089,000**
				Construction Contingency: 30%	$ 2,727,000
				Geotechnical/Site Stabilization: N/A	-
				Prevailing Wages / AIS Compliance: N/A	-
				Local Bid Market Conditions10%	$ 1,182,000
				TOTAL PROBABLE CONSTRUCTION COST (2023 DOLLARS)	**$ 12,998,000**
				Design / CMS: 15%	$ 1,772,000
				Legal and Administrative:1%	$ 118,000
				Escalation Allowance:N/A	-
				TOTAL PROBABLE PROJECT COST (2023 DOLLARS)	**$ 14,888,000**

4.3.10.4 Solar Dryer

The evaluation and selection of solar dryer alternatives was investigated in the Solar Dryer Evaluation technical memo, provided in **Appendix C**. It is recommended that the existing system undertake a retrofit of two bays while the third bay continues to dry biosolids during the retrofit. As discussed in the technical memo, the existing solar dryer facility is experiencing mechanical and electrical equipment failures and is not performing as intended, especially during the winter months. The retrofit of the solar dryer would require a new floor heating system, HVAC exchange system, curtain system, new solar dryer equipment and controls, and modifications to the existing conveyor. These modifications will also increase the capacity of the solar dryer.

In the future, a new solar dryer facility (with heated floors to achieve Class A biosolids year-round) should be installed in conjunction with a new dewatering building once the existing solar dryer reaches its capacity. Reference **Table 4-18** for the costs associated with the retrofit of the existing solar dryers and the new greenhouse.

Table 4-18: Solar Dryer OPCC

ENGINEER'S OPINION OF PROBABLE COST - CAPITAL COSTS					
					Master Plan
PROJECT:				**DATE:**	12/21/2023
	Tooele WRF Master Plan				
PROJECT DESCRIPTION:					
	Solar Dryer - Retrofit Existing and New Greenhouse				
CLIENT:					
	Tooele City				
P/N:	55-22-138				
ITEM		**SCHEDULE OF VALUES**			
NO.	**DESCRIPTION**	**QNTY**	**UNIT**	**UNIT PRICE**	**TOTAL COST**
1	Existing Solar Dryer RETROFIT - Two Bays				-
2	Site demolition	1	LS	$30,000	$30,000
3	Building concrete	1	LS	$40,000	$40,000
4	HVAC air exchange system	1	LS	$55,000	$55,000
5	HVAC Curtain System	1	LS	$15,000	$15,000
6	Solar dryer equipment (scope of supply listed below)	2	LS	$907,500	$1,815,000
7	Solar dryer Model SRT 11	1	LS		-
8	Control system	1	LS		-
9	Installation	1	LS	15%	$273,000
10	Floor Heating System - Single Bay				
11	SST floor heating design, single bay	2	EA	$750,000	$1,500,000
12	Heating pipes	1	LS	$113,000	$113,000
13	Fuel fired boiler	1	LS	$125,000	$125,000
14	Thermal storage tank	1	LS	$350,000	$350,000
15	Conveyor Modifications	1	LS	$165,000	$165,000
16					
17	New Greenhouse				
18	Site demolition, clearing/grubbing	1	LS	$25,000	$25,000
19	Building concrete	667	CY	$750	$500,000
20	Solar dryer greenhouse - 300 ft x 40 ft	18,000	SF	$150	$2,700,000
21	Overhead doors	2	EA	$25,000	$50,000
22	Passage doors	2	EA	$3,500	$7,000
23	HVAC air exchange system	1	LS	$75,000	$75,000
24	Solar dryer equipment (scope of supply listed below)	2	LS	$908,000	$1,816,000
25	Solar dryer Model SRT 11	1	LS		-
26	Control system	1	LS		-
27	Installation	1	LS	15%	$273,000
28					-
29	Floor Heating System				-
30	SST floor heating design	2	LS	$750,000	$1,500,000
31	Heating pipes	1	LS	$113,000	$113,000
32	Fuel fired boiler	1	LS	$125,000	$125,000
33	Thermal storage tank	1	LS	$350,000	$350,000
34					-
35					
36	Additional Elements (estimated % of above)				
37	Contractor mobilization and administration			10.0%	$1,202,000
38	Yard Piping			0.0%	$0
39	Site Civil			5.0%	$601,000
40	Electrical and instrumentation			15.0%	$1,802,000
41	Bonding			3.0%	$360,000
42	Contractor overhead and profit			10.0%	$1,202,000
				SUBTOTAL	**$ 17,182,000**
				Construction Contingency: 30%	$ 5,155,000
				Geotechnical/Site Stabilization: N/A	-
				Prevailing Wages / AIS Compliance: N/A	-
				Local Bid Market Conditions10%	$ 2,234,000
				TOTAL PROBABLE CONSTRUCTION COST (2023 DOLLARS)	**$ 24,571,000**
				Design / CMS: 15%	$ 3,351,000
				Legal and Administrative:1%	$ 223,000
				Escalation Allowance:N/A	-
				TOTAL PROBABLE PROJECT COST (2023 DOLLARS)	**$ 28,145,000**

4.3.10.5 Biosolids Storage

A new solids storage building is recommended when the new solar dryer is constructed. The new solids storage would be attached to the new solar dryer greenhouse for convenient access. The storage building would primarily be used for storage of finished Class A Biosolids. It can also store Class B Biosolids that can be run back through the solar dryer for further processing. Costs associated with the new storage space are presented in **Table 4-19**.

Table 4-19: Solids Storage OPCC

ENGINEER'S OPINION OF PROBABLE COST - CAPITAL COSTS					
					Master Plan
PROJECT:				**DATE:**	12/21/2023
	Tooele WRF Master Plan				
PROJECT DESCRIPTION:					
	Solids Storage				
CLIENT:					
	Tooele City				
P/N:	55-22-138				
ITEM		**SCHEDULE OF VALUES**			
NO.	**DESCRIPTION**	**QNTY**	**UNIT**	**UNIT PRICE**	**TOTAL COST**
1	New Solids Storage Building				
2	Site demolition, clearing/grubbing	1	LS	$5,000	$5,000
3	Building concrete	250	CY	$500	$125,000
4	Open sided canopy structure - 135 ft x 75 ft	10125	SF	$85	$860,625
5					
6					
7	Additional Elements (estimated % of above)				
8	Contractor mobilization and administration			10.0%	$99,000
9	Yard Piping			5.0%	$50,000
10	Site Civil			10.0%	$99,000
11	Electrical and instrumentation			10.0%	$99,000
12	Bonding			3.0%	$30,000
13	Contractor overhead and profit			10.0%	$99,000
				SUBTOTAL	**$ 1,467,000**
				Construction Contingency: 30%	$ 440,000
				Geotechnical/Site Stabilization: N/A	-
				Prevailing Wages / AIS Compliance: N/A	-
				Local Bid Market Conditions10%	$ 191,000
				TOTAL PROBABLE CONSTRUCTION COST (2023 DOLLARS)	**$ 2,098,000**
				Design / CMS: 15%	$ 286,000
				Legal and Administrative:1%	$ 19,000
				Escalation Allowance:N/A	-
				TOTAL PROBABLE PROJECT COST (2023 DOLLARS)	**$ 2,403,000**

4.3.11 Collections

The City has indicated a need for a new/expanded collections building on the northwest area of the site. The collections building would include space for five truck bays, offices, and a locker room including restrooms and showers. The collections building would be attached to the existing administration building by constructing a breezeway and overhead awning between the buildings.

The existing collections building includes a shop and storage area. It is recommended to pave the grass area adjacent to the existing building, which would provide about 11,000 additional square feet to the existing collections footprint for vehicle parking and other storage needs. Costs for collections upgrades are shown in **Table 4-20**.

Table 4-20: Collections OPCC

ENGINEER'S OPINION OF PROBABLE COST - CAPITAL COSTS					
					Master Plan
PROJECT:				**DATE:**	12/21/2023
	Tooele WRF Master Plan				
PROJECT DESCRIPTION:					
	Collections - Upgrade Existing and New Collections Building				
CLIENT:					
	Tooele City				
P/N:	55-22-138				
ITEM		**SCHEDULE OF VALUES**			
NO.	**DESCRIPTION**	**QNTY**	**UNIT**	**UNIT PRICE**	**TOTAL COST**
1	Existing Collections Building Upgrades				
2	Site demolition, clearing/grubbing	1	LS	$5,000	$5,000
3	Concrete for new truck loading area	204	CY	$500	$101,852
4					
5	New Collections Building				-
6	Metal building - 200 ft x 50 ft	10000	SF	$175	$1,750,000
7	Building concrete	247	CY	$500	$123,333
8	Office equipment	1	LS	$10,000	$10,000
9	Restroom facilities	1	LS	$10,000	$10,000
10	Breezeway awning	1	LS	$25,000	$25,000
11					-
12					-
13					
14	Additional Elements (estimated % of above)				
15	Contractor mobilization and administration			10.0%	$203,000
16	Yard Piping			5.0%	$101,000
17	Site Civil			10.0%	$203,000
18	Electrical and instrumentation			15.0%	$304,000
19	Bonding			3.0%	$61,000
20	Contractor overhead and profit			10.0%	$203,000
				SUBTOTAL	**$ 3,100,000**
				Construction Contingency: 30%	$ 930,000
				Geotechnical/Site Stabilization: N/A	-
				Prevailing Wages / AIS Compliance: N/A	-
				Local Bid Market Conditions10%	$ 403,000
				TOTAL PROBABLE CONSTRUCTION COST (2023 DOLLARS)	**$ 4,433,000**
				Design / CMS: 15%	$ 605,000
				Legal and Administrative:1%	$ 40,000
				Escalation Allowance:N/A	-
				TOTAL PROBABLE PROJECT COST (2023 DOLLARS)	**$ 5,078,000**

4.4 Summary

The recommended improvements from **Section 4.3** with corresponding capital costs are summarized in **Table 4-21.** Phasing is discussed in **Chapter 5**. It should be noted that none of the costs shown below include equipment replacement due to aging infrastructure. The City has commissioned a user rate study that will incorporate equipment replacement costs and provide for an active asset management / maintenance budget to provide funding for equipment replacement.

A conceptual site plan is presented in **Figure 4-5**, illustrating the intended expansion of the facility if the recommended improvements are implemented. Due to the tight footprint available for the future expansions, it is advised the City purchase additional land around the treatment site if practical. It is also recommended the City firm up long-term contracts with the golf course for effluent disposal as well as continue developing reuse locations in the Northwest quadrant of the City. Additionally, it is recommended to continue developing contracts for Class A and Class B biosolids disposal and continuing to work with the landfill to ensure they will continue to accept unclassified biosolids in the future.

Table 4-21: Summary of Potential Improvements and Capital Costs

Process Area	Improvements	Capital Cost (2023 dollars)
Preliminary Treatment	• Upgrade septage receiving station to packaged system	$625K
Biological Treatment	• New Veolia oxidation ditch and blower building • Retrofit existing oxidation ditch with Biomag process (this may be able to be delayed until outside of the planning period)	$41.2M
Secondary Clarification	• Add two secondary clarifiers - #4 and #5 • Upgrade Secondary Clarifier #2 mechanism and add launder covers • Upgrade Secondary Clarifier #3 mechanism and add launder covers • Add Secondary Clarifier #6 for Biomag retrofit	$15.9M
RAS/WAS Pumping	• New RAS/WAS pump station with three new RAS and three new WAS pumps	$3.4M
Filtration	• New third filter	$2.0M
UV Disinfection	• Upgrade Channel #1 ballasts and replace electrical equipment • Outfit and expansion of Channel #2 with new modules • Replace and expansion of Channel #1 modules	$5.3M
Utility Water	• Pumps replaced by City staff as part of their Maintenance Program	$0.0M
Reuse and Return Pumping	• Replace skid plate for return pumps	$126K
Solids Dewatering	• Retrofit existing dewatering building with third screw press, solids feed pump, and associated piping • New dewatering building (combination of dewatering and thickening) and associated equipment to address future limited capacity • New solids holding tank and associated equipment (diffusers, blowers, and solids holding feed pumps)	$14.9M
Solar Dryer	• Retrofit of existing solar dryer – two bays, new drying equipment and floor heating system • New greenhouse with three solar dryers and floor heating system	$28.1M
Collections	• New truck loading area at existing collections building • New collections building for truck bays, offices, and locker rooms	$5.1M
Solids Storage	• New solids storage building	$2.4M

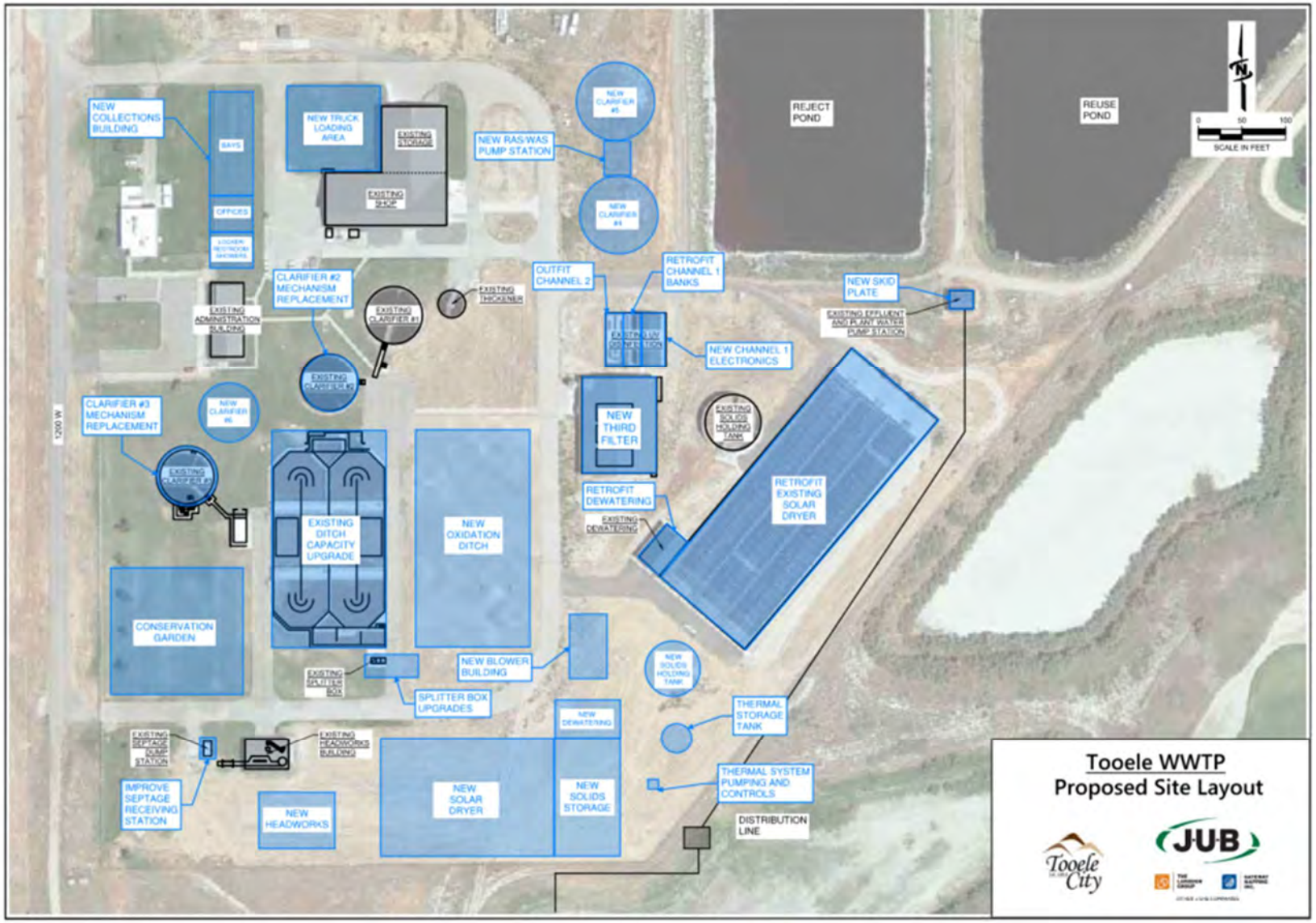

Figure 4-5: Proposed Site Layout

CHAPTER 5
CAPITAL IMPROVEMENT PLAN

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Chapter 5

5.0 Capital Improvement Plan

5.1 Recommended Phasing

The recommended improvements presented in **Chapter 4** were reviewed with operations staff to prioritize the recommended upgrades. Factors considered include the ability to reliably comply with permit conditions, the criticality of operations, the current loading compared to the estimated capacity (see **Chapter 3**), and the estimated timing until growth overloads a process. After discussion with the City, the planning period was divided into three phases, with the timing of each phase described below.

- Phase 1: 0-3 years (2025)
- Phase 2: 3-7 years (2030)
- Phase 3: 7-22 years (2045)

Recommended phasing for each major process is presented below.

- **Preliminary Treatment:**
    - Once the new headworks building is operational, the coarse screens and grit removal will have adequate capacity for the entire planning period, with space available for future expansion. No action needed.
    - The septage receiving station is still operational but will require an upgrade to address performance, aging infrastructure, and odor issues. Based on discussions with City staff, it is recommended that septage receiving station improvements be implemented in Phase 2 of the planning period.
- **Biological Treatment:**
    - A near term upgrade is required, as the existing oxidation ditch has reached its hydraulic capacity and will not be able to meet future flow demand. A new oxidation ditch will address the increase in flows and loads due to growth and provide process redundancy. The timing of the new oxidation ditch will control the construction of the new RAS/WAS pump station and new clarifiers. Due to the high cost of this project, it will take some time to acquire funding. It is anticipated funding will be available for this project in Phase 2.
    - A capacity increase for the existing ditch is not required until the end of the planning period. Process intensification is the most cost-effective option to increase capacity. However, the relatively shallow depth of the existing ditch will result in inefficient oxygen transfer and reduce the effectiveness of the proposed process intensification solution. This retrofit of the existing ditch will require the construction of a new clarifier as well. Alternatively, it may be recommended to demo and replace the ditch entirely with a new 20 ft deep ditch within the same footprint. This is a more costly alternative, but will improve long-term performance. These options will be evaluated further toward the end of Phase 3 as the new, deeper oxidation ditch installed in Phase 2 approaches capacity.

- **Secondary Clarification:**
    - The existing internal mechanisms for Clarifier #2 (Phase 1) and #3 (Phase 2) should be replaced in the planning period. Additionally, launder covers are recommended for installation to match the recent upgrades on Clarifier #1. The clarifier drain valves will also need replacement when the clarifiers are upgraded.
    - Two new secondary clarifiers are required downstream of the new oxidation ditch. Therefore, adding a fourth and fifth secondary clarifier in Phase 2 of the planning period is recommended.
    - Toward the end of Phase 3, it is recommended to upgrade the existing oxidation ditch with a process intensification option such as Biomag. This upgrade requires an additional clarifier to accommodate the increase in flow and loads. Alternatively, if a new/deeper ditch is constructed within the existing footprint of the existing ditch at the end of Phase 3, two new clarifiers will need to be installed.
- **RAS/WAS Pumping:** A new RAS/WAS pump station will be required when the new oxidation ditch and secondary clarifiers are constructed in Phase 2.
- **Filtration:** A third filter will be required when the two existing filters run in parallel with no standby unit available. The filter installation is anticipated to occur in Phase 3, or perhaps just outside of the planning period.
- **UV Disinfection:**
    - An upgrade in each phase of the planning period is required. Channel #1 should be upgraded in Phase 1 with new ballasts and electrical equipment to ensure system reliability.
    - In Phase 2, Channel #2 should be expanded and outfitted with vertically inclined banks.
    - In Phase 3, Channel #1 should be retrofitted to replace the existing UV banks with vertically inclined banks and match Channel #2.
- **Reuse and Return Pumping:** The return pump skid plate should be replaced in Phase 1 of the planning period.
- **Solids Dewatering:** Expanding the plant's dewatering capacity will add redundancy for the existing screw presses, which run nearly constantly.
    - An upgrade will retrofit the existing dewatering building by adding a new screw press, which will provide additional dewatering capacity. This upgrade should be prioritized in Phase 1 of the planning period to ensure redundancy and to reduce screw press run times.
    - New thickening, solids holding, and dewatering facilities should be constructed in coordination with the new solar dryer (Phase 3).
- **Solar Dryer:**
    - Two bays in the existing solar dryer are recommended for a retrofit floor heating system to address throughput, operations concerns, and poor performance during the winter months. One bay is recommended for a retrofit in Phase 1 to verify performance and the second bay retrofit is proposed in Phase 2.

    - A new greenhouse with heated floors and two new bays and solar dryers will provide additional solids treatment capacity. If the existing solar dryer is retrofit in Phases 1 and 2, then the new solar dryer facility would not be required until the end of Phase 3.

- **Biosolids Storage:**
    - A new biosolids storage building is recommended in Phase 3. The storage building would be constructed concurrently with the new dewatering building and solar dryer greenhouse as it will be adjacent to the two facilities.

- **Collections**:
    - It is anticipated the new collections shop / maintenance building would be constructed in Phase 2 of the planning period.

Proposed phasing for the recommended improvements is included in **Table 5-1**. A potential phasing plan illustrating the recommended improvements is included in **Figure 5-1.**

It should be noted that none of the costs shown include equipment replacement due to aging infrastructure. The City has commissioned a user rate study that will incorporate equipment replacement costs and provide for an active asset management / maintenance budget to provide funding for equipment replacement during the planning period.

Table 5-1: Proposed Phasing of Recommended Improvements

Process Area	Phase 1: 0 to 3 Years	Phase 2: 3 to 7 Years	Phase 3: 7 to 22 Years
Preliminary Treatment		• Upgrade septage receiving station to packaged system • **SUBTOTAL: $625K**	
Biological Treatment		• New, deeper oxidation ditch and blower building [1] • **SUBTOTAL: $23.7M**	• Retrofit existing oxidation ditch with process intensification process [2] • **SUBTOTAL: $17.5M**
Secondary Clarification	• Upgrade Secondary Clarifier #2 mechanism and add launder covers • **SUBTOTAL: $1.0M**	• Add two secondary clarifiers (#4 and #5) • Upgrade secondary clarifier #3 mechanism and add launder covers • **SUBTOTAL: $10.7M**	• Add Secondary Clarifier #6 for process intensification retrofit [2] • **SUBTOTAL: $4.2M**
RAS/WAS Pumping		• New RAS/WAS pump station with three new RAS and two new WAS pumps • **SUBTOTAL: $3.4M**	
Filtration			• New third filter • **SUBTOTAL: $2.0M**
Disinfection	• Upgrade Channel #1 ballasts and replace electrical equipment • **SUBTOTAL: $544K**	• Outfit and expand Channel #2 with new UV modules • **SUBTOTAL: $2.4M**	• Expansion and replacement of Channel #1 UV modules • **SUBTOTAL: $2.3M**
Return Pumping	• Replace skid plate for return pumps • **SUBTOTAL: $126K**		
Solids Dewatering	• Retrofit existing dewatering building with third screw press, solids feed pump, and associated piping for improved redundancy • **SUBTOTAL: $968K**		• New dewatering building (combination of dewatering and thickening) and associated equipment to address future limited capacity • New solids holding tank and associated equipment (diffusers, blowers, and solids holding feed pumps) • **SUBTOTAL: $13.9M**

Process Area	Phase 1: 0 to 3 Years	Phase 2: 3 to 7 Years	Phase 3: 7 to 22 Years
Solar Dryer	• Retrofit existing solar dryer – bay 1 • **SUBTOTAL: $5.2M**	• Retrofit existing solar dryer – bay 2 • **SUBTOTAL: $5.2M**	• New greenhouse with two solar dryers and floor heating system • **SUBTOTAL: $17.6M**
Collections		• New truck loading area at existing collections building • New collections building for truck bays, offices, and locker rooms • **SUBTOTAL: $5.1M**	
Solids Storage			• New solids storage building • **SUBTOTAL: $2.4M**
TOTAL (2023 Dollars)[3]	**$7.9M**	**$51.1M**	**$59.9M**

1. Oxidation ditch manufacturer to be selected during design. The highest cost option (Veolia) is included in this table.

2. Process intensification / retrofit of the existing ditch is included in this table as a Phase 3 upgrade due to it being the lowest cost option with an expedited construction schedule to facilitate construction sequencing. Timing of this retrofit is dependent on the performance of the new, deeper ditch. It is anticipated the existing ditch will need to be modified toward the end of Phase 3. Alternatively, the existing ditch could be demolished and a new, deeper ditch (matching the ditch installed in Phase 2) could be constructed. Demo and construction of a new oxidation ditch would be a higher cost option and would require two new secondary clarifiers. These options will be evaluated in more detail in 15-20 years as the new ditch installed in Phase 2 approaches capacity.

3. Percent contingency (30%) is based on AACE Class 4 feasibility study level screening plus another 10% contingency for local market conditions (inflation, tight labor market, supply chain issues, etc.). Total project costs include contractor mobilization and administration (10%), contractor overhead and profit (10%), engineering design and construction administration services (15%), and legal/administrative (1%). Costs are in 2023 dollars and should be inflated appropriately to the mid-point of construction for budgeting purposes. Costs associated with special funding requirements such as Davis-Bacon prevailing wages, American Iron and Steel (AIS), and/or Build America, Buy America (BABA) are not included.

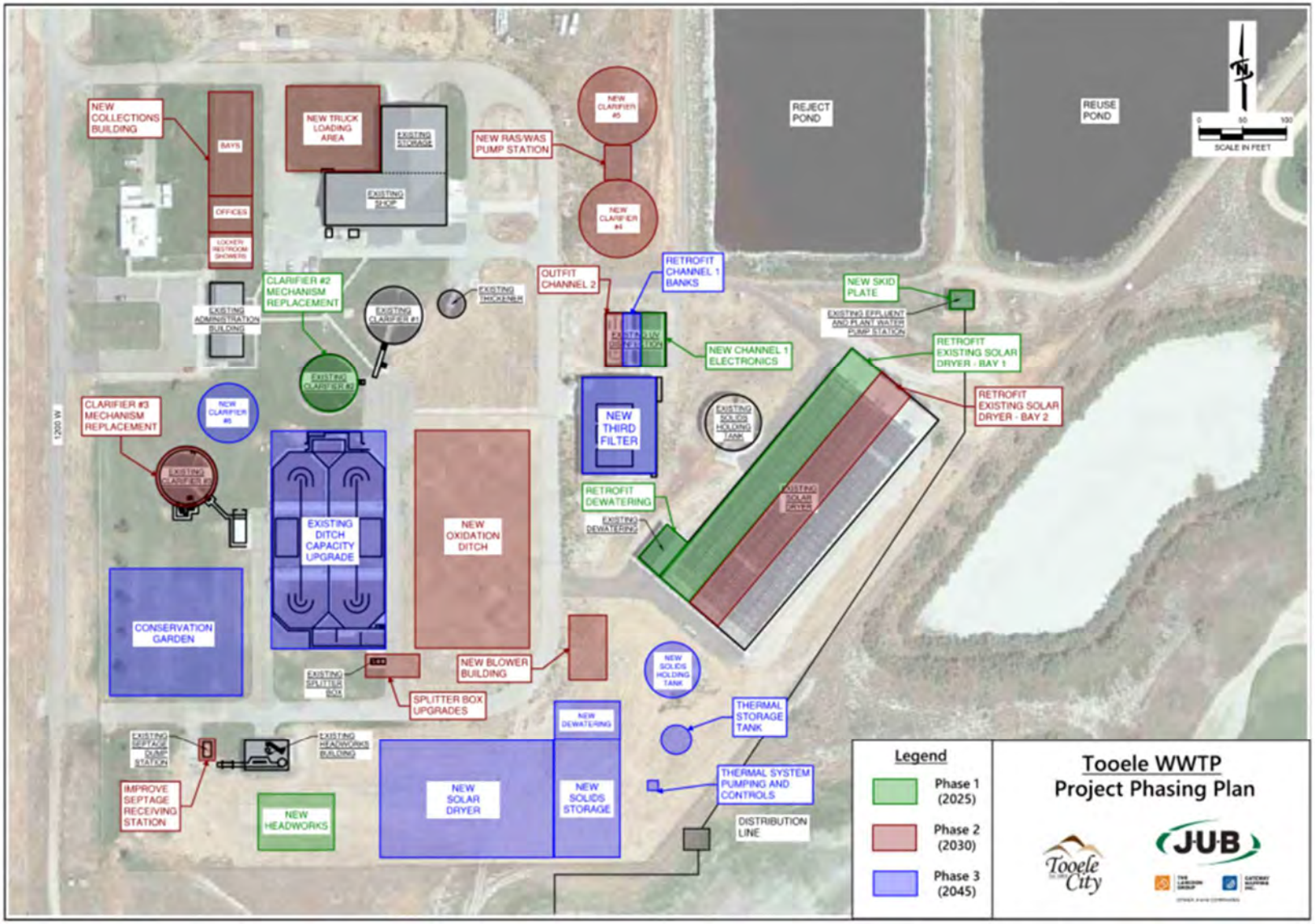

Figure 5-1: Conceptual Phasing Plan

5.2 Project Funding

The sewer user rate will need to be increased to provide necessary funding for the proposed improvements. The magnitude of the increase will depend on the interest rate and loan terms that are secured by the City. Low interest loan and grant money is typically available from the Utah Division of Water Quality and the Water Quality Board. However, due to recently implemented nutrient limits in Utah and the resulting increase in treatment facility design and construction in the region, funds are limited at this time.

Grant money from DWQ is typically provided to those communities that face an "economic hardship", which is defined by DWQ as the user rate exceeding 1.4% of the median adjusted gross income (MAGI). The 2021 MAGI in Tooele is $50,500, so grant money would not be available from DWQ under this criterion until the user rate surpasses $58.92/month.

There are other forms of hardship or project innovation that the Water Quality Board may consider when reviewing grant applications. In the case of Tooele, the following items should be considered:

- Some lower income areas of the city will have difficulty paying substantially higher user rates.
- In the absence of DWQ loan money, Tooele may be willing to obtain bonds from the private market. The city would like to leverage its loans with government grant money to reduce coverage requirements and minimize user rates. Tooele may be willing to delay receipt of this grant money to a time when the WQB has additional money available.
- The Tooele WRF is a zero-discharge facility that is environmentally sustainable and does not deliver nutrient loads to the Great Salt Lake. Additionally, the goal of their biosolids program is to generate Class A compost that can be beneficially used rather than landfilled. This visionary facility uses all its resources rather than letting them go to waste.

The City has also submitted a Title XVI funding application to the United States Bureau of Reclamation. Title XVI provides grant funding for Water Reclamation and Reuse Projects, up to 25 percent of the total project cost (not to exceed $20 million). This application has passed the preliminary review from the regional office and has been recommended to the national office for final review. A maximum of 10 applicants are awarded each year.

If the required amount of government funding cannot be procured, the City can obtain funds from the private bond market. This money tends to have a higher interest rate, but is faster to procure and has fewer strings attached. Government money may require additional environmental documentation and clearances, Davis-Bacon Wages, American Iron and Steel (AIS), and Build America, Buy America (BABA) provisions that can slow down a project and add costs.

5.3 Financial Analysis and User Rates

The current average residential sewer rate is a base fee of $7.00 per month plus an additional fee charged based on the average monthly water usage during the winter months. New users are charged an average of $27.00 per month until a rate can be established based upon next winter's water usage period. Anticipated annual O&M expenses in 2024 for the collection system and treatment facilities are $4.1 million. See **Appendix E** for Tooele City's financial documentation including budgetary numbers and other financial projections.

The City is in the process of reviewing and updating existing user rates, with an expected increase in rates in the near future. Ultimately, the final user rate will be substantially impacted by the amount of grant money that is provided, the interest rate of the loan, and the length of the loan. The City intends to increase the user rates to the amount required to sustainably fund the recommended improvements.

Appendix A: Projections

Table A-1: Population Projections

Year	Constant 2% Projection	U of U Projection	HAL Projection
2000	22502	22502	22502
2010	31605	31605	31605
2020	35742	35742	35742
2025	42036	43567	42036
2035	51893	53633	50821
2045	63257	63039	56711
2055	77110	71532	60898
2065	93997	79306	65297
2075	114582	87603	70015

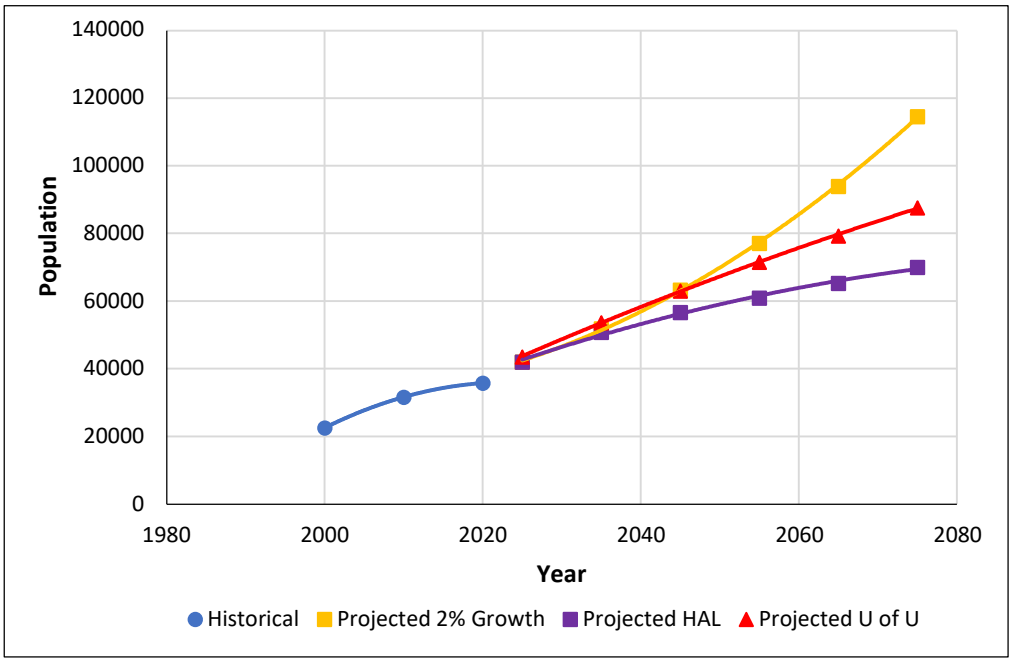

Figure A-1: Population Projections

Table A-2: Projected ERUs and Population

Year	Growth Rate	Projected ERUs	Projected Population
2020	0.026	14,400	37,076
2021	0.041	14,992	38,600
2022	0.031	15,454	39,789
2023	0.032	15,940	41,042
2024	0.031	16,435	42,314
2025	0.030	16,921	43,567
2026	0.028	17,390	44,774
2027	0.026	17,835	45,920
2028	0.023	18,252	46,994
2029	0.022	18,645	48,005
2030	0.020	19,016	48,960
2031	0.019	19,375	49,885
2032	0.019	19,733	50,808
2033	0.018	20,097	51,743
2034	0.018	20,462	52,685
2035	0.018	20,831	53,633
2036	0.018	21,201	54,588
2037	0.018	21,572	55,543
2038	0.017	21,944	56,499
2039	0.017	22,314	57,453
2040	0.017	22,685	58,407
2041	0.016	23,055	59,359
2042	0.016	23,419	60,297
2043	0.015	23,779	61,226
2044	0.015	24,134	62,138
2045	**0.015**	**24,484**	**63,039**
2046	0.014	24,834	63,940
2047	0.014	25,179	64,829
2048	0.014	25,519	65,704
2049	0.013	25,853	66,565
2050	0.013	26,179	67,404
2051	0.013	26,506	68,246
2052	0.012	26,832	69,086
2053	0.012	27,154	69,915
2054	0.012	27,472	70,733
2055	0.011	27,782	71,532
2056	0.011	28,091	72,326
2057	0.011	28,397	73,114
2058	0.011	28,704	73,904
2059	0.011	29,008	74,687
2060	0.010	29,307	75,457

Table A-3: Projected Flows

Year	Total ERUs	gal/ERU/d	Average Day MGD	Maximum Month MGD	Peak Hour MGD
2020	14,400	-	-	-	-
2021	14,992	-	-	-	-
2022	15,454	200	3.09	3.86	7.29
2023	15,940	**200**	3.19	3.99	7.48
2024	16,435	**200**	3.29	4.11	7.67
2025	**16,921**	**200**	**3.38**	**4.23**	**7.85**
2026	17,390	**200**	3.48	4.35	8.03
2027	17,835	**200**	3.57	4.46	8.20
2028	18,252	**200**	3.65	4.56	8.36
2029	18,645	**200**	3.73	4.66	8.51
2030	19,016	**200**	3.80	4.75	8.64
2031	19,375	**200**	3.88	4.84	8.78
2032	19,733	**200**	3.95	4.93	8.91
2033	20,097	**200**	4.02	5.02	9.05
2034	20,462	**200**	4.09	5.12	9.18
2035	20,831	**200**	4.17	5.21	9.32
2036	21,201	**200**	4.24	5.30	9.45
2037	21,572	**200**	4.31	5.39	9.59
2038	21,944	**200**	4.39	5.49	9.72
2039	22,314	**200**	4.46	5.58	9.86
2040	22,685	**200**	4.54	5.67	9.99
2041	23,055	**200**	4.61	5.76	10.13
2042	23,419	**200**	4.68	5.85	10.26
2043	23,779	**200**	4.76	5.94	10.39
2044	24,134	**200**	4.83	6.03	10.51
2045	24,484	**200**	**4.90**	**6.12**	**10.64**
2046	24,834	**200**	4.97	6.21	10.76
2047	25,179	**200**	5.04	6.29	10.89
2048	25,519	**200**	5.10	6.38	11.01
2049	25,853	**200**	5.17	6.46	11.12
2050	26,179	**200**	5.24	6.54	11.24
2051	26,506	**200**	5.30	6.63	11.35
2052	26,832	**200**	5.37	6.71	11.47
2053	27,154	**200**	5.43	6.79	11.58
2054	27,472	**200**	5.49	6.87	11.69
2055	27,782	**200**	5.56	6.95	11.80
2056	28,091	**200**	5.62	7.02	11.91
2057	28,397	**200**	5.68	7.10	12.01
2058	28,704	**200**	5.74	7.18	12.12
2059	29,008	**200**	5.80	7.25	12.23
2060	29,307	**200**	5.86	7.33	12.33

Table A-4: Projected Loads

Year	Total ERUs	Influent BOD		Influent TSS	
		Ave Day lbs/d	Max Month lbs/d	Ave Day lbs/d	Max Month lbs/d
2020	14,400	-	-	-	-
2021	14,992	-	-	-	-
2022	15,454	4,250	5,992	3,802	5,626
2023	15,940	4,384	6,181	3,921	5,804
2024	16,435	4,519	6,372	4,043	5,983
2025	**16,921**	**4,653**	**6,561**	**4,163**	**6,161**
2026	17,390	4,782	6,743	4,278	6,331
2027	17,835	4,905	6,915	4,387	6,493
2028	18,252	5,019	7,077	4,490	6,645
2029	18,645	5,127	7,229	4,587	6,788
2030	19,016	5,229	7,373	4,678	6,923
2031	19,375	5,328	7,513	4,766	7,054
2032	19,733	5,427	7,652	4,854	7,185
2033	20,097	5,527	7,792	4,944	7,317
2034	20,462	5,627	7,934	5,034	7,450
2035	20,831	5,728	8,077	5,124	7,584
2036	21,201	5,830	8,221	5,216	7,719
2037	21,572	5,932	8,365	5,307	7,854
2038	21,944	6,034	8,509	5,398	7,989
2039	22,314	6,136	8,652	5,489	8,124
2040	22,685	6,238	8,796	5,580	8,259
2041	23,055	6,340	8,939	5,671	8,394
2042	23,419	6,440	9,081	5,761	8,526
2043	23,779	6,539	9,220	5,850	8,658
2044	24,134	6,637	9,358	5,937	8,787
2045	24,484	**6,733**	**9,494**	**6,023**	**8,914**
2046	24,834	6,829	9,629	6,109	9,042
2047	25,179	6,924	9,763	6,194	9,167
2048	25,519	7,018	9,895	6,278	9,291
2049	25,853	7,110	10,025	6,360	9,413
2050	26,179	7,199	10,151	6,440	9,531
2051	26,506	7,289	10,278	6,521	9,650
2052	26,832	7,379	10,404	6,601	9,769
2053	27,154	7,467	10,529	6,680	9,886
2054	27,472	7,555	10,652	6,758	10,002
2055	27,782	7,640	10,773	6,834	10,115
2056	28,091	7,725	10,892	6,910	10,227
2057	28,397	7,809	11,011	6,986	10,339
2058	28,704	7,894	11,130	7,061	10,450
2059	29,008	7,977	11,248	7,136	10,561
2060	29,307	8,059	11,364	7,209	10,670

Appendix B: UPDES Permit

STATE OF UTAH
DIVISION OF WATER QUALITY
DEPARTMENT OF ENVIRONMENTAL QUALITY
SALT LAKE CITY, UTAH

UTAH POLLUTANT DISCHARGE ELIMINATION SYSTEM (UPDES) PERMITS

Minor Municipal Permit No. **UT0025445**
Biosolids Permit No. **UTL025445**
Storm Water Permit No. **UTR000000**

In compliance with provisions of the Utah *Water Quality Act, Title 19, Chapter 5, Utah Code Annotated ("UCA") 1953, as amended* (the *"Act"*),

TOOELE CITY RECLAMATION FACILITY

is hereby authorized to discharge from its wastewater treatment facility to receiving waters named

UNNAMED DITCH,

to dispose of biosolids,

and to discharge storm water,

and to distribute effluent for reuse,

in accordance with specific limitations, outfalls, and other conditions set forth herein.

This permit shall become effective on October 01, 2018

This permit expires at midnight on September 30, 2023.

Signed this 1st day of October, 2018.

Kim Shelley
Acting Director
Utah Division of Water Quality

DWQ-2018-00569_2

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Outline — Page Number

I. DISCHARGE LIMITATIONS AND REPORTING REQUIREMENTS

A. Description of Discharge Points. The authorization to discharge wastewater provided under this part is limited to those outfalls specifically designated below as discharge locations. Discharges at any location not authorized under a UPDES permit are violations of the *Act* and may be subject to penalties under the *Act*. Knowingly discharging from an unauthorized location or failing to report an unauthorized discharge may be subject to criminal penalties as provided under the *Act*.

Outfall Number	Description of Discharge Outfall
001	Located at latitude 40°35'40" and longitude 112°19'40". The discharge is by pumping out of the reuse reject pond to an unnamed irrigation ditch that collects storm water runoff from the road and fields in the area. The ditch runs north along the road until it dissipates into the ground. The ditch does not enter any other waterway or the Great Salt Lake.

Outfall Number	Description of Effluent Reuse Discharge Outfall
001R	Located at latitude 40°35'40" and longitude 112°19'40". The discharge is through a pipe to ponds on the Overlake Golf Course. The water is then used to irrigate the golf course. It is also available at the plant for use in dust control activities in in the area.

B. Narrative Standard. It shall be unlawful, and a violation of this permit, for the permittee to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum, or other nuisances such as color, odor or taste, or cause conditions which produce undesirable aquatic life or which produce objectionable tastes in edible aquatic organisms; or result in concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life, or undesirable human health effects, as determined by a bioassay or other tests performed in accordance with standard procedures.

C. Specific Limitations and Self-Monitoring Requirements.

1. Effective immediately, and lasting through the life of this permit, there shall be no acute or chronic toxicity in Outfalls 001 and 001R as defined in *Part VIII*.

2.

a. Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from Outfall 001. Such discharges shall be limited and monitored by the permittee as specified below:

Parameter	Effluent Limitations [1]				
	Maximum Monthly Avg	Maximum Weekly Avg	Yearly Average	Daily Minimum	Daily Maximum
Total Flow	2.25	--	--	--	--
BOD_5, mg/L	25	35	--	--	--
BOD_5 Min. % Removal	85	--	--	--	--
TSS, mg/L	25	35	--	--	--
TSS Min. % Removal	85	--	--	--	--

1 See Definitions, Part VIII, for definition of terms.

Parameter	Effluent Limitations [1]				
	Maximum Monthly Avg	Maximum Weekly Avg	Yearly Average	Daily Minimum	Daily Maximum
E. coli, No./100mL	126	157	--	--	--
Oil & Grease, mg/L	--	--	--	--	10.0
pH, Standard Units	--	--	--	6.5	9

Self-Monitoring and Reporting Requirements [1], [2]			
Parameter	Frequency	Sample Type	Units
Total Flow [3], [4]	Continuous	Recorder	MGD
BOD_5, Influent [5]	2 X Weekly	Composite	mg/L
Effluent	2 X Weekly	Composite	mg/L
TSS, Influent [7]	2 X Weekly	Composite	mg/L
Effluent	2 X Weekly	Composite	mg/L
E. coli	2 X Weekly	Grab	No./100mL
pH	2 X Weekly	Grab	SU
Oil & Grease [6]	When Sheen Observed	Grab	mg/L
Orthophosphate, (as P)[7] Effluent	Monthly	Composite	mg/L
Phosphorus, Total[10]			
Influent	Monthly	Composite	mg/L
Effluent	Monthly	Composite	mg/L
Total Kjeldahl Nitrogen, TKN (as N),[10]			
Influent	Monthly	Composite	mg/L
Effluent	Monthly	Composite	mg/L
Nitrate, NO3,[10]	Monthly	Composite	mg/L
Nitrite, NO2,[10]	Monthly	Composite	mg/L
Metals[8], Influent	Quarterly	Grab	mg/L
Effluent [9]	Quarterly	Grab	mg/L
Organic Toxics[10], Influent	Yearly	Grab	mg/L
Effluent [9]	Yearly		

2 Reuse monitoring results obtained during the previous month for reuse discharges shall be summarized for each month and reported on a Monthly Operational Report, submitted no later than the 28th day of the month following the completed reporting period.
3 Flow measurements of influent/effluent volume shall be made in such a manner that the permittee can affirmatively demonstrate that representative values are being obtained.
4 If the rate of discharge is controlled, the rate and duration of discharge shall be reported.
5 In addition to monitoring the final discharge, influent samples shall be taken and analyzed for this constituent at the same frequency as required for this constituent in the discharge
6 Oil & Grease sampled when sheen is present or visible. If no sheen is present or visible, report NA
7 These reflect changes required with the adoption of UCA R317-1-3.3, Technology-based Phosphorus Effluent Limits rule.
8 Testing for metals listed in the table found in Part II, H, 1 of the permit.
9 This shall be sampled from the same place as the reuse water monitoring is conducted. The results will be reported regardless of the occurrence of discharge from outfall 001.
10A list of the organics to be tested can be found in 40CFR122 appendix D table II. This shall be sampled from the same place as the reuse water monitoring is conducted. The results will be reported regardless of the occurrence of discharge from outfall 001

b. Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from Outfall 001R. Such discharges shall be limited and monitored by the permittee as specified below:

Parameter	Outfall 001R Effluent Limitations [1],				
	Max Monthly Average	Max Weekly Median	Max Daily Average	Minimum	Maximum
Turbidity [11], NTU	--	--	2	--	5
BOD_5, mg/L	10	--	--	--	--
E. coli [12], No/100mL	--	ND[13]	--	--	9
pH, Standard Units	--	--	--	6.0	9.0

Reuse Outfall 001R Self-Monitoring and Reporting Requirements [1], [3]			
Parameter	Frequency	Sample Type	Units
Total Flow, [2], [3]	Continuous	Recorder	MGD
Turbidity	Continuous	Recorder	mg/L
BOD_5	Weekly	Composite	mg/L
E. coli,	Daily	Grab	No./100mL
pH	Daily	Grab	SU

3. Compliance Schedule for a Particular Parameter

   a. There is no Compliance Schedule included in this renewal permit.

4. Acute/Chronic Whole Effluent Toxicity (WET) Testing.

   As part of the nationwide effort to control toxics, biomonitoring requirements are being included in all major permits and in minor permits for facilities where effluent toxicity is an existing or potential concern. Authorization for requiring effluent biomonitoring is provided for in UAC R317-8-4.2 and R317-8-5.3. The *Utah Pollutant Discharge Elimination System, Permit And Enforcement Guidance Document For Whole Effluent Toxicity*, February 2018,, outlines guidance to be used by Utah Division of Water Quality staff and by permittee's for implementation of WET control through the UPDES discharge permit program.

   Tooele is a minor facility that discharges all the effluent through a Reuse program. Comparison of the laboratory analysis performed on their effluent to the waste load analysis on the Unnammed Ditch, Tooele's discharge is not likely to be toxic. As a result, biomonitoring of the effluent will not be required. However, the permit will contain a WET reopener provision.

D. Reporting of Monitoring Results.

1. Reporting of Wastewater Monitoring Results Monitoring results obtained during the previous month shall be summarized for each month and reported on a Discharge

11 An alternative disposal option or diversion to storage must be automatically activated if turbidity exceeds the maximum instantaneous limit for more than 5 minutes.
12 The facility is required to disinfect to destroy, inactivate or remove pathogenic microorganisms by chemical, physical or biological means. Disinfection may be accomplished by chlorination, ozonation, or other chemical disinfectants, UV radiation. Or other approved processes.
13 The weekly median E. coli concentration shall be non-detect.

Monitoring Report Form (EPA No. 3320-1)[14] or by NetDMR, post-marked or entered into NetDMR no later than the 28th day of the month following the completed reporting period. The first report is due on November 28, 2018. If no discharge occurs during the reporting period, "no discharge" shall be reported. Legible copies of these, and all other reports including whole effluent toxicity (WET) test reports required herein, shall be signed and certified in accordance with the requirements of *Signatory Requirements (see Part VII.G)*, and submitted by NetDMR, or to the Division of Water Quality at the following address:

Department of Environmental Quality
Division of Water Quality
PO Box 144870
Salt Lake City, Utah 84114-4870

2. Reporting of Reuse Monitoring Results. Monitoring results obtained during the previous month shall be summarized for each month and reported on a Monthly Operational Report, post-marked no later than the 28th day of the month following the completed reporting period. The first report is due on November 28, 2018. If no reuse occurs during the reporting period, "no reuse" shall be reported for those applicable effluent parameters. Legible copies of these, and all other reports required herein, shall be signed and certified in accordance with the requirements of Signatory Requirements (see Part VII.G), and submitted to the Division of Water Quality at the following address:

Department of Environmental Quality
Division of Water Quality
PO Box 144870
Salt Lake City, Utah 84114-4870

14 Starting January 1, 2017 monitoring results must be submitted using NetDMR unless the permittee has successfully petitioned for an exception.

II. INDUSTRIAL PRETREATMENT PROGRAM

A. Pretreatment Program Delegation. The permittee has been delegated primary responsibility for enforcing against discharges prohibited by *40 CFR 403.5* and applying and enforcing any national Pretreatment Standards established by the United States Environmental Protection Agency in accordance with Section 307 (b) and (c) of *The Clean Water Act (CWA)*, as amended by *The Water Quality Act (WQA), of 1987*.

The permittee shall implement the Industrial Pretreatment Program in accordance with the legal authorities, policies, and procedures described in the permittee's approved Pretreatment Program submission. Such program commits the permittee to do the following:

1. Carry out inspection, surveillance, and monitoring procedures, which will determine, independent of information supplied by the industrial user, whether the industrial user is in compliance with the pretreatment standards. At a minimum, all significant industrial users shall be inspected and sampled by the permittee at least once per year;

2. Control through permit, order, or similar means, the contribution to the POTW by each industrial user to ensure compliance with applicable pretreatment standards and requirements;

3. Require development, as necessary, of compliance schedules by each industrial user for the installation of control technologies to meet applicable pretreatment standards;

4. Maintain and update industrial user information as necessary, to ensure that all IUs are properly permitted and/or controlled at all times;

5. Enforce all applicable pretreatment standards and requirements and obtain appropriate remedies for noncompliance by any industrial user;

6. Annually publish a list of industrial users that were determined to be in significant noncompliance during the previous year. The notice must be published before March 28 of the following year;

7. Maintain an adequate revenue structure and staffing level for continued implementation of the Pretreatment Program.

8. Evaluate all significant industrial users at least once every two years to determine if they need to develop a slug prevention plan. If a slug prevention plan is required, the permittee shall insure that the plan contains at least the minimum elements required in *40 CFR 403.8(f)(2)(v);*

9. Notify all significant industrial users of their obligation to comply with applicable requirements under *Subtitles C and D* of the *Resource* Conservation and Recovery Act (RCRA); and

10. Develop, implement, and maintain an enforcement response plan as required by *40 CFR 403.8(f)(5)* which shall, at a minimum,

    a. Describe how the POTW will investigate instances of noncompliance;

    b. Describe the types of escalating enforcement responses the POTW will take in response to all anticipated type of industrial user violations; and

c. Describe the time periods within which such responses will be taken and identify the POTW staff position(s) responsible for pursuing these actions.

11. Establish and enforce specific local limits as necessary to implement the provisions of the *40 CFR Parts 403.5(a)* and *(b)*, and as required by *40 CFR Part 403.5(c)*.

B. Program Updates. The permittee is required to modify its pretreatment program, as necessary, to reflect changes in the regulations of *40 CFR 403*. Such modifications shall be completed within the time frame set forth by the applicable regulations. Modification of the approved pretreatment program must be done in accordance with the requirements of *40 CFR 403.18*. Modifications of the approved program which result in less stringent industrial user requirements shall not be effective until after approval has been granted by the Director.

C. Annual Report. The permittee shall provide the Division of Water Quality and EPA with an annual report briefly describing the permittee's pretreatment program activities over the previous calendar year. Reports shall be submitted no later than March 28 of each year. These annual reports shall, at a minimum, include:

1. An updated listing of the permittee's industrial users.

2. A descriptive summary of the compliance activities including numbers of any major enforcement actions, i.e., administrative orders, penalties, civil actions, etc.

3. An assessment of the compliance status of the permittee's industrial users and the effectiveness of the permittee's Pretreatment Program in meeting its needs and objectives.

4. A summary of all sampling data taken of the influent and effluent for those pollutants listed in *Part II.H.*

5. A description of all substantive changes made to the permittee's pretreatment program referenced in *Section B* of this section. Substantive changes include, but are not limited to, any change in any ordinance, major modification in the program's administrative structure or operating agreement(s), a significant reduction in monitoring, or a change in the method of funding the program.

6. Other information as may be determined necessary by the Director.

D. General and Specific Prohibitions. Pretreatment standards (*40 CFR 403.5*) specifically prohibit the introduction of the following pollutants into the waste treatment system from any source of non-domestic discharge:

1. Pollutants which create a fire or explosion hazard in the publicly owned treatment works (POTW), including, but not limited to, wastestreams with a closed cup flashpoint of less than 140°F (60°C);

2. Pollutants, which will cause corrosive structural damage to the POTW, but in no case, discharges with a pH lower than 5.0;

3. Solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW resulting in interference;

4. Any pollutant, including oxygen demanding pollutants (BOD, etc.), released in a discharge at such volume or strength as to cause interference in the POTW;

5. Heat in amounts, which will inhibit biological activity in the POTW, resulting in interference, but in no case, heat in such quantities that the influent to the sewage treatment works exceeds 104°F (40°C);

6. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;

7. Pollutants, which result in the presence of toxic gases, vapor, or fumes within the POTW in a quantity that may cause worker health or safety problems;

8. Any trucked or hauled pollutants, except at discharge points designated by the POTW; or

9. Any pollutant that causes pass through or interference at the POTW.

10. Any specific pollutant which exceeds any local limitation established by the POTW in accordance with the requirement of *40 CFR 403.5(c)* and *40 CFR 403.5(d)*.

E. Categorical Standards. In addition to the general and specific limitations expressed in *Part A and D* of this section, applicable National Categorical Pretreatment Standards must be met by all industrial users of the POTW. These standards are published in the federal regulations at *40 CFR 405* et. seq.

F. Enforcement Notice. *UCA 19-5-104* provides that the State may issue a notice to the POTW stating that a determination has been made that appropriate enforcement action must be taken against an industrial user for noncompliance with any pretreatment requirements within 30 days. The issuance of such notice shall not be construed to limit the authority of the Director.

G. Formal Action. The Director retains the right to take legal action against any industrial user and/or POTW for those cases where a permit violation has occurred because of the failure of an industrial user to meet an applicable pretreatment standard.

H. Self-Monitoring and Reporting Requirements.

1. Influent and Effluent Monitoring and Reporting Requirements. The permittee shall sample and analyze both the influent and effluent quarterly, for the following parameters.

Monitoring for Pretreatment Program				
Parameter	MDL [15]	Sample Type	Frequency	Units
Total Arsenic	0.1	Composite	Quarterly	mg/L
Total Cadmium	0.0043			
Total Chromium	0.016			
Total Copper	0.027			
Total Lead	0.1			
Total Cyanide	0.022	Composite/Grab		
Total Mercury	0.0024			

15 The minimum detection limit (MDL) of the test method used for analysis must be below this limit, if a test method is not available the permittee must submit documentation to the Director regarding the method that will be used.

Total Molybdenum	NA	Composite		
Total Nickel	0.843			
Total Selenium	0.018			
Total Silver	0.013			
Total Zinc	0.216			
TTOs[16], b*	NA	Composite/Grab	Yearly	

The results of the analyses of metals, cyanide and toxic organics shall be submitted along with the Discharge Monitoring Report (DMR) at the end of the earliest possible reporting period.

2. In accordance with the requirements of *40 CFR Part 403.5(c)*, the permittee shall determine if there is a need to develop or revise its local limits in order to implement the general and specific prohibitions of *40 CFR Part 403.5 (a)* and *Part 403.5 (b)*. A technical evaluation of the need to develop or revise local limits shall be submitted to the Division within **12 months** of the effective date of this permit. This evaluation should be conducted in accordance with the latest revision of the *Utah Model industrial Pretreatment Program, Section 4, Local Limits*. If a technical evaluation, which may be based on the *Utah Model Industrial Pretreatment Program, Section 4, Local Limits*, reveals that development or revision of local limits is necessary, the permittee shall submit the proposed local limits revision to the Division of Water Quality for approval, and after approval implement the new local limits, within **12 months** of the Division's determination that a revision is necessary.

I. Industrial Wastes.

1. The "Industrial Waste Survey" as required by *Part II.A.1.* consists of; identifying each significant industrial user (SIU), determination of the qualitative and quantitative characteristics of each discharge, and appropriate production data. A (SIU) is defined as an industrial user discharging to a publicly-owned treatment works (POTW) that satisfies any of the following: (1) has a process wastewater flow of 25,000 gallons or more per average work day; (2) has a flow greater than five percent of the flow carried by the municipal system receiving the waste; (3) is subject to Categorical Pretreatment Standards, or (4) has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement.

2. The permittee must notify the Director of any new introductions by new or existing SIUs or any substantial change in pollutants from any major industrial source. Such notice must contain the information described in 1. above and be forwarded no later than sixty (60) days following the introduction or change.

3. The permittee shall provide adequate notice to the Director and the Division of Water Quality Industrial Pretreatment Coordinator of;

   a. Any new introduction of pollutants into the treatment works from an indirect discharger (i.e., industrial user) which would be subject to *Sections 301* or *306* of the *WQA* if it were directly discharging those pollutants;

16 In addition, the permittee shall analyze the treatment facility influent and effluent for the presence of the toxic pollutants listed in 40 CFR 122 Appendix D Table II (Organic Toxic Pollutants) yearly. The pesticides fraction of Appendix D, Table II is suspended unless pesticides are expected to be present.

b. Any substantial change in the volume or character of pollutants being introduced into the treatment works by a source introducing pollutants into the treatment works at the time of issuance of the permit; and

c. For the purposes of this section, adequate notice shall include information on:

(1) The quality and quantity of effluent to be introduced into such treatment works; and,

(2) Any anticipated impact of the change on the quantity or quality of effluent to be discharged from such publicly owned treatment works.

4. The Director retains, at all times, the right to take legal action against the industrial user and/or the treatment works, in those cases where a permit violation has occurred because of the failure of an industrial user to discharge at an acceptable level. If the permittee has failed to properly delineate maximum acceptable industrial contributor levels, the Director will look primarily to the permittee as the responsible party.

III. BIOSOLIDS REQUIREMENTS

A. Biosolids Treatment and Disposal. The authorization to dispose of biosolids provided under this permit is limited to those biosolids produced from the treatment works owned and operated by the permittee. The treatment methods and disposal practices are designated below.

1. Treatment

   a. Drying and Testing, Biosolids produced at Tooele are stabilized in an oxidation ditch for about 15 days. Thickened by gravity and stored in a holding tank. The biosolids are dewatered with a screw presses to about 25% solids, and dried in a solar greenhouse dryer. Tooele then test the biosolids for Pathogens to meet *40 CFR 503*.

2. Description of Biosolids Disposal Method

   a. Class A biosolids may be sold or given away to the public for lawn and garden use or land application.

   b. Class B biosolids may be land applied for agriculture use or at reclamation sites at agronomic rates.

   c. Biosolids may be disposed of in a landfill, or transferred to another facility for treatment/disposal.

3. Changes in Treatment Systems and Disposal Practices.

   a. Should the permittee change their disposal methods or the biosolids generation and handling processes of the plant, the permittee must notify the Director at least 30 days in advance if the process/method is specified in 40 CFR 503. This includes, but is not limited to, the permanent addition or removal of any biosolids treatment units (i.e., digesters, drying beds, belt presses, etc.) and/or any other change.

   b. Should the permittee change their disposal methods or the biosolids generation and handling processes of the plant, the permittee must notify the Director at least 180 days in advance if the process/method is not specified in 40 CFR 503. This includes, but is not limited to, the permanent addition or removal of any biosolids treatment units (i.e., digesters, drying beds, belt presses, etc.) and/or any other change.

For any biosolids that are land filled, the requirements in *Section 2.12* of the latest version of the *EPA Region VIII Biosolids Management Handbook* must be followed

B. Specific Limitations and Monitoring Requirements. All biosolids generated by this facility to be sold or given away to the public shall meet the requirements of *Part III.B.1, 2, 3* and *4* listed below.

1. Metals Limitations. All biosolids sold or given away in a bag or similar container for application to lawns and home gardens must meet the metals limitations as described below. If these metals limitations are not met, the biosolids must be landfilled.

Pollutant Limits, (40 CFR Part 503.13(b)) Dry Mass Basis				
Heavy Metals	Table 1	Table 2	Table 3	Table 4
	Ceiling Conc. Limits, (mg/kg)	CPLR[17], (mg/ha)	Pollutant Conc. Limits, (mg/kg)	APLR[18], (mg/ha-yr)
Total Arsenic	75	41	41	41
Total Cadmium	85	39	39	39
Total Copper	4300	1500	1500	1500
Total Lead	840	300	300	300
Total Mercury	57	17	17	17
Total Molybdenum	75	N/A	N/A	N/A
Total Nickel	420	420	420	420
Total Selenium	100	100	100	100
Total Zinc	7500	2800	2800	2800

2. Pathogen Limitations. All biosolids sold or given away in a bag or a similar container for application to lawns and home gardens must meet the pathogen limitations for Class A. Land applied biosolids must meet the pathogen limitations for Class B as described below. If the pathogen limitations are not met, the biosolids must be landfilled.

   a. Class A biosolids shall meet one of the pathogen measurement requirements in the following Pathogen Control Class table or shall meet the requirements for a Process to Further Reduce Pathogens as defined in *40 CFR Part 503.32(a) Sewage Sludge – Class A.*

   b. Class B biosolids shall meet the pathogen measurement requirements in the following Pathogen Control Class table or shall meet the requirements for a Process to Significantly Reduce Pathogens as defined in 40 CFR Part 503.32(b) *Sewage Sludge – Class B.* In addition, the permittee shall comply with all applicable site restrictions listed below *(40 CFR Part 503.32,(b),(5)):*

      (1) Food crops with harvested parts that touch the biosolids/soil mixture and are totally above the land surface shall not be harvested for 14 months after application.

      (2) Food crops with harvested parts below the land surface shall not be harvested for 20 months after application if the biosolids remains on the land surface for four months or more prior to incorporation into the soil.

      (3) Food crops with harvested parts below the surface of the land shall not be harvested for 38 months after application of sewage sludge when the sewage sludge remains on the land surface for less than four months prior to incorporation into the soil.

      (4) Food crops, feed crops, and fiber crops shall not be harvested from the land for 30 days after application.

      (5) Animals shall not be allowed to graze on the land for 30 days after application.

17 CPLR -- Cumulative Pollutant Loading Rate
18 APLR – Annual Pollutant Loading Rate

(6) Turf grown on land where biosolids is applied shall not be harvested for one year after application if the harvested turf is placed on either land with a high potential for public exposure or a lawn.

(7) Public access to land with a high potential for public exposure shall be restricted for one year after application.

(8) Public access to land with a low potential for public exposure shall be restricted for 30 days after application.

(9) The sludge or the application of the sludge shall not cause or contribute to the harm of a threatened or endangered species or result in the destruction or adverse modification of critical habitat of a threatened or endangered species after application.

Pathogen Control Class	
Class A	Class B
B Salmonella species –less than three (3) MPN[19] per four (4) grams total solids (or less than 1,000 fecal coliforms per gram total solids)	Fecal Coliforms –less than 2,000,000 colony forming units (CFU) per gram total solids
Enteric viruses –less than one (1) MPN (or plaque forming unit) per four (4) grams total solids	
Viable helminth ova –less than one (1) MPN per four (4) grams total solids	

3. Vector Attraction Reduction Requirements.

a. The permittee will meet vector attraction reduction through use of one of the methods listed in *40 CFR 503.33*. Facility is meeting the requirements though the following methods.

(1) Facility is meeting vector attraction reduction through Drying *40 CFR Part 503.33*. The percent of solids is 90% or more prior to sale or giveaway, for Class A biosolids, (*40 CFR 503.33 (b)(7)*), or the percent of solids is 75% or more prior to sale or giveaway, for Class B biosolids, (*40 CFR 503.33 (b)(8)*).

If the permittee intends to use another one of the alternatives, the Director and the EPA must be informed at least thirty (30) days prior to its use. This change may be made without additional public comment.

4. Self-Monitoring Requirements.

a. At a minimum, upon the effective date of this permit, all chemical pollutants, pathogens and applicable vector attraction reduction requirements shall be monitored according to *40 CFR 503.16(1)(a)*.

Minimum Frequency of Monitoring (40 CFR Part 503.16, 503.26. and 503.46)		
Amount of Biosolids Disposed Per Year		Monitoring Frequency
Dry US Tons	Dry Metric Tons	Per Year or Batch
> 0 to < 320	> 0 to < 290	Once Per Year or Batch

[19] MPN –Most Probable Number

> 320 to < 1650	> 290 to < 1,500[20]	Once a Quarter or Four Times
> 1,650 to < 16,500	> 1,500 to < 15,000	Bi-Monthly or Six Times
> 16,500	> 15,000	Monthly or Twelve Times

b. Sample collection, preservation and analysis shall be performed in a manner consistent with the requirements of *40 CRF 503* and/or other criteria specific to this permit. A metals analysis is to be performed using *Method SW 846* with *Method 3050* used for digestion. For the digestion procedure, an amount of biosolids equivalent to a dry weight of one gram shall be used. The methods are also described in the latest version of the *Region VIII Biosolids Management Handbook.*

c. The Director may request additional monitoring for specific pollutants derived from biosolids if the data shows a potential for concern.

d. After two (2) years of monitoring at the frequency specified, the permittee may request that the Director reduce the sampling frequency for the heavy metals. The frequency cannot be reduced to less than once per year for biosolids that are sold or given away to the public for any parameter. The frequency also cannot be reduced for any of the pathogen or vector attraction reduction requirements listed in this permit.

C. Management Practices of Biosolids.

1. Biosolids Distribution Information

a. For biosolids that are sold or given away, an information sheet shall be provided to the person who receives the biosolids. The label or information sheet shall contain:

(1) The name and address of the person who prepared the biosolids for a sale or to be given away.

(2) A statement that prohibits the application of the biosolids to the land except in accordance with the instructions on the label or information sheet.

2. Biosolids Application Site Storage

a. For biosolids or material derived from biosolids that are stored in piles for one year or longer, measures shall be taken to ensure that erosion (whether by wind or water) does not occur. However, best management practices should also be used for piles used for biosolids treatment. If a treatment pile is considered to have caused a problem, best management practices could be added as a requirement in the next permit renewal

3. Land Application Practices

a. The permittee shall operate and maintain the land application site operations in accordance with the following requirements:

(1) The permittee shall provide to the Director and the EPA within 90 days of the effective date of this permit a land application plan.

[20] Permittee produced 547 Dry Metric Tons in 2017. Accordingly, they will sample at least four times per year.

(2) Application of biosolids shall be conducted in a manner that will not contaminate the groundwater or impair the use classification for that water underlying the sites.

(3) Application of biosolids shall be conducted in a manner that will not cause a violation of any receiving water quality standard from discharges of surface runoff from the land application sites. Biosolids shall not be applied to land 10 meters or less from waters of the United States (as defined in 40 CFR 122.2).

(4) No person shall apply biosolids for beneficial use to frozen, ice-covered, or snow-covered land where the slope of such land is greater than three percent and is less than or equal to six percent unless one of the following requirements is met:

(a) there is 80 percent vegetative ground cover; or,

(b) approval has been obtained based upon a plan demonstrating adequate runoff containment measures.

(5) Application of biosolids is prohibited to frozen, ice-covered, or snow covered sites where the slope of the site exceeds six percent.

(6) Agronomic Rate

(a) Application of biosolids shall be conducted in a manner that does not exceed the agronomic rate for available nitrogen of the crops grown on the site. At a minimum, the permittee is required to follow the methods for calculating agronomic rate outlined in the latest version of the *Region VIII Biosolids Management Handbook* (other methods may be approved by the Director). The treatment plant shall provide written notification to the applier of the biosolids of the concentration of total nitrogen (as N on a dry weight basis) in the biosolids. Written permission from the Director is required to exceed the agronomic rate.

(b) The permittee may request the limits of *Part III. C. 6* be modified if different limits would be justified based on local conditions. The limits are required to be developed in cooperation with the local agricultural extension office or university.

(c) Deep soil monitoring for nitrate-nitrogen is required for all land application sites (does not apply to sites where biosolids are applied less than once every five years). A minimum of six samples for each 320 (or less) acre area is to be collected. These samples are to be collected down to either a 5 foot depth, or the confining layer, whichever is shallower (sample at 1 foot, 2 foot, 3 foot, 4 foot and 5 foot intervals). Each of these one-foot interval samples shall be analyzed for nitrate-nitrogen. In addition to the one-foot interval samples, a composite sample of the 5 foot intervals shall be taken, and analyzed for nitrate-nitrogen as well. Samples are required to be taken once every five years for non-irrigated sites that receive more than 18 inches of precipitation annually or for irrigated sites

(7) Biosolids shall not be applied to any site area with standing surface water. If the annual high groundwater level is known or suspected to be within five feet of the surface, additional deep soil monitoring for nitrate-nitrogen as described

in *Part III.C.(6),(c).* is to be performed. At a minimum, this additional monitoring will involve a collection of more samples in the affected area and possibly more frequent sampling. The exact number of samples to be collected will be outlined in a deep soil monitoring plan to be submitted to the Director and the EPA within 90 days of the effective date of this permit. The plan is subject to approval by the Director.

(8) The specified cover crop shall be planted during the next available planting season. If this does not occur, the permittee shall notify the Director in writing. Additional restrictions may be placed on the application of the biosolids on that site on a case-by-case basis to control nitrate movement. Deep soil monitoring may be increased under the discretion of the Director.

(9) When weather and or soil conditions prevent adherence to the biosolids application procedure, biosolids shall not be applied on the site.

(10) For biosolids that are sold or given away, an information sheet shall be provided to the person who receives the biosolids. The label or information sheet shall contain:

(a) The name and address of the person who prepared the biosolids for sale or give away for application to the land.

(b) A statement that prohibits the application of the biosolids to the land except in accordance with the instructions on the label or information sheet.

(c) The annual whole biosolids application rate for the biosolids that do not cause the metals loading rates in Tables 1, 2, and 3 (*Part III.B.1.*) to be exceeded.

(11) Biosolids subject to the cumulative pollutant loading rates in Table 2 (*Part III.B.1.*) shall not be applied to agricultural land, forest, a public contact site, or a reclamation site if any of the cumulative pollutant loading rates in Table 2 have been reached.

(12) If the treatment plant applies the biosolids, it shall provide the owner or leaseholder of the land on which the biosolids are applied notice and necessary information to comply with the requirements in this permit.

(13) The permittee shall inspect the application of the biosolids to active sites to prevent malfunctions and deterioration, operator errors and discharges, which may cause or lead to the release of biosolids to the environment or a threat to human health. The permittee must conduct these inspections often enough to identify problems in time to correct them before they harm human health or the environment. The permittee shall keep an inspection log or summary including at least the date and time of inspection, the printed name and the handwritten signature of the inspector, a notation of observations made and the date and nature of any repairs or corrective action.

D. Special Conditions on Biosolids Storage. Permanent storage of biosolids is prohibited. Biosolids shall not be temporarily stored for more than two (2) years. Written permission to store biosolids for more than two years must be obtained from the Director. Storage of

biosolids for more than two years will be allowed only if it is determined that significant treatment is occurring.

E. Representative Sampling. Biosolids samples used to measure compliance with *Part III* of this Permit shall be collected at locations representative of the quality of biosolids generated at the treatment works and immediately prior to land application.

F. Reporting of Monitoring Results.

1. Biosolids. The permittee shall provide the results of all monitoring performed in accordance with *Part III.B*, and information on management practices, biosolids treatment, site restrictions and certifications shall be provided no later than February 19 of each year. Each report is for the previous calendar year. If no biosolids were sold or given away during the reporting period, "no biosolids were sold or given away" shall be reported. Legible copies of these, and all other reports required herein, shall be signed and certified in accordance with the *Signatory Requirements (see Part VII.G)*, and submitted to the Utah Division of Water Quality by NetDMR[21] or at the following address:

Original to: Biosolids Coordinator
Utah Division of Water Quality
P. O. Box 144870
Salt Lake City Utah, 84114-4870

G. Additional Record Keeping Requirements Specific to Biosolids.

1. Unless otherwise required by the Director, **the permittee is not required to keep records** on compost products if the permittee prepared them from biosolids that meet the limits in Table 3 (*Part III.B.1*), the Class A pathogen requirements in *Part III.B.2* and the vector attraction reduction requirements in *Part III.B.3*. The Director may notify the permittee that additional record keeping is required if it is determined to be significant to protecting public health and the environment.

2. **The permittee is required** to keep the following information for at least 5 years:

a. Concentration of each heavy metal in Table 3 (*Part III.B.1*).

b. A description of how the pathogen reduction requirements in *Part III.B.2* were met.

c. A description of how the vector attraction reduction requirements in *Part III.B.3* were met.

d. A description of how the management practices in *Part III.C* were met (if necessary).

e. The following certification statement:

"I certify under the penalty of law, that the heavy metals requirements in *Part III.B.1*, the pathogen requirements in *Part III.B.2*, the vector attraction requirements in *Part III.B.3*, the management practices in *Part III.C*. This determination has been made under my direction and supervision in accordance with the system designed to assure that qualified personnel properly gather and evaluate the information used to

21 Starting January 1, 2017 monitoring results must be submitted using NetDMR unless the permittee has successfully petitioned for an exception. Annual Biosolids Reports should also be submitted through this system.

determine that the pathogen requirements, the vector attraction reduction requirements and the management practices have been met. I am aware that there are significant penalties for false certification including the possibility of imprisonment."

3. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit and records of all data used to complete the application for this permit for the life of the permit. Data collected on site, copies of Biosolids Report forms, and a copy of this UPDES biosolids-only permit must be maintained on site during the duration of activity at the permitted location.

IV. STORM WATER REQUIREMENTS.

A. Coverage of This Section. The requirements listed under this section shall apply to storm water discharges. Storm water discharges from the following portions of the facility may be eligible for coverage under this permit: biosolids drying beds, haul or access roads on which transportation of biosolids may occur, grit screen cleaning areas, chemical loading, unloading and storage areas, salt or sand storage areas, vehicle or equipment storage and maintenance areas, or any other wastewater treatment device or system, used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including lands dedicated to the disposal of sewage sludge that are located within the confines of the facility that may have a reasonable expectation to contribute to pollutants in a storm water discharge.

B. Prohibition of Non-Storm Water Discharges. Except for discharges identified in *Part I.*, and discharges described below in this paragraph, non-storm water discharges are prohibited. The following non-storm water discharges may be authorized under this permit provided the non-storm water component of the discharge is in compliance with this section; discharges from fire fighting activities; fire hydrant flushing; potable water sources including waterline flushing; drinking fountain water; irrigation drainage and lawn watering; routine external building wash down water where detergents or other compounds have not been used in the process; pavement wash waters where spills or leaks of toxic or hazardous materials (including oils and fuels) have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; uncontaminated compressor condensate; uncontaminated springs; uncontaminated ground water; and foundation or footing drains where flows are not contaminated with process materials such as solvents.

C. Storm Water Pollution Prevention Plan Requirements. The permittee must have (on site) or develop and implement a storm water pollution prevention plan as a condition of this permit.

1. Contents of the Plan. The plan shall include, at a minimum, the following items:

a. *Pollution Prevention Team.* Each plan shall identify a specific individual or individuals within the facility organization as members of a storm water Pollution Prevention Team who are responsible for developing the storm water pollution prevention plan and assisting the facility or plant manager in its implementation, maintenance, and revision. The plan shall clearly identify the responsibilities of each team member. The activities and responsibilities of the team shall address all aspects of the facility's storm water pollution prevention plan.

b. *Description of Potential Pollutant Sources.* Each plan shall provide a description of potential sources which may reasonably be expected to add significant amounts of pollutants to storm water discharges or which may result in the discharge of pollutants during dry weather from separate storm sewers draining the facility. Each plan shall identify all activities and significant materials, which may be reasonably expected to have the potential as a significant pollutant source. Each plan shall include, at a minimum:

(1) *Drainage.* A site map indicating drainage areas and storm water outfalls. For each area of the facility that generates storm water discharges associated with the waste water treatment related activity with a reasonable potential for containing significant amounts of pollutants, a prediction of the direction of flow and an identification of the types of pollutants that are likely to be present in storm water discharges associated with the activity. Factors to consider include the toxicity of the pollutant; quantity of chemicals used, produced or discharged; the likelihood of contact with storm water; and history of

significant leaks or spills of toxic or hazardous pollutants. Flows with a significant potential for causing erosion shall be identified. The site map shall include but not be limited to:

(a) Drainage direction and discharge points from all wastewater associated activities including but not limited to grit screen cleaning, bio-solids drying beds and transport, chemical/material loading, unloading and storage areas, vehicle maintenance areas, salt or sand storage areas.

(b) Location of any erosion and sediment control structure or other control measures utilized for reducing pollutants in storm water runoff.

(c) Location of bio-solids drying beds where exposed to precipitation or where the transportation of bio-solids may be spilled onto internal roadways or tracked off site.

(d) Location where grit screen cleaning or other routinely performed industrial activities are located and are exposed to precipitation.

(e) Location of any handling, loading, unloading or storage of chemicals or potential pollutants such as caustics, hydraulic fluids, lubricants, solvents or other petroleum products, or hazardous wastes and where these may be exposed to precipitation.

(f) Locations where any major spills or leaks of toxic or hazardous materials have occurred.

(g) Location of any sand or salt piles.

(h) Location of fueling stations or vehicle and equipment maintenance and cleaning areas that are exposed to precipitation.

(i) Location of receiving streams or other surface water bodies.

(j) Locations of outfalls and the types of discharges contained in the drainage areas of the outfalls.

(2) *Inventory of Exposed Materials.* An inventory of the types of materials handled at the site that potentially may be exposed to precipitation. Such inventory shall include a narrative description of significant materials that have been handled, treated, stored or disposed in a manner to allow exposure to storm water between the time of 3 years prior to the effective date of this permit and the present; method and location of onsite storage or disposal; materials management practices employed to minimize contact of materials with storm water runoff between the time of 3 years prior to the effective date of this permit and the present; the location and a description of existing structural and nonstructural control measures to reduce pollutants in storm water runoff; and a description of any treatment the storm water receives.

(3) *Spills and Leaks.* A list of significant spills and significant leaks of toxic or hazardous pollutants that occurred at areas that are exposed to precipitation or that otherwise drain to a storm water conveyance at the facility after the date of 3 years prior to the effective date of this permit. Such list shall be updated as appropriate during the term of the permit.

(4) *Sampling Data.* A summary of existing discharge sampling data describing pollutants in storm water discharges from the facility, including a summary of sampling data collected during the term of this permit.

(5) *Summary of Potential Pollutant Sources and Risk Assessment.* A narrative description of the potential pollutant sources from the following activities associated with treatment works: access roads/rail lines; loading and unloading operations; outdoor storage activities; material handling sites; outdoor vehicle storage or maintenance sites; significant dust or particulate generating processes; and onsite waste disposal practices. Specific potential pollutants shall be identified where known.

(6) *Measures and Controls.* The permittee shall develop a description of storm water management controls appropriate for the facility, and implement such controls. The appropriateness and priorities of controls in a plan shall reflect identified potential sources of pollutants at the facility. The description of storm water management controls shall address the following minimum components, including a schedule for implementing such controls:

(7) *Good Housekeeping.* All areas that may contribute pollutants to storm waters discharges shall be maintained in a clean, orderly manner. These are practices that would minimize the generation of pollutants at the source or before it would be necessary to employ sediment ponds or other control measures at the discharge outlets. Where applicable, such measures or other equivalent measures would include the following: sweepers and covered storage to minimize dust generation and storm runoff; conservation of vegetation where possible to minimize erosion; sweeping of haul roads, bio-solids access points, and exits to reduce or eliminate off site tracking; sweeping of sand or salt storage areas to minimize entrainment in storm water runoff; collection, removal, and proper disposal of waste oils and other fluids resulting from vehicle and equipment maintenance; other equivalent measures to address identified potential sources of pollution.

(8) *Preventive Maintenance.* A preventive maintenance program shall involve timely inspection and maintenance of storm water management devices (e.g., cleaning oil/water separators, catch basins) as well as inspecting and testing facility equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters, and ensuring appropriate maintenance of such equipment and systems.

(9) *Spill Prevention and Response Procedures.* Areas where potential spills that can contribute pollutants to storm water discharges can occur, and their accompanying drainage points, shall be identified clearly in the storm water pollution prevention plan. Where appropriate, specifying material handling procedures, storage requirements, and use of equipment such as diversion valves in the plan should be considered. Procedures and equipment for cleaning up spills shall be identified in the plan and made available to the appropriate personnel.

(10) *Inspections.* In addition to the comprehensive site evaluation required under paragraph *(Part IV.C.1.b.(16))* of this section, qualified facility personnel shall be identified to inspect designated equipment and areas of the facility on a periodic basis. The following areas shall be included in all inspections: access

roads/rail lines, equipment storage and maintenance areas (both indoor and outdoor areas); fueling; material handling areas, residual treatment, storage, and disposal areas; and wastewater treatment areas. A set of tracking or follow-up procedures shall be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections shall be maintained. The use of a checklist developed by the facility is encouraged.

(11) *Employee Training.* Employee training programs shall inform personnel responsible for implementing activities identified in the storm water pollution prevention plan or otherwise responsible for storm water management at all levels of responsibility of the components and goals of the storm water pollution prevention plan. Training should address topics such as spill response, good housekeeping and material management practices. The pollution prevention plan shall identify how often training will take place, but training should be held at least annually (once per calendar year). Employee training must, at a minimum, address the following areas when applicable to a facility: petroleum product management; process chemical management; spill prevention and control; fueling procedures; general good housekeeping practices; proper procedures for using fertilizers, herbicides and pesticides.

(12) *Record keeping and Internal Reporting Procedures.* A description of incidents (such as spills, or other discharges), along with other information describing the quality and quantity of storm water discharges shall be included in the plan required under this part. Inspections and maintenance activities shall be documented and records of such activities shall be incorporated into the plan.

(13) *Non-storm Water Discharges.*

(a) *Certification.* The plan shall include a certification that the discharge has been tested or evaluated for the presence of non-storm water discharges. The certification shall include the identification of potential significant sources of non-storm water at the site, a description of the results of any test and/or evaluation for the presence of non-storm water discharges, the evaluation criteria or testing method used, the date of any testing and/or evaluation, and the onsite drainage points that were directly observed during the test. Certifications shall be signed in accordance with *Part VII.G* of this permit.

(b) *Exceptions.* Except for flows from fire fighting activities, sources of non-storm water listed in *Part IV.B.* (Prohibition of Non-storm Water Discharges) of this permit that are combined with storm water discharges associated with industrial activity must be identified in the plan. The plan shall identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

(c) *Failure to Certify.* Any facility that is unable to provide the certification required (testing for non-storm water discharges), must notify the Director within 180 days after the effective date of this permit. If the failure to certify is caused by the inability to perform adequate tests or evaluations, such notification shall describe: the procedure of any test conducted for the presence of non-storm water discharges; the results of such test or other relevant observations; potential sources of non-storm water discharges to the storm sewer; and why adequate tests for such storm sewers were not

feasible. Non-storm water discharges to waters of the State, which are not, authorized by a *UPDES* permit are unlawful, and must be terminated.

(14) *Sediment and Erosion Control.* The plan shall identify areas, which, due to topography, activities, or other factors, have a high potential for significant soil erosion, and identify structural, vegetative, and/or stabilization measures to be used to limit erosion.

(15) *Management of Runoff.* The plan shall contain a narrative consideration of the appropriateness of traditional storm water management practices (practices other than those which control the generation or source(s) of pollutants) used to divert, infiltrate, reuse, or otherwise manage storm water runoff in a manner that reduces pollutants in storm water discharges from the site. The plan shall provide that measures that the permittee determines to be reasonable and appropriate shall be implemented and maintained. The potential of various sources at the facility to contribute pollutants to storm water discharges associated with industrial activity *Part IV.C.1.b* (Description of Potential Pollutant Sources) of this permit] shall be considered when determining reasonable and appropriate measures. Appropriate measures or other equivalent measures may include: vegetative swales and practices, reuse of collected storm water (such as for a process or as an irrigation source), inlet controls (such as oil/water separators), snow management activities, infiltration devices, wet detention/retention devices and discharging storm water through the waste water facility for treatment.

(16) *Comprehensive Site Compliance Evaluation.* Qualified personnel shall conduct site compliance evaluations at appropriate intervals specified in the plan, but in no case less than once a year. Such evaluations shall provide:

(a) Areas contributing to a storm water discharge associated with industrial activity shall be visually inspected for evidence of, or the potential for, pollutants entering the drainage system. Measures to reduce pollutant loadings shall be evaluated to determine whether they are adequate and properly implemented in accordance with the terms of the permit or whether additional control measures are needed. Structural storm water management measures, sediment and erosion control measures, and other structural pollution prevention measures identified in the plan shall be observed to ensure that they are operating correctly. A visual inspection of equipment needed to implement the plan, such as spill response equipment, shall be made.

(b) Based on the results of the evaluation, the description of potential pollutant sources identified in the plan in accordance with *Part IV.C.1.b* (Description of Potential Pollutant Sources) of this section and pollution prevention measures and controls identified in the plan in accordance with *Part IV.C.1.b.(6)* (Measures and Controls) of this section shall be revised as appropriate within 2 weeks of such evaluation and shall provide for implementation of any changes to the plan in a timely manner, but in no case more than 12 weeks after the evaluation.

(c) A report summarizing the scope of the evaluation, personnel making the evaluation, the date(s) of the evaluation, major observations relating to the implementation of the storm water pollution prevention plan, and actions taken in accordance with paragraph *i.* (above) shall be made and retained

as part of the storm water pollution prevention plan for at least 3 years after the date of the evaluation. The report shall identify any incidents of noncompliance. Where a report does not identify any incidents of noncompliance, the report shall contain a certification that the facility is in compliance with the storm water pollution prevention plan and this permit. The report shall be signed in accordance with *Part VII.G* (Signatory Requirements) of this permit.

(17) *Deadlines for Plan Preparation and Compliance*. The permittee shall prepare and implement a plan in compliance with the provisions of this section within 270 days of the effective date of this permit. If the permittee already has a plan, it shall be revised according to *Part IV.C.1.b.(16)*, Comprehensive Site Evaluation.

(18) *Keeping Plans Current*. The permittee shall amend the plan whenever there is a change in design, construction, operation, or maintenance, that has a significant effect on the potential for the discharge of pollutants to the waters of the state or if the storm water pollution prevention plan proves to be ineffective in eliminating or significantly minimizing pollutants from sources identified by the plan, or in otherwise achieving the general objective of controlling pollutants in storm water discharges associated with the activities at the facility.

D. Monitoring and Reporting Requirements.

1. Quarterly Visual Examination of Storm Water Quality. Facilities shall perform and document a visual examination of a storm water discharge associated with industrial activity from each outfall, except discharges exempted below. The examination must be made at least once in each of the following designated periods during daylight hours unless there is insufficient rainfall or snow melt to produce a runoff event: January through March; April through June; July through September; and October through December.

   a. *Sample and Data Collection*. Examinations shall be made of samples collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 1 hour) of when the runoff or snowmelt begins discharging. The examinations shall document observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution. The examination must be conducted in a well lit area. No analytical tests are required to be performed on the samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. Where practicable, the same individual should carry out the collection and examination of discharges for entire permit term.

   b. *Visual Storm Water Discharge Examination Reports*. Visual examination reports must be maintained onsite in the pollution prevention plan. The report shall include the examination date and time, examination personnel, the nature of the discharge (i.e., runoff or snow melt), visual quality of the storm water discharge (including observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution), and probable sources of any observed storm water contamination.

   c. *Representative Discharge*. When the permittee has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management

practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may collect a sample of effluent of one of such outfalls and report that the observation data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluents. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

d. *Adverse Conditions.* When a discharger is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the discharger must document the reason for not performing the visual examination and retain this documentation onsite with the results of the visual examination. Adverse weather conditions, which may prohibit the collection of samples, include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

e. *Inactive and Unstaffed Site.* When a discharger is unable to conduct visual storm water examinations at an inactive and unstaffed site, the operator of the facility may exercise a waiver of the monitoring requirement as long as the facility remains inactive and unstaffed. The facility must maintain a certification with the pollution prevention plan stating that the site is inactive and unstaffed so that performing visual examinations during a qualifying event is not feasible.

V. MONITORING, RECORDING & GENERAL REPORTING REQUIREMENTS

A. Representative Sampling. Samples taken in compliance with the monitoring requirements established under *Part I* shall be collected from the effluent stream prior to discharge into the receiving waters. Samples and measurements shall be representative of the volume and nature of the monitored discharge. Samples of biosolids shall be collected at a location representative of the quality of biosolids immediately prior to the use-disposal practice.

B. Monitoring Procedures. Monitoring must be conducted according to test procedures approved under *Utah Administrative Code ("UAC") R317-2-10 and 40CFR Part 503*, unless other test procedures have been specified in this permit.

C. Penalties for Tampering. The *Act* provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six months per violation, or by both.

D. Compliance Schedules. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any Compliance Schedule of this permit shall be submitted no later than 14 days following each schedule date.

E. Additional Monitoring by the Permittee. If the permittee monitors any parameter more frequently than required by this permit, using test procedures approved under *UAC R317-2-10* and *40 CFR 503* or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or the Biosolids Report Form. Such increased frequency shall also be indicated. Only those parameters required by the permit need to be reported.

F. Records Contents. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements:
2. The individual(s) who performed the sampling or measurements;
3. The date(s) and time(s) analyses were performed;
4. The individual(s) who performed the analyses;
5. The analytical techniques or methods used; and,
6. The results of such analyses.

G. Retention of Records. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time. A copy of this UPDES permit must be maintained on site during the duration of activity at the permitted location

H. Twenty-four Hour Notice of Noncompliance Reporting.

1. The permittee shall (orally) report any noncompliance including transportation accidents, spills, and uncontrolled runoff from biosolids transfer or land application sites which may seriously endanger health or environment, as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of circumstances. The

report shall be made to the Division of Water Quality, (801) 231-1769, or 24-hour answering service (801) 536-4123.

2. The following occurrences of noncompliance shall be reported by telephone (801) 536-4300 as soon as possible but no later than 24 hours from the time the permittee becomes aware of the circumstances:

   a. Any noncompliance which may endanger health or the environment;

   b. Any unanticipated bypass, which exceeds any effluent limitation in the permit (See *Part VI.G, Bypass of Treatment Facilities.)*;

   c. Any upset which exceeds any effluent limitation in the permit (See *Part VI.H, Upset Conditions.*);

   d. Violation of a maximum daily discharge limitation for any of the pollutants listed in the permit; or,

   e. Violation of any of the Table 3 metals limits, the pathogen limits, the vector attraction reduction limits or the management practices for biosolids that have been sold or given away.

3. A written submission shall also be provided within five days of the time that the permittee becomes aware of the circumstances. The written submission shall contain:

   a. A description of the noncompliance and its cause;

   b. The period of noncompliance, including exact dates and times;

   c. The estimated time noncompliance is expected to continue if it has not been corrected;

   d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance; and,

   e. Steps taken, if any, to mitigate the adverse impacts on the environment and human health during the noncompliance period.

4. The Director may waive the written report on a case-by-case basis if the oral report has been received within 24 hours by the Division of Water Quality, (801) 536-4300.

5. Reports shall be submitted to the addresses in *Part I.D, Reporting of Monitoring Results.*

I. Other Noncompliance Reporting. Instances of noncompliance not required to be reported within 24 hours shall be reported at the time that monitoring reports for *Part I.D* are submitted. The reports shall contain the information listed in *Part V.H.3*

J. Inspection and Entry The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit, including but not limited to, biosolids treatment, collection, storage facilities or area, transport vehicles and containers, and land application sites;

4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the *Act*, any substances or parameters at any location, including, but not limited to, digested biosolids before dewatering, dewatered biosolids, biosolids transfer or staging areas, any ground or surface waters at the land application sites or biosolids, soils, or vegetation on the land application sites; and,

5. The permittee shall make the necessary arrangements with the landowner or leaseholder to obtain permission or clearance, the Director, or authorized representative, upon the presentation of credentials and other documents as may be required by law, will be permitted to enter without delay for the purposes of performing their responsibilities.

VI. COMPLIANCE RESPONSIBILITIES

A. Duty to Comply. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity, which may result in noncompliance with permit requirements.

B. Penalties for Violations of Permit Conditions. The *Act* provides that any person who violates a permit condition implementing provisions of the *Act* is subject to a civil penalty not to exceed $10,000 per day of such violation. Any person who willfully or negligently violates permit conditions or the Act is subject to a fine not exceeding $25,000 per day of violation. Any person convicted under *UCA 19-5-115(2)* a second time shall be punished by a fine not exceeding $50,000 per day. Except as provided at *Part VI.G, Bypass of Treatment Facilities* and *Part VI.H, Upset Conditions*, nothing in this permit shall be construed to relieve the permittee of the civil or criminal penalties for noncompliance.

C. Need to Halt or Reduce Activity not a Defense. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. Duty to Mitigate. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit, which has a reasonable likelihood of adversely affecting human health or the environment. The permittee shall also take all reasonable steps to minimize or prevent any land application in violation of this permit.

E. Proper Operation and Maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems, which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

F. Removed Substances. Collected screening, grit, solids, sludge, or other pollutants removed in the course of treatment shall be disposed of in such a manner so as to prevent any pollutant from entering any waters of the state or creating a health hazard. Sludge/digester supernatant and filter backwash shall not directly enter either the final effluent or waters of the state by any other direct route.

G. Bypass of Treatment Facilities.

1. Bypass Not Exceeding Limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to paragraph 2 and 3 of this section.

2. Prohibition of Bypass.

a. Bypass is prohibited, and the Director may take enforcement action against a permittee for bypass, unless:

(1) Bypass was unavoidable to prevent loss of human life, personal injury, or severe property damage;

(2) There were no feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance, and

(3) The permittee submitted notices as required under *section VI.G.3*.

b. The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed in *sections VI.G.2.a (1), (2) and (3)*.

3. Notice.

a. *Anticipated bypass*. Except as provided above in *section VI.G.2* and below in *section VI.G.3.b*, if the permittee knows in advance of the need for a bypass, it shall submit prior notice, at least ninety days before the date of bypass. The prior notice shall include the following unless otherwise waived by the Director:

(1) Evaluation of alternative to bypass, including cost-benefit analysis containing an assessment of anticipated resource damages:

(2) A specific bypass plan describing the work to be performed including scheduled dates and times. The permittee must notify the Director in advance of any changes to the bypass schedule;

(3) Description of specific measures to be taken to minimize environmental and public health impacts;

(4) A notification plan sufficient to alert all downstream users, the public and others reasonably expected to be impacted by the bypass;

(5) A water quality assessment plan to include sufficient monitoring of the receiving water before, during and following the bypass to enable evaluation of public health risks and environmental impacts; and,

(6) Any additional information requested by the Director.

b. *Emergency Bypass*. Where ninety days advance notice is not possible, the permittee must notify the Director, and the Director of the Department of Natural Resources, as soon as it becomes aware of the need to bypass and provide to the Director the information in *section VI.G.3.a.(1) through (6)* to the extent practicable.

c. *Unanticipated bypass*. The permittee shall submit notice of an unanticipated bypass to the Director as required under *Part IV.H*, Twenty Four Hour Reporting. The permittee shall also immediately notify the Director of the Department of Natural Resources, the public and downstream users and shall implement measures to minimize impacts to public health and environment to the extent practicable.

H. Upset Conditions.

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of paragraph 2 of this section are met. Director's administrative determination regarding a claim of upset cannot be judiciously challenged by the permittee until such time as an action is initiated for noncompliance.

2. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

   a. An upset occurred and that the permittee can identify the cause(s) of the upset;

   b. The permitted facility was at the time being properly operated;

   c. The permittee submitted notice of the upset as required under *Part V.H, Twenty-four Hour Notice of Noncompliance Reporting*; and,

   d. The permittee complied with any remedial measures required under *Part VI.D, Duty to Mitigate*.

3. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

VII. GENERAL REQUIREMENTS

A. Planned Changes. The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when the alteration or addition could significantly change the nature or increase the quantity of parameters discharged or pollutant sold or given away. This notification applies to pollutants, which are not subject to effluent limitations in the permit. In addition, if there are any planned substantial changes to the permittee's existing sludge facilities or their manner of operation or to current sludge management practices of storage and disposal, the permittee shall give notice to the Director of any planned changes at least 30 days prior to their implementation.

B. Anticipated Noncompliance. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity, which may result in noncompliance with permit requirements.

C. Permit Actions. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

D. Duty to Reapply. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee shall apply for and obtain a new permit. The application shall be submitted at least 180 days before the expiration date of this permit.

E. Duty to Provide Information. The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

F. Other Information. When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Director, it shall promptly submit such facts or information.

G. Signatory Requirements. All applications, reports or information submitted to the Director shall be signed and certified.

1. All permit applications shall be signed by either a principal executive officer or ranking elected official.

2. All reports required by the permit and other information requested by the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described above and submitted to the Director, and,

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. A duly authorized representative may thus be either a named individual or any individual occupying a named position.

3. Changes to authorization. If an authorization under *paragraph VII.G.2* is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of *paragraph VII.G.2.* must be submitted to the Director prior to or together with any reports, information, or applications to be signed by an authorized representative.

4. Certification. Any person signing a document under this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

H. Penalties for Falsification of Reports. The *Act* provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than $10,000.00 per violation, or by imprisonment for not more than six months per violation, or by both.

I. Availability of Reports. Except for data determined to be confidential under *UAC R317-8-3.2*, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the office of Director. As required by the *Act*, permit applications, permits and effluent data shall not be considered confidential.

J. Oil and Hazardous Substance Liability. Nothing in this permit shall be construed to preclude the permittee of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under the *Act*.

K. Property Rights. The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

L. Severability. The provisions of this permit are severable, and if any provisions of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

M. Transfers. This permit may be automatically transferred to a new permittee if:

1. The current permittee notifies the Director at least 20 days in advance of the proposed transfer date;

2. The notice includes a written agreement between the existing and new permittee's containing a specific date for transfer of permit responsibility, coverage, and liability between them; and,

3. The Director does not notify the existing permittee and the proposed new permittee of his or her intent to modify, or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph *2* above.

N. State or Federal Laws. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by *UCA 19-5-117* and *Section 510* of the *Act* or any applicable Federal or State transportation regulations, such as but not limited to the Department of Transportation regulations.

O. Water Quality - Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include the appropriate effluent limitations and compliance schedule, if necessary, if one or more of the following events occurs:

1. Water Quality Standards for the receiving water(s) to which the permittee discharges are modified in such a manner as to require different effluent limits than contained in this permit.

2. A final wasteload allocation is developed and approved by the State and/or EPA for incorporation in this permit.

3. Revisions to the current CWA § 208 areawide treatment management plans or promulgations/revisions to TMDLs (40 CFR 130.7) approved by the EPA and adopted by the Division of Water Quality which calls for different effluent limitations than contained in this permit.

P. Biosolids – Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include the appropriate biosolids limitations (and compliance schedule, if necessary), management practices, other appropriate requirements to protect public health and the environment, or if there have been substantial changes (or such changes are planned) in biosolids use or disposal practices; applicable management practices or numerical limitations for pollutants in biosolids have been promulgated which are more stringent than the requirements in this permit; and/or it has been determined that the permittees biosolids use or land application practices do not comply with existing applicable state of federal regulations.

Q. Toxicity Limitation - Reopener Provision: This permit may be reopened and modified (following proper administrative procedures) to include whole effluent toxicity (WET)

testing, a WET limitation, a compliance date, additional or modified numerical limitations, or any other conditions related to the control of toxicants if toxicity is suspected during the life of this permit.

R. Storm Water-Reopener Provision. At any time during the duration (life) of this permit, this permit may be reopened and modified (following proper administrative procedures) as per *UAC R317.8*, to include, any applicable storm water provisions and requirements, a storm water pollution prevention plan, a compliance schedule, a compliance date, monitoring and/or reporting requirements, or any other conditions related to the control of storm water discharges to "waters-of-State".

VIII. DEFINITIONS

A. Wastewater.

1. The "7-day (and weekly) average", other than for *E. coli* bacteria, fecal coliform bacteria, and total coliform bacteria, is the arithmetic average of all samples collected during a consecutive 7-day period or calendar week, whichever is applicable. Geometric means shall be calculated for *E. coli* bacteria, fecal coliform bacteria, and total coliform bacteria. The 7-day and weekly averages are applicable only to those effluent characteristics for which there are 7-day average effluent limitations. The calendar week, which begins on Sunday and ends on Saturday, shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms. Weekly averages shall be calculated for all calendar weeks with Saturdays in the month. If a calendar week overlaps two months (i.e., the Sunday is in one month and the Saturday in the following month), the weekly average calculated for that calendar week shall be included in the data for the month that contains Saturday.

2. The "30-day (and monthly) average," other than for *E. coli* bacteria, fecal coliform bacteria and total coliform bacteria, is the arithmetic average of all samples collected during a consecutive 30-day period or calendar month, whichever is applicable. Geometric means shall be calculated for *E. coli* bacteria, fecal coliform bacteria and total coliform bacteria. The calendar month shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms.

3. "Act," means the *Utah Water Quality Act*.

4. "Acute toxicity" occurs when 50 percent or more mortality is observed for either species at any effluent concentration. Mortality in the control must simultaneously be 10 percent or less for the effluent results to be considered valid.

5. "Bypass," means the diversion of waste streams from any portion of a treatment facility.

6. "Chronic toxicity" occurs when during a chronic toxicity test, the 25% inhibition concentration (IC25) calculated on the basis of test organism survival and growth, or survival and reproduction, is less than or equal to the effluent dilution designated as the receiving water concentration (RWC).

7. "IC_{25}" (inhibition concentration) is a point estimate of the toxicant concentration that would cause a 25% reduction in a biological measurement of the test organism, such as reproduction or growth.

8. "Composite Samples" shall be flow proportioned. The composite sample shall, as a minimum, contain at least four (4) samples collected over the compositing period. Unless otherwise specified, the time between the collection of the first sample and the last sample shall not be less than six (6) hours nor more than 24 hours. Acceptable methods for preparation of composite samples are as follows:

   a. Constant time interval between samples, sample volume proportional to flow rate at time of sampling;

b. Constant time interval between samples, sample volume proportional to total flow (volume) since last sample. For the first sample, the flow rate at the time the sample was collected may be used;

c. Constant sample volume, time interval between samples proportional to flow (i.e., sample taken every "X" gallons of flow); and,

d. Continuous sample volume, with sample collection rate proportional to flow rate.

9. "CWA," means *The Federal Water Pollution Control Act*, as amended, by *The Clean Water Act of 1987*.

10. "Daily Maximum" (Daily Max.) is the maximum value allowable in any single sample or instantaneous measurement.

11. "EPA," means the United States Environmental Protection Agency.

12. "Director," means Director of the Division of Water Quality.

13. A "grab" sample, for monitoring requirements, is defined as a single "dip and take" sample collected at a representative point in the discharge stream.

14. An "instantaneous" measurement, for monitoring requirements, is defined as a single reading, observation, or measurement.

15. "Severe Property Damage," means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

16. "Upset," means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

B. Biosolids.

1. "Biosolids," means any material or material derived from sewage solids that have been biologically treated.

2. "Dry Weight-Basis," means 100 percent solids (i.e. zero percent moisture).

3. "Land Application" is the spraying or spreading of biosolids onto the land surface; the injection of biosolids below the land surface; or the incorporation of biosolids into the land so that the biosolids can either condition the soil or fertilize crops or vegetation

grown in the soil. Land application includes distribution and marketing (i.e. the selling or giving away of the biosolids).

4. "Pathogen," means an organism that is capable of producing an infection or disease in a susceptible host.

5. "Pollutant" for the purposes of this permit is an organic substance, an inorganic substance, a combination of organic and inorganic substances, or pathogenic organisms that after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food-chain, could on the basis of information available to the Administrator of EPA, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in reproduction), or physical deformations in either organisms or offspring of the organisms.

6. "Runoff" is rainwater, leachate, or other liquid that drains over any part of a land surface and runs off the land surface.

7. "Similar Container" is either an open or closed receptacle. This includes, but is not limited to, a bucket, a box, a carton, and a vehicle or trailer with a load capacity of one metric ton or less.

8. "Total Solids" are the materials in the biosolids that remain as a residue if the biosolids are dried at 103° or 105° Celsius.

9. "Treatment Works" are either Federally owned, publicly owned, or privately owned devices or systems used to treat (including recycling and reclamation) either domestic sewage or a combination of domestic sewage and industrial waste or liquid manure.

10. "Vector Attraction" is the characteristic of biosolids that attracts rodents, flies mosquito's or other organisms capable of transporting infectious agents.

11. "Animals" for the purpose of this permit are domestic livestock.

12. "Annual Whole Sludge Application Rate" is the amount of sewage sludge (dry-weight basis) that can be applied to a unit area of land during a cropping cycle.

13. "Agronomic Rate is the whole sludge application rate (dry-weight basis) designed to: (1) provide the amount of nitrogen needed by the crop or vegetation grown on the land; and (2) minimize the amount of nitrogen in the sewage sludge that passes below the root zone of the crop or vegetation grown on the land to the ground water.

14. "Annual Pollutant Loading Rate" is the maximum amount of a pollutant (dry-weight basis) that can be applied to a unit area of land during a 365-day period.

15. "Application Site or Land Application Site" means all contiguous areas of a users' property intended for sludge application.

16. "Cumulative Pollutant Loading Rate" is the maximum amount of an inorganic pollutant (dry-weight basis) that can be applied to a unit area of land.

17. "Grit and Screenings" are sand, gravel, cinders, other materials with a high specific gravity and relatively large materials such as rags generated during preliminary treatment of domestic sewage at a treatment works and shall be disposed of according to *40 CFR 258*.

18. "High Potential for Public Contact Site" is land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses.

19. "Low Potential for Public Contact Site" is the land with a low potential for contact by the public. This includes, but is not limited to, farms, ranches, reclamation areas, and other lands which are private lands, restricted public lands, or lands which are not generally accessible to or used by the public.

20. "Monthly Average" is the arithmetic mean of all measurements taken during the month.

21. "Volatile Solids" is the amount of the total solids in sewage sludge lost when the sludge is combusted at 550 degrees Celsius for 15-20 minutes in the presence of excess air.

C. Storm Water.

1. "Best Management Practices" ("BMPs") means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control facility site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

2. "Coal pile runoff" means the rainfall runoff from or through any coal storage pile.

3. "Co-located industrial activity" means when a facility has industrial activities being conducted onsite that are described under more than one of the coverage sections of *Appendix II* in the General Multi-Sector Permit for Storm Water Discharges Associated with Industrial Activity. Facilities with co-located industrial activities shall comply with all applicable monitoring and pollution prevention plan requirements of each section in which a co-located industrial activity is described.

4. "Commercial Treatment and Disposal Facilities" means facilities that receive, on a commercial basis, any produced hazardous waste (not their own) and treat or dispose of those wastes as a service to the generators. Such facilities treating and/or disposing exclusively residential hazardous wastes are not included in this definition.

5. "Landfill" means an area of land or an excavation in which wastes are placed for permanent disposal, and that is not a land application unit, surface impoundment, injection well, or waste pile.

6. "Land application unit" means an area where wastes are applied onto or incorporated into the soil surface (excluding manure spreading operations) for treatment or disposal.

7. "Municipal separate storm sewer system" (large and/or medium) means all municipal separate storm sewers that are either:

   a. Located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (at the issuance date of this permit, Salt Lake City is the only city in Utah that falls in this category); or

   b. Located in the counties with unincorporated urbanized populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties (at the issuance date of this permit Salt Lake County is the only county that falls in this category); or

   c. Owned or operated by a municipality other than those described in paragraph *a.* or *b.* (above) and that are designated by the *Director* as part of the large or medium municipal separate storm sewer system.

8. "NOI" means "notice of intent", it is an application form that is used to obtain coverage under the General Multi-Sector Permit for Storm Water Discharges Associated with Industrial Activity.

9. "NOT" means "notice of termination", it is a form used to terminate coverage under the General Multi-Sector Permit for Storm Water Discharges Associated with Industrial Activity.

10. "Point source" means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

11. "Section 313 water priority chemical" means a chemical or chemical categories that:

    a. Are listed at *40 CFR 372.65* pursuant to *Section 313* of the *Emergency Planning and Community Right-to-Know Act* (*EPCRA*) (also known as *Title III of the Superfund Amendments and Reauthorization Act* (*SARA*) of 1986);

    b. Are present at or above threshold levels at a facility subject to *EPCRA Section 313* reporting requirements; and

    c. Meet at least one of the following criteria:

       (1) Are listed in *Appendix D* of *40 CFR Part 122* on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols) or Table V (certain toxic pollutants and hazardous substances);

(2) Are listed as a hazardous substance pursuant to *Section 311(b)(2)(A)* of the *CWA* at *40 CFR 116.4*; or

(3) Are pollutants for which EPA has published acute or chronic water quality criteria. See *Appendix III* of this permit. This appendix was revised based on final rulemaking EPA published in the *Federal Register* November 30, 1994.

12. "Significant materials" includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under *Section 101(14)* of *CERCLA*; any chemical the facility is required to report pursuant to *EPCRA Section 313*; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges.

13. "Significant spills" includes, but is not limited to: releases of oil or hazardous substances in excess of reportable quantities under *Section 311 of the Clean Water Act* (see *40 CFR 110.10* and *CFR 117.21*) or *Section 102* of *CERCLA* (see *40 CFR 302.4*).

14. "Storm water" means storm water runoff, snowmelt runoff, and surface runoff and drainage.

15. "SWDMR" means "storm water discharge monitoring report", a report of the results of storm water monitoring required by the permit. The Division of Water Quality provides the storm water discharge monitoring report form.

16. "Storm water associated with industrial activity" (*UAC R317-8-3.8(6)(c) & (d)*) means the discharge from any conveyance that is used for collecting and conveying storm water and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the *UPDES* program. For the categories of industries identified in paragraphs *(a)* through *(j)* of this definition, the term includes, but is not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined in *40 CFR Part 401*); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. For the categories of industries identified in paragraph *(k)* of this definition, the term includes only storm water discharges from all areas (except access roads and rail lines) listed in the previous sentence where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water. For the purposes of this paragraph, material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such

as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas. Industrial facilities (including industrial facilities that are Federally, State, or municipally owned or operated that meet the description of the facilities listed in paragraphs *(a)* to *(k)* of this definition) include those facilities designated under *UAC R317-8-3.8(1)(a)5.* The following categories of facilities are considered to be engaging in "industrial activity" for purposes of this subsection:

a. Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under *40 CFR Subchapter N* (except facilities with toxic pollutant effluent standards that are exempted under category (k) of this definition);

b. Facilities classified as Standard Industrial Classifications 24 (except 2434), 26 (except 265 and 267), 28 (except 283 and 285), 29, 311, 32 (except 323), 33, 3441, 373;

c. Facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations no longer meeting the definition of a reclamation area under *40 CFR 434.11(l)* because the performance bond issued to the facility by the appropriate SMCRA authority has been released, or except for areas of non-coal mining operations that have been released from applicable State or Federal reclamation requirements after December 17, 1990) and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations; inactive mining operations are mining sites that are not being actively mined, but that have an identifiable owner/operator;

d. Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of RCRA;

e. Landfills, land application sites, and open dumps that have received any industrial wastes (waste that is received from any of the facilities described under this subsection) including those that are subject to regulation under *Subtitle D* of *RCRA*;

f. Facilities involved in the recycling of materials, including metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards, including but limited to those classified as Standard Industrial Classification 5015 and 5093;

g. Steam electric power generating facilities, including coal handling sites;

h. Transportation facilities classified as Standard Industrial Classifications 40, 41, 42 (except 4221-25), 43, 44, 45 and 5171 that have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment

cleaning operations, airport deicing operations, or that are otherwise identified under paragraphs (a) to (g) or (I) to (k) of this subsection are associated with industrial activity;

i. Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 mgd or more, or required to have an approved pretreatment program under *40 CFR Part 403*. Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and that are not physically located in the confines of the facility, or areas that are in compliance with *40 CFR Part 503*;

j. Construction activity including clearing, grading and excavation activities except: operations that result in the disturbance of less than 5 acres of total land area that are not part of a larger common plan of development or sale;

k. Facilities under Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 323, 34 (except 3441), 35, 36, 37 (except 373), 38, 39, 4221-25, (and that are not otherwise included within categories (a) to (j))

17. "Waste pile" means any non-containerized accumulation of solid, non-flowing waste that is used for treatment or storage.

FACT SHEET AND STATEMENT OF BASIS
TOOELE CITY RECLAMATION FACILITY
RENEWAL PERMIT: DISCHARGE, BIOSOLIDS & STORM WATER
UPDES PERMIT NUMBER: UT0025445
UPDES BIOSOLIDS PERMIT NUMBER: UTL-025445
UPDES MULTI-SECTOR STORM WATER GENERAL PERMIT NUMBER: UTR000000
MINOR MUNICIPAL

FACILITY CONTACTS

Person Name:	Jim Bolser
Position:	Public Works Director
Phone Number:	(435) 843-2100
Person Name:	Ray Henninger
Position:	Waste Reclamation Superintendent
Phone Number:	(435) 882-1952
Facility Name:	The Tooele City Reclamation Facility (Tooele)
Mailing Address:	90 North Main Tooele, Utah 84074
Telephone:	(435) 882-1952
Actual Address:	3300 North 1200 West

DESCRIPTION OF FACILITY

The Tooele City Reclamation Facility (Tooele) is located at 3300 North 1200 West, Tooele, Utah and serves the City of Tooele with the outfall located at latitude 40°35'40" and longitude 112°19'40". The design capacity is 3.4 MGD, population equivalent of 35,000, and influent organic loadings of 200 mg/L each for BOD5 and TSS. Present flow is approximately 2.1 MGD on average and up to a peak hourly flow of 11 MGD. The current UPDES permit is limited to 2.25 MGD. This limit applies only to any effluent that might be discharged to the ditch, and not to any Reuse water that might be used.

The facility consists of a headwork's with an automatic bar screen and grit removal system, 2 oxidation ditches, 3 final clarifiers, 3 sand filters, 1 chlorine contact basins, 1 Ultra Violet facility with multiple UV channels and banks, 2 holding reuse ponds with pump stations, 1 gravity sludge thickener, 1 aerobic digester, 1 biosolids solar drying facility. Tertiary treatment is required to meet Type 1 Reuse requirements and is provided by the 3 traveling bed sand filters.

The UV Disinfection System was added after the chlorination system with a bypass of the chlorine contact basin. The chlorination system and contact basin are still operational as backups, and are maintained but chlorination is not required as long as the UV system is operating.

The facility produces Type I reuse water and maintains a UPDES permit in the event that a discharge from their facility is necessary.

SUMMARY OF CHANGES FROM PREVIOUS PERMIT

1. WLA Model.
A new model is used by the Division of Water Quality to develop a waste load allocation (WLA) for dischargers to Waters of the State.

2. RP
During the permit cycle, the Division of Water Quality has worked to improve our reasonable potential analysis (RP) for parameters to have limits included by using an EPA provided model. The results of the RP Analysis are included in Attachment 3 of the FSSOB.

3. Metals and Organic Toxics Monitoring
Metals and organic toxics monitoring has been included in the permit since the 2007 renewal to help establish a record of the presence or absence of pollutant in relation to possible pretreatment requirements. Tooele has not had a discharge since 2005 which has resulted in no data for use in RP or local limits development. Tooele has however had a daily reuse discharge since then. As a result the Division of Water Quality has determined that the configuration of the Toole system allows for them to sample the reuse water for metals and toxic organics and it is representative of the effluent if the discharge is to the ditch. The analysis of the metals and organics will assist in the development of local limits for the pretreatment program.

4. TBPEL Rule
The Water Quality Board adopted UAC R317-1-3.3, Technology-Based Phosphorus Effluent Limit (TBPEL) Rule in 2014. The TBPEL rule as it relates to "non-lagoon" wastewater treatment plants establishes new regulations for the discharge of phosphorus to surface waters and is self-implementing. The TBPEL rule includes the following requirements for non-lagoon wastewater treatment plants:

The TBPEL requires that all non-lagoon wastewater treatment works discharging wastewater to surface waters of the state shall provide treatment processes which will produce effluent less than or equal to an annual mean of 1.0 mg/L for total phosphorus. This TBPEL shall be achieved by January 1, 2020.

The TBPEL discharging treatment works are required to implement, at a minimum, monthly monitoring of the following beginning July 1, 2015:

R317-1-3.3, D, 1	Influent for total phosphorus (as P) and total Kjeldahl nitrogen (as N) concentrations;
R317-1-3.3, D, 2.	Effluent for total phosphorus and orthophosphate (as P), ammonia, nitrate-nitrite and total Kjeldahl nitrogen (an N);

In R317-1-3.3, D, 3 the rule states that all monitoring shall be based on 24-hour composite samples by use of an automatic sampler or a minimum of four grab samples collected a minimum of two hours apart.

The Director may authorize a variance to the TBPEL or phosphorus loading cap under any of the conditions listed in R317-1-3.3 C, 1. On April 17, 2018 the Director authorized a variance under the "Clearly Unnecessary" provision (R317-1-3.3 C, 1, c) due to the total reuse configuration of the Tooele facility. As a result a phosphorus limit will not be implemented at Tooele.

DISCHARGE

DESCRIPTION OF DISCHARGE
Tooele is a total reuse facility. Tooele maintains a UPDES permit in the event that a discharge from their facility is necessary.

Tooele has been reporting self-monitoring results on a monthly basis. The reports have indicated "No Discharge" since 2005 when Tooele discharged for 3 days. There have been no discharges since 2005, and no violations.

Outfall	Description of Discharge Point
001	Located at latitude 40°35'40" and longitude 112°19'40". The discharge is by pumping out of the reuse reject pond to an unnamed irrigation ditch that collects storm water runoff from the road and fields in the area. The ditch runs north along the road until it dissipates into the ground. The ditch does not enter any other waterway or the Great Salt Lake.

Outfall	Description of Reuse Water Discharge Point
001R	Located at latitude 40°35'40" and longitude 112°19'40". The discharge is through a pipe to ponds on the Overlake Golf Course. The water is then used to irrigate the golf course. It is also available at the plant for use in dust control activities in in the area.

RECEIVING WATERS AND STREAM CLASSIFICATION
If a discharge were to occur, it would be pumped into an irrigation ditch, which is a Class 2B, 3E, 4 Water according to *Utah Administrative Code (UAC) R317-2-13*:

Class 2B -- Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.

Class 3E -- Severely habitat-limited waters. Narrative standards will be applied to protect these waters for aquatic wildlife.

Class 4 -- Protected for agricultural uses including irrigation of crops and stock watering.

BASIS FOR EFFLUENT LIMITATIONS
Limitations on total suspended solids (TSS), biochemical oxygen demand (BOD5), *E. coli*, pH and percent removal for BOD5 and TSS are based on current Utah Secondary Treatment Standards, UAC R317-1-3.2. The oil and grease is based on best professional judgment (BPJ). Attached is a Wasteload Analysis for this discharge into the unnamed irrigation ditch. It has been determined that this discharge will not cause a violation of water quality standards. An Antidegradation Level II review is not required since the Level I review shows that water quality impacts are minimal. The permittee is expected to be able to comply with these limitations.

Reasonable Potential Analysis
Since January 1, 2016, the Division of Water Quality has conducted reasonable potential analysis (RP) on all new and renewal applications received after that date. RP for this permit renewal was conducted following the Division of Water Quality's September 10, 2015 Reasonable Potential Analysis Guidance (RP Guidance). There are four outcomes defined in the RP Guidance: Outcome A, B, C, or D. These

Outcomes provide a frame work for what routine monitoring or effluent limitations are required. Tooele did not discharge effluent through outfall 001 during the previous permit. As a result no RP could be conducted.

The permit limitations are:

Parameter	Effluent Limitations [1]				
	Maximum Monthly Avg	Maximum Weekly Avg	Yearly Average	Daily Minimum	Daily Maximum
Total Flow	2.25	--	--	--	--
BOD_5, mg/L	25	35	--	--	--
BOD_5 Min. % Removal	85	--	--	--	--
TSS, mg/L	25	35	--	--	--
TSS Min. % Removal	85	--	--	--	--
E. coli, No./100mL	126	157	--	--	--
Oil & Grease, mg/L	--	--	--	--	10.0
pH, Standard Units	--	--	--	6.5	9

The permit limitations for Outfall (001R) (Reuse) are:

Parameter	Outfall 001R Effluent Limitations [1],				
	Max Monthly Average	Max Weekly Median	Max Daily Average	Minimum	Maximum
Turbidity [2], NTU	--	--	2	--	5
BOD_5, mg/L	10	--	--	--	--
E. coli [3], No/100mL	--	ND [4]	--	--	9
pH, Standard Units	--	--	--	6.0	9.0

SELF-MONITORING AND REPORTING REQUIREMENTS

The following self-monitoring requirements are updated from the previous permit. The permit will require reports to be submitted monthly and annually, as applicable, on Discharge Monitoring Report (DMR) forms due 28 days after the end of the monitoring period. Effective January 1, 2017, monitoring results must be submitted using NetDMR unless the permittee has successfully petitioned for an exception. Lab sheets for biomonitoring must be attached to the biomonitoring DMR. Lab sheets for metals and toxic organics must be attached to the DMRs.

Self-Monitoring and Reporting Requirements [1, 5]			
Parameter	Frequency	Sample Type	Units
Total Flow [6, 7]	Continuous	Recorder	MGD

[1] See Definitions, Part VIII, for definition of terms.

[2] An alternative disposal option or diversion to storage must be automatically activated if turbidity exceeds the maximum instantaneous limit for more than 5 minutes.

[3] The facility is required to disinfect to destroy, inactivate or remove pathogenic microorganisms by chemical, physical or biological means. Disinfection may be accomplished by chlorination, ozonation, or other chemical disinfectants, UV radiation. Or other approved processes.

[4] The weekly median E. coli concentration shall be non-detect.

[5] Reuse monitoring results obtained during the previous month for reuse discharges shall be summarized for each month and reported on a Monthly Operational Report, submitted no later than the 28th day of the month following the completed reporting period.

Self-Monitoring and Reporting Requirements [1, 5]			
Parameter	Frequency	Sample Type	Units
BOD_5, Influent [8]	2 X Weekly	Composite	mg/L
Effluent	2 X Weekly	Composite	mg/L
TSS, Influent [7]	2 X Weekly	Composite	mg/L
Effluent	2 X Weekly	Composite	mg/L
E. coli	2 X Weekly	Grab	No./100mL
pH	2 X Weekly	Grab	SU
Oil & Grease [9]	When Sheen Observed	Grab	mg/L
Orthophosphate, (as P)[10] Effluent	Monthly	Composite	mg/L
Phosphorus, Total[10]			
Influent	Monthly	Composite	mg/L
Effluent	Monthly	Composite	mg/L
Total Kjeldahl Nitrogen, TKN (as N),[10]			
Influent	Monthly	Composite	mg/L
Effluent	Monthly	Composite	mg/L
Nitrate, NO3,[10]	Monthly	Composite	mg/L
Nitrite, NO2,[10]	Monthly	Composite	mg/L
Metals[11], Influent	Quarterly	Grab	mg/L
Effluent [12]	Quarterly	Grab	mg/L
Organic Toxics [13], Influent	Yearly	Grab	mg/L
Effluent	Yearly		

The following is a summary of the Type I reuse self-monitoring and reporting requirements.

Reuse Outfall 001R Self-Monitoring and Reporting Requirements [1, 3]			
Parameter	Frequency	Sample Type	Units
Total Flow, [2, 3]	Continuous	Recorder	MGD
Turbidity	Continuous	Recorder	mg/L
BOD_5	Weekly	Composite	mg/L
E. coli,	Daily	Grab	No./100mL
pH	Daily	Grab	SU

[6] Flow measurements of influent/effluent volume shall be made in such a manner that the permittee can affirmatively demonstrate that representative values are being obtained.
[7] If the rate of discharge is controlled, the rate and duration of discharge shall be reported.
[8] In addition to monitoring the final discharge, influent samples shall be taken and analyzed for this constituent at the same frequency as required for this constituent in the discharge
[9] Oil & Grease sampled when sheen is present or visible. If no sheen is present or visible, report NA
[10] These reflect changes required with the adoption of UCA R317-1-3.3, Technology-based Phosphorus Effluent Limits rule.
[11] Testing for metals listed in the table found in Part II.I.1. of the permit.
[12] This shall be sampled from the same place as the reuse water monitoring is conducted. The results will be reported regardless of the occurrence of discharge from outfall 001.
[13] A list of the organics to be tested can be found in 40CFR122 appendix D table II. This shall be sampled from the same place as the reuse water monitoring is conducted. The results will be reported regardless of the occurrence of discharge from outfall 001

BIOSOLIDS

For clarification purposes, sewage sludge is considered solids, until treatment or testing shows that the solids are safe, and meet beneficial use standards. After the solids are tested or treated, the solids are then known as biosolids. Class A biosolids, may be used for high public contact sites, such as home lawns and gardens, parks, or playing fields, etc. Class B biosolids may be used for low public contact sites, such as farms, rangeland, or reclamation sites, etc.

DESCRIPTION OF TREATMENT AND DISPOSAL

The solids at Tooele are stabilized within oxidation ditches for about 15 days, then sent to a thickener, then to sludge holding tank, then pumped to screw a press for de-watering. The solids are further de-watered and dried with solar greenhouses hopefully to meet Class A standards. If the biosolids do not meet Class A standards it will be landfilled. Testing to date has shown the biosolids do meet Class B standards. The goal of the greenhouses is to produce a Class A biosolids product through testing, to show that the biosolids are safe a product which may be sold or given away to the public. However, with the lower temperatures during the winter months, it may not always be possible to meet the Class A requirements through testing, and a Class B product may be produced for land application to farm fields, or other low public contact sites. Tooele plans to continue using the screw presses and the greenhouses for the life of this five year permit.

The Permittee submitted their 2017 annual biosolids report on February 20, 2018. The report states the Permittee produced 547 dry metric tons (DMT) of solids. After testing , a total of 79 DMT of biosolids met class A and were land applied or sold/given away to the public.

The last inspection conducted at the facility was September 8, 2017. The inspection showed that Tooele was in compliance with all aspects of the biosolids management program.

SELF-MONITORING REQUIREMENTS

Under *40 CFR 503.16(a)(1),* the self-monitoring requirements are based upon the amount of biosolids disposed per year and shall be monitored according to the chart below.

Minimum Frequency of Monitoring (40 CFR Part 503.16, 503.26. and 503.46)		
Amount of Biosolids Disposed Per Year		Monitoring Frequency
Dry US Tons	Dry Metric Tons	Per Year or Batch
> 0 to < 320	> 0 to < 290	Once Per Year or Batch
> 320 to < 1650	> 290 to < 1,500	Once a Quarter or Four Times
> 1,650 to < 16,500	> 1,500 to < 15,000	Bi-Monthly or Six Times
> 16,500	> 15,000	Monthly or Twelve Times

In 2017, Tooele produced of 547 DMT of biosolids, therefore they need to sample at least four times a year.

Landfill Monitoring

Under *40 CFR 258,* the landfill monitoring requirements include a paint filter test. If the biosolids do not pass a paint filter test, the biosolids cannot be disposed in the sanitary landfill *(40 CFR 258.28(c)(1).*
Tooele disposed of 400 DMT of biosolids at the Wasatch Regional Landfill.

BIOSOLIDS LIMITATIONS

Heavy Metals

Class A Biosolids for Home Lawn and Garden Use

The intent of the heavy metals regulations of Table 3, *40 CFR 503.13* is to ensure the heavy metals do not build up in the soil in home lawn and gardens to the point where the heavy metals become phytotoxic to plants. The permittee will be required to produce an information sheet (see *Part III. C.* of the permit) to made available to all people who are receiving and land applying Class A biosolids to their lawns and gardens. If the instructions of the information sheet are followed to any reasonable degree, the Class A biosolids will be able to be land applied year after year, to the same lawns and garden plots without any deleterious effects to the environment. The information sheet must be provided to the public, because the permittee is not required, nor able to track the quantity of Class A biosolids that are land applied to home lawns and gardens.

Class A Requirements With Regards to Heavy Metals

If the biosolids are to be applied to a lawn or home garden, the biosolids shall not exceed the maximum heavy metals in Table 1 and the monthly average pollutant concentrations in Table 3 (see Table 1 and Table 3 below). If the biosolids do not meet these requirements, the biosolids cannot be sold or given away for applications to home lawns and gardens.

Class B Requirements for Agriculture and Reclamation Sites

The intent of the heavy metals regulations of Tables 1, 2 and 3, of *40 CFR 503.13* is to ensure that heavy metals do not build up in the soil at farms, forest land, and land reclamation sites to the point where the heavy metals become phytotoxic to plants. The permittee will be required to produce an information sheet (see *Part III. C.* of the permit) to be handed out to all people who are receiving and land applying Class B biosolids to farms, ranches, and land reclamation sites (if biosolids are only applied to land owned by the permittee, the information sheet requirements are waived). If the biosolids are land applied according to the regulations of *40 CFR 503.13*, to any reasonable degree, the Class B biosolids will be able to be land applied year after year, to the same farms, ranches, and land reclamation sites without any deleterious effects to the environment.

Class B Requirements With Regards to Heavy Metals

If the biosolids are to be land applied to agricultural land, forest land, a public contact site or a reclamation site it must meet at all times:

> The maximum heavy metals listed in *40 CFR Part 503.13(b) Table 1* and the heavy metals loading rates in *40 CFR Part 503.13(b) Table 2*; or
>
> The maximum heavy metals in *40 CFR Part 503.13(b) Table 1* and the monthly heavy metals concentrations in *40 CFR Part 503.13(b) Table 3*.

Tables 1, 2, and 3 of Heavy Metal Limitations

Pollutant Limits, (40 CFR Part 503.13(b)) Dry Mass Basis				
Heavy Metals	Table 1	Table 2	Table 3	Table 4

	Ceiling Conc. Limits, (mg/kg)	CPLR[14], (mg/ha)	Pollutant Conc. Limits, (mg/kg)	APLR[15], (mg/ha-yr)
Total Arsenic	75	41	41	41
Total Cadmium	85	39	39	39
Total Copper	4300	1500	1500	1500
Total Lead	840	300	300	300
Total Mercury	57	17	17	17
Total Molybdenum	75	N/A	N/A	N/A
Total Nickel	420	420	420	420
Total Selenium	100	100	100	100
Total Zinc	7500	2800	2800	2800

Any violation of these limitations shall be reported in accordance with the requirements of Part III.F.1. of the permit .If the biosolids do not meet these requirements they cannot be land applied.

Pathogens

The Pathogen Control class listed in the table below must be met;

Pathogen Control Class[16], [17]	
Class A	Class B
B Salmonella species –less than three (3) MPN[18] per four (4) grams total solids (or less than 1,000 fecal coliforms per gram total solids)	Fecal Coliforms –less than 2,000,000 colony forming units (CFU) per gram total solids
Enteric viruses –less than one (1) MPN (or plaque forming unit) per four (4) grams total solids	
Viable helminth ova –less than one (1) MPN per four (4) grams total solids	

Class A Requirements for Home Lawn and Garden Use

If biosolids are land applied to home lawns and gardens, the biosolids need to be treated by a specific process to further reduce pathogens (PFRP), and meet a microbiological limit of less than less than 3 most probable number (MPN) of *Salmonella* per 4 grams of total solids (or less than 1,000 most probable number (MPN/g) of fecal coliform per gram of total solids) to be considered Class A biosolids. Tooele will achieve PFRP through a practice of pathogen testing.

1. Pathogen Testing - Tooele is allowed to do additional testing of pathogens in lieu of a process to further reduce pathogens (PFRP) to meet Class A standards. This additional testing requires Tooele to monitor for viable helminth ova (tape worms and round worm eggs that

[14] CPLR -- Cumulative Pollutant Loading Rate
[15] APLR – Annual Pollutant Loading Rate
[16] There are additional pathogen reduction and vector attraction reduction alternatives available in 40 CFR 503.32 and 40 CFR 503.33.
[17] Fecal coliform or salmonella bacteria. Based on a minimum of seven (7) samples of biosolids collected over a two-week period.
[18] MPN –Most Probable Number

could hatch), enteric viruses (viruses of the gut), and either fecal coliform or salmonella bacteria,

This method is found under *(40 CFR 503.32(6) Class A, Alternative 4(i)).*

The practice of sale or giveaway to the public is an acceptable use of biosolids of this quality as long as the biosolids continue to meet Class A standards with respect to pathogens. If the biosolids do not meet Class A pathogen standards the biosolids cannot be sold or given away to the public, and the permittee will need find another method of beneficial use or disposal.

Pathogens Class B

If biosolids are to be land applied for agriculture or land reclamation the solids need to be treated by a specific process to significantly reduce pathogens (PSRP). The PSRP may be accomplished through testing:

1. Under *40 CFR 503.32 (b)(2)*, Tooele may test the biosolids and must meet a microbiological limit of less than 2,000,000 MPN of fecal coliform per gram for the biosolids to be considered Class B biosolids with respect to pathogens.

Vector Attraction Reduction (VAR)

If the biosolids are land applied Tooele will be required to meet VAR through the use of a method of listed under *40 CFR 503.33.* Tooele intends to meet the vector attraction reduction requirements through the methods listed below.

1. Drying- The percent of solids is 90% or more prior to sale or giveaway, for Class A biosolids or Class B biosolids, *(40 CFR 503.33 (b)(7))*, or the percent of solids is 75% or more prior to sale or giveaway, for Class B biosolids, *(40 CFR 503.33 (b)(8)*

If the biosolids do not meet a method of VAR, the biosolids cannot be land applied.

If the permittee intends to use another one of the listed alternatives in *40 CFR 503.33*, the Director and the EPA must be informed at least thirty (30) days prior to its use. This change may be made without additional public notice

Landfill Monitoring

Under *40 CFR 258,* the landfill monitoring requirements include a paint filter test to determine if the biosolids exhibit free liquid. If the biosolids do not pass a paint filter test, the biosolids cannot be disposed in the sanitary landfill *(40 CFR 258.28(c)(1).*

Record Keeping

The record keeping requirements from *40 CFR 503.17* are included under *Part III.G.* of the permit. The amount of time the records must be maintained are dependent on the quality of the biosolids in regards to the metals concentrations. If the biosolids continue to meet the metals limits of *Table 3* of *40 CFR 503.13*, and are sold or given away the records must be retained for a minimum of five years. If the biosolids are disposed in a landfill the records must retained for a minimum of five years.

Reporting

Tooele must report annually as required in *40 CFR 503.18.* This report is to include the results of all monitoring performed in accordance with *Part III.B* of the permit, information on management practices, biosolids treatment, and certifications. This report is due no later than February 19 of each year. Each

report is for the previous calendar year.

MONITORING DATA

METALS MONITORING DATA
The Tooele was required to sample for metals at least four times in 2017. Tooele sampled the Class A solids three times, and the land filled biosolids one time. All biosolids land applied in 2017 met *Table 3* of *40 CFR 503.13,* therefore the Permittee biosolids qualify as EQ with regards to metals. The monitoring data is below.

Tooele Metals Monitoring Data 2017

Tooele Metals Monitoring Data, 2017 (Class A Solar Drying)			
Parameter	Table 3, mg/kg (Exceptional Quality)	Average, mg/kg	Maximum, mg/kg
Arsenic	41.0	8.46	10.4
Cadmium	39.0	0.73	1.02
Copper	1,500.0	410.67	420
Lead	300.0	21.03	22.5
Mercury	17.0	0.63	0.97
Molybdenum	75.0	8.16	9.5
Nickel	400.0	13.67	14.7
Selenium	36.0	4.96	10.1
Zinc	2,800.0	605.67	756

Tooele Metals Monitoring Data, 2017 (Landfill)			
Parameter	Table 3, mg/kg (Exceptional Quality)	Average, mg/kg	Maximum, mg/kg
Arsenic	41.0	10.5	10.5
Cadmium	39.0	0.77	0.77
Copper	1,500.0	399	399
Lead	300.0	29	29
Mercury	17.0	.84	.84
Molybdenum	75.0	10.3	10.3
Nickel	400.0	19.8	19.8
Selenium	36.0	7.24	7.24
Zinc	2,800.0	642	642

PATHOGEN MONITORING DATA (Class A Solar Drying)
Tooele was required to monitor the biosolids for pathogens at least four times (quarterly) in 2017. The biosolids in the solar dryer during part of the year did not meet class A standards due to temperature and were stockpiled for landfill disposal. They did not bother to sample these biosolids for pathogens, reducing the number of samples taken. They did take pathogens samples for the rest of the year resulting in 3 pathogen sampling events. Each monitoring event needs to consist of seven samples, for a total 21 samples. All compost sold or given away in 2017 met the Class A pathogen standards for compost. The monitoring data is below.

Tooele *Salmonella* Monitoring Data 2017 (Class A Solar Drying)

Geometric Mean of 21 Samples, Most Probable Number Per Gram (2017)	Maximum of 21 Samples, Most Probable Number Per Gram (2017)
3.38	8

STORM WATER

STORMWATER REQUIREMENTS

Storm water provisions are included in this combined UPDES permit.

The storm water requirements are based on the UPDES Multi-Sector General Permit for Storm Water Discharges for Industrial Activity, General Permit No. UTR000000 (MSGP). All sections of the MSGP that pertain to discharges from wastewater treatment plants have been included and sections which are redundant or do not pertain have been deleted.

The permit requires the preparation and implementation of a storm water pollution prevention plan for all areas within the confines of the plant. Elements of this plan are required to include:

1. The development of a pollution prevention team:
2. Development of drainage maps and materials stockpiles:
3. An inventory of exposed materials:
4. Spill reporting and response procedures:
5. A preventative maintenance program:
6. Employee training:
7. Certification that storm water discharges are not mixed with non-storm water discharges:
8. Compliance site evaluations and potential pollutant source identification, and:
9. Visual examinations of storm water discharges.

Tooele is currently covered under the UPDES Multi Sector General Permit for Industrial Activities.

PRETREATMENT REQUIREMENTS

The permittee has been required to develop a pretreatment program and is currently in the process of developing a pretreatment program. An industrial waste survey (IWS) is required of the permittee as stated in Part II of the permit. The IWS is to assess the needs of the permittee regarding pretreatment assistance. The IWS is required to be submitted within sixty (60) days after the issuance of the permit. If an Industrial User begins to discharge or an existing Industrial User changes their discharge the permittee must resubmit an IWS no later than sixty days following the introduction or change as stated in Part II of the permit.

Any wastewater discharges to the sanitary sewer are subject to Federal, State and local regulations. Pursuant to Section 307 of the Clean Water Act, the permittee shall comply with all applicable Federal General Pretreatment Regulations promulgated, found in 40 CFR 403 and the State Pretreatment Requirements found in UAC R317-8-8.

It is required that the permittee submit for review any local limits that are developed to the Division of Water Quality for review. If local limits are developed it is required that the permittee perform an annual evaluation of the need to revise or develop technically based local limits for pollutants of concern, to implement the general and specific prohibitions *40 CFR, Part 403.5(a)* and *Part 403.5(b)*. This evaluation may indicate that present local limits are sufficiently protective, need to be revised or should be

developed.

BIOMONITORING REQUIREMENTS

A nationwide effort to control toxic discharges where effluent toxicity is an existing or potential concern is regulated in accordance with the State of Utah Permitting and Enforcement Guidance Document for Whole Effluent Toxicity Control (biomonitoring). Authority to require effluent biomonitoring is provided in Permit Conditions, UAC R317-8-4.2, Permit Provisions, UAC R317-8-5.3 and Water Quality Standards, UAC R317-2-5 and R317 -2-7.2.

The permittee is a minor municipal facility that will be discharging an infrequent amount of effluent, in which toxicity is neither an existing concern, nor likely to be present. Also, the receiving irrigation ditch is regularly dry; therefore there is not any available data to conclude that the irrigation ditch is impaired. Based on these considerations, and the absence of receiving stream water quality monitoring data, there is no reasonable potential for toxicity in the permittee's discharge (per State of Utah Permitting and Enforcement Guidance Document for WET Control). As such, there will be no numerical WET limitations or WET monitoring requirements in this permit. However, the permit will contain a toxicity limitation re-opener provision that allows for modification of the permit should additional information indicate the presence of toxicity in the discharge.

PERMIT DURATION

It is recommended that this permit be effective for a duration of five (5) years.

Drafted by
Daniel Griffin, Discharge, Biosolids, Reasonable Potential Analysis
Jennifer Robinson, Pretreatment
Michael George, Storm Water
Nicholas von Stackelberg, Wasteload Analysis
Utah Division of Water Quality, (801) 536-4300

PUBLIC NOTICE

Began: August 2, 2018
Ended: September 3, 2018

Comments will be received at: 195 North 1950 West
PO Box 144870
Salt Lake City, UT 84114-4870

The Public Noticed of the draft permit was published in the Tooele Transcript & Bulletin.

During the public comment period provided under R317-8-6.5, any interested person may submit written comments on the draft permit and may request a public hearing, if no hearing has already been scheduled. A request for a public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. All comments will be considered in making the final decision and shall be answered as provided in R317-8-6.12.

During finalization of the Permit certain dates, spelling edits and minor language corrections may be completed. Due to the nature of these changes they were not considered Major and the permit may not be required to be Public Noticed again.

No comments were received for this draft renewal permit therefore the final permit is the same as the public noticed version.

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ATTACHMENT 1

Industrial Waste Survey

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Industrial Pretreatment Wastewater Survey

Do you periodically experience any of the following treatment works problems:

foam, floaties or unusual colors
plugged collection lines caused by grease, sand, flour, etc.
discharging excessive suspended solids, even in the winter
smells unusually bad
waste treatment facility doesn't seem to be treating the waste right

Perhaps the solution to a problem like one of these may lie in investigating the types and amounts of wastewater entering the sewer system from industrial users.

An industrial user (IU) is defined as a non-domestic user discharging to the waste treatment facility which meets any of the following criteria:

1. **has a lot of process wastewater (5% of the flow at the waste treatment facility or more than 25,000 gallons per work day.)**

   Examples: Food processor, dairy, slaughterhouse, industrial laundry.

2. **is subject to Federal Categorical Pretreatment Standards;**

   Examples: metal plating, cleaning or coating of metals, blueing of metals, aluminum extruding, circuit board manufacturing, tanning animal skins, pesticide formulating or packaging, and pharmaceutical manufacturing or packaging,

3. **is a concern to the POTW.**

   Examples: septage hauler, restaurant and food service, car wash, hospital, photo lab, carpet cleaner, commercial laundry.

All users of the water treatment facility are **prohibited** from making the following types of discharges:

1. A discharge which creates a fire or explosion hazard in the collection system.

2. A discharge which creates toxic gases, vapor or fumes in the collection system.

3. A discharge of solids or thick liquids which creates flow obstructions in the collection system.

4. An acidic discharge (low pH) which causes corrosive damage to the collection system.

5. Petroleum oil, non-biodegradable cutting oil, or products of mineral oil origin in amounts that will cause problems in the collection system or at the waste treatment facility.

6. Waste haulers are prohibited from discharging without permission. (No midnight dumping!)

When the solution to a sewer system problem may be found by investigating the types and amounts of wastewater entering the sewer system discharged from IUs, it's appropriate to conduct an Industrial Waste Survey.

An Industrial Waste Survey consists of:

Step 1: Identify Industrial Users

Make a list of all the commercial and industrial sewer connections.

Sources for the list:

business license, building permits, water and wastewater billing, Chamber of Commerce, newspaper, telephone book, yellow pages.

Split the list into two groups:

domestic wastewater only--no further information needed
everyone else (IUs)

Step 2: Preliminary Inspection

Go visit each IU identified on the "everybody else" list.

Fill out the **Preliminary Inspection Form** during the site visit.

Step 3: Informing the State

Please fax or send a copy of the Preliminary inspection form (both sides) to:

Jennifer Robinson

Division of Water Quality
288 North 1460 West
P.O. Box 144870
Salt Lake City, UT 84114-4870

Phone: (801) 536-4383
Fax: (801) 536-4301
E-mail: jenrobinson@utah.gov

PRELIMINARY INSPECTION FORM

INSPECTION DATE ___ / ____ /

Name of Business **Person Contacted** _____
Address _____ **Phone Number** _____
_____

Description of Business _____

Principal product or service: _____

Raw Materials used: _____
_____

Production process is: [ ] Batch [ ] Continuous [ ] Both

Is production subject to seasonal variation? [ ] yes [ ] no
If yes, briefly describe seasonal production cycle.
_____

This facility generates the following types of wastes (check all that apply):

1. [ ] Domestic wastes (Restrooms, employee showers, etc.)
2. [ ] Cooling water, non-contact
3. [ ] Boiler/Tower blowdown
4. [ ] Cooling water, contact
5. [ ] Process
6. [ ] Equipment/Facility washdown
7. [ ] Air Pollution Control Unit
8. [ ] Storm water runoff to sewer
9. [ ] Other describe

Wastes are discharged to (check all that apply):

[ ] Sanitary sewer
[ ] Storm sewer
[ ] Surface water
[ ] Ground water
[ ] Waste haulers
[ ] Evaporation
[ ] Other (describe)
Name of waste hauler(s), if used
_____

Is a grease trap installed? Yes No
Is it operational? Yes No

Does the business discharge a lot of process wastewater?

- **More than 5% of the flow to the waste treatment facility? Yes No**
- **More than 25,000 gallons per work day? Yes No**

Does the business do any of the following:

[ ] Adhesives
[ ] Aluminum Forming
[ ] Battery Manufacturing
[ ] Copper Forming
[ ] Electric & Electronic Components
[ ] Explosives Manufacturing
[ ] Foundries
[ ] Inorganic Chemicals Mfg. or Packaging
[ ] Industrial Porcelain Ceramic Manufacturing
[ ] Iron & Steel
[ ] Metal Finishing, Coating or Cleaning
[ ] Mining
[ ] Nonferrous Metals Manufacturing
[ ] Organic Chemicals Manufacturing or Packaging
[ ] Paint & Ink Manufacturing
[ ] Pesticides Formulating or Packaging
[ ] Petroleum Refining
[ ] Pharmaceuticals Manufacturing or Packaging
[ ] Plastics Manufacturing
[ ] Rubber Manufacturing
[ ] Soaps & Detergents Manufacturing
[ ] Steam Electric Generation
[ ] Tanning Animal Skins
[ ] Textile Mills

[ ] Car Wash
[ ] Carpet Cleaner
[ ] Dairy
[ ] Food Processor
[ ] Hospital
[ ] Laundries
[ ] Photo Lab
[ ] Restaurant & Food Service
[ ] Septage Hauler
[ ] Slaughter House

Are any process changes or expansions planned during the next three years? Yes No
If yes, attach a separate sheet to this form describing the nature of planned changes or expansions.

_____
Inspector

_____
Waste Treatment Facility

Please send a copy of the preliminary inspection form (both sides) to:

Jennifer Robinson
Division of Water Quality
P. O. Box 144870
Salt Lake City, Utah 84114-4870

Phone: (801) 536-4383
Fax: (801) 536-4301
E-Mail: jenrobinson@utah.gov

	Industrial User	Jurisdiction	SIC Codes	Categorical Standard Number	Total Average Process Flow (gpd)	Total Average Facility Flow (gpd)	Facility Description
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							

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ATTACHMENT 2

Wasteload Analysis

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Utah Division of Water Quality
Fact Sheet and Statement of Basis
ADDENDUM
Wasteload Analysis and Antidegradation Review

Date: **May 22, 2018**

Facility: **Tooele Wastewater Treatment Plant**
Tooele, UT
UPDES No. UT-0025445

Receiving water: **Unnamed Irrigation Ditch (2B, 3E, 4)**

This addendum summarizes the wasteload analysis that was performed to determine water quality based effluent limits (WQBEL) for this discharge. Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on in-stream water quality. The wasteload analysis also takes into account downstream designated uses (UAC R317-2-8). Projected concentrations are compared to numeric water quality standards to determine acceptability. The numeric criteria in this wasteload analysis may be modified by narrative criteria and other conditions determined by staff of the Division of Water Quality.

Discharge
Outfall 001: Unnamed Irrigation Ditch

The design capacity for the treatment facility is 2.25 MGD average flow, as estimated by the permittee. The facility does not have a permanent outfall to the receiving ditch, and only discharges during emergencies by pumping water from the reject water holding pond.

Receiving Water
The receiving water for outfall 001 is an unnamed irrigation ditch. Per UAC R317-2-13.9, the designated uses for irrigation canals and ditches are 2B, 3E, and 4.

- *Class 2B - Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.*
- *Class 3E - Severely habitat-limited waters. Narrative standards will be applied to protect these waters for aquatic wildlife.*
- *Class 4 - Protected for agricultural uses including irrigation of crops and stock watering.*

The critical flow for the wasteload analysis is considered the lowest stream flow for seven consecutive days with a ten year return frequency (7Q10). The 7Q10 flow for the irrigation ditch is assumed to be zero.

Downstream Analysis

The unnamed irrigation ditch drains to the north along 1200 West where the channel eventually disperses in a farm field north of Erda Way. Based on site reconnaissance and anecdotal evidence from the previous discharge from the facility (2005), a discharge of limited duration is not likely to reach the Great Salt Lake or other natural waterbody.

TMDL

The receiving waters do not have an approved TMDL for any parameters.

Mixing Zone

Since no flow is in the receiving water during critical conditions, no mixing zone is allowed and no dilution factor was applied.

Whole Effluent Toxicity (WET) Limits

The percent of effluent in the receiving water in a fully mixed condition, and acute and chronic dilution in a not fully mixed condition are calculated in the WLA in order to generate WET limits. The LC_{50} (lethal concentration, 50%) percent effluent for acute toxicity and the IC_{25} (inhibition concentration, 25%) percent effluent for chronic toxicity, as determined by the WET test, needs to be below the WET limits, as determined by the WLA. The WET limit for LC_{50} is typically 100% effluent and does not need to be determined by the WLA.

Table 1: WET Limits for IC_{25}

Season	Percent Effluent
Annual	100%

Effluent Limits

Due to a lack of flow dilution, effluent limits for this discharge are water quality standards for the receiving water. The applicable water quality standards are attached as an appendix to this wasteload.

Class 3E waters do not have numeric aquatic life use criteria; therefore, the discharge must meet narrative standards per UAC R317-2-7.3. However, for the purposes of administering the pretreatment program, acute criteria for metals applicable to 3D waters were used for Tooele's discharge in order to interpret the narrative standards. Chronic aquatic life criteria were not considered, due to the unlikelihood of an extended period of discharge from the facility

For parameters without a WQBEL, permit limits should be set according to rules found in R317-1-3 and categorical UPDES discharge requirements.

Utah Division of Water Quality
Wasteload Analysis
Tooele WWTP, Tooele, UT
UPDES No. UT0025445

Antidegradation Level I Review

The objective of the Level I ADR is to ensure the protection of existing uses, defined as the beneficial uses attained in the receiving water on or after November 28, 1975. No evidence is known that the existing uses deviate from the designated beneficial uses for the receiving water. Therefore, the beneficial uses will be protected if the discharge remains below the WQBELs presented in this wasteload.

A Level II Antidegradation Review (ADR) is not required for this discharge since the pollutant concentration and load to the receiving waters are not increasing under this permit renewal.

WLA Document: *tooele_potw_wla_2018-05-22.docx*
Analysis: *tooele_potw_wla_2018.xlsm*

Prepared by:
Nicholas von Stackelberg, P.E.
Standards and Technical Services Section

WASTELOAD ANALYSIS [WLA] Date: 5/22/2018

Appendix A: Mass Balance Mixing Analysis for Conservative Constituents

Discharging Facility:	Tooele Wastewater Treatment Plant		
UPDES No:	UT-0025445		
Permit Flow [MGD]:	2.25	Annual	Max. Monthly
Receiving Water:	Unnamed Irrigation Ditch		
Stream Classification:	2B, 3E, 4		
Stream Flows [cfs]:	0.0	All Seasons	Critical Low Flow
Fully Mixed:	YES		
Acute River Width:	100%		
Chronic River Width:	100%		

Modeling Information

A mass balance mixing analysis was used to determine the effluent limits.

All model numerical inputs, intermediate calculations, outputs and graphs are available for discussion, inspection and copy at the Division of Water Quality.

Effluent Limitations

Current State water quality standards are required to be met under a variety of conditions including in-stream flows targeted to the 7-day, 10-year low flow (R317-2-9).

Other conditions used in the modeling effort reflect the environmental conditions expected at low stream flows.

Effluent Limitations for Protection of Recreation (Class 2B Waters)

Physical Parameter	Concentration Minimum	Maximum
pH	6.5	9.0
Turbidity Increase (NTU)		10.0
Bacteriological		
E. coli (30 Day Geometric Mean)	206 (#/100 mL)	
E. coli (Maximum)	668 (#/100 mL)	

Effluent Limitations for Protection of Aquatic Wildlife (Class 3E Waters)

It shall be unlawful, and a violation of these rules, for any person to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum or other nuisances such as color, odor or taste; or cause conditions which produce undesirable aquatic life or which produce objectionable tastes in edible aquatic organisms; or result in concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life, or undesirable human health effects, as determined by bioassay or other tests performed in accordance with standard procedures; or determined by biological assessments in Subsection R317-2-7.3.

Pretreatment Program Limits

Total Recoverable Metals	Acute Standard (1 Hour Average)[1]
Parameter	**Standard/Limit**
Aluminum (µg/L)	750
Arsenic (µg/L)	340
Cadmium (µg/L)	4.3
Chromium VI (µg/L)	16.0
Chromium III (µg/L)	3,181
Copper (µg/L)	26.9
Cyanide (µg/L)	22.0
Iron (µg/L)	1,000
Lead (µg/L)	197
Mercury (µg/L)	2.4
Nickel (µg/L)	843
Selenium (µg/L)	18.4
Silver (µg/L)	12.5
Tributylin (µg/L)	0.46
Zinc (µg/L)	216

1: Based upon a Hardness of 200 mg/l as CaCO3

Effluent Limitation for Protection of Agriculture (Class 4 Waters)

	Maximum Concentration
Parameter	**Standard/Limit**
Total Dissolved Solids (mg/L)	1,200
Boron (mg/L)	0.75
Arsenic, Dissolved (µg/L)	100
Cadmium, Dissolved (µg/L)	10
Chromium, Dissolved (µg/L)	100
Copper, Dissolved (µg/L)	200
Lead, Dissolved (µg/L)	100
Selenium, Dissolved (µg/L)	50
Gross Alpha (pCi/L)	15

ATTACHMENT 3

Reasonable Potential Analysis

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REASONABLE POTENTIAL ANALYSIS

The Division of Water Quality has worked to improve our reasonable potential analysis (RP) for the inclusion of limits for parameters in the permit by using an EPA provided model. As a result of the model, more parameters may be included in the renewal permit. A Copy of the Reasonable Potential Analysis Guidance (RP Guide) is available from the Division of Water Quality. There are four outcomes for the RP Analysis[19]. They are;

Outcome A:	A new effluent limitation will be placed in the permit.
Outcome B:	No new effluent limitation. Routine monitoring requirements will be placed or increased from what they are in the permit,
Outcome C:	No new effluent limitation. Routine monitoring requirements maintained as they are in the permit,
Outcome D:	No limitation or routine monitoring requirements are in the permit.

Neither an initial metals screening or full RP analysis could be accomplished because Tooele has not had an actual discharge through Outfall 001 since 2005, consequently they have not had the opportunity to sample the effluent during the previous permits. According to the RP Guide, this does not result in any real outcome from the RP.

All treated water at the Tooele facility flows from the traveling bed sand filters through a single pipe to the UV system then off to the reuse pond. This section of pipe between the sand filters and UV system is where the pull all effluent and reuse samples prior to the valve that automatically rejects the water to the reject pond when it cannot meet the turbidity requirements. Sampling metals and toxic organic in this same area is representative of what would be discharged and is being indicated for the renewal to insure samples are available for future RP and local limits development..

[19] See Reasonable Potential Analysis Guidance for definitions of terms

Appendix C: Solar Dryer Evaluation Tech Memo

HELPING EACH OTHER
CREATE BETTER COMMUNITIES

J-U-B

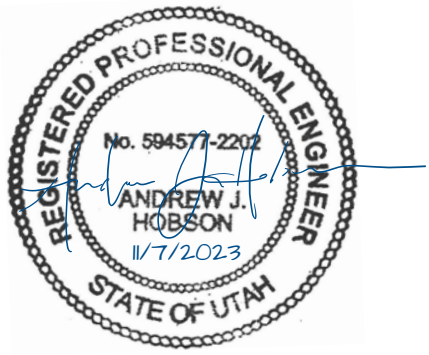
THE LANGDON GROUP

GATEWAY MAPPING INC.

J-U-B FAMILY OF COMPANIES

TECHNICAL MEMORANDUM

To:	Tooele City Water Reclamation Facility 90 North Main Street Tooele, UT 84074
From:	Andrew Hobson, P.E.
Subject:	Solar Dryer Technical Memorandum
Date:	November 7, 2023



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Appendix

1.0 Introduction

The purpose of this Technical Memorandum is to present design information, key features, and advantages/disadvantages of the existing Tooele Water Reclamation Facility (WRF) Solar Dryer operation relating to increased cold-weather efficiency. Alternatives for expansion versus retrofit of the existing solar dryer are evaluated to meet cold-weather performance. Options for floor heating are presented based on two proposals: concrete floor heating and stainless-steel floor heating.

1.1 Background

The current solar dryer system is underperforming in the winter months and some mechanical and control systems are difficult to maintain and may be at the end of their useful life. The system can reliably produce Class A biosolids in the summer but produces unclassified biosolids in the winter. The existing screw presses also run continuously to keep up with sludge generation from the biological treatment process.

Solar drying of biosolids is traditionally a low energy alternative to other biosolids drying processes. It converts the waste-solids produced in wastewater treatment to dry sewage sludge with renewable solar energy. The City desires to continue drying all treated sewage sludge using solar technology. However, since the winter-conditions lead to slow drying, freezing sludge, and unclassified biosolids, most of the biosolids produced during these conditions are transported directly to the landfill. Annual landfill costs can be as high as $250,000.

In order to offset the high costs of landfilling the sludge, the City would like to investigate the ability to produce high-quality class-A biosolids year-round. To accomplish this, supplemental heating will need to be added to the solar dryer process. The supplemental heating will be used during months when outside temperatures are low and solar radiation is poor (4-6 months of the year).

To add supplemental floor heating, two solar dryer alternatives were compared with two heating technologies:

1. Retrofit solar dryer facility with floor heating
    a. Concrete heated floors
    b. Steel heated floors
2. Expand the solar dryer facilities with new steel heated floors

1.2 Existing Facility

The Tooele WRF serves all of Tooele City. The original WRF was constructed in 1956 and relocated in the 1990s. The facility was abandoned and replaced with the existing facility in 2000. Major upgrades were performed on the plant in 2008. Additional upgrades were completed in 2022 and a new headworks building and is currently under construction.

1.3 Existing Infrastructure

The current biosolids solar dryer at the Tooele WRF is in a greenhouse, adjacent to the dewatering building on the southeast side of the treatment site. The greenhouse has three 40-ft by 300-ft bays equipped each with one HUBER mechanical turning unit. Dried class-A biosolids are transported by tractor to a covered storage bay for summer-time disposal to local farmers.

The biosolids are generated from an activated sludge process, pass through a gravity thickener and solids holding tank, and then dewatered in one of two screw presses. Solids are transported by screw conveyor to the greenhouse bays.

In early 2023, a review of the existing solar dryer system was conducted, with feedback provided by WRF operators. The following list of maintenance improvements were created from the meeting, which shows needs and improvements for the solar dryer system (**Table 1**).

Table 1. Identified Solar Dryer Needs

Item	Identified Need/Deficiency
Greenhouse	Build greenhouse east to west so sun can have full effect on solids
	Need heated floor for winter drying
	Make all doors large enough for front end loader
	Fix unloading area drainage and loading area concrete support
	Provide maintenance access pathway to side of turners
	Run all electrical overhead so it is not in operators' way
Solar Dryer	Turner 2 PLC screen keeps freezing
	Turner 2 shovel drive errors out with small amounts of sludge
	Adjustable scraper blades are at maximum range
	Produce Class A biosolids year-round

2.0 Cold-Weather Biosolids Drying

Increasing cold weather biosolids drying efficiency is analyzed by adding supplemental heating at the greenhouse floor, considering heating source alternatives and climate drivers that dictate the amount of supplemental heating required.

2.1 Heated Floor Options

The heated floor design of the greenhouse building, proposed for either alternative, is important to maintain temperature within the solar drying process. The existing floor is unheated concrete, but the

concrete base allows overlay of other flooring material. Heated flooring reduces the greenhouse footprint required to dry solids and increases throughput for the same area. The proposed heated floor alternatives are a concrete thermal floor and a stainless-steel floor overlay.

One manufacturer recommended all new concrete slab flooring with a heating pipe system provided by others that would operate up to a temperature of 140 °F. Another manufacturer proposed a stainless-steel floor overlay for the existing unheated greenhouse floor with a maximum operating temperature of 210 °F. A comparison of the heated floor alternatives is summarized in **Table 2**.

Peak biosolids output is related to the maximum temperature achieved in the flooring design. Therefore, the stainless-steel floor option achieves more efficient biosolids drying than the heated concrete floor.

Table 2. Heated Floor Comparison

Criteria	Heated Concrete Slab	Stainless-Steel
Flooring	New Concrete Thermal Floor	New Stainless-Steel Overlay
Heat Source	Heating Water Pipes set in concrete floor	Integral hot water heating in stainless steel floor
Maximum Temperature	140 °F	210 °F

2.2 External Heat Source Alternatives

A primary component of solar drying beds is heating the system for drying productivity and freezing prevention during winter months. Both the thermal concrete floor and stainless-steel overlay options will require an external heat source. The external heat source alternatives are a parabolic solar system with thermal storage tank and a fuel-fired boiler.

2.2.1 Parabolic Solar and Thermal Storage Tank

The parabolic solar collection system would include solar panels that are shaped parabolically for efficiency in capturing sunlight throughout the day. Thermal energy from sunlight is absorbed by the cells in the panel and then stored in a thermal storage tank.

An approximate area of 94,000 square feet is needed for the solar thermal collectors. A hot thermal storage tank, 35 feet in diameter and 45 feet tall, would hold 300,000 gallons of hot water to collect, buffer, and store thermal energy for use when the solar resource is low. Note that weather conditions will vary, and this sizing is not a guarantee that the system will produce adequate thermal energy 100% of the year. These sizing factors will be confirmed during project design.

2.2.2 Fuel-Fired boiler

While not proposed by any of the contacted manufacturers, a fuel-fired boiler is the preferred heating option by the City, with the supplemental option of solar thermal collectors in the future. The fuel-fired

boiler is a heating source with a reduced footprint requirement but high demand on natural gas or other fuel. The boiler would provide efficient steam and hot water for the solar dryer process. This option would also need a thermal storage tank, but the sizing could be reduced. These details will be confirmed during design.

2.2.3 Heat Source Summary

Table 3 depicts the heating system comparisons between the parabolic solar and fuel-fired boiler alternatives.

Table 3. Heating System Comparison

Criteria	Parabolic Solar	Fuel-Fired Boiler
Footprint	94,000 ft^2	Reduced Footprint
Tank	300,000-gal Thermal Storage Tank	300,000-gal Thermal Storage Tank -

2.3 Design Criteria

The design criteria vary based on the capabilities of equipment and needs of the system.

The parameters discussed for the Retrofit Alternative with concrete or steel heated floor options have four directly comparable criteria, the design feed rate; intake cake concentration; final percent solids; and annual operating months.

2.3.1 Design Feed Rate

The design feed rate describes the sludge quantity in wet tons per year capable of being dried. The design feed rate is larger for the steel floor option yielding a larger dried sludge volume in the same amount of time compared to the concrete floor option.

2.3.2 Intake Cake Concentration

The intake cake concentration is the same for both heating options because the upstream dewatering processes are the same.

2.3.3 Final Percent Solids

The final percentage of solids required for Class A biosolids is 90%. The final percent of solids for Class B biosolids is 75%. The concrete heated floor can deliver a final percent solid of 80% while the steel floor alternative achieves 90% final percent solids. The main difference is due to the higher temperatures achieved in the steel floor option.

2.3.4 Annual Operating Months

The concrete floor option produces biosolids 10 out of 12 months per year and requires up to 200 tons of sludge stored (and later processed) or landfilling in the off months. One of the reasons for this

shortfall is because concrete, when heated, has an upper thermal limit. During the coldest months, the required heating cannot be achieved in the concrete without suffering thermal fatigue and eventual material failure.

The steel floor alternative can produce the proposed solids year-round.

The concrete floor further details sludge characteristics such as, volatile suspended solids; protein content; and water evaporation requirements, which are not included for the steel floor alternative.

For both floor heating options, dewatered sludge is the primary drying material. **Table 4** demonstrates the design criteria comparisons.

Table 4. Design Criteria Comparison

Criteria	Concrete Floor	Stainless Steel Floor	Units
Design Feed Rate	3,200	4,599	Wet tons/year
Intake Cake Concentration	15	15	%
Sludge Volatile Suspended Solids	≤70	-	%
Sludge Protein Content	≤30	-	%
Final Percent Solids	80	90	%
Estimated Solids Loading Rate Out	650	-	Wet tons/year
Annual Water Evaporation Requirement	2,600	-	Ton water/year
Annual Operating Months	10	12	Months

2.4 Climatology Data

The surrounding environment for the solar dryers is important for understanding the efficiency of the technology year-round. The existing dryer system is underperforming in colder portions of the year supported by climatology data trends as it relates to change in performance summarized in **Table 5**. The climatic data details the monthly climate with characteristics including, temperature, relative humidity, global radiation, supplemental heat, and evaporation. As the relative humidity increases, temperature decreases, and global radiation decreases during the winter months, the evaporation decreases which in turn lowers the dryer's efficiency.

Table 5. Climatology Data

Month	Temperature (°F)	Relative Humidity (%)	Global Radiation (kWh/ft²/day)	Supplemental Heat (kWh/ft²/day)	Total (kWh/ft²/day)	Evaporation (ton/ft²)
January	27.2	76.4	0.20	0.67	0.87	0.015
February	31.9	68.4	0.29	0.67	0.96	0.018
March	40.2	59.5	0.42	0.50	0.92	0.021
April	46.9	54.1	0.54	0.50	1.04	0.027
May	57.0	48.1	0.63	0.33	0.97	0.029
June	68.5	39.0	0.72	0.00	0.72	0.026
July	78.6	34.0	0.69	0.00	0.69	0.028
August	76.0	33.5	0.62	0.00	0.62	0.026
September	65.7	37.6	0.51	0.20	0.71	0.026
October	50.9	48.5	0.37	0.50	0.87	0.026
November	38.3	59.1	0.24	0.67	0.91	0.021
December	27.4	73.3	0.17	0.67	0.84	0.015
Average			**0.45**			**0.023**
Annually			**164**			

By acknowledging seasonal climate variance, changes in operations may be performed throughout the year. Any system (new facility or Retrofit Alternative) would require supplemental heating, as indicated by the supplemental heat demand, during the colder months.

3.0 Expansion vs. Retrofit Alternatives

The current solar dryer system is underperforming in the winter months and some mechanical and control systems are difficult to maintain and may be at the end of their useful life. The solar dryer alternatives studied include expanding or retrofitting the existing greenhouse building and updating the mechanics and controls. The two alternatives compared are referred to as the Expansion Alternative and the Retrofit Alternative. The alternatives are compared on greenhouse construction, turning unit proposed, control system, and equipment and material details.

3.1.1 Greenhouse Construction

Expansion Alternative. The Expansion Alternative proposes new construction for the WRF solar dryer facilities. The proposed construction includes two new bays, 40 feet by 300 feet each galvanized steel

frame greenhouse building with space for a future third bay. The new greenhouse would implement two passage doors and two overhead doors for access. The exhaust fans would aid in biosolids drying and humidity control.

Overall, the new greenhouse building is advantageous in providing new solar dryer equipment and a larger processing area; however, the WRF's footprint increases with new construction.

Retrofit Alternative. The Retrofit Alternative proposes updating two of the three existing greenhouse bays. The heat produced during solar drying is controlled by the proposed installation of a barrier curtain to the third, unheated bay. The curtain acts in addition to recirculation fans to isolate airflow in sections of the existing bays.

3.1.2 Turning Unit

Expansion Alternative. The turning unit for the Expansion Alternative is the Huber Solstice SRT 11 Solar Dryer. The turning unit both distributes and transports the sludge inside the greenhouse. The proposed recirculation fans and scraper plate would further increase the efficiency of the drying process by aiding in air circulation and dried sludge. For safety and accessibility to the solar dryer, a new rail system would be implemented using galvanized steel. The Expansion Alternative also includes use of a traction drive system which converts energy to electricity for the solar dryer.

Retrofit Alternative. The SRT turning unit for the Retrofit Alternative proposes the Huber Solar Active Dryer SRT 9. The SRT 9 is 9 meters wide and is shorter than the SRT-11 since the existing bays are fixed width. The existing greenhouse building railing hinders access to the treatment process, so it is recommended to reduce the width of the drying floor and rails to nine meters to create maintenance access on the side of the turning unit. Also proposed is raising the existing scraper plate and installing a new conveyor parallel to the existing conveyor.

3.1.3 Control System

The control system for both the Expansion and Retrofit Alternative proposed Huber SRT controls. The controls provide various settings for the Huber systems to reflect the WRF's needs throughout the day and year. The control system will be updated in either alternative.

3.1.4 Equipment and Material Details

Expansion Alternative. The Expansion Alternative detailed the materials of construction and equipment. The items that require a motor are standardized at 60 hertz (Hz), 460 volts alternating current (VAC), and three phase motor. The horsepower (hp) varies from 1.5 – 10 hp. The type of material for construction is specified as 304L stainless steel, which requires pickling and passivating in an acid bath. The rail system is listed as applying galvanized steel for implementation.

Retrofit Alternative. The Retrofit Alternative will use similar equipment and power demand will be similar to the expansion alternative.

3.1.5 Summary

The Expansion Alternative and Retrofit Alternative details for greenhouse construction, turning unit, control system, and equipment and materials are summarized in **Table 6**.

Table 6. Expansion vs. Retrofit Summary

Criteria	Expansion Alternative	Retrofit Alternative
Greenhouse	Galvanized Steel Frame	Existing Building
Footprint	New 40’ x 300’ Greenhouse	Existing Bay
Doors	Two Passage Doors; Two Overhead Doors per bay	Existing 11 Passage Doors; Nine Overhead Doors
Fans	Exhaust Fans and controls	Exhaust Fans & Controls Inlet Air Heating Coils
Material	Twin wall polycarbonate	-
Huber SRT Turning Unit	SRT 11 Rail System Recirculation Fans Scraper Plate New Conveyance Traction Drive system	SRT 9 Reduce Rail Width Curtain to Isolate Airflow Raise Scraper Plate New conveyance Traction Drive system
Control System	Huber SRT Controls	Huber SRT Controls
Equipment and Material Details	Traction Drive: 3 hp, 460 VAC,3 ph, 60 Hz, VFD Motor Turning Unit: 10 hp, 460 VAC, 3 ph, 60 Hz, VFD Motor Rail System: Galvanized Steel Recirculation Fans: Approximately 6, 1.5 hp, 460 VAC, 3 ph, 60 Hz Exhaust Fans: Approximately 2, 1.5 hp, 460 VAC, 3 ph, 60 Hz Scraper Plate: 1.0 hp, 460 VAC, 3 hp, 60 Hz Motor	Traction Drive: 3 hp, 460 VAC,3 ph, 60 Hz, VFD Motor Turning Unit: 10 hp, 460 VAC, 3 ph, 60 Hz, VFD Motor Rail System: Galvanized Steel Recirculation Fans Retrofit: Approximately 6, 1.5 hp, 460 VAC, 3 ph, 60 Hz Exhaust Fans - Replace: Approximately 4, 1.5 hp, 460 VAC, 3 ph, 60 Hz Scraper Plate: 1.0 hp, 460 VAC, 3 hp, 60 Hz Motor

4.0 Cost Opinion

4.1 Cost Estimate

The cost estimate for the Expansion and Retrofit Alternatives is compared below. These values are based on the AACE Level 5 cost estimate with an expected range of – 50% to + 100%. The Retrofit Alternative estimated cost is **$10.5 million,** and the Expansion Alternative is **$18 million**. **Table 7** compares the proposed construction items and costs for the alternatives studied.

Table 7. Proposed Equipment items and cost

Item	Expansion Alternative	Retrofit Alternative
Huber SRT Turning Unit	✓	✓
Greenhouse	✓	✓
Heated Floors	✓	✓
Heating Source	✓	✓
Total Cost	$18,000,000	$10,500,000

5.0 Recommendations

J-U-B has studied and analyzed the advantages and disadvantages of each alternative based on the future biosolids drying needs of the Tooele WRF. A summary of the Toole WRF solar dryer needs and deficiencies was provided in **Table 1**. Recommendations for expansion versus retrofit of the existing solar dryer system, heated floor alternatives, and external heat source alternatives are provided.

5.1 Expansion vs. Retrofit Recommendation

J-U-B advises the implementation of the Retrofit Alternative with stainless steel heated floor as it is determined to be best suited for the Tooele WRF's needs. While the concrete floor option has merit, the solids produced would only meet Class B biosolids requirements. The steel floor option produces Class A biosolids year-round.

The Expansion Alternative proposes building a new larger greenhouse. Building a larger greenhouse provides more drying space per unit length of the building. Tooele will be able to utilize the existing greenhouse while the new greenhouse is built. However, the expansion alternative will require all new equipment to deliver and process the biosolids. This includes a new thickener, solids holding tank, dewatering building, greenhouse, solar dryer, and storage facilities. While new capacity will eventually be needed, all the accompanying infrastructure has a high capital cost to implement.

While both alternatives will provide new SRT units and address deficiencies in the mechanical and controls systems, the Retrofit Alternative better meets the existing and near-term needs of Tooele City due to the lower upfront project cost.

5.2 Heated Floor Recommendation

The Tooele WRF has identified the need for a heated floor regardless of the Expansion Alternative or Retrofit Alternative being chosen. The alternatives evaluated were a heated concrete slab or heated stainless-steel floor overlay. J-U-B recommends the stainless-steel overlay option for heated flooring. The stainless-steel overlay has a higher maximum operating temperature than the heated concrete slab allowing for better heat transfer and higher dried biosolids output.

5.3 External Heat Source Recommendation

The external heat source alternatives evaluated were parabolic solar with thermal storage and a fuel-fired boiler. The fuel-fired boiler has a minimal footprint compared to the parabolic solar alternative. Additionally, the parabolic solar alternative is not guaranteed to produce the needed thermal energy 100% of the year. As a well-known and reliable solution, a fuel-fired boiler is the recommended alternative. The parabolic solar option could be implemented in the future to help offset the cost of energy and provide a supplement to Tooele City's clean-energy initiatives.

APPENDIX A - HUBER PROPOSAL

BUDGET PROPOSAL

Tooele, UT

Equipment:
HUBER SOLSTICE® SRT 11

Represented by:
Goble Sampson Associates
John Deogracias
(480) 220-2327
jdeogracias@goblesampson.com

Regional Sales Director:
Ron Maiorana
704-718-4477
Ronald.Maiorana@hhusa.net

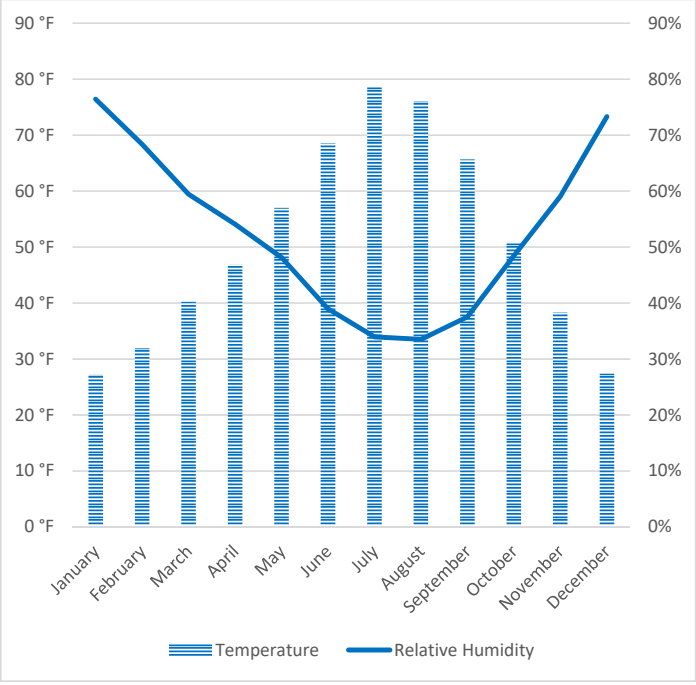
Project Number: 437289
Revision: 0
Date: 7/22/2022

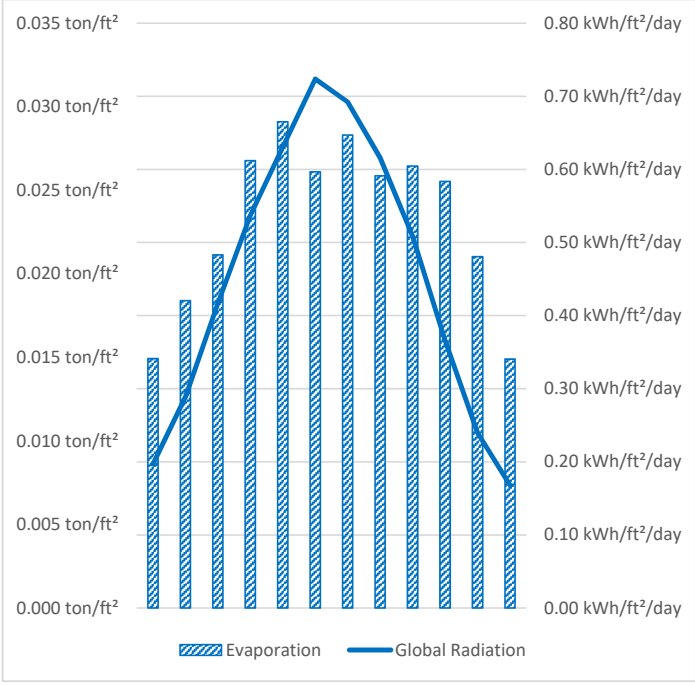
HUBER Technology, Inc.
1009 Airlie Pkwy, Denver, NC 28037
704-949-1010 | www.huber-technology.com

Design Information

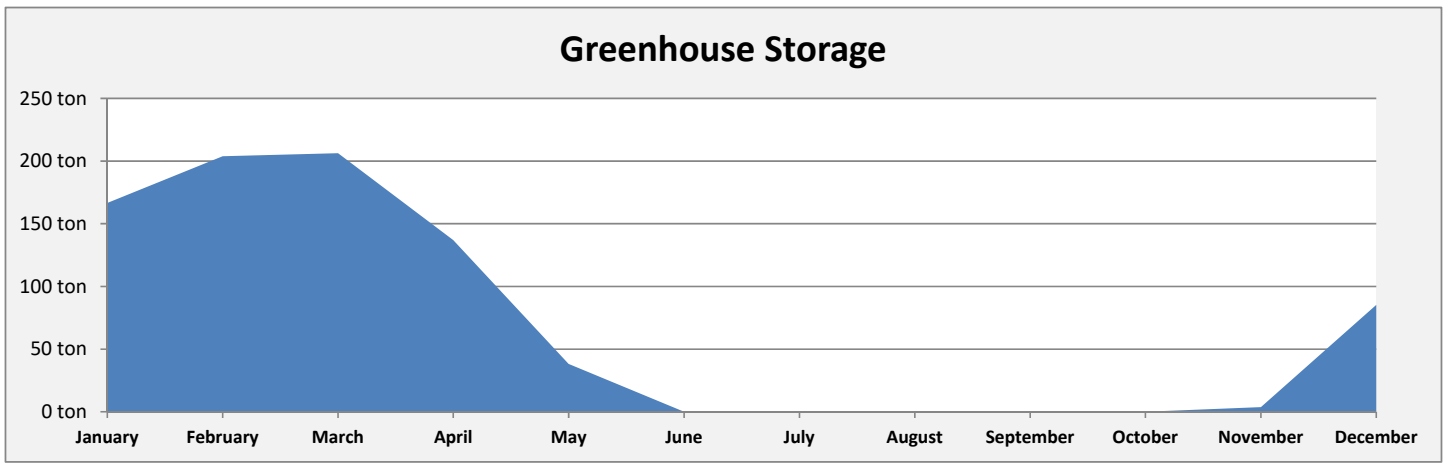
Technical Data			
Sludge Type	**Stabilized Sludge**		
Upstream Digestion Process	**Aerobic Digester**	**with unknown sludge age**	
Design Feed Rate (given)	**3250**		**wet tons/yr**
Inlet Cake Concentration	**18**		**%**
Sludge Volatile Suspended Solids (VSS)	**≤70**		**%**
Sludge Protein Content	**≤30**		**%**
Calculated Sludge Loading Rate (per unit)	**585**		**dry ton/yr**
	3,250		**wet ton/yr**
Outlet Percent Solids of Sludge	**90**		**%**
Estimated Solids Loading Rate Out	**650**		**wet ton/yr**
Annual Water Evaporation Requirement	**2,600**		**ton water/yr**

Climatology Data						
Month	Temperature	Relative Humidity	Global Radiation	Supplemental Heat	Total	Evaporation
January	27.2 °F	76.4%	0.20 kWh/ft²/day	0.67 kWh/ft²/day	0.87 kWh/ft²/day	0.015 ton/ft²
February	31.9 °F	68.4%	0.29 kWh/ft²/day	0.67 kWh/ft²/day	0.96 kWh/ft²/day	0.018 ton/ft²
March	40.2 °F	59.5%	0.42 kWh/ft²/day	0.50 kWh/ft²/day	0.92 kWh/ft²/day	0.021 ton/ft²
April	46.9 °F	54.1%	0.54 kWh/ft²/day	0.50 kWh/ft²/day	1.04 kWh/ft²/day	0.027 ton/ft²
May	57.0 °F	48.1%	0.63 kWh/ft²/day	0.33 kWh/ft²/day	0.97 kWh/ft²/day	0.029 ton/ft²
June	68.5 °F	39.0%	0.72 kWh/ft²/day	0.00 kWh/ft²/day	0.72 kWh/ft²/day	0.026 ton/ft²
July	78.6 °F	34.0%	0.69 kWh/ft²/day	0.00 kWh/ft²/day	0.69 kWh/ft²/day	0.028 ton/ft²
August	76.0 °F	33.5%	0.62 kWh/ft²/day	0.00 kWh/ft²/day	0.62 kWh/ft²/day	0.026 ton/ft²
September	65.7 °F	37.6%	0.51 kWh/ft²/day	0.20 kWh/ft²/day	0.71 kWh/ft²/day	0.026 ton/ft²
October	50.9 °F	48.5%	0.37 kWh/ft²/day	0.50 kWh/ft²/day	0.87 kWh/ft²/day	0.026 ton/ft²
November	38.3 °F	59.1%	0.24 kWh/ft²/day	0.67 kWh/ft²/day	0.91 kWh/ft²/day	0.021 ton/ft²
December	27.4 °F	73.3%	0.17 kWh/ft²/day	0.67 kWh/ft²/day	0.84 kWh/ft²/day	0.015 ton/ft²
Average			**0.45 kWh/ft²/day**			**0.023 ton/ft²**
Annually			**164 kWh/ft²/yr**			

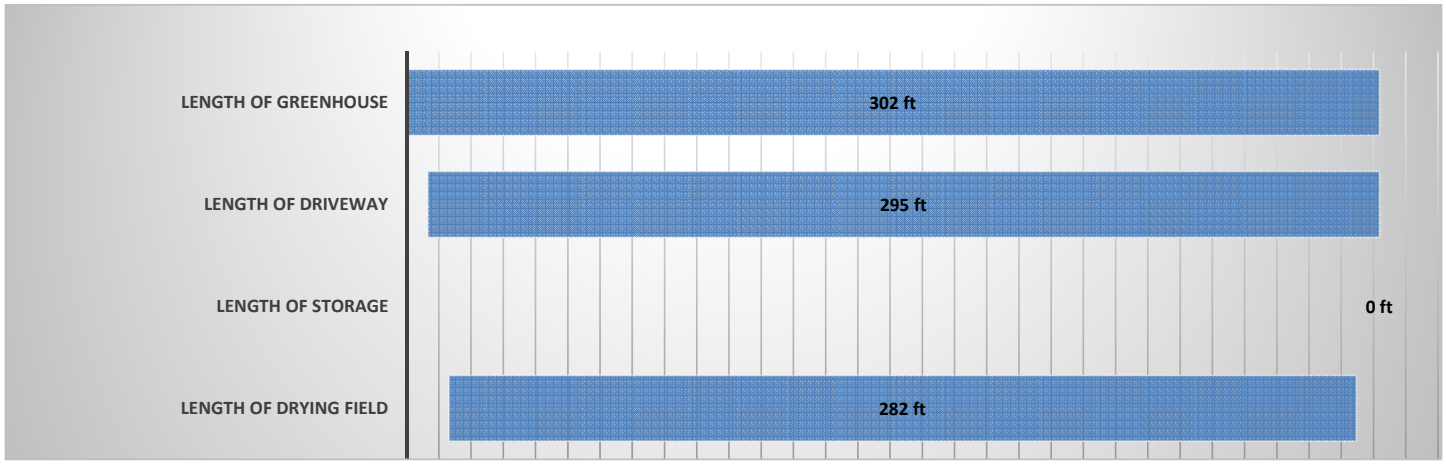




Monthly Dryer Mass Balance						
Month	Input	DS_{in}	Output	DS_{out}	Water Evaporation	Sludge Height
January	271 ton	18.0%	38 ton	90.0%	152 ton	9.8 in
February	271 ton	18.0%	47 ton	90.0%	187 ton	11.6 in
March	271 ton	18.0%	54 ton	90.0%	215 ton	11.7 in
April	271 ton	18.0%	68 ton	90.0%	272 ton	8.4 in
May	271 ton	18.0%	74 ton	90.0%	296 ton	3.8 in
June	271 ton	18.0%	62 ton	90.0%	247 ton	2.0 in
July	271 ton	18.0%	54 ton	90.0%	217 ton	2.0 in
August	271 ton	18.0%	54 ton	90.0%	217 ton	2.0 in
September	271 ton	18.0%	54 ton	90.0%	217 ton	2.0 in
October	271 ton	18.0%	54 ton	90.0%	217 ton	2.0 in
November	271 ton	18.0%	53 ton	90.0%	214 ton	2.1 in
December	271 ton	18.0%	38 ton	90.0%	151 ton	6.0 in
Sum/Average	**3,250 ton**	**18.0%**	**650 ton**	**90.0%**	**2,600 ton**	**5.3 in**



Equipment Recommendation	
Model	HUBER Solstice® SRT 11 Solar Dryer
Quantity	1
Length of Drying Field	282 ft
Drying Area (per unit)	10,161 ft²
Greenhouse Dimensions[1]	302 ft long × 39 ft wide



Equipment Details

Model	HUBER Solstice® SRT 11 Solar Dryer
Quantity	1
Materials of Construction	304L stainless steel construction; pickled and passivated in acid bath
Traction Drive System	3 hp, 460 VAC, 3 ph, 60 Hz, VFD Motor
Sludge Turning Unit	10 hp, 460 VAC, 3 ph, 60 Hz, VFD Motor
Rail System	Galvanized Steel
Recirculation Fans	Approximately 6, 1.5 hp, 460 VAC, 3 ph, 60 Hz
Exhaust Fans	Approximately 2, 1.5 hp, 460 VAC, 3 ph, 60 Hz
Scraper Plate	1.0 hp, 460 VAC, 3 ph, 60 Hz Motor

Greenhouse	
Dimensions	Width and length to meet design criteria above
Glazing	Twin wall polycarbonate (roof and side walls)
Frame Material	Galvanized Steel
Access	Two (2) passage doors; two (2) overhead doors

Control System
Solar Dryer Main Control Panel
Solar Dryer Transfer Control Panel
Junction Box
Pre-programmed and Factory Tested

Pricing

Equipment	Model	Quantity	Pricing
HUBER Solar Dryer	HUBER SRT 11	1	Included
Greenhouse	Dimensions Above	1	Included
HUBER Control System	HUBER Standard	1	Included
Freight and Startup Services	Standard HUBER Start-up Services	26 days & 6 trips	Included
TOTAL:			**$1,210,000.00**

Floor Heating System - Budget Estimate

Equipment	Scope	Pricing
HUBER's Standard Floor Heating Design	Concrete Slab & Heat Pipes - to be provided by OTHERS	**$405,000.00**

Standard delivery is 36-42 weeks from approval of submittals.

Thank you for your interest in HUBER Technology, Inc. If you have any questions, please do not hesitate to contact our Regional Sales Director or our local sales representative.

This proposal has been reviewed for accuracy and approved for issue by: ZMA

Notes and Technical Clarifications

1. Equipment specification and drawings are available upon request.
2. If there are site-specific hydraulic constraints that must be applied, please consult the manufacturer's representative to ensure compatibility with the proposed system.
3. Electrical disconnects required per local NEC code are not included in this proposal.
4. Huber Technology warrants all components of the system against faulty workmanship and materials for a period of 12 months from date of start-up or 18 months after shipment, whichever occurs first.
5. Budget estimate is based on Huber Technology's standard Terms & Conditions and is quoted in US dollars unless otherwise stated.
6. Equipment lead time from approval of shop drawings is expected to be around 26-34 weeks.
7. Equipment recommendations are based on information provided to Huber Technology. Subsequent information which differs from what has been provided may alter the equipment recommendation.
8. Pricing is based on Huber's standard control panel arrangement.
9. The offer is based on normal, homogenous municipal sludge with a minimum organic content of 30% and a maximum organic content of 70%. Sludge with organic content around 70% is assumed to have less than 30% protein value.
10. Feed sludge must be free of any pollutants which could be hazardous, toxic, radioactive, corrosive, flammable, or explosive.
11. Feed sludge must be free of lime which may have been added to stabilize or improve storage of the sludge. Sludge stabilized with lime can only be treated in drying plants which are specifically designed for this purpose.
12. Design assumes supplemental heat of 300 W/m^2 (95.1 $BTU/hr/ft^2$) at a maximum temperature of 60°C (140°F) will be provided by others.
13. Floor heating estimate is based only on prior experience and is solely for budgetary purposes. HUBER cannot guarantee final pricing and it will be the responsibility of the engineer or contractor to procure firm quotes for these items.

APPENDIX B - BROWN AND CALDWELL PROPOSAL

2 North Central Ave, Suite 1600
Phoenix, AZ 85004

T: 602.567.4000

September 8th, 2022

Jamie Grandpre
Public Works Director, City of Tooele
3300 1200 W, Tooele, UT 84074

Subject: Thermally Enhanced Solar Biosolids Dryer Retrofit

Dear Jamie,

At your request, Brown and Caldwell is presenting a conceptual level retrofit concept to improve the performance and consistency of the existing greenhouse dryer system. This brief memo summarizes the upgrade concepts based on our discussions with and data from the City and JUB, and based on observations from the BC site visit in late April, 2022.

Design Criteria

Our understanding from discussions with the City is that the current greenhouse dryer system is underperforming in the colder portions of the year and that some of the mechanical and control systems are difficult to maintain and may be near end of life. Table 1 below summarized the loading assumptions used in this memo.

Table-1. Loading Assumptions

Item	Value	Units	Notes
Current Average Loading	12.6	wton/day	Per City data
Percent Solids at Average Loading	15%	% solids	Per City data
Final Percent Solids	80%	% solids	Based on design assumptions

Proposed Improvements

BC has implemented a novel greenhouse dryer system for the City of Surprise in Surprise, Arizona using several key improvements to a traditional solar greenhouse dryer system. Chief among these is a stainless steel thermal floor, which reduces the greenhouse footprint required to dry solids (or increases throughput for the same area). With such a floor overlaid on the existing concrete unheated greenhouse floor, BC estimates that the entire plant average load of 12.6 wet tons per day can be processed by converting only one of the three existing bays. With sufficient heat supplied to the floor from a solar thermal collection system, this single bay in is likely capable of a peak of 15 wet tons/day loading rate.

Based on the successful installation at Surprise, BC proposes the following improvements for inside the greenhouse, as shown in Figure 1:

- Reduce the width of the drying floor and rails to 9 meters to create maintenance access on either side
- A new, 9 meter size Huber SRT with updated controls
- A stainless steel heated floor to vastly improve heat transfer to the solids and enable utilizing an external heat source
- Improved ventilation inside the greenhouse with downdraft fans

- Hot water driven heating air coils on the inlet air on the modified drying bay to warm inlet air in colder conditions
- A conveyance solution to run in parallel with the existing conveyors to better move and distribute dewatered solids to the first drying bay
- A new plastic curtain to separate the upgraded drying bay from the rest of the greenhouse, which will allow more directed and controlled airflow
- Updated control strategy reflecting the much faster rate of drying possible with the heated floor

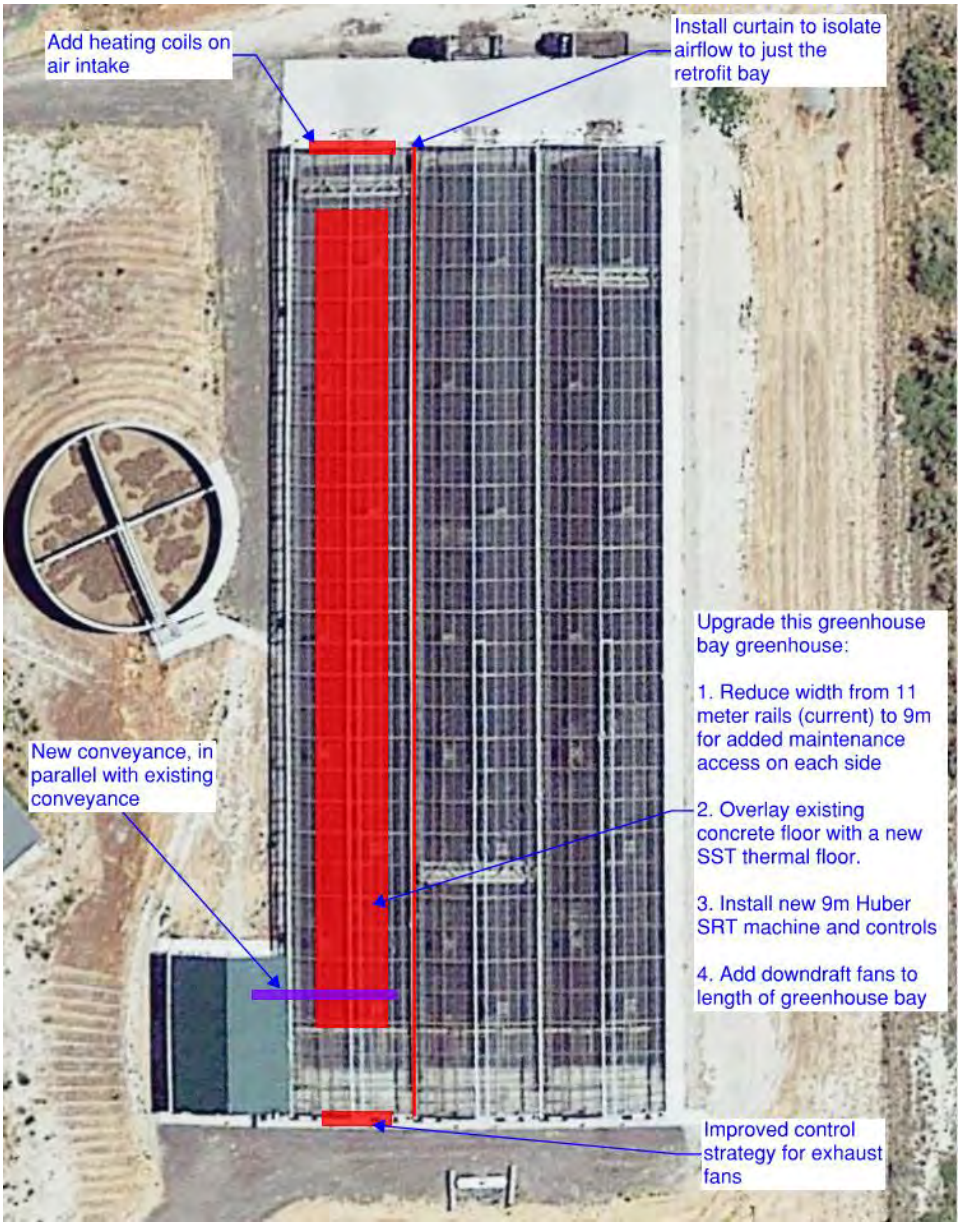


Figure 1 - Retrofit improvements to existing greenhouse bay

BC proposes the following improvements for the external thermal system improvements, as shown in Figure 2:

- Concentrating solar thermal collectors to capture heat energy for the greenhouse, sized to provide adequate heat in the worst-case week in winter
- A hot water thermal storage tank to collect, buffer, and store thermal energy for use when the solar resource is low
- Heat loop hot water pumps, appurtenances, and controls

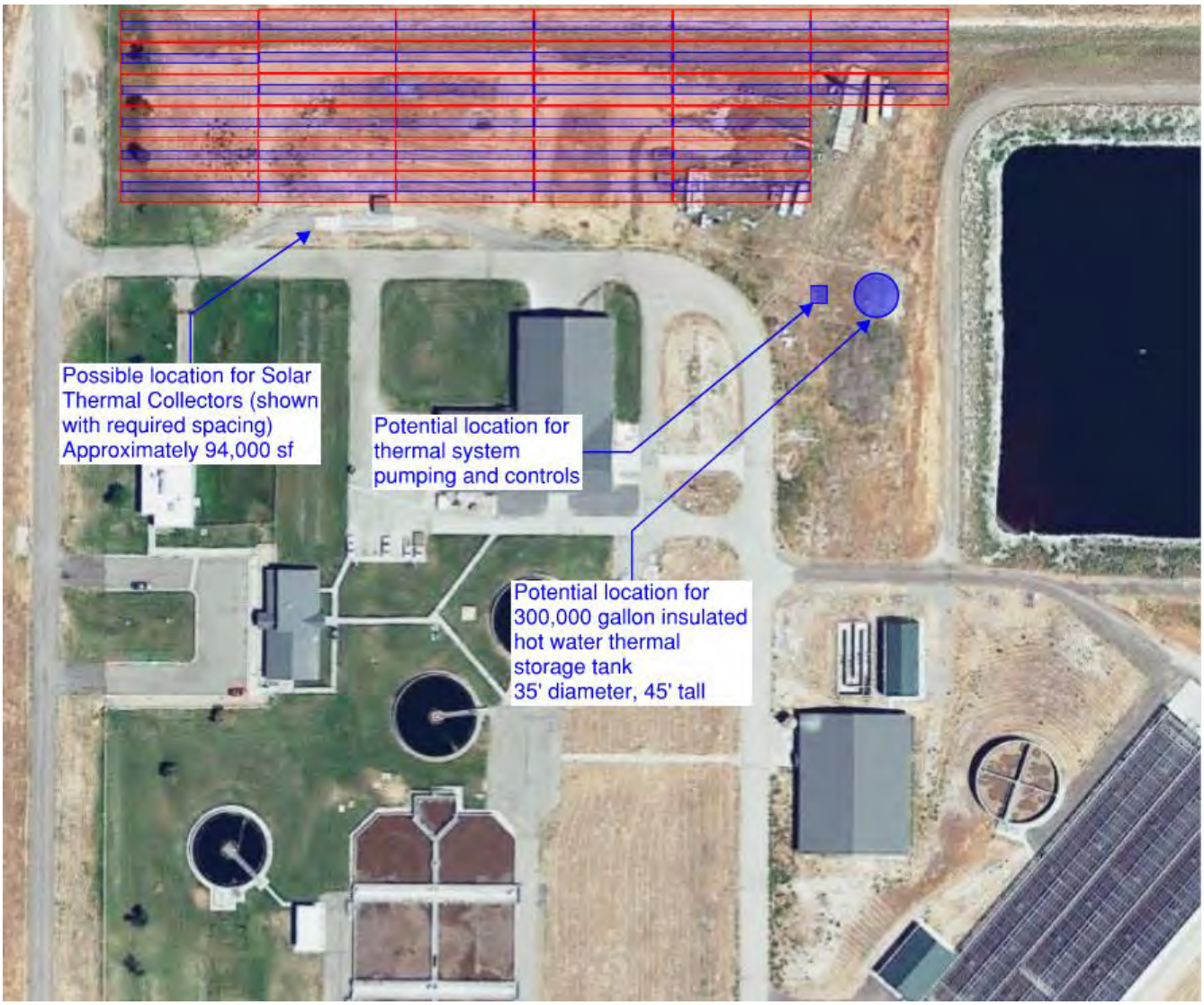


Figure 2 - Proposed footprint for outside equipment

The solar thermal system consists of parabolic-trough style collectors which can reach very high thermal fluid temperatures, see Figure 3. For this application, BC anticipated using water (with glycol to prevent freezing) as the thermal fluid and running the collection system at or below 210 F

Figure 3 - Parabolic trough solar thermal collectors

Solar resource, or how much sunlight is available for the system to collect, varies daily and seasonally. As mentioned, the solar thermal collection system has been designed to meet the design loading rates described in Table 1 throughout the year based on historic weather data. Note that weather conditions will vary, and this sizing is not a guarantee that the system will produce adequate thermal energy 100% of the year.

However, since the system is sized for winter solar resource, the system will provide excess heat in other times of year. This additional heat should enable higher than the design loading rate of throughput in the upgraded greenhouse bay. As an upper limit, BC anticipates that the greenhouse thermal floor as described above may be capable of up to 24 wet tons/day with adequate heat. In order to achieve this loading in winter, approximately 1/3 additional solar thermal collectors would be required, or an additional 31,000 square feet.

Cost Estimate

Based on the loading rate, BC estimated the capital cost for a greenhouse dryer system including solar thermal collectors as a source of heat and a hot water thermal storage system to buffer the solar thermal energy. The project costs, including equipment and labor, are presented in Table 2 below. This cost does not include markups, sales tax, bond, or contingency. Note that these values are intended to be used for planning purposes only and do not imply or guarantee any specific costs.

Table-2. Budgetary Construction Cost Estimate

Item	Cost
Equipment and Labor	$2,600,000

Brown and Caldwell appreciates that the City of Tooele has expressed interest in our services in assisting with this project. Should you have any questions, please do not hesitate to call me at (602) 320-8814.

Very truly yours,
Brown and Caldwell

Ric Traeger
Phoenix, AZ

cc: Kenny Klittich, Brown and Caldwell

Limitations:

This document was prepared solely for Tooele in accordance with professional standards at the time the services were performed and in accordance with the verbal agreement between Tooele, JUB, and Brown and Caldwell. This document is governed by the specific scope of work requested by JUB; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by Tooele, JUB, and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Appendix D: Vendor Proposals

Tooele WWTP

Utah

Engineer
JUB Engineers, Inc.

Representative
Mike Charnholm
Goble Sampson Associates
Salt Lake City, Utah
(801) 268-8790
mcharnholm@goblesampson.com

Contact
Adrian Williams
awilliams@westech-inc.com

Matt Pearson
mpearson@westech-inc.com

WesTech®

Proposal Number: 2260558
Wednesday, August 23, 2023

Table of Contents

Technical Proposal

Item A – Clarifier Mechanisms, Model COPC1G

General Scope of Supply		
Item	**Unit**	**Value/Description**
Number of Mechanisms	Each	2
Application	-	Activated Sludge Secondary
Tank Diameter	ft	90
Tank Side Wall Depth	ft	16
Tank Side Water Depth	ft	14
Tank Bottom Slope	-	1:12

**Assumed Values

The WesTech COPC1G Clarifier mechanism includes a Sludge Ring and Dual Gate EDI

Detailed Scope of Supply - Each Mechanism Includes the Following			
Item	**Qty**	**Size/Description**	**Material**
Walkway Bridge	1	36" wide Truss Bridge	Steel
Walkway Handrail	-	Truss Serves as Handrail Component	Steel
Walkway Flooring	-	1.25" Grating	Aluminum
Drive Platform	1	24" Minimum Drive Clearance	Steel
Platform Handrail	-	2 Rail Component Handrail, Pop Rivet	Aluminum
Platform Flooring	-	0.25" Checker Plate	Aluminum
Center Column	1	30" dia. x 0.25" thick	Steel
Center Cage	1	4' Square	Steel
Dual Gate EDI	1	9' dia. x 2.5' deep x 0.1875" plate	Steel
Feedwell	1	19' dia. x 5' deep x 0.1875" plate	Steel
Full Radius Rake Arms	2	Box Truss w/ Spiral Scrapers	Steel
Sludge Withdrawal Ring	1	20% Tank Diameter w/ Evenly Spaced Ports	Steel
Skimmer Blade & Supports	2	Extends from feedwell to hinged skimmer	Steel
Hinged Skimmer Assembly	2	With neoprene wipers	HDG/304 SS/Alum
Scum Box & Supports	1	5' Scum Box	Steel
Scum Flushing Valve	1	Skimmer Actuated	Polymer/SS
Electrical Control Panel	1	NEMA 4X	304 SS
Drive Unit	1	See Drive Unit Table for description	
Anchor Bolts & Fasteners	-	-	304 SS

Drive Unit

Description	Unit	Value/Description
Drive Type	C42	Cage Drive w/ Precision Bearing
Housing Material	-	Fabricated Steel
Continuous Rated Torque	ft·lbs	35,750
Momentary Peak Torque	ft·lbs	71,500
Rake Tip Speed	ft/min	14.1
Motor Size	HP	1
Motor Voltage/Frequency/Phase	V / Hz / Phase	460 / 60 / 3
Torque Control Settings	Alarm: ft·lbs Motor Cutout: ft·lbs	100%: 35,750 120%: 42,900
Main Gear and Pinion Lubrication	-	Oil
Main Bearing and Reducer Lubrication	-	Grease

Surface Preparation and Coating

Application Surfaces	Surface Preparation	Finish
Submerged	SSPC-SP10	One (1) Coat Tnemec N140-1255, 4-6 mils DFT, and One (1) Coat Tnemec N140-B5712, 4-6 mils DFT
Non-Submerged	SSPC-SP6	One (1) Coat Tnemec N140-1255, 4-6 mils DFT, and One (1) Coat Tnemec 1074U-B5712, 3-5 mils DFT
Drive Unit	SSPC-SP6	One (1) coat Tnemec N140F-1255 Epoxy, 4-6 mils DFT, and one (1) coat Tnemec 1074U-B5712 Polyurethane, 3-5 mils DFT

Approximate Weights

Item	Weight	Unit
Center Column	2100	lbs
Center Cage, Rake Arms, Spiral Rake Blades, Sludge Withdrawal Ring	8550	lbs
Dual Gate EDI, Feedwell, Feedwell Supports	5500	lbs
Standard Skimmer, Scum Box & Supports	2800	lbs
Bridge & Platform	3200	lbs
Drive Unit	4000	lbs
Heaviest Single Item (Drive Unit)	4000	lbs

Additional Services and Equipment

WesTech has included on-site technical assistance for inspection, observation of torque testing, startup, and instruction of plant personnel. Additional on-site services may be purchased at standard WesTech daily rates plus travel and living expenses.

On-Site Technical Service

Item	Quantity
Total Number of Trips	2
Total Number of Days	2

Items Not Included in WesTech's Base Scope of Supply (unless specifically noted)

- Concrete/Grout
- Concrete and Anchor Reinforcement
- Conduits and Wiring
- Erection or Assembly
- Lubricants
- Piping, Valves, or Fittings
- Scum Baffle & Supports
- Unloading or Storage
- Weir

Optional Items

Equipment Options			
No.	**Item**	**Description**	**Material**
A-1	9” Weir	V-Notch	FRP
	12” Scum Baffle and Supports	-	FRP
A-2	Density Current Baffle	-	FRP

Clarifications and Exceptions

General Clarifications

Terms & Conditions: This proposal, including all terms and conditions contained herein, shall become part of any resulting contract or purchase order. Changes to any terms and conditions, including but not limited to submittal and shipment days, payment terms, and escalation clause shall be negotiated at order placement, otherwise the proposal terms and conditions contained herein shall apply.

Paint: If your equipment has paint included in the price, please take note to the following. Primer paints are designed to provide only a minimal protection from the time of application (usually for a period not to exceed 30 days). Therefore, it is imperative that the finish coat be applied within 30 days of shipment on all shop primed surfaces. Without the protection of the final coatings, primer degradation may occur after this period, which in turn may require renewed surface preparation and coating. If it is impractical or impossible to coat primed surfaces within the suggested time frame, WesTech strongly recommends the supply of bare metal, with surface preparation and coating performed in the field. All field surface preparation, field paint, touch-up, and repair to shop painted surfaces are not by WesTech.

Escalation: If between the proposal date and actual procurement and through no fault of the Seller, the relevant cost of labor, material, freight, tariffs, and other Seller costs combined relating to the contract, increase by greater than 2.5% of the overall contract price, then the contract price shall be subject to escalation and increased. Such increase shall be verified by documentation and the amount of contract price escalation shall be calculated as either the actual increased cost to the Seller or, if agreed by the Parties, the equivalent increase of a relevant industry recognized third-party index, and in both cases without any additional profit or margin being added.

USA Tariffs and Current Trade Laws: All prices are based on current USA and North America tariffs and trade laws/agreements at time of bid. Any changes in costs due to USA Tariffs and trade laws/ agreements will be passed through to the purchaser at cost.

The Infrastructure Investment and Jobs Act of 2021 (IIJA) includes potentially significant changes to historical “Buy American” or “American Iron and Steel” (AIS) requirements for federally funded projects, including water-related infrastructure projects as administered by the Environmental Protection Agency (EPA). The IIJA was signed into law on Nov 15, 2021. However the EPA has yet to issue additional information and guidance clarifying the application and interpretation of these changes. Although WesTech makes every effort to source the steel for our equipment and products domestically, not everything is reasonably or commercially available to meet all project specific constraints. Consequently, any proposal or offer for sale by WesTech, including any resulting equipment order, does not guarantee compliance with the Buy American provisions of the Infrastructure Investment and Jobs Act of 2021 at this time.

Exceptions

Not applicable

Commercial Proposal

Proposal Name: Tooele WWTP
Proposal Number: 2260558
Wednesday, August 23, 2023

1. Bidder's Contact Information

Company Name	WesTech Engineering, LLC
Primary Contact Name	Adrian Williams
Phone	(801) 265-1000
Email	awilliams@westech-inc.com
Address: Number/Street	3665 S West Temple
Address: City, State, Zip	Salt Lake City, UT 84115

2. Budget Pricing

Currency: USD

Scope of Supply

A	Two (2) 90' Diameter Clarifier Mechanisms Model COPC1G	$791,400
A-1	Two (2) Sets FRP Weirs and Baffles	$33,100
A-2	Two (2) Sets FRP Density Current Baffles	$157,000
	Taxes (sales, use, VAT, IVA, IGV, duties, import fees, etc.)	Not Included

Prices are valid for a period not to exceed 30 days from date of proposal.

Additional Field Service

Daily Rate (Applicable Only to Field Service Not Included in Scope)	$1,350

Pricing does not include field service unless noted in scope of supply, but is available at the daily rate plus expenses. The greater of a two week notice or visa procurement time is required prior to departure date. Our field service policy can be provided upon request for more details.

3. Payment Terms

Purchase Order Acceptance and Contract Execution	10%
Submittals Provided by WesTech	15%
Release for Fabrication	35%
Notification of Ready to Ship	40%

All payments are net 30 days. Partial shipments are allowed. An approved Letter of Credit is required if Incoterms CIF, CFR, DAP, CIP, or CPT are applicable. Payment is required in full for all other Incoterms prior to international shipment. Other terms per WesTech proforma invoice. Please note that the advising bank must be named as: Wells Fargo Bank, International Department, 9000 Flair Drive, 3rd Floor, El Monte, California 91731, USA.

4. Schedule

Submittals, after Purchase Order Acceptance and Contract Execution	6 to 8 weeks
Ready to Ship, after Receipt of Final Submittal Approval	18 to 20 weeks
Estimated Weeks to Ready to Ship	**24 to 28 weeks***

*Customer submittal approval is typically required to proceed with equipment fabrication and is not accounted for in the schedule above. Project schedule will be extended to account for time associated with receipt of customer submittal approval.

5. Freight

Domestic	FOB Shipping Point - Full Freight Allowed to Jobsite (FSP-FFA)	
From	**Final Destination**	**Number of Trucks or Containers**
WesTech Shops	Jobsite	TBD

One-Year Warranty

WesTech is meeting a global need for clean water through technology treatment solutions. We are proud that the equipment and systems we design, build, maintain, and operate are making the world a better place and creating a more sustainable environment for future generations.

Equipment manufactured or sold by WesTech Engineering, LLC, once paid for in full, is backed by the following warranty:

> Subject to the terms below, WesTech warrants all new equipment manufactured or sold by WesTech Engineering, LLC to be unencumbered and free from defects in material and workmanship, and WesTech will replace or repair, F.O.B. its factories or other location it chooses, any part or parts returned to WesTech which WesTech's examination and analysis determine have failed within the warranty period because of defects in material and workmanship. The warranty period is either, one calendar year immediately following start-up, or eighteen (18) months from when WesTech sent its ready-to-ship notification to the purchaser, whichever expires sooner. All repair or replacement parts qualifying under this warranty shall be free of charge. Purchaser will provide timely written notice to WesTech of any defects it believes should be repaired or replaced under this warranty. WesTech will reject as untimely any warranty defect claim that purchaser submits more than thirty (30) days after the possible warranty defect first occurred. Unless specifically stated otherwise, this warranty does not cover normal wear or consumables. This warranty is not transferable.
>
> This warranty shall be void and shall not apply where the equipment or any part thereof
>
> a) has been dismantled, modified, repaired or connected to other equipment, outside of a WesTech factory, or without WesTech's written approval, or
> b) has not been installed in complete adherence to all WesTech's or parts manufacturer's requirements, recommendations, and procedures, or
> c) has been subject to misuse, abuse, neglect, or accident, or has not at all times been operated and maintained in strict compliance with all of WesTech's requirements and recommendations therefor, including, but not limited to, the relevant WesTech Operations & Maintenance Manual and any other of WesTech's specified guidelines & procedures, or
> d) has been subject to force majeure events; use of chemicals not approved in writing by WesTech; electrical surges; overloading; significant power, water or feed supply fluctuations; or non-compliance with agreed feedwater or chemical volumes, specifications or procedures.

In any case where a part or component of equipment under this warranty is or may be faulty and the component or part is also covered under the warranty of a third party then the purchaser shall provide reasonable assistance to first pursue a claim under the third party warranty before making a claim under this warranty from WesTech. WesTech Engineering, LLC gives no warranty with respect to parts, accessories, or components purchased other than through WesTech. The warranties which apply to such items are those offered by the respective manufacturers.

This warranty is expressly given by WesTech and accepted by purchaser in lieu of all other warranties whether written, oral, express, implied, statutory or otherwise, including without limitation, warranties of merchantability and fitness for particular purpose. WesTech neither accepts nor authorizes any other person to assume for it any other liability with respect to its equipment. WesTech shall not be liable for normal wear and tear, corrosion, or any contingent, incidental, or consequential damage or expense due to partial or complete inoperability of its equipment for any reason whatsoever. The purchaser's exclusive and only remedy for breach of this warranty shall be the repair and or replacement of the defective part or parts within a reasonable time of WesTech's accepting the validity of a warranty claim made by the purchaser.

Terms & Conditions

Terms and Conditions appearing in any order based on this proposal which are inconsistent herewith shall not be binding on WesTech Engineering, LLC The sale and purchase of equipment described herein shall be governed exclusively by the foregoing proposal and the following provisions:

1. SPECIFICATIONS: WesTech Engineering, LLC is furnishing its standard equipment as outlined in the proposal and as will be covered by final approved drawings. The equipment may not be in strict compliance with the Engineer's/Owner's plans, specifications, or addenda as there may be deviations. The equipment will, however, meet the general intention of the mechanical specifications of these documents.

2. ITEMS INCLUDED: This proposal includes only the equipment specified herein and does not include erection, installation, accessories, nor associated materials such as controls, piping, etc., unless specifically listed.

3. PARTIES TO CONTRACT: WesTech Engineering, LLC is not a party to or bound by the terms of any contract between WesTech Engineering, LLC's customer and any other party. WesTech Engineering, LLC's undertakings are limited to those defined in the contract between WesTech Engineering, LLC and its direct customers.

4. PRICE AND DELIVERY: All selling prices quoted are subject to change without notice after 30 days from the date of this proposal unless specified otherwise. Unless otherwise stated, all prices are F.O.B. WesTech Engineering, LLC or its supplier's shipping points. All claims for damage, delay or shortage arising from such equipment shall be made by Purchaser directly against the carrier. When shipments are quoted F.O.B. job site or other designation, Purchaser shall inspect the equipment shipped, notifying WesTech Engineering, LLC of any damage or shortage within forty-eight hours of receipt, and failure to so notify WesTech Engineering, LLC shall constitute acceptance by Purchaser, relieving WesTech Engineering, LLC of any liability for shipping damages or shortages.

5. PAYMENTS: All invoices are net 30 days. Delinquencies are subject to a 1.5 percent service charge per month or the maximum permitted by law, whichever is less on all past due accounts. Pro rata payments are due as shipments are made. If shipments are delayed by the Purchaser, invoices shall be sent on the date when WesTech Engineering, LLC is prepared to make shipment and payment shall become due under standard invoicing terms. If the work to be performed hereunder is delayed by the Purchaser, payments shall be based on the purchase price and percentage of completion. Products held for the Purchaser shall be at the risk and expense of the Purchaser. Unless specifically stated otherwise, prices quoted are for equipment only. These terms are independent of and not contingent upon the time and manner in which the Purchaser receives payment from the owner.

6. PAYMENT TERMS: Credit is subject to acceptance by WesTech Engineering, LLC's Credit Department. If the financial condition of the Purchaser at any time is such as to give WesTech Engineering, LLC, in its judgment, doubt concerning the Purchaser's ability to pay, WesTech Engineering, LLC may require full or partial payment in advance or may suspend any further deliveries or continuance of the work to be performed by the WesTech Engineering, LLC until such payment has been received.

7. ESCALATION: If between the proposal date and actual procurement and through no fault of the Seller, the relevant cost of labor, material, freight, tariffs, and other Seller costs combined relating to the contract, increase by greater than 2.5% of the overall contract price, then the contract price shall be subject to escalation and increased. Such increase shall be verified by documentation and the amount of contract price escalation shall be calculated as either the actual increased cost to the Seller or, if agreed by the Parties, the equivalent increase of a relevant industry recognized third-party index, and in both cases without any additional profit or margin being added.

8. APPROVAL: If approval of equipment submittals by Purchaser or others is required, a condition precedent to WesTech Engineering, LLC supplying any equipment shall be such complete approval.

9. INSTALLATION SUPERVISION: Prices quoted for equipment do not include installation supervision. WesTech Engineering, LLC recommends and will, upon request, make available, at WesTech Engineering, LLC's then current rate, an experienced installation supervisor to act as the Purchaser's employee and agent to supervise installation of the equipment. Purchaser shall at its sole expense furnish all necessary labor equipment, and materials needed for installation.

Responsibility for proper operation of equipment, if not installed by WesTech Engineering, LLC or installed in accordance with WesTech Engineering, LLC's instructions, and inspected and accepted in writing by WesTech Engineering, LLC, rests entirely with Purchaser; and any work performed by WesTech Engineering, LLC personnel in making adjustment or changes must be paid for at WesTech Engineering, LLC's then current per diem rates plus living and traveling expenses.

WesTech Engineering, LLC will supply the safety devices described in this proposal or shown in WesTech Engineering, LLC's drawings furnished as part of this order but excepting these, WesTech Engineering, LLC shall not be required to supply or install any safety devices whether required by law or otherwise. The Purchaser hereby agrees to indemnify and hold harmless WesTech Engineering, LLC from any claims or losses arising due to alleged or actual insufficiency or inadequacy of the safety devices offered or supplied hereunder, whether specified by WesTech Engineering, LLC or Purchaser, and from any damage resulting from the use of the equipment supplied hereunder.

10. ACCEPTANCE OF PRODUCTS: Products will be deemed accepted without any claim by Purchaser unless written notice of non-acceptance is received by WesTech Engineering, LLC within 30 days of delivery if shipped F.O.B. point of shipment, or 48 hours of delivery if shipped F.O.B. point of destination. Such written notice shall not be considered received by WesTech Engineering, LLC unless it is accompanied by all freight bills for said shipment, with Purchaser's notations as to damages, shortages and conditions of equipment, containers, and seals. Non-accepted products are subject to the return policy stated below.

11. TAXES: Any federal, state, or local sales, use or other taxes applicable to this transaction, unless specifically included in the price, shall be for Purchaser's account.

12. TITLE: The equipment specified herein, and any replacements or substitutes therefore shall, regardless of the manner in which affixed to or used in connection with realty, remain the sole and personal property of WesTech Engineering, LLC until the full purchase price has been paid. Purchaser agrees to do all things necessary to protect and maintain WesTech Engineering, LLC's title and interest in and to such equipment; and upon Purchaser's default, WesTech Engineering, LLC may retain as liquidated damages any and all partial payments made and shall be free to enter the premises where such equipment is located and remove the same as its property without prejudice to any further claims on account of damages or loss which WesTech Engineering, LLC may suffer from any cause.

13. INSURANCE: From date of shipment until the invoice is paid in full, Purchaser agrees to provide and maintain at its expense, but for WesTech Engineering, LLC's benefit, adequate insurance including, but not limited

to, builders risk insurance on the equipment against any loss of any nature whatsoever.

14. SHIPMENTS: Any shipment of delivery dates recited represent WesTech Engineering, LLC's best estimate but no liability, direct or indirect, is assumed by WesTech Engineering, LLC for failure to ship or deliver on such dates.

WesTech Engineering, LLC shall have the right to make partial shipments; and invoices covering the same shall be due and payable by Purchaser in accordance with the payment terms thereof. If Purchaser defaults in any payment when due hereunder, WesTech Engineering, LLC may, without incurring any liability therefore to Purchaser or Purchaser's customers, declare all payments immediately due and payable with maximum legal interest thereon from due date of said payment, and at its option, stop all further work and shipments until all past due payments have been made, and/or require that any further deliveries be paid for prior to shipment.

If Purchaser requests postponements of shipments, the purchase price shall be due and payable upon notice from WesTech Engineering, LLC that the equipment is ready for shipment; and thereafter any storage or other charge WesTech Engineering, LLC incurs on account of the equipment shall be for the Purchaser's account.

If delivery is specified at a point other than WesTech Engineering, LLC or its supplier's shipping points, and delivery is postponed or prevented by strike, accident, embargo, or other cause beyond WesTech Engineering, LLC's reasonable control and occurring at a location other than WesTech Engineering, LLC or its supplier's shipping points, WesTech Engineering, LLC assumes no liability in delivery delay. If Purchaser refuses such delivery, WesTech Engineering, LLC may store the equipment at Purchaser's expense. For all purposes of this agreement such tender of delivery or storage shall constitute delivery.

15. WARRANTY: WesTech Engineering LLC warrants equipment it supplies only in accordance with the attached WesTech Warranty. This warranty is expressly given by WesTech and accepted by purchaser in lieu of all other warranties whether written, oral, express, implied, statutory or otherwise, including without limitation, warranties of merchantability and fitness for particular purpose. WesTech neither accepts nor authorizes any other person to assume for it any other liability with respect to its equipment. WesTech shall not be liable for normal wear and tear, corrosion, or any contingent, incidental, or consequential damage or expense due to partial or complete inoperability of its equipment for any reason whatsoever. The purchaser's exclusive and only remedy for breach of this warranty shall be the repair and or replacement of the defective part or parts within a reasonable time of WesTech's accepting the validity of a warranty claim made by the purchaser.

16. PATENTS: WesTech Engineering, LLC agrees that it will, at its own expense, defend all suits or proceedings instituted against Purchaser and pay any award of damages assessed against it in such suits or proceedings, so far as the same are based on any claim that the said equipment or any part thereof constitutes an infringement of any apparatus patent of the United States issued at the date of this Agreement, provided WesTech Engineering, LLC is given prompt notice in writing of the institution or threatened institution of any suit or proceeding and is given full control of the defense, settlement, or compromise of any such action; and Purchaser agrees to give WesTech Engineering, LLC needed information, assistance, and authority to enable WesTech Engineering, LLC so to do. In the event said equipment is held or conceded to infringe such a patent, WesTech Engineering, LLC shall have the right at its sole option and expense to a) modify the equipment to be non-infringing, b) obtain for Purchaser the license to continue using said equipment, or c) accept return of the equipment and refund to the Purchaser the purchase price thereof less a reasonable charge for the use thereof. WesTech Engineering, LLC will reimburse Purchaser for actual out-of-pocket expenses, exclusive of legal fees, incurred in preparing such information and rendering such assistance at WesTech Engineering, LLC's request. The foregoing states the entire liability of WesTech Engineering, LLC, with respect to patent infringement; and except as otherwise agreed to in writing, WesTech Engineering, LLC assumes no responsibility for process patent infringement.

17. SURFACE PREPARATION AND PAINTING: If furnished, shop primer paint is intended to serve only as minimal protective finish. WesTech Engineering, LLC will not be responsible for the condition of primed or finish painted surfaces after equipment leaves its shops. Purchasers are invited to inspect paint in shops for proper preparation and application prior to shipment. WesTech Engineering, LLC assumes no responsibility for field surface preparation or touch-up of shipping damage to paint. Painting of fasteners and other touch-up to painted surfaces will be by Purchaser's painting contractor after mechanism installation.

Motors, gear motors, and other components not manufactured by WesTech Engineering, LLC will be painted with that manufacturer's standard paint system. It is WesTech Engineering, LLC's intention to ship major steel components as soon as fabricated, often before drive, motors, and other manufactured components. Unless Purchaser can ensure that shop primed steel shall be field painted within thirty (30) days after arrival at the job site, WesTech Engineering, LLC encourages the Purchaser to order these components without primer.

WesTech Engineering, LLC's prices are based on paints and surface preparations as outlined in the main body of this proposal. In the event that an alternate paint system is selected, WesTech Engineering, LLC requests that Purchaser's order advise of the paint selection. WesTech Engineering, LLC will then either adjust the price as may be necessary to comply or ship the material unpainted if compliance is not possible due to application problems or environmental controls.

18. CANCELLATION, SUSPENSION, OR DELAY: After acceptance by WesTech Engineering, LLC, this proposal, or Purchaser's order based on this proposal, shall be a firm agreement and is not subject to cancellation, suspension, or delay except upon payment by Purchaser of appropriate charges which shall include all costs incurred by WesTech Engineering, LLC to date of cancellation, suspension, or delay plus a reasonable profit. Additionally, all charges related to storage and/or resumption of work, at WesTech Engineering, LLC's plant or elsewhere, shall be for Purchaser's sole account; and all risks incidental to storage shall be assumed by Purchaser.

19. FORCE MAJEURE: Neither party hereto shall be liable to the other for default or delay in delivery caused by extreme weather or other act of God, strike or other labor shortage or disturbance, fire, accident, war or civil disturbance, act of government, pandemic, delay of carriers, failure of normal sources of supply, complete or partial shutdown of plant by reason of inability to attain sufficient raw materials or power, and/or other similar contingency beyond the reasonable control of the respective parties. The time for delivery specified herein shall be extended during the continuance of such conditions, or any other cause beyond such party's reasonable control. Escalation resulting from a Force Majeure event shall be equitably adjusted per the escalation policy stated above.

20. RETURN OF PRODUCTS: No products may be returned to WesTech Engineering, LLC without WesTech Engineering, LLC's prior written permission. Said permission may be withheld by WesTech Engineering, LLC at its sole discretion.

21. BACKCHARGES: WesTech Engineering LLC will not approve or accept backcharges for labor, materials, or other costs incurred by Purchaser or others in modification, adjustment, service, or repair of WesTech Engineering LLC furnished materials unless such back charge has been authorized in advance in writing by a WesTech Engineering LLC purchase order, or work requisition signed by WesTech Engineering LLC.

22. INDEMNIFICATION: Purchaser agrees to indemnify WesTech Engineering, LLC from all costs incurred, including but not limited to court costs and reasonable attorney fees, from enforcing any provisions of this contract, including but not limited to breach of contract or costs incurred in collecting monies owed on this contract.

23. ENTIRE AGREEMENT: This proposal expresses the entire agreement between the parties hereto superseding any prior understandings and is not subject to modification except by a writing signed by an authorized officer of each party.

24. MOTORS AND MOTOR DRIVES: In order to avoid shipment delays of WesTech Engineering, LLC equipment, the motor drives may be sent directly to the job site for installation by the equipment installer. Minor fit-up may be required.

25. EXTENDED STORAGE: Extended storage instructions will be part of information provided to shipment. If equipment installation and start-up is delayed more than 30 days, the provisions of the storage instructions must be followed to keep WARRANTY in force.

26. LIABILITY: Professional liability insurance, including but not limited to, errors and omissions insurance, is not included. In any event, liability for errors and omissions shall be limited to the lesser of $100,000 USD or the value of the particular piece of equipment (not the value of the entire order) supplied by WesTech Engineering LLC against which a claim is sought.

27. ARBITRATION NEGOTIATION: Any controversy or claim arising out of or relating to the performance of any contract resulting from this proposal or contract issued, or the breach thereof, shall be settled by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association, and judgment upon the award rendered by the arbitrator(s) may be entered to any court having jurisdiction.

ACCEPTED BY PURCHASER

Customer Name: _____

Customer Address: _____

_____

_____

Contact Name: _____

Contact Phone: _____

Contact Email: _____

Signature: _____

Printed Name: _____

Title: _____

Date: _____

Tooele WWTF

Tooele, Utah

Owner
City of Tooele

Contact
David Mendenhall
dmendenhall@westech-inc.com
(801) 290-1860

David Mortensen
dmortensen@westech-inc.com
(801) 290-1877

Representative
Mike Charnholm
Goble Sampson Associates, Utah
Salt Lake City, Utah
(801) 268-8790
mcharnholm@goblesampson.com

Firm_145078_x0
Wednesday, August 09, 2023

Table of Contents

Technical Proposal

Item A – Replacement Parts for One (1) WesTech Clarifier

WesTech shall supply replacement WesTech clarifier parts for one (1) Model COPC1, Serial No. 18010A, at Tooele WWTF Tooele, Utah.

Summary	
Item	Unit
Number of Mechanisms	1
Tank Diameter	60 ft
Tank Bottom Slope	1 : 12

Detailed Scope of Supply per Mechanism

Item	Unit	Qty	Size/Description	Material
Drive Unit	each	1	C31 with Torque Control Device	Steel
Center Influent Column	each	1	With Influent ports	Steel
Feed Well with Supports	set	1	With baffled scum ports and skimmer blade	Steel
Drive Cage	each	1	Square	Steel
Rake Arms	each	2	With spiral blades, scraper blades, and adjustable stainless-steel squeegees	Steel
Skimmer Blades	set	1	With Supports, extends from feedwell to hinged skimmer	Steel
Hinged Scum Skimmer Assembly	set	1	3’ wide with neoprene wipers	304 SS/NPRN
Scum box		1	With supports, a 6” discharge port connection (with flexible coupling), and a scum flushing valve	Steel
Energy Dissipating Inlet Well	set	1	With multiple inlet gates and supports	Steel
Sludge Withdrawal Ring	each	1	With 4” to 6” inside width taper	Steel
Density Current Baffle	set	1		FRP
Launder Covers	set	1		FRP
Fasteners	lot	1	---	304 SS

Drive Unit Details	
Description	Proposed Unit
Drive Type	C31 Cage Drive with Precision Bearing
Housing Material	Steel
Continuous Rated Torque (ft·lbs)	13,500
Rake Tip Speed (RPM)	0.07
Motor Size (HP)	1
Motor Speed/VAC/Hz/Phase	1800 RPM/460V/60Hz/3 Ph
Torque Control Settings (ft·lbs)	Alarm: 13,500 (100%) Motor Cutout: 16,200 (120%)

Main Gear and Pinion Lubrication	Oil
Main Bearing Lubrication	Grease

Surface Preparation and Coating		
Coating Area	Surface Preparation	Coating
Submerged	SSPC-SP10	One (1) coat Tnemec N69-14 RD Epoxy, 4-6 mils DFT, and one (1) coat Tnemec N69-44 BR Epoxy, 4-6 mils DFT one (1) coat Tnemec N69-55 BL Epoxy, 4-6 mils DFT
Drive Unit	SSPC-SP6	One (1) coat Tnemec N140F-1255 Epoxy, 3-9 mils DFT, and one (1) coat Tnemec 1074U-B5712 Polyurethane, 2-5 mils DFT

Items NOT Included in WesTech's Base Scope of Supply:

- Bridge/Platform, weirs, baffles, spray system, clarifier control panel, and any parts not specifically listed above
- Piping, Valves, or Fittings
- Wiring
- Lubricants
- Unloading or storage
- Concrete work

Additional Information

- WesTech will send a technician on site to measure the critical areas of the existing clarifier to aid in the design.
- A submittal will be sent for customer review. The submittal will consist of general arrangement drawings for the unit, based on the field measurements taken by the WesTech technician. The shipment lead time begins after WesTech has received written submittal approval.
- One (1) electronic PDF copy of the Operation & Maintenance Manual for the drive unit is included.
- The coating system will NOT require a Holiday Test but shall have an Adhesion Test (only on the 8x6 test pieces).
- Pricing is based on costs associated with the Clarifier #1 project.
- Installation of the replacement parts is to be provided by WesTech. Winter conditions will increase installation costs.
- All field surface preparation, field paint, touch-up, and repair to shop painted surfaces are not by WesTech.

Clarifications and Exceptions

General Clarifications

Terms & Conditions: This proposal, including all terms and conditions contained herein, shall become part of any resulting contract or purchase order. Changes to any terms and conditions, including but not limited to submittal and shipment days, payment terms, and escalation clause shall be negotiated at order placement, otherwise the proposal terms and conditions contained herein shall apply.

Paint: If your equipment has paint included in the price, please take note to the following. Primer paints are designed to provide only a minimal protection from the time of application (usually for a period not to exceed 30 days). Therefore, it is imperative that the finish coat be applied within 30 days of shipment on all shop primed surfaces. Without the protection of the final coatings, primer degradation may occur after this period, which in turn may require renewed surface preparation and coating. If it is impractical or impossible to coat primed surfaces within the suggested time frame, WesTech strongly recommends the supply of bare metal, with surface preparation and coating performed in the field. All field surface preparation, field paint, touch-up, and repair to shop painted surfaces are not by WesTech.

Escalation: If between the proposal date and actual procurement and through no fault of the Seller, the relevant cost of labor, material, freight, tariffs, and other Seller costs combined relating to the contract, increase by greater than 2.5% of the overall contract price, then the contract price shall be subject to escalation and increased. Such increase shall be verified by documentation and the amount of contract price escalation shall be calculated as either the actual increased cost to the Seller or, if agreed by the Parties, the equivalent increase of a relevant industry recognized third-party index, and in both cases without any additional profit or margin being added.

USA Tariffs and Current Trade Laws: All prices are based on current USA and North America tariffs and trade laws/agreements at time of bid. Any changes in costs due to USA Tariffs and trade laws/ agreements will be passed through to the purchaser at cost.

Exceptions

Not applicable

Commercial Proposal

Proposal Name: Tooele WWTF
Proposal Number: 145078
Wednesday, August 09, 2023

1. Bidder's Contact Information

Company Name	WesTech Engineering, LLC
Primary Contact Name	David Mendenhall
Phone	(801) 265-1000
Email	dmendenhall@westech-inc.com
Address: Number/Street	3665 S West Temple
Address: City, State, Zip	Salt Lake City, UT 84115

2. Firm Pricing

Currency: USD

	Scope of Supply		
A	Replacement Parts for One (1) WesTech Clarifier with Installation		$575,000
		Equipment	$357,000
		Installation	$218,000
	Taxes (sales, use, VAT, IVA, IGV, duties, import fees, etc.)		Not Included

Prices are valid for a period not to exceed 30 days from date of proposal.

3. Payment Terms

Equipment: Due Net 30 after Notification of Ready to Ship	100%

All payments are net 30 days. Partial shipments are allowed. An approved Letter of Credit is required if Incoterms CIF, CFR, DAP, CIP, or CPT are applicable. Payment is required in full for all other Incoterms prior to international shipment. Other terms per WesTech proforma invoice. Please note that the advising bank must be named as: Wells Fargo Bank, International Department, 9000 Flair Drive, 3rd Floor, El Monte, California 91731, USA.

4. Schedule

Submittal: After Purchase Order Acceptance and Contract Execution	5-6 weeks
Equipment: Ready to Ship, from written submittal approval	18 weeks
Installation: From commencement of work	3 weeks

5. Freight

Domestic	FOB Shipping Point - Full Freight Allowed to Jobsite (FSP-FFA)	
From	Final Destination	Number of Trucks or Containers
WesTech Shops	Tooele, UT	Approximately TBD

One-Year Warranty

WesTech is meeting a global need for clean water through technology treatment solutions. We are proud that the equipment and systems we design, build, maintain, and operate are making the world a better place and creating a more sustainable environment for future generations.

Equipment manufactured or sold by WesTech Engineering, LLC, once paid for in full, is backed by the following warranty:

Subject to the terms below, WesTech warrants all new equipment manufactured or sold by WesTech Engineering, LLC to be unencumbered and free from defects in material and workmanship, and WesTech will replace or repair, F.O.B. its factories or other location it chooses, any part or parts returned to WesTech which WesTech's examination and analysis determine have failed within the warranty period because of defects in material and workmanship. The warranty period is either, one calendar year immediately following start-up, or eighteen (18) months from when WesTech sent its ready-to-ship notification to the purchaser, whichever expires sooner. All repair or replacement parts qualifying under this warranty shall be free of charge. Purchaser will provide timely written notice to WesTech of any defects it believes should be repaired or replaced under this warranty. WesTech will reject as untimely any warranty defect claim that purchaser submits more than thirty (30) days after the possible warranty defect first occurred. Unless specifically stated otherwise, this warranty does not cover normal wear or consumables. This warranty is not transferable.
This warranty shall be void and shall not apply where the equipment or any part thereof

(a) has been dismantled, modified, repaired or connected to other equipment, outside of a WesTech factory, or without WesTech's written approval, or

(b) has not been installed in complete adherence to all WesTech's or parts manufacturer's requirements, recommendations, and procedures, or

(c) has been subject to misuse, abuse, neglect, or accident, or has not at all times been operated and maintained in strict compliance with all of WesTech's requirements and recommendations therefor, including, but not limited to, the relevant WesTech Operations & Maintenance Manual and any other of WesTech's specified guidelines & procedures, or

(d) has been subject to force majeure events; use of chemicals not approved in writing by WesTech; electrical surges; overloading; significant power, water or feed supply fluctuations; or non-compliance with agreed feedwater or chemical volumes, specifications or procedures.

In any case where a part or component of equipment under this warranty is or may be faulty and the component or part is also covered under the warranty of a third party then the purchaser shall provide reasonable assistance to first pursue a claim under the third party warranty before making a claim under this warranty from WesTech. WesTech Engineering, LLC gives no warranty with respect to parts, accessories, or components purchased other than through WesTech. The warranties which apply to such items are those offered by the respective manufacturers.

This warranty is expressly given by WesTech and accepted by purchaser in lieu of all other warranties whether written, oral, express, implied, statutory or otherwise, including without limitation, warranties of merchantability and fitness for particular purpose. WesTech neither accepts nor authorizes any other

person to assume for it any other liability with respect to its equipment. WesTech shall not be liable for normal wear and tear, corrosion, or any contingent, incidental, or consequential damage or expense due to partial or complete inoperability of its equipment for any reason whatsoever. The purchaser's exclusive and only remedy for breach of this warranty shall be the repair and or replacement of the defective part or parts within a reasonable time of WesTech's accepting the validity of a warranty claim made by the purchaser.

Terms & Conditions

Terms and Conditions appearing in any order based on this proposal which are inconsistent herewith shall not be binding on WesTech Engineering, LLC The sale and purchase of equipment described herein shall be governed exclusively by the foregoing proposal and the following provisions:

1. SPECIFICATIONS: WesTech Engineering, LLC is furnishing its standard equipment as outlined in the proposal and as will be covered by final approved drawings. The equipment may not be in strict compliance with the Engineer's/Owner's plans, specifications, or addenda as there may be deviations. The equipment will, however, meet the general intention of the mechanical specifications of these documents.

2. ITEMS INCLUDED: This proposal includes only the equipment specified herein and does not include erection, installation, accessories, nor associated materials such as controls, piping, etc., unless specifically listed.

3. PARTIES TO CONTRACT: WesTech Engineering, LLC is not a party to or bound by the terms of any contract between WesTech Engineering, LLC's customer and any other party. WesTech Engineering, LLC's undertakings are limited to those defined in the contract between WesTech Engineering, LLC and its direct customers.

4. PRICE AND DELIVERY: All selling prices quoted are subject to change without notice after 30 days from the date of this proposal unless specified otherwise. Unless otherwise stated, all prices are F.O.B. WesTech Engineering, LLC or its supplier's shipping points. All claims for damage, delay or shortage arising from such equipment shall be made by Purchaser directly against the carrier. When shipments are quoted F.O.B. job site or other designation, Purchaser shall inspect the equipment shipped, notifying WesTech Engineering, LLC of any damage or shortage within forty-eight hours of receipt, and failure to so notify WesTech Engineering, LLC shall constitute acceptance by Purchaser, relieving WesTech Engineering, LLC of any liability for shipping damages or shortages.

5. PAYMENTS: All invoices are net 30 days. Delinquencies are subject to a 1.5 percent service charge per month or the maximum permitted by law, whichever is less on all past due accounts. Pro rata payments are due as shipments are made. If shipments are delayed by the Purchaser, invoices shall be sent on the date when WesTech Engineering, LLC is prepared to make shipment and payment shall become due under standard invoicing terms. If the work to be performed hereunder is delayed by the Purchaser, payments shall be based on the purchase price and percentage of completion. Products held for the Purchaser shall be at the risk and expense of the Purchaser. Unless specifically stated otherwise, prices quoted are for equipment only. These terms are independent of and not contingent upon the time and manner in which the Purchaser receives payment from the owner.

6. PAYMENT TERMS: Credit is subject to acceptance by WesTech Engineering, LLC's Credit Department. If the financial condition of the Purchaser at any time is such as to give WesTech Engineering, LLC, in its judgment, doubt concerning the Purchaser's ability to pay, WesTech Engineering, LLC may require full or partial payment in advance or may suspend any further deliveries or continuance of the work to be performed by the WesTech Engineering, LLC until such payment has been received.

7. ESCALATION: If between the proposal date and actual procurement and through no fault of the Seller, the relevant cost of labor, material, freight, tariffs, and other Seller costs combined relating to the contract, increase by greater than 2.5% of the overall contract price, then the contract price shall be subject to escalation and increased. Such increase shall be verified by documentation and the amount of contract price escalation shall be calculated as either the actual increased cost to the Seller or, if agreed by the Parties, the equivalent increase of a relevant industry recognized third-party index, and in both cases without any additional profit or margin being added.

8. APPROVAL: If approval of equipment submittals by Purchaser or others is required, a condition precedent to WesTech Engineering, LLC supplying any equipment shall be such complete approval.

9. INSTALLATION SUPERVISION: Prices quoted for equipment do not include installation supervision. WesTech Engineering, LLC recommends and will, upon request, make available, at WesTech Engineering, LLC's then current rate, an experienced installation supervisor to act as the Purchaser's employee and agent to supervise installation of the equipment. Purchaser shall at its sole expense furnish all necessary labor equipment, and materials needed for installation.

Responsibility for proper operation of equipment, if not installed by WesTech Engineering, LLC or installed in accordance with WesTech Engineering, LLC's instructions, and inspected and accepted in writing by WesTech Engineering, LLC, rests entirely with Purchaser; and any work performed by WesTech Engineering, LLC personnel in making adjustment or changes must be paid for at WesTech Engineering, LLC's then current per diem rates plus living and traveling expenses.

WesTech Engineering, LLC will supply the safety devices described in this proposal or shown in WesTech Engineering, LLC's drawings furnished as part of this order but excepting these, WesTech Engineering, LLC shall not be required to supply or install any safety devices whether required by law or otherwise. The Purchaser hereby agrees to indemnify and hold harmless WesTech Engineering, LLC from any claims or losses arising due to alleged or actual insufficiency or inadequacy of the safety devices offered or supplied hereunder, whether specified by WesTech Engineering, LLC or Purchaser, and from any damage resulting from the use of the equipment supplied hereunder.

10. ACCEPTANCE OF PRODUCTS: Products will be deemed accepted without any claim by Purchaser unless written notice of non-acceptance is received by WesTech Engineering, LLC within 30 days of delivery if shipped F.O.B. point of shipment, or 48 hours of delivery if shipped F.O.B. point of destination. Such written notice shall not be considered received by WesTech Engineering, LLC unless it is accompanied by all freight bills for said shipment, with Purchaser's notations as to damages, shortages and conditions of equipment, containers, and seals. Non-accepted products are subject to the return policy stated below.

11. TAXES: Any federal, state, or local sales, use or other taxes applicable to this transaction, unless specifically included in the price, shall be for Purchaser's account.

12. TITLE: The equipment specified herein, and any replacements or substitutes therefore shall, regardless of the manner in which affixed to or used in connection with realty, remain the sole and personal property of WesTech Engineering, LLC until the full purchase price has been paid. Purchaser agrees to do all things necessary to protect and maintain WesTech Engineering, LLC's title and interest in and to such equipment; and upon Purchaser's default, WesTech Engineering, LLC may retain as liquidated damages any and all partial payments made and shall be free to enter the premises where such equipment is located and remove the same as its property without prejudice to any further claims on account of damages or loss which WesTech Engineering, LLC may suffer from any cause.

13. INSURANCE: From date of shipment until the invoice is paid in full, Purchaser agrees to provide and maintain at its expense, but for WesTech Engineering, LLC's benefit, adequate insurance including, but not limited

to, builders risk insurance on the equipment against any loss of any nature whatsoever.

14. SHIPMENTS: Any shipment of delivery dates recited represent WesTech Engineering, LLC's best estimate but no liability, direct or indirect, is assumed by WesTech Engineering, LLC for failure to ship or deliver on such dates.

WesTech Engineering, LLC shall have the right to make partial shipments; and invoices covering the same shall be due and payable by Purchaser in accordance with the payment terms thereof. If Purchaser defaults in any payment when due hereunder, WesTech Engineering, LLC may, without incurring any liability therefore to Purchaser or Purchaser's customers, declare all payments immediately due and payable with maximum legal interest thereon from due date of said payment, and at its option, stop all further work and shipments until all past due payments have been made, and/or require that any further deliveries be paid for prior to shipment.

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15. WARRANTY: WesTech Engineering, LLC warrants equipment it supplies only in accordance with the attached WesTech Warranty. This warranty is expressly given by WesTech and accepted by purchaser in lieu of all other warranties whether written, oral, express, implied, statutory or otherwise, including without limitation, warranties of merchantability and fitness for particular purpose. WesTech neither accepts nor authorizes any other person to assume for it any other liability with respect to its equipment. WesTech shall not be liable for normal wear and tear, corrosion, or any contingent, incidental, or consequential damage or expense due to partial or complete inoperability of its equipment for any reason whatsoever. The purchaser's exclusive and only remedy for breach of this warranty shall be the repair and or replacement of the defective part or parts within a reasonable time of WesTech's accepting the validity of a warranty claim made by the purchaser.

16. PATENTS: WesTech Engineering, LLC agrees that it will, at its own expense, defend all suits or proceedings instituted against Purchaser and pay any award of damages assessed against it in such suits or proceedings, so far as the same are based on any claim that the said equipment or any part thereof constitutes an infringement of any apparatus patent of the United States issued at the date of this Agreement, provided WesTech Engineering, LLC is given prompt notice in writing of the institution or threatened institution of any suit or proceeding and is given full control of the defense, settlement, or compromise of any such action; and Purchaser agrees to give WesTech Engineering, LLC needed information, assistance, and authority to enable WesTech Engineering, LLC so to do. In the event said equipment is held or conceded to infringe such a patent, WesTech Engineering, LLC shall have the right at its sole option and expense to a) modify the equipment to be non-infringing, b) obtain for Purchaser the license to continue using said equipment, or c) accept return of the equipment and refund to the Purchaser the purchase price thereof less a reasonable charge for the use thereof. WesTech Engineering, LLC will reimburse Purchaser for actual out-of-pocket expenses, exclusive of legal fees, incurred in preparing such information and rendering such assistance at WesTech Engineering, LLC's request. The foregoing states the entire liability of WesTech Engineering, LLC, with respect to patent infringement; and except as otherwise agreed to in writing, WesTech Engineering, LLC assumes no responsibility for process patent infringement.

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18. CANCELLATION, SUSPENSION, OR DELAY: After acceptance by WesTech Engineering, LLC, this proposal, or Purchaser's order based on this proposal, shall be a firm agreement and is not subject to cancellation, suspension, or delay except upon payment by Purchaser of appropriate charges which shall include all costs incurred by WesTech Engineering, LLC to date of cancellation, suspension, or delay plus a reasonable profit. Additionally, all charges related to storage and/or resumption of work, at WesTech Engineering, LLC's plant or elsewhere, shall be for Purchaser's sole account; and all risks incidental to storage shall be assumed by Purchaser.

19. FORCE MAJEURE: Neither party hereto shall be liable to the other for default or delay in delivery caused by extreme weather or other act of God, strike or other labor shortage or disturbance, fire, accident, war or civil disturbance, act of government, pandemic, delay of carriers, failure of normal sources of supply, complete or partial shutdown of plant by reason of inability to attain sufficient raw materials or power, and/or other similar contingency beyond the reasonable control of the respective parties. The time for delivery specified herein shall be extended during the continuance of such conditions, or any other cause beyond such party's reasonable control. Escalation resulting from a Force Majeure event shall be equitably adjusted per the escalation policy stated above.

20. RETURN OF PRODUCTS: No products may be returned to WesTech Engineering, LLC without WesTech Engineering, LLC's prior written permission. Said permission may be withheld by WesTech Engineering, LLC at its sole discretion.

21. BACKCHARGES: WesTech Engineering, LLC will not approve or accept backcharges for labor, materials, or other costs incurred by Purchaser or others in modification, adjustment, service, or repair of WesTech Engineering, LLC furnished materials unless such back charge has been authorized in advance in writing by a WesTech Engineering, LLC purchase order, or work requisition signed by WesTech Engineering, LLC.

22. INDEMNIFICATION: Purchaser agrees to indemnify WesTech Engineering, LLC from all costs incurred, including but not limited to court costs and reasonable attorney fees, from enforcing any provisions of this contract, including but not limited to breach of contract or costs incurred in collecting monies owed on this contract.

23. ENTIRE AGREEMENT: This proposal expresses the entire agreement between the parties hereto superseding any prior understandings and is not subject to modification except by a writing signed by an authorized officer of each party.

24. MOTORS AND MOTOR DRIVES: In order to avoid shipment delays of WesTech Engineering, LLC equipment, the motor drives may be sent directly to the job site for installation by the equipment installer. Minor fit-up may be required.

25. EXTENDED STORAGE: Extended storage instructions will be part of information provided to shipment. If equipment installation and start-up is delayed more than 30 days, the provisions of the storage instructions must be followed to keep WARRANTY in force.

26. LIABILITY: Professional liability insurance, including but not limited to, errors and omissions insurance, is not included. In any event, liability for errors and omissions shall be limited to the lesser of $100,000 USD or the value of the particular piece of equipment (not the value of the entire order) supplied by WesTech Engineering, LLC against which a claim is sought.

27. ARBITRATION NEGOTIATION: Any controversy or claim arising out of or relating to the performance of any contract resulting from this proposal or contract issued, or the breach thereof, shall be settled by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association, and judgment upon the award rendered by the arbitrator(s) may be entered to any court having jurisdiction.

ACCEPTED BY PURCHASER

Customer Name: _____

Customer Address: _____

_____

_____

Contact Name: _____

Contact Phone: _____

Contact Email: _____

Signature: _____

Printed Name: _____

Title: _____

Date: _____

Veolia Water Technologies
Treatment Solutions USA Inc.
600 WILLOW TREE RD
LEONIA NJ 07605
UNITED STATES

PHONE: 201-676-2525

Quotation

Quote Date	Quotation Exp. Date	Veolia TS Quote
31AUG2023	30SEP2023	**20591778**
Sales org.	**Sales Representative / Contact**	**Reference**
B611	Troy Meyer	ZED Ballast Power Center Upgrade

Sold to : 1000150785
TOOELE CITY CORPORATION
90 NORTH MAIN STREET
TOOELE UT 84074
UNITED STATES

Ship to : 4000217891
TOOELE CITY CORPORATION
3300 NORTH 1200 WEST
TOOELE UT 84074
UNITED STATES

Bill to : 0000510119
TOOELE CITY CORPORATION
90 NORTH MAIN STREET
TOOELE UT 84074
UNITED STATES

Payment terms
Net 30 Days From Invoice Date

Inco terms
EXW FACTORY

Currency: U.S. Dollar

Freight: Freight Prepaid

SNo.	Part Number / Item Description	Quantity	Unit	Price	Unit	Amount
10	X0075H03 POWER CONTROL CENTER, UV 3X, TYPE "A"					
	10 EA	10	EA	6,594.00	EA	65,940.00
20	3187393 FEE,SERVICE,SEE ORDER LONG TEXT					
	5 EA INCLUDES 3 DAYS ONSITE & TRAVEL TIME. SCOPE: INSTALL & TEST UPGRADE ZED BALLAST POWER CONTROL CENTERS (PCC) IN EXISTING PSU FOR 5 MODULES, 10 PCC's TOTAL. NOTES & EXCEPTIONS: THE CITY IS RESPONSABLE FOR RECEIVING, UNLOADING & STORING PCC'S. THE CITY IS RESPONSABLE FOR THE DISPOSAL OF REMOVED PCC'S. IT IS ASSUMED THAT ALL MODULES ARE IN GOOD WORKING CONDITION TO TEST NEW PCC'S.	5	EA	1,390.00	EA	6,950.00
30	3059963 FEE,T&L, EXPENSE					
	5 EA	5	EA	300.00	EA	1,500.00
40	3059959 FEE,T&L,AIRFARE					
	1 EA	1	EA	1,200.00	EA	1,200.00

Thank you for your Consideration. To place an order, please fax signed Purchase Orders to the Customer Care number shown above.
To ensure that you receive the pricing quoted, please reference this quotation number on your order.
All sales are subject to our terms and conditions, contained with this quotation.
Freight for Bulk Delivery and specialized freight charges, where applicable, are not included unless specifically indicated in the materials listing above.
Pricing above does not include applicable taxes, which will be applied at time of order.

Veolia Water Technologies
Treatment Solutions USA Inc.
600 WILLOW TREE RD
LEONIA NJ 07605
UNITED STATES

PHONE: 201-676-2525

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UNITED STATES

Payment terms
Net 30 Days From Invoice Date

Inco terms
EXW FACTORY

Currency: U.S. Dollar

Freight: Freight Prepaid

SNo.	Part Number / Item Description	Quantity	Unit	Price	Unit	Amount
	All services are estimated amounts. Customer will only be invoiced for actual time and travel expenses. Expenses are estimated and will be invoiced at actual cost plus 15%					

NET PRICE	USD	75,590.00
FREIGHT & HANDLING	USD	685.00
TOTAL AMOUNT		76,275.00

Thank you for your Consideration. To place an order, please fax signed Purchase Orders to the Customer Care number shown above.
To ensure that you receive the pricing quoted, please reference this quotation number on your order.
All sales are subject to our terms and conditions, contained with this quotation.
Freight for Bulk Delivery and specialized freight charges, where applicable, are not included unless specifically indicated in the materials listing above.
Pricing above does not include applicable taxes, which will be applied at time of order.

Veolia Treatment Solutions Inc.
Terms and Conditions of Sale

1. Exclusive Terms and Conditions. Together with any other terms that any legal entity that is part of the Veolia Treatment Solutions Inc. business ("Seller") and the legal entity purchasing the Goods and Services ("Buyer") agree to in writing, # together with the last proposal in order of time issued by the Seller - these Terms and Conditions of Sale form the exclusive terms ("Agreement") whereby Buyer agrees to purchase, and Seller agrees to sell products and equipment ("Goods") and provide advice, instruction and other services in connection with the sale of those Goods ("Services"). Buyer agrees that this Agreement will control the relationship by accepting Goods and Services from Seller, even if Buyer sends to Seller other terms and conditions to which Seller may not respond.

2. Buyer Obligations. Seller will not control the actual operation of either Buyer's systems or Goods at the site, and unless otherwise specifically agreed in writing, application and/or installation of Goods shall be the responsibility of Buyer. Goods and Services provided hereunder are based upon the information Buyer makes available to Seller, and Seller reserves the right to utilize the most compact and feasible design compatible with sound engineering practices, and to make changes in details of design, construction and arrangement of Goods unless precluded by limitations (including, but not limited to actual space and feedwater/substance quality specifications) specified by Buyer in writing at the time an order is placed. If no such limitations are specified, Seller shall not be held responsible for incompatibility of the Goods and Services due to changes in feedwater/substance quality specifications or site conditions nor for incompatibility with actual space or design limitations, which were not initially disclosed by Buyer and become apparent at a later date. For Services to be accurate and Goods to work as intended, Buyer must fulfill the following obligations ("Obligations"): (a) provide Seller complete and accurate information and data relevant to the scope of work to be provided, such as information related to Buyer's site conditions, systems, related equipment and processes, feedwater or other substances to be treated or measured with the Goods, including any hidden, unapparent, or changing conditions that may affect the effectiveness of the Goods; (b) operate all related systems and the Goods within the agreed to control parameters or, if none, within industry customary operating conditions; (c) maintain all related systems and Goods in good operating condition and repair; and (d) maintain and handle Goods in a proper and safe manner. If Buyer fails to fulfill the foregoing Obligations, Seller shall be relieved of any obligations with respect to warranties or any other commitments made to Buyer in writing, and Seller shall have no liability for any loss, damage or injury which Buyer may sustain or for which Buyer may be liable. Buyer is solely responsible for the operation of Buyer's systems, including ensuring that the systems are operated and maintained properly and comply with all laws, rules, regulations, license conditions and orders. Seller will not operate, inspect, or maintain Buyer's systems or act as a licensed operator as defined by local regulatory authorities. Goods and Services sold by Seller are not intended for use in connection with any nuclear facility or activity. Buyer shall not sell or permit the use of the Goods in connection with any nuclear installation or activity without the prior written consent of the Seller. If, in breach of this, any such use occurs, Seller (and its parent, affiliates, suppliers and subcontractors) disclaims all liability for any nuclear or other damage, injury or contamination, and, in addition to any other rights of Seller, Buyer shall indemnify and hold Seller (and its parent, affiliates, suppliers and subcontractors) harmless against all such liability. Buyer shall be responsible for using or disposing of all Goods, including the empty packaging in which Goods were contained once delivered to Buyer and where applicable such disposal should be pursuant to Section 9 herein. Buyer shall maintain all risk property and boiler and machinery breakdown insurance covering the full replacement value of Buyer's site, systems and related equipment, together with business interruption coverage, which includes a waiver of subrogation in favor of Seller and its affiliates. Prior to commencement of any work under this Agreement, and not less than annually thereafter during the term of this Agreement, Buyer shall deliver to Seller a certificate(s) of insurance and copy of waiver of subrogation endorsement evidencing that the foregoing insurance is in full force and effect. Seller shall maintain types and amounts of insurance against loss or damage and such other risks as customarily insured against by businesses whose operations are comparable to those of the Seller. Seller shall not be obliged to add Buyer or any other third party as an additional insured under Seller's insurance policies.

3. Delivery. All delivery designations are INCOTERMS 2010. Except for the provisions relating to Consigned Goods as per additional terms and conditions to be provided by Seller, to this Agreement and section 8 of this Agreement, title and risk of loss or damage to Goods as well as containers and tanks in which Goods are contained, shall pass to Buyer upon Seller making the Goods available to Buyer for collection at Seller's premises. Delivery dates indicated by Seller are only approximate. Quotations and proposal drawings provided by Seller show only general style, arrangement and approximate dimensions and weight. If any part of the Goods cannot be delivered when ready due to any cause not attributable to Seller, Buyer shall designate an alternate storage location, and Seller shall ship such Goods to storage. Title and risk of loss shall thereupon pass to Buyer and amounts payable to Seller upon delivery or shipment shall be paid by Buyer along with expenses incurred by Seller. Services provided herein shall be charged at the rate prevailing at the time of actual use and Buyer shall pay any increase, and Buyer shall directly pay all costs for storage and subsequent transportation. Failure by Buyer to take delivery of the Goods shall be a material breach of this Agreement.

4. Payment and Prices. Unless otherwise specified in writing, payment is due net thirty (30) days from the date of Seller's invoice, which shall be issued at the time of shipment. The prices quoted herein do not include taxes or duties. Buyer shall be directly responsible, and reimburse Seller, for the gross amount of any present or future bond, sales, use, excise, value-added, environmental or other similar tax or duty applicable to the price, sale of delivery of any Goods or Services furnished hereunder. Buyer shall provide to Seller, within one month of payment, official receipts from the applicable governmental authority for deducted or withheld taxes. Unless Buyer has furnished Seller with evidence of tax exemption or direct pay permit acceptable to taxing authorities prior to the execution of the Agreement or Seller's acceptance of Buyer's purchase order (as the case may be), Buyer shall pay all taxes as invoiced by Seller and Seller is relieved of any obligation to (i) apply any tax exemption or direct pay permit, and/or (ii) refund to the Buyer any tax paid by the Seller. Seller's invoices will only be issued without domestic VAT where Buyer either makes available to Seller their valid VAT number in the case of an intercommunity supply or provides a valid certificate or acceptable statement for VAT or duty exemption. If Buyer is to arrange the export or intercommunity shipment, upon request by Seller, Buyer agrees to provide free of charge to Seller, evidence of exportation or intercommunity shipment that makes reference to Seller's invoice number and this documentation is acceptable to the relevant tax or custom authorities. In the event that there is either a failure to meet any of the above conditions or the information or documentation provided is deemed to be defective in any way by the tax or custom authorities then the Seller will have the right to separately invoice Buyer for any taxes, VAT or duties payable together with any interest or penalties that Seller incurs as a result and Buyer shall pay this invoice in accordance with the payment terms of this Agreement. For multi-year agreements, pricing stated shall remain firm for twelve (12) months, after which Seller shall be entitled to adjust pricing upward on an annual basis according to the designated formula used by Seller in Buyer's country and which shall be notified to Buyer. Buyer will provide to Seller a new purchase order at least thirty (30) days before expiration of any purchase order issued under this Agreement. If purchase orders are not renewed or new purchase orders issued by Buyer within this time scale, Seller, without any liability and without being subject to any penalties that may be applicable as negotiated with Buyer, may either: (a) decline to make deliveries of Goods or provide Services; or (b) if requested in writing by Buyer, continue to deliver Goods and Services subject to new prices that may be applicable and the Terms and Conditions of Seller (or any deviation agreed to in writing by the Parties) and invoice Buyer for these under the expired purchase order at prices in effect as of that date. However, where the Agreement contains a designated price adjustment formula the Goods and Services so delivered as per this Section 4 will be invoiced at the new rate defined by said price adjustment formula. Buyer agrees to be bound to pay such invoices in accordance with the payment terms of the Agreement. Unless otherwise specified, all prices are Incoterms 2010 FCA Seller's premises as of where Goods will be shipped to Buyer. Buyer agrees to reimburse Seller for collection costs, including two percent (2%) interest per month, not to exceed the maximum amount permitted by applicable law, should Buyer fail to timely pay. Buyer shall have no rights to any setoffs of any nature relating to any payments due under the Agreement. Notwithstanding the terms set forth herein or of any agreement or acceptance of Seller's quotation, Seller reserves the right at any time and from time to time by notice in writing to the Buyer to (a) increase Prices (or impose temporary price adjustments) based on increases in the cost of base components for the Goods or Services provided, where the increase is due to increased global demand, limited supply, temporary product shortages, allocation of supply, or such other similar inflationary pressures; and (b) impose a surcharge equal to any increase in the cost of the Goods or Services as a result of a modification of exchange rates, taxes or other levies imposed by public authorities.

5. Payment for Excessive Usage; Lost and Damaged Goods. If payment for Goods is based on some factor other than the actual amount of Goods delivered (e.g., payment is for a fixed amount, or based on usage or production), then Buyer agrees to pay for all Goods (a) consumed as a result of Buyer's failure to comply with Obligations as set forth in Section 2; or (b) lost or damaged after delivery to Buyer. Buyer shall provide Seller all information necessary to calculate amounts due and enable Seller to audit those records.

6. Consigned Goods. If Goods are being made available to Seller under a consignment arrangement, Additional terms and conditions shall be applicable and shall be provided by Seller.

7. Limited Warranties. Seller warrants that the Goods shall conform to Seller's specifications and shall be free from defects in material and workmanship when at all times operated in accordance with Seller's written instructions; and that the Services will be performed with the degree of skill which can reasonably be expected from a seller engaged in a comparable business and providing comparable services under comparable circumstances. Under no circumstances do Services include the operation, inspection or maintenance of Buyer's systems or acting as a licensed operator as defined by local regulatory authorities. Unless otherwise provided in any Warranty Schedule that may be attached hereto, the foregoing warranties are valid: (a) for Chemicals, the earlier of, the shelf-life of the product, or six (6) months from their date of delivery or the provision of Services; (b) for Consumables, including Filters and Membranes, twelve (12) months from their date of delivery, (c) for Goods other than Chemicals and Consumables, the earlier of, fifteen (15) months from receipt, or twelve (12) months from start-up/first use; d) for Software, nine (9) months from the date of receipt. Unless expressly agreed in a "Performance Warranty Document" signed between the parties on a separate basis, there is no performance warranty on Goods and Services or warranty on process results. For Goods not manufactured by Seller, the warranty shall be the manufacturer's transferable warranty only. Any claim for breach of these warranties must be promptly notified in writing or the claim will be void. Seller's sole responsibility and Buyer's exclusive remedy arising out of or relating to the Goods or Services or any breach of these warranties is limited to, at Seller's option: (a) replacement of non-conforming Goods or refund of purchase price of the non-conforming Goods; and (b) re-performance of the Services at issue, or a refund of the amount paid for the Services at issue. No allowance will be made for repairs or alterations made by Buyer without Seller's written consent or approval. Goods may not be returned to Seller without Seller's written permission. Seller will provide Buyer with a "Return Material Order" number to use for returned goods. Buyer, as the original purchaser, is not entitled to extend or transfer this warranty to any other party. The foregoing warranties are in lieu of and exclude all other warranties, statutory, express, or implied, including any warranty of merchantability or of fitness for a particular purpose.

8. Use of Equipment, Tanks, and Containers. Semi-bulk containers (SBCs) owned by Seller shall be used only for the storage of Goods approved by Seller and Buyer shall return to Seller all SBCs owned by the Seller in an "empty" condition, as defined by appropriate transport or environmental regulations. Title to, and risk of loss or damage of, all equipment, product containers (e.g., pails, drums, recyclable intermediate bulk containers "IBC"), and tanks supplied to Buyer shall pass to Buyer as provided for in Section 3 of this Agreement, except that returnable SBCs shall remain property of Seller, unless otherwise stated in Seller's documentation.

9. Compliance with Laws; Permits. Buyer is responsible for compliance with all laws and regulations applicable to the operation of its systems and to the storage, use, handling, installation, maintenance, removal, registration and labeling of all Goods from and after Buyer's receipt of the Goods, as well as for the proper management and disposal of all wastes and residues associated with the Goods (including but not limited to containers, excess or off-spec product, testing wastes (e.g., spent or expired lab reagents and test kits) and signing manifests for waste transport and disposal. Buyer agrees to ensure that all Goods and Services provided to Buyer for export are exported only in compliance with applicable export control laws and regulations. Permits and licenses which are required to operate apparatus or equipment or to use the Goods, shall be procured by Buyer at Buyer's sole expense. Buyer shall be responsible for and procure all permits, licenses, exemptions, authorizations and approvals necessary to the operation of its systems, including but not limited to permits related to liquid and solid waste handling and discharge, air and water emissions, sound, safety, etc. Seller shall not be liable if any such permit, license, exemption, authorization or approval is delayed, denied, revoked, restricted, violated or not renewed and Buyer shall not be relieved thereby of its obligations to pay Seller in accordance with this Agreement. Seller's obligations are conditioned upon Buyer's compliance with all applicable trade control laws and regulations. Buyer shall not trans-ship, re-export, divert or direct Goods (including related equipment, software and technical data) other than in and to the ultimate country of destination declared by Buyer and specified as the country of ultimate destination on Seller's invoice. The obligations of the parties to comply with all applicable trade control laws and regulations shall survive any termination or discharge of any other contract obligations.

10. Excusable Delays. Seller shall not be liable nor in breach or default of its obligations under this Agreement to the extent performance of such obligations is delayed or prevented, directly or indirectly, due to causes beyond the reasonable control of Seller, including, but not limited to: acts of God, natural disasters, unusually severe weather, fire, terrorism, war (declared or undeclared) epidemics, material shortages, insurrection, act (or omissions) of Buyer or Buyer's contractors/suppliers or agents, any act (or omission) by any governmental authority, strikes, labor disputes, transportation shortages, or vendor non-performance. The delivery or performance date shall be extended for a period equal to the time lost by reason of delay or non-performance, plus such additional time as may be necessary to overcome the effect of the delay or non-performance. If delivery or performance is delayed for a period exceeding 180 (one hundred and eighty) days, either Party may terminate this Agreement without further liability provided that Seller shall be paid an amount equal to that which would be payable to Seller under the Section entitled "Termination and Suspension". If Seller is delayed by any acts (or omissions) of Buyer, or by the prerequisite work of Buyer's other contractors or suppliers, Seller shall be entitled to an equitable adjustment in schedule, price and/or performance, as applicable.

11. Confidentiality and Intellectual Property. Both parties agree to keep confidential the other party's proprietary non-public information, if any, which may be acquired in connection with this Agreement. Buyer will not, without Seller's advance written consent, subject Goods to testing, analysis, or any type of reverse engineering or provide the Goods to any third party which may subject the Goods to testing, analysis, or any type of reverse engineering. Seller retains all intellectual property rights including copyright which it has in all drawings and data or other deliverables supplied or developed under this Agreement, subject to Buyer's right to use such drawings and data for its own use without additional cost. Buyer acknowledges that Seller is in the business of selling the Goods subject to this Agreement and agrees that it will not file patent applications on the Goods, or processes and methods of using the Goods, without Sellers express written permission. Buyer further agrees that in any event any such patents will not be asserted against Seller or its customers based upon purchase and use of such Goods. Any software Seller owns and provides pursuant to this Agreement shall remain Seller's property. Seller provides to Buyer a limited, non-exclusive, and terminable license to use the object code of such software for the term of this Agreement. Buyer agrees not to export, copy (except that Buyer may make one copy for backup purposes), sub-license, translate, transfer, reverse engineer, or decode the software. Single user versions of software may be used on one CPU. LAN/WAN versions may be used on a single server with only the number of concurrent users as agreed to by the parties. Unless otherwise expressly agreed by Seller, this license shall terminate and the software shall be returned to Seller upon termination of this Agreement, or the material breach of the terms in this section. Seller shall indemnify and hold harmless Buyer from any rightful claim of any third party that any Good or Service infringes
a patent in effect in the jurisdiction where such Good or Service was provided by Seller to Buyer. The Buyer shall notify the Seller promptly of the receipt of any such claim, shall not take any position adverse to the Seller regarding such claim and give the Seller information, assistance and exclusive authority to settle and defend the claim. The Seller shall, at its own expense and choice, either (i) settle or defend the claim and pay all damages and costs awarded in it against the Buyer, or (ii) procure for the Buyer the right to continue using the Good or Service, or (iii) modify or replace the Good or Service so that it becomes non-infringing, or (iv) remove the infringing Good or cease performance of the Service, and refund the price. The foregoing list of sub-sections (i), (ii), (iii), and (iv) and related terms state the entire liability of the Seller for intellectual property infringement of any Good or Service. Buyer shall be fully liable for any infringement of intellectual property rights, including patent rights, of third parties arising out of the products or services supplied hereunder where the construction or other characteristics of such products or services such as design, or specifications, or requirements, or modification of the Goods or Services, are prescribed to the Seller, or completed independently, by the Buyer or agent(s). Buyer shall fully defend and indemnify the Seller in case of such claim(s). Buyer shall indemnify Seller and hold Seller harmless for any patent infringement by a Good or Service in the event that the Buyer modifies the Good or Service provided by Seller, or that the Buyer uses the Good or Service in combination with other goods, services, and/or other features which were not explicitly authorized by Seller.

12. Limitation on Liability. Except where expressly communicated to Seller, Seller shall have no liability for incompatibility of Goods with Buyer's actual space or design limitations. To the extent permitted by law, the total liability of the Seller for all claims arising out of or relating to the performance or breach of this Agreement or use of any Goods or Services shall not exceed the total price paid by Buyer under this Agreement or for multi-annual agreements, the annual price paid by Buyer under this Agreement. Seller shall not be liable for any advice, instruction, assistance, or any services that are not required
under this Agreement or for which Seller does not charge Buyer. In no event will either party be liable to the other for lost profits or revenues, cost of capital or replacement water or power, downtime costs or increased operating costs, lost or decreased production, claims of Buyer's customers for such damages or any similar or comparable damages, or for any incidental, special, consequential or indirect damages of any type or kind, irrespective of whether arising from actual or alleged breach of warranty, indemnification, product liability or strict liability, or any other legal theory. If Buyer is supplying, or otherwise making available, Seller's Goods or Services to a third party, Buyer agrees to protect, defend, indemnify and hold Seller, its corporate subsidiaries and affiliates, and their respective officers, directors, employees and agents, free and harmless from and against any and all losses, expenses, liabilities, claims, demands, causes of action, suits or other litigation, arising out of or related to Seller's Goods or Services provided by the Buyer to a third party, including but not limited to products or services that may be related to Seller's Goods or Services. Seller's liability shall end upon expiration of the applicable warranty period, provided that Buyer may continue to enforce a claim for which it has given notice prior to that date by commencing an action or arbitration, as applicable under this Agreement, before expiration of any statute of limitations or other legal time limitation but in no event later than five (5) months after expiration of such warranty period. For purposes of this section "Seller" shall include Seller, its affiliates, subcontractors and suppliers of any tier, and their respective agents and employees, individually or collectively.

13. General Indemnity. Seller shall indemnify and hold harmless Buyer from claims for physical damage to third party property or injury to persons, including death, to the extent caused by the negligence of Seller or its officers, agents, employees, and/or assigns while engaged in activities under this Agreement. Buyer shall likewise indemnify and hold harmless Seller from claims for physical damage to third party property or injury to persons, including death, to the extent caused by the negligence of Buyer, its officers, agents, employees, and/or assigns. In the event such damage or injury is caused by the joint or concurrent negligence of Seller and Buyer, the loss shall be borne by each Party in proportion to its negligence. For the purpose of this Section: (i) "Third party" shall not include Buyer or any subsequent owner of the Goods or Services, their subsidiaries, parents, affiliates, agents, successors or assigns including any operation or maintenance contractor, or their insurer; and (ii) no portion of the Goods is "third party property". Buyer expressly acknowledges that the limited or excluded warranties or liabilities stipulated herein and waivers of actions against Seller deriving from the same, are also stipulated in favor of Seller's insurers.

14. Conflicts; No Third-Party Beneficiary Rights. If there is any conflict between this Agreement and any written proposal or quotation provided by Seller, then the terms and conditions set forth in the proposal or quotation shall prevail. If any term or condition of this Agreement or any accompanying terms and conditions are held invalid or illegal, then such terms and conditions shall be reformed to be made legal or valid, or deleted, but the remaining terms and conditions shall remain in full force and effect, and the Agreement shall be interpreted and implemented in a manner which best fulfills our intended agreement. Except as specifically set forth above in Sections 2 entitled "Buyer Obligations", 11 entitled "Confidentiality and Intellectual Property" and 12 entitled "Limitation on Liability", this Agreement and all of the provisions hereof shall be binding upon and inure only to the benefit of the parties hereto and their respective successors and permitted assigns, and no other party, including any employee or creditor of any party hereto or any affiliate thereof, shall have any rights or obligations hereunder.

15. Assignment and Subcontracting. To the extent permitted by applicable law, Seller may assign or novate its rights and obligations under this Agreement, in whole or in part, to any of its affiliates and/or may assign any of its accounts receivable under this Agreement to any party without Buyer's consent. Buyer agrees to execute any documents that may be necessary to complete Seller's assignment or novation. This Agreement shall not otherwise be assigned by either Party without the other Party's prior written consent, and any assignment without said consent shall be void. Nothing herein shall prevent the Seller from placing or permitting the placing of subcontracts or orders on others for the supply of materials, manpower or services within the Seller's scope of supply provided that the placing of such subcontracts or orders shall not in any way relieve the Seller from any of its obligations under this Agreement, and provided that Seller will procure that its subcontractors (to the extent engaged for Seller's scope hereunder) comply with all known and reasonable instructions related to accessing Buyer's facility.

16. Emergencies. If the safety of Seller's personnel is threatened or likely to be threatened by circumstances outside the reasonable control of Seller, including but not limited to war, armed conflict, civil unrest, riots, terrorism, kidnapping, presence of or exposure to hazardous materials, unsafe working conditions, or by the threat of such circumstances or a lack of adequate protections against such circumstances, Seller shall, with no liability as per the terms of the Agreement, be entitled to take all necessary steps to ensure the security and safety of its personnel including the evacuation of personnel until such circumstances no longer apply and suspension of its obligations under the Agreement until said circumstances, at Seller's sole opinion, have ceased. Any such occurrence shall be considered an excusable delay event. Buyer shall reasonably assist in the event of any such evacuation

17. Termination and Suspension. This Agreement and any performance pursuant to it may be terminated or suspended by either party if the other party (a) is the subject of bankruptcy or insolvency proceedings; or (b) defaults in its material obligations under this Agreement, and such default is not cured within thirty (30) days; (b) If Seller shall have any doubt at any time as to Buyer's ability to pay, Seller, without any liability and without being subject to any penalties that may be applicable as negotiated with Buyer, may decline to make deliveries of Goods or provide Services except on receipt of satisfactory security. Upon the termination of this Agreement: (a) Buyer agrees to pay for all Goods in Buyer's possession or for which title has passed to Buyer, at current prices or at such other prices as have been agreed to in writing; and (b) all amounts owing, if any, for the equipment or tanks relating to those Goods shall immediately become due and shall be paid within thirty (30) days of receipt of an invoice. In the event of cancellation of an order by Buyer, a cancellation charge will be made against the Buyer, in proportion to the work completed by Seller, or obligated against the order, plus any cancellation charges assessed against Seller by Seller's suppliers. In addition, unless Buyer has been invoiced by Seller specifically for all Goods delivered (including any levelized billing agreements that have already reconciled based on shipments), Seller will invoice Buyer and Buyer shall pay Seller for all Goods on Buyer's site at the time of termination, including any fixed fees, consignment and production based agreements.

18. Governing Law and Dispute Resolution. This Agreement shall be governed by the substantive laws of the State of New York. If the Agreement includes the sale of Goods and the Buyer is outside the Seller's country, the United Nations Convention on Contracts for the International Sale of Goods shall apply. In the event of a dispute concerning this Agreement, the complaining party shall notify the other party in writing thereof. Management level representatives of both parties shall meet at an agreed location to attempt to resolve the dispute in good faith. Should the dispute not be resolved within thirty (30) days after such notice, the complaining party shall seek remedies exclusively through arbitration. The seat of arbitration shall be the federal district court in Philadelphia, PA, and the rules of the arbitration will be the Commercial Arbitration Rules of the American Arbitration Association, which are incorporated by reference into this Section.

19. U.S Government Contracts. This Section 18 applies only if the Agreement is for the direct or indirect sale to any agency of the U.S. Government and/or is funded in whole or in part by any agency of the U.S. Government. Buyer agrees that all Goods and Services provided by Seller meet the definition of "commercial-off-the-shelf" ("COTS") or "commercial item" as those terms are defined in Federal Acquisition Regulation ("FAR") 2.101. To the extent the Buy American Act, Trade Agreements Act, or other domestic preference requirements are applicable to this Agreement, the country of origin of Goods is unknown unless otherwise specifically stated by Seller in this Agreement. Buyer agrees that any Services offered by Seller are exempt from the Service Contract Act of 1965 (FAR 52.222-41). Buyer represents and agrees that this Agreement is not funded in whole or in part by American Recovery Reinvestment Act funds unless otherwise specifically stated in the Agreement. The version of any applicable FAR clause listed in this Section 18 shall be the one in effect on the effective date of this Agreement. If Buyer is an agency of the U.S. Government, then as permitted by FAR 12.302, Buyer agrees that all paragraphs of FAR 52.212-4 (except those listed in 12.302(b)) are replaced with these Terms and Conditions. Buyer further agrees the subparagraphs of FAR 52.212-5 apply only to the extent applicable for sale of COTS and/or commercial items and as appropriate for the prices under this Agreement. If Buyer is procuring the Goods or Services as a contractor, or subcontractor at any tier, on behalf of any agency of the U.S Government, then Buyer agrees that FAR 52.212-5(e) or 52.244-6 (whichever is applicable) applies only to the extent applicable for sale of COTS and/or commercial items and as appropriate for the prices under this Agreement.

20. Miscellaneous. No modification, amendment, revision, waiver, or other change shall be binding on either Party unless agreed in writing by the Party's authorized representative. Any oral or written representation, warranty, course of dealing, or trade usage not specified herein shall not be binding on either Party. Each Party agrees that it has not relied on, or been induced by, any representations of the other Party not contained in this Agreement.

TROJAN UV SIGNA™

PROPOSAL FOR TOOELE, UTAH
QUOTE: 242445

10/26/2023

TrojanUVSigna™ incorporates revolutionary innovations, including TrojanUV Solo Lamp™ technology, to reduce the total cost of ownership and drastically simplify operation and maintenance. It is the ideal solution for facilities wanting to upgrade their disinfection system easily and cost-effectively.

We are pleased to provide the enclosed TrojanUVSigna proposal. Please do not hesitate to contact us if you have any questions regarding this proposal. We look forward to working with you.

With best regards,

Jordan Fournier
Regional Manager
Trojan Technologies
519.619.7352
jfournier@trojantechnologies.com

Local Representative:

James Goldhardt
The Coombs hopkins Company
801.674.2177
James@chcwater.com

DESIGN CRITERIA

Peak Design Flow:	**7.50 MGD**
UV Transmittance:	**65%** (minimum)
Total Suspended Solids:	**10 mg/l (Maximum,** grab sample)
Disinfection Limit:	**9 E.coli per 100 ml**, 1 day Maximum of consecutive daily grab samples
Dose:	**80 mJ/cm^2**

DESIGN SUMMARY

CHANNEL (Refer to Trojan layout drawing for complete details)	
Number of Channels:	**1**
Minimum Channel Length Required:	**41'**
Channel Width at UV Banks:	**2.6'**
Channel Depth Recommended:	**8.0**
UV BANKS	
Number of Banks per Channel:	**6**
Number of Lamps per Bank:	**8**
Total Number of UV Lamps:	**48**
Maximum Duty Power Draw:	**50.55 kW**
UV PANELS	
Power Distribution Center Quantity:	**1**
Hydraulic System Center Quantity:	**2**
System Control Center Quantity:	**1**
ANCILLARY EQUIPMENT	
Level Controller Quantity and Type:	**Motorized Weir Gate**
Integral Bank Walls:	**Included**
Other Equipment:	
ELECTRICAL REQUIREMENTS	
1. Each Power Distribution Center requires an electrical supply of one (1) 480/277V 60Hz, 56.6 kVA **2.** Electrical supply for Hydraulic System Center will be (1) 480V 60Hz, 2.5 kVA **3.** Electrical supply for System Control Center will be (1) 120V 60Hz, 1.8 kVA **4.** Electrical disconnects are not included in this proposal. Refer to local electrical codes	

COMMERCIAL INFORMATION

Total Capital Cost: $570,000 (USD)

This price excludes any taxes or duties that may be applicable.
Standard equipment warrantees and start up by Trojan-certified technicians are included.

Easy and Cost-Effective Maintenance

- The 1000 watt TrojanUV Solo Lamp combines the benefits of both low pressure and medium pressure lamps
- Fewer lamps, long lamp life and easy change-outs save time and money
- Lamp change-outs and cleaning solution replacement are done while the UV system is in the channel – minimizing downtime and simplifying maintenance
- Routine maintenance can be performed while banks are in the channel, but an Automatic Raising Mechanism (ARM) makes other tasks, such as winterization, simple, safe and easy
- Lamp plugs with LED status indicators and integral safety interlock prevent an operator from accidentally removing an energized lamp
- ActiClean WW™ chemical/mechanical cleaning system to keep sleeves clean during operation

SYSTEM OVERVIEW

SOLO LAMP TECHNOLOGY

Simple to Design and Install

- Light locks on the UV banks control water level within the channel, reducing dependence on downstream weirs and preventing short-circuiting above the lamp arc
- UV Banks include integral reactor walls to make installation easy and prevent short circuiting at the channel walls
- Stringent tolerances on concrete channel walls are not required – making retrofits simple and cost-effective

Supported by Trojan Technologies

- Trojan Technologies warrants all components of the system (excluding UV lamps) against faulty workmanship and materials for a period of 12 months from date of start-up or 18 months after shipment, whichever comes first.
- UV lamps are warranted for 15,000 hours of operation or 3 years from shipment, whichever comes first. Lamp warranty is pro-rated after 9,000 hours of operation. This means that if a lamp fails prior to 9,000 hours of use, a new lamp is provided at no charge.
- Trojan offers an unparalleled Lifetime Performance Guarantee. The spirit of this guarantee is simple: the Trojan equipment, as sized for the project, will meet the disinfection requirements for the life of the system.

Submitted to: JUB Engineering

Submitted by: Sarah Spivey
Applications Engineer

Date: 1/16/2024

Veolia Water Technologies, Inc. (dba Kruger)
4001 Weston Parkway
Cary, NC 27513
tel. +1 919-677-8310 • fax +1 919-677-0082
www.veoliawatertech.com

Introduction

Kruger is pleased to present this revised proposal for our BIO-DENIPHO System for the expansion of the Tooele WWTP, UT. The proposal has been updated with the intention of using the same footprint as the existing Biodenipho system, but with a SWD of 20'. The BIO-DENIPHO system proposed herein includes a design with diffused air in order to achieve a larger capacity and obtain a more energy optimal design for BOD, TSS and Ammonium removal using the same footprint as the original BIO-DENIPHO system.

The system proposed for Tooele WWTP, UT is fully optimized to provide maximum efficiency and process flexibility with sufficient aeration to ensure demands are met at full load, at all times of the day. In comparing the BIO-DENIPHO system to competitors' systems, it is imperative that all other systems under consideration provide *at minimum* the daily design AOR stated herein, and be capable of maintaining the same residual DO concentration. If the level of safety and assurance of oxygen supply represented in this proposal is not required, Kruger can potentially reduce the size of the aeration system. In addition, to ensure the targeted effluent Ammonium limit is reached under winter time conditions, an absolute minimum total volume (aerobic) should be provided by all systems under consideration and should not be less than the volume stated herein.

Thank you for your consideration of the BIO-DENIPHO system. Detailed operational descriptions, process calculations, recommended spare parts lists, concrete estimates, power consumption estimates and other supporting information can be provided upon request.

We appreciate the opportunity to provide this proposal to you. If you have any questions or need further information, please contact Rodrigo Lara, at (503) 380-3995) (rodrigo.lara@veolia.com).

CC: James Goldhardt (Coombs Hopkins Company (CHC))

Revision	Date	Process Eng.	Comments
0	08/04/2023	PP	Initial, budgetary proposal.
1	08/24/2023	PP	Updated Proposal to Include Screw Blowers
2	10/24/2023	PP	Updated to a SWD of 20'
3	11/03/2023	PP	Update Proposal removing the blower building and including PD Blowers
4	01/15/2024	PP	Update Proposal

Process Description

BIO-DENIPHO® Phased Isolation Tank

The proposed system will operate in the BIO-DENIPHO mode of Phased Isolation Technology. A distinguishing feature of this process is the alternating flow pattern and variable process conditions (aerobic and anoxic) occurring within each reactor. This operating strategy allows nitrogen and carbonaceous BOD removal to occur within the active process volume, eliminating the need for internal recycle pumping.

Phased Isolation Technology imparts tremendous process flexibility. The time-based operational strategy provides the ability to effectively vary the process volumes (e.g. aerobic or anoxic), unlike conventional processes where these volumes are fixed. By adjusting the specific phase lengths of the process, the volume allocated to a specific treatment objective can be adjusted, thereby enabling the treatment process to accommodate a wide range in influent flow and characteristics. This type of process provides an operating strategy to allow the facility to accommodate the actual loading, as opposed to treating flows with a treatment strategy designed for 20 year projected loadings. For example, during start-up conditions a greater fraction of the process volume could be allocated to anoxic conditions, thereby minimizing the facility's energy consumption.

The phased isolation operation is executed by a PLC-based control system that coordinates the operation of the mechanical process equipment and controls the phase lengths within each tank. The PLC control system can allow both manual and automatic control of the treatment process. The PLC-based control panel also includes pre-programmed operational modes, such as the storm water mode to address I/I concerns. For example, automatic or manual activation of the storm water mode incorporates a sedimentation phase into the BIO-DENIPHO process to prevent solids washout during severe rain events. This innovation may potentially reduce the required size of the secondary clarifiers or eliminate the requirement for redundant clarifiers.

To ensure economical and efficient treatment, during aerobic phases the control system also controls the aeration equipment by automatic dissolved oxygen (D.O.) control. D.O. probes continuously monitor and report residual D.O. levels within the reactors to a PLC-based control panel that controls the aeration equipment to meet, but not exceed, the current oxygen demand. This control eliminates costly and wasteful over-aeration that can compromise process stability and operational budgets.

In summary, BIO-DENIPHO Phased Isolation Technology offers many significant advantages to other biological nutrient removal processes.

- No internal recycle pumping, resulting in simpler process control.
- Automated and simple control system with preprogrammed operational modes ensures energy efficient treatment.
- Separation of mixing and aeration combined with automatic dissolved oxygen control ensures energy efficiency and stable operation.
- Automatic dissolved oxygen control enhances denitrification capability and saves energy.

- Process flexibility afforded by the capability to vary the effective process volumes allocated for aerobic treatment and anoxic, thereby providing a process that can adapt to either load or seasonal variations.
- Reactors can be easily isolated (no inflow or outflow) to capture and treat slug loads of contaminants.
- Design incorporates improved anaerobic selector reactor configuration which enhances phosphorus uptake and removal;
- Anaerobic selector technology prevents the excessive growth of filamentous bacteria responsible for sludge bulking, thereby producing a superior settling floc.

Design Summary

The design assumes that the raw influent wastewater is biodegradable, no toxic compounds are present, sufficient alkalinity is available to avoid pH depressions, that the COD/BOD ratio is between 1.7 and 2.3, and that none of the equipment provided would be used in a classified area (e.g. Class 1, Division 1 or Class 1, Division 2).

Influent Design Basis

Parameter	New Plant	Existing Plant
Influent Flow MM, Design (MGD)	4.3	1.83
Peak Hour Flow Capacity (MGD)*	~9.0	~4.0
BOD_5 (mg/L) (Lbs/day)	 260 9,324	 260 3,986
TSS (mg/L) (Lbs/day)	 245 8,786	 245 3,733
TKN (mg/L) (Lbs/day)	 33 1,183	 33 506
TP** (mg/L) (Lbs/day)	 2.5 90	 2.5 38
Elevation (ft AMSL)	4,450	
Min/Max Temperature (˚C)	10/25	

* - Max hydraulic capacity of the 7m effluent weirs ~20 MGD with 6 MGD as RAS (TDH ~0.75 ft)
** TP seems very low for typical domestic WW. Please confirm.

Effluent Objectives

Parameter	Value
$CBOD_5$ (mg/L)	< 10
TSS (mg/L)	< 25
TN (mg/L)	< 15
NH4-N (mg/L)	< 0.5

*Listed values represent anticipated performance; guaranteed values may be different.
**BOD and TSS values dependent on secondary clarifier performance

Bio-P Selector Reactor

Parameter	Value
Number of Trains / Number of Tanks per Train	1/3
(Length/Width) per Tank (ft)	20 x 28
Side Water Depth (ft)	20.7
Total Anaerobic Volume (MG)	0.27
HRT (hrs)	1.5

BIO-DENIPHO Design Summary

Parameter	New System	Existing System
Number of Oxidation Tanks	2	2
Internal Length per Ditch (ft)	200	200
Internal Channel Width per Ditch (ft)	31	31
Average Side Water Depth (ft)	20	12
Total System Volume (MG)	3.5	2.12
Design Anoxic / Aerobic Operating Time (%)	20 /80	20/80
System HRT (hrs)	20.0	-
System SRT (days)	12.5	-
MLSS at 10°C (mg/L)	3,500	-
System F/M Ratio ($days^{-1}$)	0.12	-
Design Sludge Yield (lbs MLSS/lb BOD_5 applied)	0.89	-
Waste Activated Sludge (lb WAS/day)	~12,000	

BIO-DENIPHO Aeration Summary for the New Plant

Parameter	Average Day	Peak Day
AOR BOD Basis (lbs O_2/lb BOD_5 applied)	1.2	
AOR TKN Basis (lbs O_2/lb TKN nitrified)	4.6	
AOR Denite Basis (lbs O_2/lb NO_3-N denitrified)	-2.86	
Total System AOR (lbs O_2/day)	13,685	17,790
Design Alpha / Beta	0.58 / 0.95	
Design Residual DO during Aerobic Phase (summer/winter)	1.5/2.0	1.5/2.0
Total System Design SOR (lbs O_2/day)	36,000	46,800
Total System Design SOR (lbs O_2/hr)	1,500	1,950
Airflow Requirement at Design Load (SCFM)	3,780	5,460
Number of Blowers	3 + 1	
Nameplate Power per Blower (HP)	150	

Scope of Supply

Kruger is pleased to present our scope of supply which includes process engineering design, equipment procurement, and field services required for the proposed treatment system, as related to the equipment specified. The work will be performed to Kruger's high standards under the direction of a Project Manager. All matters related to the design, installation, or performance of the system shall be communicated through the Kruger representative giving the Engineer and Owner ready access to Kruger's extensive capabilities.

Process and Design Engineering

Kruger provides comprehensive process engineering and design support for our BIO-DENIPHO system, including but not limited to:

- Detail process design assistance including BIOWIN modeling of the system for confirmation of design capabilities.
- Provision of drawings and specifications for use by the consulting engineer in developing the detailed plant design.
- Provision of calculations and other data and attendance at meetings as necessary during state approval processes.
- Shop drawing submittal for Engineer's review and approval. Includes detailed equipment information for all equipment supplied by Kruger.
- Equipment installation instructions for all equipment supplied by Kruger, as well as detailed Operations and Maintenance Manuals.

BIO-DENIPHO System Equipment

Mechanical Equipment Items	Qty	Description	Est. HP
Influent Flow Control Weirs	2	5.0 meter automated Weir	1/3
Effluent Flow Control Weirs	2	7.0 meter automated Weir	1/3
BIO-P Mixers	3	TR50 Submersible Mixer, 304 SS Rails w/ Hoist	4.2
Oxidation Tank Mixers	8	TR221 Submersible Mixer, 304 SS Rails w/ Hoist	7.4
Positive Displacement Blowers	3 + 1	Three (3) duty plus one (1) standby. Each blower will be rated for 1,850 SCFM at 10 psig discharge pressure.	150
Modulating Airflow Control Valves	2	One (1) 10" actuated BFV for each basin	N/A
Fine bubble aeration system	2	One (1) fine bubble aeration system per reactor. 304L SS drop pipe with PVC header, lateral piping, and SS hardware (excluding anchor bolts).	N/A

Instrumentation and Controls Equipment Items*	Qty	Description
Process Air Flow Meter	2	FCI Thermal Mass Flowmeter, one for each BIO-DENIPHO reactor
Dissolved Oxygen Probe	4	Hach LDO w/ SC450 Transmitter
PLC Control Cabinet	1	NEMA 12; ControlLogix PLC; Panelview HMI; 120V Feed

Field Services

Kruger provides very comprehensive support of our systems throughout the installation and start-up period. Our experienced staff of field service personnel will inspect the installation of each component and assist in mechanical start-up, and will typically include direct manufacturer assistance for key pieces of equipment. Our dedicated team of instrumentation and controls engineers will provide calibration and start-up of all instrumentation and onsite verification of proper functioning of our PLC programming and operator interface systems. Process Engineers will assist in verification of program functions, start-up of the process, any process performance testing and optimization of the process. Kruger personnel will also provide onsite instruction of the operations staff in the proper operation of the Kruger supplied equipment and systems. Together, Kruger's estimate of on-site field service for this project includes:

- Six (6) Total Trips to the Project Site
- Thirty (30) Total Man-Days of Service (Travel Time Inclusive)

Extended Services

Kruger provides remote performance support for one (1) year following system commissioning as a standard service for our customers, consisting of both incoming and outbound call support and regular reports to summarize performance observations and recommendations. This support is provided with the Hubgrade digital service of Veolia, which includes various web-based dashboards for displaying data, issuing process alerts and summarizing key performance indicators.

a. Treatment Performance Summary Report: Quarterly

b. Outbound Wellness Call: Quarterly

c. Process/Automation Support Bank (Inbound Calls): 16 hrs

Scope of Supply BY INSTALLER/PURCHASER

The following items are NOT included in the scope of supply for the system and should be provided for by the Installing Contractor/Purchaser of the system *unless explicitly stated as included in the above scope of supply*. These items include, but are not necessarily limited to, the following items:

- Concrete foundations, pads, tanks, structural components, walkways, handrail, grating and covers,
- Equipment installation, piping to and from the system, interconnecting piping, manual isolation valves or gates, anchor bolts, epoxy/adhesive for anchors,
- Raw influent wastewater pumping, influent screening and grit removal facilities,
- Solids handling/disposal system, WAS pumps, digester equipment,
- Effluent holding tanks/equipment, disinfection equipment, outfalls,
- Chemical addition systems, containment, odor control equipment, laboratory systems or equipment,
- Overhead gantries or cranes,

- Motor control center, motor starters, adjustable frequency drives, main disconnects, breakers, generators, or power supply,
- Field wiring, interconnecting wiring, conduit, wiring terminations at equipment, local equipment disconnects, local equipment control panels, and wiring terminations at control panels,
- All electrical and mechanical hardware with the exception of the equipment that is identified above,
- All work associated with buildings or other structures used for housing any part of the system provided, including HVAC and electrical work.

Schedule

- Drawings and Specifications for use in preparation of Engineer's Bidding Documents can be provided following completion of Kruger P&S Questionnaire and follow-up design discussions to confirm materials, equipment preferences, overall scope of supply, controls requirements, etc. Drawings and specifications typically require 1-2 weeks following questionnaire completion and confirmation of scope.
- Shop drawings will be submitted within 6-8 weeks of receipt of an executed contract by all parties.
- All equipment will be delivered within 18-20 weeks after receipt of written approval of the shop drawings.
- Installation manuals will be furnished upon delivery of equipment.
- Operation and Maintenance Manuals will be submitted within 90 days after receipt of approved shop drawings.

Pricing

The price for the Kruger BIO-DENIPHO system, as defined herein, including process and design engineering, field services, and equipment supply is: **$2,399,500**

Pricing is FDD shipping point, with freight allowed to the job site. This pricing does not include any sales or use taxes. In addition, pricing is valid for thirty (30) days from the date of issue and is subject to negotiation of a mutually acceptable contract.

Please note that the above pricing is expressly contingent upon the items in this proposal and are subject to Kruger Standard Terms of Sale detailed herein.

Kruger Standard Terms of Payment

The terms of payment are as follows:

- 10% on receipt of fully executed contract
- 15% on submittal of shop drawings
- 75% on the delivery of equipment to the site

Payment shall not be contingent upon receipt of funds by the Contractor from the Owner. There shall be no retention in payments due to Kruger. All other terms per our Standard Terms of Sale are attached.

All payment terms are net 30 days from the date of invoice. Final payment not to exceed 120 days from delivery of equipment.

Kruger Standard Terms of Sale

1. Applicable Terms. These terms govern the purchase and sale of the equipment and related services, if any (collectively, "Equipment"), referred to in Seller's purchase order, quotation, proposal or acknowledgment, as the case may be ("Seller's Documentation"). Whether these terms are included in an offer or an acceptance by Seller, such offer or acceptance is conditioned on Buyer's assent to these terms. Seller rejects all additional or different terms in any of Buyer's forms or documents.

2. Payment. Buyer shall pay Seller the full purchase price as set forth in Seller's Documentation. Unless Seller's Documentation provides otherwise, freight, storage, insurance and all taxes, duties or other governmental charges relating to the Equipment shall be paid by Buyer. If Seller is required to pay any such charges, Buyer shall immediately reimburse Seller. All payments are due within 30 days after receipt of invoice. Buyer shall be charged the lower of 1 ½% interest per month or the maximum legal rate on all amounts not received by the due date and shall pay all of Seller's reasonable costs (including attorneys' fees) of collecting amounts due but unpaid. All orders are subject to credit approval.

3. Delivery. Delivery of the Equipment shall be in material compliance with the schedule in Seller's Documentation. Unless Seller's Documentation provides otherwise, Delivery terms are F.O.B. Seller's facility.

4. Ownership of Materials. All devices, designs (including drawings, plans and specifications), estimates, prices, notes, electronic data and other documents or information prepared or disclosed by Seller, and all related intellectual property rights, shall remain Seller's property. Seller grants Buyer a non-exclusive, non-transferable license to use any such material solely for Buyer's use of the Equipment. Buyer shall not disclose any such material to third parties without Seller's prior written consent.

5. Changes. Seller shall not implement any changes in the scope of work described in Seller's Documentation unless Buyer and Seller agree in writing to the details of the change and any resulting price, schedule or other contractual modifications. This includes any changes necessitated by a change in applicable law occurring after the effective date of any contract including these terms.

6. Warranty. Subject to the following sentence, Seller warrants to Buyer that the Equipment shall materially conform to the description in Seller's Documentation and shall be free from defects in material and workmanship. The foregoing warranty shall not apply to any Equipment that is specified or otherwise demanded by Buyer and is not manufactured or selected by Seller, as to which (i) Seller hereby assigns to Buyer, to the extent assignable, any warranties made to Seller and (ii) Seller shall have no other liability to Buyer under warranty, tort or any other legal theory. If Buyer gives Seller prompt written notice of breach of this warranty within 18 months from delivery or 1 year from beneficial use, whichever occurs first (the "Warranty Period"), Seller shall, at its sole option and as Buyer's sole remedy, repair or replace the subject parts or refund the purchase price therefore. If Seller determines that any claimed breach is not, in fact, covered by this warranty, Buyer shall pay Seller its then customary charges for any repair or replacement made by Seller. Seller's warranty is conditioned on Buyer's (a) operating and maintaining the Equipment in accordance with Seller's instructions, (b) not making any unauthorized repairs or alterations, and (c) not being in default of any payment obligation to Seller. Seller's warranty does not cover damage caused by chemical action or abrasive material, misuse or improper installation (unless installed by Seller). THE WARRANTIES SET FORTH IN THIS SECTION ARE SELLER'S SOLE AND EXCLUSIVE WARRANTIES AND ARE SUBJECT TO SECTION 10 BELOW. SELLER MAKES NO OTHER WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR PURPOSE.

7. Indemnity. Seller shall indemnify, defend and hold Buyer harmless from any claim, cause of action or liability incurred by Buyer as a result of third party claims for personal injury, death or damage to tangible property, to the extent caused by Seller's negligence. Seller shall have the sole authority to direct the defense of and settle any indemnified claim. Seller's indemnification is conditioned on Buyer (a) promptly, within the Warranty Period, notifying Seller of any claim, and (b) providing reasonable cooperation in the defense of any claim.

8. Force Majeure. Neither Seller nor Buyer shall have any liability for any breach (except for breach of payment obligations) caused by extreme weather or other act of God, strike or other labor shortage or disturbance, fire, accident, war or civil disturbance, delay of carriers, failure of normal sources of supply, act of government or any other cause beyond such party's reasonable control.

9. Cancellation. If Buyer cancels or suspends its order for any reason other than Seller's breach, Buyer shall promptly pay Seller for work performed prior to cancellation or suspension and any other direct costs incurred by Seller as a result of such cancellation or suspension.

10. LIMITATION OF LIABILITY. NOTWITHSTANDING ANYTHING ELSE TO THE CONTRARY, SELLER SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, PUNITIVE OR OTHER INDIRECT DAMAGES, AND SELLER'S TOTAL LIABILITY ARISING AT ANY TIME FROM THE SALE OR USE OF THE EQUIPMENT SHALL NOT EXCEED THE PURCHASE PRICE PAID FOR THE EQUIPMENT. THESE LIMITATIONS APPLY WHETHER THE LIABILITY IS BASED ON CONTRACT, TORT, STRICT LIABILITY OR ANY OTHER THEORY.

11. Miscellaneous. If these terms are issued in connection with a government contract, they shall be deemed to include those federal acquisition regulations that are required by law to be included. These terms, together with any quotation, purchase order or acknowledgement issued or signed by the Seller, comprise the complete and exclusive statement of the agreement between the parties (the "Agreement") and supersede any terms contained in Buyer's documents, unless separately signed by Seller. No part of the Agreement may be changed or cancelled except by a written document signed by Seller and Buyer. No course of dealing or performance, usage of trade or failure to enforce any term shall be used to modify the Agreement. If any of these terms is unenforceable, such term shall be limited only to the extent necessary to make it enforceable, and all other terms shall remain in full force and effect. Buyer may not assign or permit any other transfer of the Agreement without Seller's prior written consent. The Agreement shall be governed by the laws of the State of North Carolina without regard to its conflict of laws provisions.

Tooele WWTP

Utah

Engineer
JUB Engineers, Inc.

Representative
Mike Charnholm
Goble Sampson Associates
Salt Lake City, Utah
(801) 268-8790
mcharnholm@goblesampson.com

Contact
Adrian Williams
awilliams@westech-inc.com

Bethany Burton
bburton@westech-inc.com

WesTech®

Proposal Number: 2260558
Wednesday, January 10, 2024

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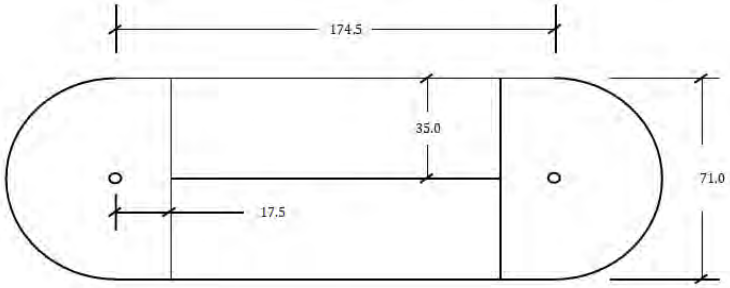
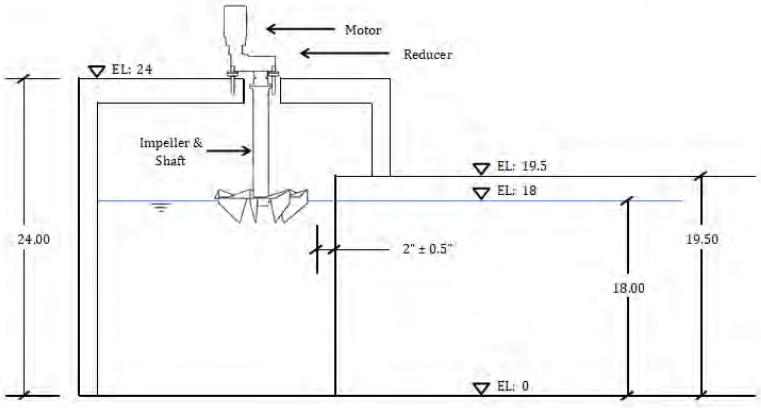
Technical Proposal

Item A – Two (2) OxyStream™ Biological Nutrient Removal Systems Model AES2A3

Process Design		
Description	**Unit**	**Dimension/Capacity**
Flow (Average/Design/Peak)	MGD	4.9/6.12/12.94
BOD (Influent/Effluent)	mg/L	260/10
TSS (Influent/Effluent)	mg/L	245/25
TKN (Influent)	mg/L	33
Ammonia (Effluent)	mg/L	.05
Waste Temp (Min/Max)	°C	10/25
Site Elevation	ft. above sea level	5043

Equipment		
Description	Type	Quantity
Aerators	Landy7	4
Advanced OxyStream Control System		
Instrumentation	Hach	4 probes, 2 controllers
VFD	Stand Alone Panel	4
PLC-Based Control	HMI Interface	1





Equipment Description (Aerators)

Description	Unit	Dimension/Capacity
Aerator		
Motor Power	HP	200
Motor Voltage	V/Ph/Hz	480/3/60
Motor Speed	rpm	1800
Motor Frame	-	TEFC, C-Face
Motor B-10 Bearing Life	hours	100000
Motor Heater	-	Included
Reducer Service Factor	-	2.5
Reducer B-10 Bearing Life	hours	100000
Reducer B-10 Life (Output)	hours	250,000
Reducer Oil Heater	-	Included
Impeller Diameter	mm	3100
Impeller Thickness	inches	5/8
Impeller Material	-	A36 Steel
Jackstuds Material	-	A307 ZP
Mounting Bars Material	-	A36 Steel

Advanced OxyStream Control System

Description	**Unit**	**Dimension/Capacity**
DO Probes		4
Probe Type	-	LDO
Mounting Configuration	-	Pole Mount
Cable Length	ft	33
Range	mg/L	0 – 20.0
Accuracy	-	± 0.05 ppm below 1 ppm ± 0.1 ppm below 5 ppm ± 0.2 ppm above 5 ppm
DO Controller		2
Communication Protocol	-	MODBUS 232/485 Profibus DP
4-20 mA Outputs	-	2
Display	in	1.89 x 2.67

Variable Frequency Drives

Description	**Unit**	**Dimension/Capacity**
Variable Frequency Drives		
Power Rating	HP	200
Power Feed	V/Ph/Hz	480/3/60
Enclosure Type	-	NEMA 12
Enclosure Cooling	-	6
VFD Rectifier	6/12/18 Pulse	6
dv/dt Filter	Y/N	N

PLC Control System		
Description	**Unit**	**Dimension/Capacity**
PLC Control System		
Power Feed	V/Ph/Hz	120/1/60
Enclosure Type	-	NEMA 12
UPS	Y/N	N
HMI Size	in	10
HMI Manufacturer	-	Allen Bradley
PLC Manufacturer	-	Allen Bradley
PLC Model	-	1769 CompactLogix

Coatings

All steel items, with the exception of the drive mechanism, will be shipped to the jobsite bare metal with no surface blasting for complete preparation and painting in the field in order to ensure unit responsibility. The drive mechanism will be finished painted in the shop with the manufacturer's recommended paint system.

On-Site Services

WesTech Trips to the Site	
Number of Trips	2
Number of Days	6

Field Service

Included field service is for installation inspection, startup, and operator training. Any additional trips that the customer may request can be purchased at the standard WesTech daily rates plus travel and living expenses.

Spare Parts

Spare Parts	
Low Oil Cutout Switch	1
High Speed Coupling	1

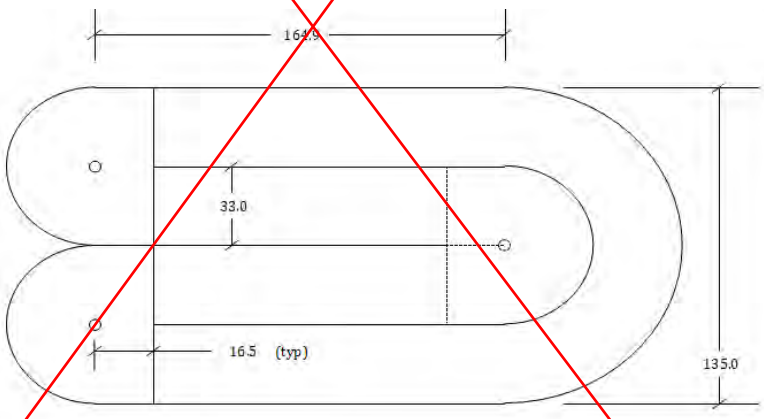
Item B – One (1) OxyStream™ Biological Nutrient Removal Systems Model AES2A3

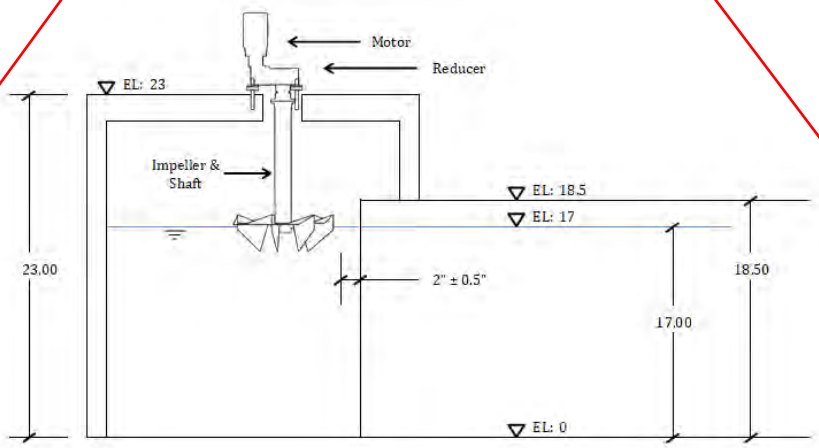
Process Design

Description	Unit	Dimension/Capacity
Flow (Average/Design/Peak)	MGD	4.9/6.12/12.94
BOD (Influent/Effluent)	mg/L	260/10
TSS (Influent/Effluent)	mg/L	245/25
TKN (Influent)	mg/L	33
Ammonia (Effluent)	mg/L	.05
Site Elevation	ft. above sea level	5043

Equipment

Description	Type	Quantity
Aerators	Landy7	3
Advanced OxyStream Control System		
Instrumentation	Hach	3 probes, 2 controllers
VFD	Stand Alone Panel	3
PLC-Based Control	HMI Interface	1





Equipment Description (Aerators)

Description	Unit	Dimension/Capacity
Aerator		
Motor Power	HP	250
Motor Voltage	V/Ph/Hz	480/3/60
Motor Speed	rpm	1800
Motor Frame	-	TEFC, C-Face
Motor B-10 Bearing Life	hours	100000
Motor Heater	-	Included
Reducer Service Factor	-	2.5
Reducer B-10 Bearing Life	hours	100000
Reducer B-10 Life (Output)	hours	250,000
Reducer Oil Heater	-	Included
Impeller Diameter	mm	3200
Impeller Thickness	inches	5/8
Impeller Material	-	A36 Steel
Jackstuds Material	-	A307 ZP
Mounting Bars Material	-	A36 Steel

Advanced OxyStream Control System

Description	**Unit**	**Dimension/Capacity**
DO Probes		3
Probe Type	-	LDO
Mounting Configuration	-	Pole Mount
Cable Length	ft	33
Range	mg/L	0 – 20.0
Accuracy	-	± 0.05 ppm below 1 ppm ± 0.1 ppm below 5 ppm ± 0.2 ppm above 5 ppm
DO Controller		2
Communication Protocol	-	MODBUS 232/485 Profibus DP
4-20 mA Outputs	-	2
Display	in	1.89 x 2.67

Variable Frequency Drives

Description	**Unit**	**Dimension/Capacity**
Variable Frequency Drives		
Power Rating	HP	250
Power Feed	V/Ph/Hz	480/3/60
Enclosure Type	-	NEMA 12
Enclosure Cooling	-	6
VFD Rectifier	6/12/18 Pulse	6
dv/dt Filter	Y/N	N

PLC Control System		
Description	**Unit**	**Dimension/Capacity**
PLC Control System		
Power Feed	V/Ph/Hz	120/1/60
Enclosure Type	-	NEMA 12
UPS	Y/N	N
HMI Size	in	10
HMI Manufacturer	-	Allen Bradley
PLC Manufacturer	-	Allen Bradley
PLC Model	-	1769 CompactLogix

Coatings

All steel items, with the exception of the drive mechanism, will be shipped to the jobsite bare metal with no surface blasting for complete preparation and painting in the field in order to ensure unit responsibility. The drive mechanism will be finished painted in the shop with the manufacturer's recommended paint system.

On-Site Services

WesTech Trips to the Site	
Number of Trips	2
Number of Days	6

Field Service

Included field service is for installation inspection, startup, and operator training. Any additional trips that the customer may request can be purchased at the standard WesTech daily rates plus travel and living expenses.

Spare Parts

Spare Parts	
Low Oil Cutout Switch	1
High Speed Coupling	1

Clarifications and Exceptions

General Clarifications

Terms & Conditions: This proposal, including all terms and conditions contained herein, shall become part of any resulting contract or purchase order. Changes to any terms and conditions, including but not limited to submittal and shipment days, payment terms, and escalation clause shall be negotiated at order placement, otherwise the proposal terms and conditions contained herein shall apply.

Paint: If your equipment has paint included in the price, please take note to the following. Primer paints are designed to provide only a minimal protection from the time of application (usually for a period not to exceed 30 days). Therefore, it is imperative that the finish coat be applied within 30 days of shipment on all shop primed surfaces. Without the protection of the final coatings, primer degradation may occur after this period, which in turn may require renewed surface preparation and coating. If it is impractical or impossible to coat primed surfaces within the suggested time frame, WesTech strongly recommends the supply of bare metal, with surface preparation and coating performed in the field. All field surface preparation, field paint, touch-up, and repair to shop painted surfaces are not by WesTech.

Escalation: If between the proposal date and actual procurement and through no fault of the Seller, the relevant cost of labor, material, freight, tariffs, and other Seller costs combined relating to the contract, increase by greater than 2.5% of the overall contract price, then the contract price shall be subject to escalation and increased. Such increase shall be verified by documentation and the amount of contract price escalation shall be calculated as either the actual increased cost to the Seller or, if agreed by the Parties, the equivalent increase of a relevant industry recognized third-party index, and in both cases without any additional profit or margin being added.

USA Tariffs and Current Trade Laws: All prices are based on current USA and North America tariffs and trade laws/agreements at time of bid. Any changes in costs due to USA Tariffs and trade laws/ agreements will be passed through to the purchaser at cost.

The Infrastructure Investment and Jobs Act of 2021 (IIJA) includes potentially significant changes to historical “Buy American” or “American Iron and Steel” (AIS) requirements for federally funded projects, including water-related infrastructure projects as administered by the Environmental Protection Agency (EPA). The IIJA was signed into law on Nov 15, 2021. However the EPA has yet to issue additional information and guidance clarifying the application and interpretation of these changes. Although WesTech makes every effort to source the steel for our equipment and products domestically, not everything is reasonably or commercially available to meet all project specific constraints. Consequently, any proposal or offer for sale by WesTech, including any resulting equipment order, does not guarantee compliance with the Buy American provisions of the Infrastructure Investment and Jobs Act of 2021 at this time.

Equipment Clarifications

The proposed system was designed based on the information provided and WesTech's standard equipment. The proposed equipment is backed by a 1 Year warranty.

Items Not Included in WesTech's Base Scope of Supply

- Electrical Wiring
- Conduit
- Piping
- Valves/Fittings
- Lubricating Oil/Grease
- Field Welding
- Field Erection

Exceptions

Not applicable

Commercial Proposal

Proposal Name: Tooele WWTP
Proposal Number: 2260558
Wednesday, January 10, 2024

1. Bidder's Contact Information

Company Name	WesTech Engineering, LLC
Primary Contact Name	Adrian Williams
Phone	(801) 265-1000
Email	awilliams@westech-inc.com
Address: Number/Street	3665 S West Temple
Address: City, State, Zip	Salt Lake City, UT 84115

2. Budget Pricing

Currency: USD

Scope of Supply		
A	Straight Ditch Design: Two (2) OxyStream™ Biological Nutrient Removal Systems Model AES2A3	$1,276,000
B	~~Folded Ditch Design: One (1) OxyStream™ Biological Nutrient Removal System Model AES2A3~~	~~$1,112,000~~
	Taxes (sales, use, VAT, IVA, IGV, duties, import fees, etc.)	Not Included

Prices are valid for a period not to exceed 30 days from date of proposal.

Additional Field Service	
Daily Rate (Applicable Only to Field Service Not Included in Scope)	$1,350

Pricing does not include field service unless noted in scope of supply, but is available at the daily rate plus expenses. The greater of a two week notice or visa procurement time is required prior to departure date. Our field service policy can be provided upon request for more details.

3. Payment Terms

Purchase Order Acceptance and Contract Execution	10%
Submittals Provided by WesTech	15%
Release for Fabrication	35%
Notification of Ready to Ship	40%

All payments are net 30 days. Partial shipments are allowed. An approved Letter of Credit is required if Incoterms CIF, CFR, DAP, CIP, or CPT are applicable. Payment is required in full for all other Incoterms prior to international shipment. Other terms per WesTech proforma invoice. Please note that the advising bank must be named as: Wells Fargo Bank, International Department, 9000 Flair Drive, 3rd Floor, El Monte, California 91731, USA.

4. Schedule

Submittals, after Purchase Order Acceptance and Contract Execution	8 to 10 weeks
Ready to Ship, after Receipt of Final Submittal Approval	24 to 28 weeks
Estimated Weeks to Ready to Ship	**32 to 38 weeks***

*Customer submittal approval is typically required to proceed with equipment fabrication and is not accounted for in the schedule above. Project schedule will be extended to account for time associated with receipt of customer submittal approval.

5. Freight

Domestic	FOB Shipping Point - Full Freight Allowed to Jobsite (FSP-FFA)	
From	**Final Destination**	**Number of Trucks or Containers**
WesTech Shops	Tooele, UT	Item A – Approximately 2 Item B – Approximately 2

One-Year Warranty

WesTech is meeting a global need for clean water through technology treatment solutions. We are proud that the equipment and systems we design, build, maintain, and operate are making the world a better place and creating a more sustainable environment for future generations.

Equipment manufactured or sold by WesTech Engineering, LLC, once paid for in full, is backed by the following warranty:

Subject to the terms below, WesTech warrants all new equipment manufactured or sold by WesTech Engineering, LLC to be unencumbered and free from defects in material and workmanship, and WesTech will replace or repair, F.O.B. its factories or other location it chooses, any part or parts returned to WesTech which WesTech's examination and analysis determine have failed within the warranty period because of defects in material and workmanship. The warranty period is either, one calendar year immediately following start-up, or eighteen (18) months from when WesTech sent its ready-to-ship notification to the purchaser, whichever expires sooner. All repair or replacement parts qualifying under this warranty shall be free of charge. Purchaser will provide timely written notice to WesTech of any defects it believes should be repaired or replaced under this warranty. WesTech will reject as untimely any warranty defect claim that purchaser submits more than thirty (30) days after the possible warranty defect first occurred. Unless specifically stated otherwise, this warranty does not cover normal wear or consumables. This warranty is not transferable.

This warranty shall be void and shall not apply where the equipment or any part thereof

a) has been dismantled, modified, repaired or connected to other equipment, outside of a WesTech factory, or without WesTech's written approval, or
b) has not been installed in complete adherence to all WesTech's or parts manufacturer's requirements, recommendations, and procedures, or
c) has been subject to misuse, abuse, neglect, or accident, or has not at all times been operated and maintained in strict compliance with all of WesTech's requirements and recommendations therefor, including, but not limited to, the relevant WesTech Operations & Maintenance Manual and any other of WesTech's specified guidelines & procedures, or
d) has been subject to force majeure events; use of chemicals not approved in writing by WesTech; electrical surges; overloading; significant power, water or feed supply fluctuations; or non-compliance with agreed feedwater or chemical volumes, specifications or procedures.

In any case where a part or component of equipment under this warranty is or may be faulty and the component or part is also covered under the warranty of a third party then the purchaser shall provide reasonable assistance to first pursue a claim under the third party warranty before making a claim under this warranty from WesTech. WesTech Engineering, LLC gives no warranty with respect to parts, accessories, or components purchased other than through WesTech. The warranties which apply to such items are those offered by the respective manufacturers.

This warranty is expressly given by WesTech and accepted by purchaser in lieu of all other warranties whether written, oral, express, implied, statutory or otherwise, including without limitation, warranties of merchantability and fitness for particular purpose. WesTech neither accepts nor authorizes any other person to assume for it any other liability with respect to its equipment. WesTech shall not be liable for normal wear and tear, corrosion, or any contingent, incidental, or consequential damage or expense due to partial or complete inoperability of its equipment for any reason whatsoever. The purchaser's exclusive and only remedy for breach of this warranty shall be the repair and or replacement of the defective part or parts within a reasonable time of WesTech's accepting the validity of a warranty claim made by the purchaser.

Terms & Conditions

Terms and Conditions appearing in any order based on this proposal which are inconsistent herewith shall not be binding on WesTech Engineering, LLC The sale and purchase of equipment described herein shall be governed exclusively by the foregoing proposal and the following provisions:

1. SPECIFICATIONS: WesTech Engineering, LLC is furnishing its standard equipment as outlined in the proposal and as will be covered by final approved drawings. The equipment may not be in strict compliance with the Engineer's/Owner's plans, specifications, or addenda as there may be deviations. The equipment will, however, meet the general intention of the mechanical specifications of these documents.

2. ITEMS INCLUDED: This proposal includes only the equipment specified herein and does not include erection, installation, accessories, nor associated materials such as controls, piping, etc., unless specifically listed.

3. PARTIES TO CONTRACT: WesTech Engineering, LLC is not a party to or bound by the terms of any contract between WesTech Engineering, LLC's customer and any other party. WesTech Engineering, LLC's undertakings are limited to those defined in the contract between WesTech Engineering, LLC and its direct customers.

4. PRICE AND DELIVERY: All selling prices quoted are subject to change without notice after 30 days from the date of this proposal unless specified otherwise. Unless otherwise stated, all prices are F.O.B. WesTech Engineering, LLC or its supplier's shipping points. All claims for damage, delay or shortage arising from such equipment shall be made by Purchaser directly against the carrier. When shipments are quoted F.O.B. job site or other designation, Purchaser shall inspect the equipment shipped, notifying WesTech Engineering, LLC of any damage or shortage within forty-eight hours of receipt, and failure to so notify WesTech Engineering, LLC shall constitute acceptance by Purchaser, relieving WesTech Engineering, LLC of any liability for shipping damages or shortages.

5. PAYMENTS: All invoices are net 30 days. Delinquencies are subject to a 1.5 percent service charge per month or the maximum permitted by law, whichever is less on all past due accounts. Pro rata payments are due as shipments are made. If shipments are delayed by the Purchaser, invoices shall be sent on the date when WesTech Engineering, LLC is prepared to make shipment and payment shall become due under standard invoicing terms. If the work to be performed hereunder is delayed by the Purchaser, payments shall be based on the purchase price and percentage of completion. Products held for the Purchaser shall be at the risk and expense of the Purchaser. Unless specifically stated otherwise, prices quoted are for equipment only. These terms are independent of and not contingent upon the time and manner in which the Purchaser receives payment from the owner.

6. PAYMENT TERMS: Credit is subject to acceptance by WesTech Engineering, LLC's Credit Department. If the financial condition of the Purchaser at any time is such as to give WesTech Engineering, LLC, in its judgment, doubt concerning the Purchaser's ability to pay, WesTech Engineering, LLC may require full or partial payment in advance or may suspend any further deliveries or continuance of the work to be performed by the WesTech Engineering, LLC until such payment has been received.

7. ESCALATION: If between the proposal date and actual procurement and through no fault of the Seller, the relevant cost of labor, material, freight, tariffs, and other Seller costs combined relating to the contract, increase by greater than 2.5% of the overall contract price, then the contract price shall be subject to escalation and increased. Such increase shall be verified by documentation and the amount of contract price escalation shall be calculated as either the actual increased cost to the Seller or, if agreed by the Parties, the equivalent increase of a relevant industry recognized third-party index, and in both cases without any additional profit or margin being added.

8. APPROVAL: If approval of equipment submittals by Purchaser or others is required, a condition precedent to WesTech Engineering, LLC supplying any equipment shall be such complete approval.

9. INSTALLATION SUPERVISION: Prices quoted for equipment do not include installation supervision. WesTech Engineering, LLC recommends and will, upon request, make available, at WesTech Engineering, LLC's then current rate, an experienced installation supervisor to act as the Purchaser's employee and agent to supervise installation of the equipment. Purchaser shall at its sole expense furnish all necessary labor equipment, and materials needed for installation.

Responsibility for proper operation of equipment, if not installed by WesTech Engineering, LLC or installed in accordance with WesTech Engineering, LLC's instructions, and inspected and accepted in writing by WesTech Engineering, LLC, rests entirely with Purchaser; and any work performed by WesTech Engineering, LLC personnel in making adjustment or changes must be paid for at WesTech Engineering, LLC's then current per diem rates plus living and traveling expenses.

WesTech Engineering, LLC will supply the safety devices described in this proposal or shown in WesTech Engineering, LLC's drawings furnished as part of this order but excepting these, WesTech Engineering, LLC shall not be required to supply or install any safety devices whether required by law or otherwise. The Purchaser hereby agrees to indemnify and hold harmless WesTech Engineering, LLC from any claims or losses arising due to alleged or actual insufficiency or inadequacy of the safety devices offered or supplied hereunder, whether specified by WesTech Engineering, LLC or Purchaser, and from any damage resulting from the use of the equipment supplied hereunder.

10. ACCEPTANCE OF PRODUCTS: Products will be deemed accepted without any claim by Purchaser unless written notice of non-acceptance is received by WesTech Engineering, LLC within 30 days of delivery if shipped F.O.B. point of shipment, or 48 hours of delivery if shipped F.O.B. point of destination. Such written notice shall not be considered received by WesTech Engineering, LLC unless it is accompanied by all freight bills for said shipment, with Purchaser's notations as to damages, shortages and conditions of equipment, containers, and seals. Non-accepted products are subject to the return policy stated below.

11. TAXES: Any federal, state, or local sales, use or other taxes applicable to this transaction, unless specifically included in the price, shall be for Purchaser's account.

12. TITLE: The equipment specified herein, and any replacements or substitutes therefore shall, regardless of the manner in which affixed to or used in connection with realty, remain the sole and personal property of WesTech Engineering, LLC until the full purchase price has been paid. Purchaser agrees to do all things necessary to protect and maintain WesTech Engineering, LLC's title and interest in and to such equipment; and upon Purchaser's default, WesTech Engineering, LLC may retain as liquidated damages any and all partial payments made and shall be free to enter the premises where such equipment is located and remove the same as its property without prejudice to any further claims on account of damages or loss which WesTech Engineering, LLC may suffer from any cause.

13. INSURANCE: From date of shipment until the invoice is paid in full, Purchaser agrees to provide and maintain at its expense, but for WesTech Engineering, LLC's benefit, adequate insurance including, but not limited

to, builders risk insurance on the equipment against any loss of any nature whatsoever.

14. SHIPMENTS: Any shipment of delivery dates recited represent WesTech Engineering, LLC's best estimate but no liability, direct or indirect, is assumed by WesTech Engineering, LLC for failure to ship or deliver on such dates.

WesTech Engineering, LLC shall have the right to make partial shipments; and invoices covering the same shall be due and payable by Purchaser in accordance with the payment terms thereof. If Purchaser defaults in any payment when due hereunder, WesTech Engineering, LLC may, without incurring any liability therefore to Purchaser or Purchaser's customers, declare all payments immediately due and payable with maximum legal interest thereon from due date of said payment, and at its option, stop all further work and shipments until all past due payments have been made, and/or require that any further deliveries be paid for prior to shipment.

If Purchaser requests postponements of shipments, the purchase price shall be due and payable upon notice from WesTech Engineering, LLC that the equipment is ready for shipment; and thereafter any storage or other charge WesTech Engineering, LLC incurs on account of the equipment shall be for the Purchaser's account.

If delivery is specified at a point other than WesTech Engineering, LLC or its supplier's shipping points, and delivery is postponed or prevented by strike, accident, embargo, or other cause beyond WesTech Engineering, LLC's reasonable control and occurring at a location other than WesTech Engineering, LLC or its supplier's shipping points, WesTech Engineering, LLC assumes no liability in delivery delay. If Purchaser refuses such delivery, WesTech Engineering, LLC may store the equipment at Purchaser's expense. For all purposes of this agreement such tender of delivery or storage shall constitute delivery.

15. WARRANTY: WesTech Engineering LLC warrants equipment it supplies only in accordance with the attached WesTech Warranty. This warranty is expressly given by WesTech and accepted by purchaser in lieu of all other warranties whether written, oral, express, implied, statutory or otherwise, including without limitation, warranties of merchantability and fitness for particular purpose. WesTech neither accepts nor authorizes any other person to assume for it any other liability with respect to its equipment. WesTech shall not be liable for normal wear and tear, corrosion, or any contingent, incidental, or consequential damage or expense due to partial or complete inoperability of its equipment for any reason whatsoever. The purchaser's exclusive and only remedy for breach of this warranty shall be the repair and or replacement of the defective part or parts within a reasonable time of WesTech's accepting the validity of a warranty claim made by the purchaser.

16. PATENTS: WesTech Engineering, LLC agrees that it will, at its own expense, defend all suits or proceedings instituted against Purchaser and pay any award of damages assessed against it in such suits or proceedings, so far as the same are based on any claim that the said equipment or any part thereof constitutes an infringement of any apparatus patent of the United States issued at the date of this Agreement, provided WesTech Engineering, LLC is given prompt notice in writing of the institution or threatened institution of any suit or proceeding and is given full control of the defense, settlement, or compromise of any such action; and Purchaser agrees to give WesTech Engineering, LLC needed information, assistance, and authority to enable WesTech Engineering, LLC so to do. In the event said equipment is held or conceded to infringe such a patent, WesTech Engineering, LLC shall have the right at its sole option and expense to a) modify the equipment to be non-infringing, b) obtain for Purchaser the license to continue using said equipment, or c) accept return of the equipment and refund to the Purchaser the purchase price thereof less a reasonable charge for the use thereof. WesTech Engineering, LLC will reimburse Purchaser for actual out-of-pocket expenses, exclusive of legal fees, incurred in preparing such information and rendering such assistance at WesTech Engineering, LLC's request. The foregoing states the entire liability of WesTech Engineering, LLC, with respect to patent infringement; and except as otherwise agreed to in writing, WesTech Engineering, LLC assumes no responsibility for process patent infringement.

17. SURFACE PREPARATION AND PAINTING: If furnished, shop primer paint is intended to serve only as minimal protective finish. WesTech Engineering, LLC will not be responsible for the condition of primed or finish painted surfaces after equipment leaves its shops. Purchasers are invited to inspect paint in shops for proper preparation and application prior to shipment. WesTech Engineering, LLC assumes no responsibility for field surface preparation or touch-up of shipping damage to paint. Painting of fasteners and other touch-up to painted surfaces will be by Purchaser's painting contractor after mechanism installation.

Motors, gear motors, and other components not manufactured by WesTech Engineering, LLC will be painted with that manufacturer's standard paint system. It is WesTech Engineering, LLC's intention to ship major steel components as soon as fabricated, often before drive, motors, and other manufactured components. Unless Purchaser can ensure that shop primed steel shall be field painted within thirty (30) days after arrival at the job site, WesTech Engineering, LLC encourages the Purchaser to order these components without primer.

WesTech Engineering, LLC's prices are based on paints and surface preparations as outlined in the main body of this proposal. In the event that an alternate paint system is selected, WesTech Engineering, LLC requests that Purchaser's order advise of the paint selection. WesTech Engineering, LLC will then either adjust the price as may be necessary to comply or ship the material unpainted if compliance is not possible due to application problems or environmental controls.

18. CANCELLATION, SUSPENSION, OR DELAY: After acceptance by WesTech Engineering, LLC, this proposal, or Purchaser's order based on this proposal, shall be a firm agreement and is not subject to cancellation, suspension, or delay except upon payment by Purchaser of appropriate charges which shall include all costs incurred by WesTech Engineering, LLC to date of cancellation, suspension, or delay plus a reasonable profit. Additionally, all charges related to storage and/or resumption of work, at WesTech Engineering, LLC's plant or elsewhere, shall be for Purchaser's sole account; and all risks incidental to storage shall be assumed by Purchaser.

19. FORCE MAJEURE: Neither party hereto shall be liable to the other for default or delay in delivery caused by extreme weather or other act of God, strike or other labor shortage or disturbance, fire, accident, war or civil disturbance, act of government, pandemic, delay of carriers, failure of normal sources of supply, complete or partial shutdown of plant by reason of inability to attain sufficient raw materials or power, and/or other similar contingency beyond the reasonable control of the respective parties. The time for delivery specified herein shall be extended during the continuance of such conditions, or any other cause beyond such party's reasonable control. Escalation resulting from a Force Majeure event shall be equitably adjusted per the escalation policy stated above.

20. RETURN OF PRODUCTS: No products may be returned to WesTech Engineering, LLC without WesTech Engineering, LLC's prior written permission. Said permission may be withheld by WesTech Engineering, LLC at its sole discretion.

21. BACKCHARGES: WesTech Engineering LLC will not approve or accept backcharges for labor, materials, or other costs incurred by Purchaser or others in modification, adjustment, service, or repair of WesTech Engineering LLC furnished materials unless such back charge has been authorized in advance in writing by a WesTech Engineering LLC purchase order, or work requisition signed by WesTech Engineering LLC.

22. INDEMNIFICATION: Purchaser agrees to indemnify WesTech Engineering, LLC from all costs incurred, including but not limited to court costs and reasonable attorney fees, from enforcing any provisions of this contract, including but not limited to breach of contract or costs incurred in collecting monies owed on this contract.

23. ENTIRE AGREEMENT: This proposal expresses the entire agreement between the parties hereto superseding any prior understandings and is not subject to modification except by a writing signed by an authorized officer of each party.

24. MOTORS AND MOTOR DRIVES: In order to avoid shipment delays of WesTech Engineering, LLC equipment, the motor drives may be sent directly to the job site for installation by the equipment installer. Minor fit-up may be required.

25. EXTENDED STORAGE: Extended storage instructions will be part of information provided to shipment. If equipment installation and start-up is delayed more than 30 days, the provisions of the storage instructions must be followed to keep WARRANTY in force.

26. LIABILITY: Professional liability insurance, including but not limited to, errors and omissions insurance, is not included. In any event, liability for errors and omissions shall be limited to the lesser of $100,000 USD or the value of the particular piece of equipment (not the value of the entire order) supplied by WesTech Engineering LLC against which a claim is sought.

27. ARBITRATION NEGOTIATION: Any controversy or claim arising out of or relating to the performance of any contract resulting from this proposal or contract issued, or the breach thereof, shall be settled by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association, and judgment upon the award rendered by the arbitrator(s) may be entered to any court having jurisdiction.

ACCEPTED BY PURCHASER

Customer Name: _____

Customer Address: _____

_____

_____

Contact Name: _____

Contact Phone: _____

Contact Email: _____

Signature: _____

Printed Name: _____

Title: _____

Date: _____

TOOELE WATER RECLAMATION FACILITY

TOOELE, UT

BIOMAG™ CONCEPTUAL PROPOSAL

JUB

September 2023

Evoqua Sales Contact:

Richard Liebhaber
richard.liebhaber@evoqua.com

N19 W23993 Ridgeview Pkwy, Suite 200, Waukesha WI 53188

+1 (262) 547-0141 (toll) +1 (800) 524-6324 (toll-free) www.evoqua.com

CONTENTS

1. Introduction

Evoqua Water Technologies is pleased to present a preliminary BioMag system proposal. The BioMag system is a treatment intensification process using magnetite to ballast the biological flocs in an activated sludge process. This high-density ballast material increases the settling rate of the flocs allowing the plant to operate at elevated mixed liquor concentrations, treating more within a smaller footprint, while still achieving excellent effluent quality.

The treatment goals for this facility, in applying the BioMag system, are to:

- increase capacity of the plant.
- reduce overall bioreactor footprint.
- handle peak flows and storm flows more reliably.

Figure 1 below is a process flow diagram showing how the components of a BioMag system are typically integrated into the RAS and WAS lines of the main secondary treatment process of a plant. The BioMag system provided by Evoqua primary consists of magnetite feed and recovery equipment that gets integrated as a side stream process to the main secondary treatment system.

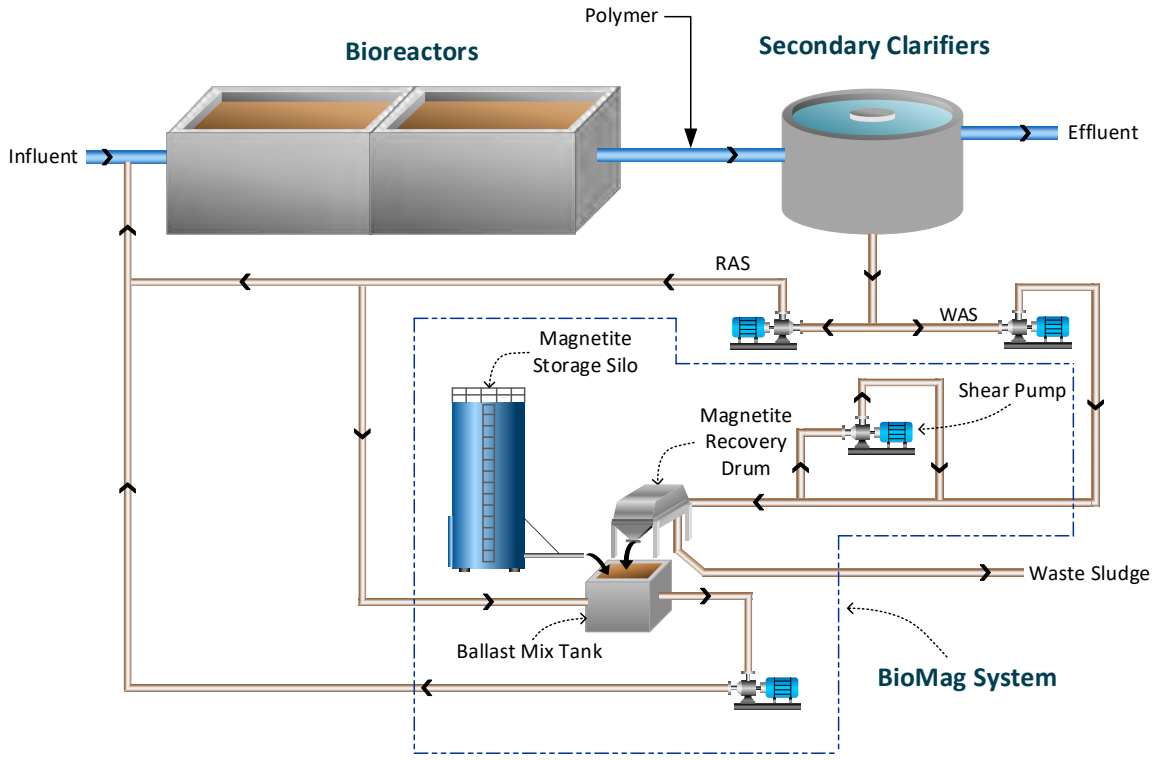


Figure 1: Typical BioMag process flow diagram.

2. BioMag System Description

The BioMag system uses magnetite to ballast the biological flocs in an activated sludge process. Magnetite is a ferrimagnetic, iron oxide with chemical formula Fe_3O_4. It has a dark gray to black color and is chemically inert. Magnetite is a high-density material with a specific gravity ranging from 4.8 to 5.2 and is strongly attracted to magnets. The magnetite material used as part of the BioMag system is graded for a specific particle size range, optimized for embedment into the biological flocs of the activated sludge process. The high density and magnetic properties are key to the BioMag system. The high density leads to increased settling rates and the attraction to magnets allows the material to be recovered and reused.

Figure 2: Sample of magnetite material used with the BioMag system.

The BioMag system operates as a side stream process to the main secondary treatment system. The BioMag system passes a small portion of the mixed liquor from the main secondary treatment system through a ballast mix tank where magnetite is incorporated to ballast the biological flocs. The BioMag system also recovers magnetite from the waste activated sludge (WAS) for reuse in the process.

Recovery of the magnetite from the WAS stream is done through a two-step process (see Figure 3 below). First the WAS is passed through a shear pump to break apart the magnetite from the biological floc. The WAS is then passed through a magnetic recovery drum to recover the magnetite. Evoqua has four (4) recovery drum models ranging in size to meet various design loads.

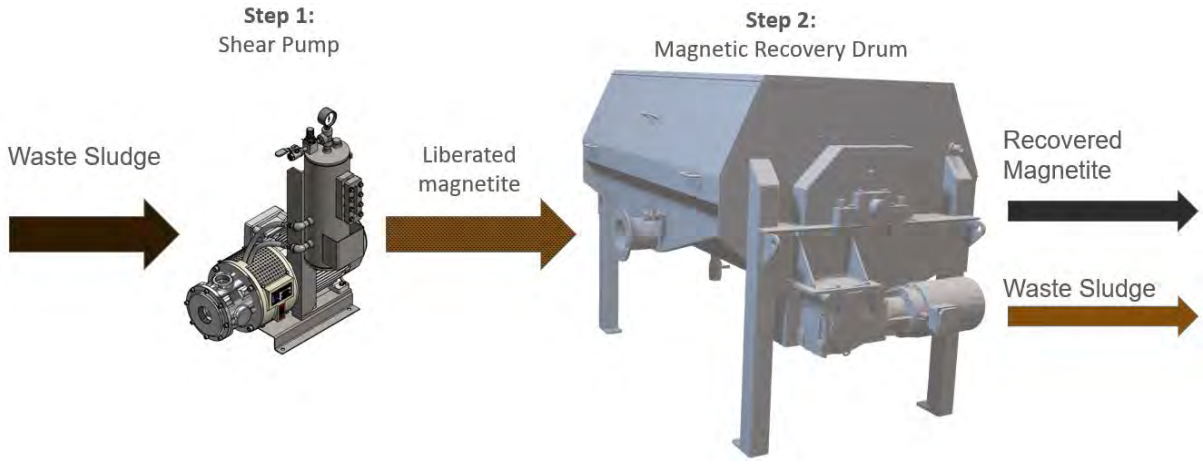


Figure 3: Two-step magnetite recovery process.

3. Design Criteria

Table 1 summarizes the design influent flows used as the basis for the proposed BioMag system.

Table 1: Design influent flows.

Parameter	Unit	Value
Average Daily Flow (ADF)	MGD	4.9
Max Month Flow (MMF)	MGD	6.12
Peak Daily Flow (PDF)	MGD	9.8 (assumed)
Peak Hourly Flow (PHF)	MGD	12.94

Table 2 summarizes the design influent water quality used as the basis for the proposed BioMag system.

Table 2: Design influent water quality.

Parameter	Unit	Value
Biochemical Oxygen Demand (BOD_5)	mg/L	186
Total Suspended Solids (TSS)	mg/L	175
Ammonia Nitrogen (NH_3-N)	mg/L	32 (assumed)
Total Kjeldahl Nitrogen (TKN)	mg/L	40 (assumed)
Total Phosphorus (TP)	mg/L	7 (assumed)
Alkalinity	mg/L as $CaCO_3$	350 (assumed)
Maximum Influent Temperature	°C	20 (assumed)
Minimum Influent Temperature	°C	10 (assumed)

Table 3 summarizes the effluent performance requirements used as the basis for the proposed BioMag system. Evoqua can provide effluent performance guarantees upon request depending on the scope of supply from Evoqua. An effluent guarantee for biologically treated parameters such as BOD, ammonia, and TN can be provided if the biological treatment system design, equipment, and controls are provided by Evoqua. If the scope of supply by Evoqua is limited to the BioMag feed and recovery system, as outlined in this proposal, Evoqua can offer a performance guarantee for solids separation parameters such as effluent TSS and/or TP.

Table 3: Monthly average effluent performance.

Parameter	Unit	Value
BOD_5	mg/L	10

Parameter	Unit	Value
TSS	mg/L	25
NH_3-N	mg/L	1
TN	mg/L	NA
TP	mg/L	NA

4. BioMag Process Design Summary

To develop a design for the BioMag system, Evoqua must first establish an MLSS concentration threshold for the BioMag system. The biological sizing must be confirmed by the engineer for a final design. Evoqua's intent behind establishing an MLSS threshold is to evaluate two (2) key items for the BioMag system design:

1. MLSS concentration for allowable clarifier loadings with BioMag.
2. Waste sludge generation for sizing of BioMag feed and recovery equipment.

Table 4 summarizes the main process parameters used as the basis for the conceptual BioMag system outlined in this proposal. Biological reactor volume and WAS rates to be confirmed by the engineer for a final design.

Table 4: Design and process parameters.

Parameter	Value
Number of bioreactor treatment trains	TBD
MLSS	MMF: ≤ 5,500 mg/L
Evoqua Recommendations for Mixing	Recommended design ranges for mixing in a BioMag system based on various aeration and mixing types: Fine bubble: 0.2-0.3 scfm/ft^2 at ADF Coarse bubble: 30-50 scfm/1000 ft^3 Floating mixers: 50 HP/MG Submersible mixers: bulk velocity of 1.2-1.5 ft/s
WAS	ADF: 5,765 lb/d @ 7,600 mg/L MMF: 8,327 lb/d @ 11,000 mg/L
RAS requirements	100% at ADF & MMF conditions Up to 8 MGD at peak flow
Number of clarifiers, existing	3

Parameter	Value
Clarifier diameter	60 ft
Number of new clarifiers required	1
Clarifier diameter – new	60 ft

5. Operating Costs

As a guidance and reference, Table 5 lists the main consumables associated with the BioMag system recommended for this project.

Table 5: Estimated BioMag consumables.

Item	Guidance
Magnetite consumption	513 - 583 lb/day at avg. day (≈ $0.34/lb.)
Magnetite feed/recovery equipment power	~882 kWh/d
Polymer – as dry active	0.5 to 1.5 mg/L at peak flows

6. Additional Design Considerations

In the event that BioMag is the selected technology for this project, the following items will need to be evaluated and discussed in more detail for a finalized design:

- Secondary clarifier mechanism.
- Secondary clarifier side water depth.
- Peak flow duration.
- Supplemental mixing requirements.
- Existing return sludge and waste sludge pumping capacity.
- Headworks screening. Evoqua recommends a minimum influent screen size of ¼" for the BioMag system. If influent screening is insufficient, Evoqua may require pre-screening of the WAS flow before the BioMag recovery system.
- BioMag building layout and location.
- Biosolids wasting strategy. The proposed BioMag design assumes continuous wasting of activated sludge to the BioMag recovery system (24 hours per day, 7 days per week). If the wasting will not be continuous, Evoqua will need to reevaluate the sizing of our equipment as this will require intermittent processing at higher flows.
- Chemical feed system, chemical preference.

7. System Design Responsibilities

Table 6 below helps outline which parties have primary responsibility for the design of various systems involved in the upgrade of the plant with BioMag.

Table 6: Design responsibilities

Item	Primary	Guidance
Biological system sizing, design, and equipment. This includes calculation of oxygen requirements, sludge yield, sludge age and waste sludge generation.	Others	EVOQUA
Clarifier equipment design and supply.	Others	EVOQUA
BioMag feed and recovery system sizing, design, and equipment.	EVOQUA	
BioMag equipment building layout and design	Others	EVOQUA
Plant hydraulics, pipe sizing and pump headloss calculations.	Others	EVOQUA

For the purposes of this budgetary proposal, Evoqua has conducted a preliminary sizing of the biological process since certain parameters such as MLSS and waste sludge volume are needed as inputs for the design of the BioMag equipment. However, final design of the biological process would be completed by others unless Evoqua has been selected to provide the equipment for the biological process (i.e. aeration, mixers, controls, etc.).

Evoqua has also conducted a preliminary sizing of the secondary clarifiers to determine the minimum required surface area and RAS pumping capacity associated with the enhanced settling rates of the BioMag system. A more detailed review of the clarifier sludge removal mechanism would need to be completed for any final design.

8. Equipment Scope of Supply

Table 7 below outlines the scope of supply from Evoqua for the proposed BioMag system. All equipment or services not specified in Table 7 are to be supplied by others. Motor HP's listed below are estimates. Final motor sizes to be determined during detailed design.

Table 7: Evoqua scope of supply.

Item	Qty	Description
Ballast Storage & Feed System		

Item	Qty	Description
Flow control valve – ballast mix tank feed	1	Motor operated plug valve
Flow meter – ballast mix tank feed	1	Mag meter
Level transmitter – ballast mix tank (tank by others)	1	Radar
High level switch – ballast mix tank (tank by others)	1	Float style
Pump – ballast mix tank discharge	1D, 1S	Positive displacement, 5 HP each
Ballast mix tank mixer	1	Vertical shaft, 3 HP each
Magnetite storage	1	25-ton outdoor silo
Magnetite dry feeder	1	Up to 10' long Stinger® feed pipe extending from silo to ballast mix tank
Air compressor	2 (lead/lag)	10 HP units
Air receiver	1	240-gallon vertical tank
Air dryer	1	Heatless desiccant
Compressed air system instrumentation	1 lot	Dew point sensor, pressure switch, pressure gauge
Ballast Recovery System		
Magnetic recovery drum	3	36" x 72" drum, 7.5 HP each
Shear pump	1	10 HP each
Pump – post recovery WAS transfer pump (after magnetite recovery)	1D, 1S	Positive displacement, 5 HP each
Flow control valve – mag drum feed	3	Motor operated plug valve
Flow meter – mag drum feed	3	Mag meter
Level switch – mag drum	3	Capacitance style
Speed switch – mag drum	3	Proximity style

Item	Qty	Description
Level transmitter – post recovery WAS sump (sump by others)	1	Radar
High level switch – post recovery WAS sump (sump by others)	1	Float style
Control System Hardware		
Control panel	1	NEMA 12 control panel, HMI, PLC, I/O
Services		
Engineering support		Engineering submittals and O&M manual
Installation oversight, start-up, commissioning, performance testing and training		Up to 21 days
Optional Spare Parts		
Mag drum spares kit	1	
Shear pump spares kit	1	
Compressed air system spares kit	1	
Silo spares kit	1	

9. Budgetary Pricing

The budgetary price for the Evoqua BioMag system, as defined herein, including engineering, field services, and equipment supply is as follows:

BioMag System: **$2,800,000**

Optional Spare Parts: **$90,000**

This price makes no provision for taxes, tariffs, duties, permitting fees and other fees and charges that are not made explicit above.

All pricing is quoted at FOB jobsite with standard freight allowed to the jobsite. No taxes, regulatory fees or other costs related to the procurement and installation of the system are included.

The initial magnetite charge for the proposed system will require approximately **75-100** ton(s) of virgin magnetite at design conditions. Evoqua can provide magnetite at a cost of **$680** per ton plus freight.

The scope of supply and pricing are based on Evoqua standard equipment selection, standard terms of sale and warranty terms. Any variations from these standards may affect this budgetary quotation. Additionally, please note this budgetary quotation is for review and informational purposes only and does not constitute an offer for acceptance. Any figures reflected herein are merely suggestive of the potential cost of the works described and are therefore only to be regarded as approximate, indicative and/or speculative.

Should you have any questions regarding this quotation, or would like to request a firm proposal and order form, please contact the following Evoqua Regional Representative:

Michael Moe
MISCOwater
Salt Lake City, UT Office
PH: (801) 842-7704
Email: mmoe@miscowater.com

Submitted to: JUB Engineering

Submitted by: Pia Prohaska
Senior Process Engineer

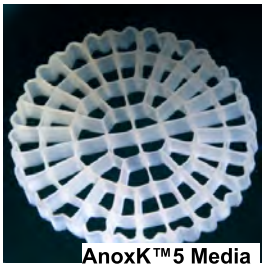
Date: 9/01/2023

Veolia Water Technologies Inc. (dba Kruger)
4001 Weston Parkway
Cary, NC 27513
tel. +1 919-677-8310 | fax. +1 919-677-0082
www.veoliawatertech.com

Water Technologies

Process Description

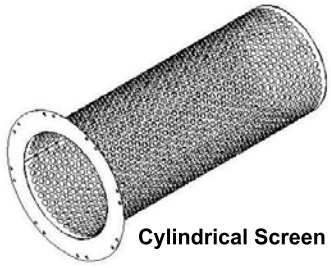
AnoxKaldnes MBBR and IFAS


AnoxK™5 Media

Kruger's AnoxKaldnes process design is based on more than 30 years of experience with Moving Bed Biological Reactors (MBBR) and Integrated Fixed Film Activated Sludge (IFAS) systems. Our knowledge is supported by lab and pilot scale studies and data from more than 1,200 AnoxKaldnes operating systems for BOD, nitrification, and TN removal.

The MBBR and IFAS (or Hybas™ – Hybrid Biofilm Activated Sludge) processes are continuous flow through, non-clogging bio-film reactors containing "carrier elements" or media with a high specific surface. The media does not require backwashing or cleaning.

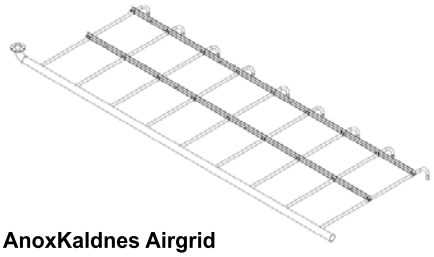
The biomass that treats the wastewater is attached to the surfaces of the media. The media is designed to provide a large protected surface area for the biofilm and optimal conditions for biological activity when suspended in water. Media of different shapes and sizes provide flexibility to use the most suitable type depending on wastewater characteristics, discharge standards and available volumes. AnoxKaldnes media is made from polyethylene and has a density slightly less than water.


Cylindrical Screen

In the MBBR process, all of the biomass is attached to the media and retained in the reactor, with no returned sludge. In the Hybas process, the reactor contains both free-floating biomass (activated sludge) and biomass attached to the media. The free-floating biomass passes through the reactor, is settled and recycled back to the reactor. The media and attached biofilm remain in the reactor as in a MBBR.

The Hybas process is often considered for upgrading existing conventional activated sludge systems within the existing tankage for either maintaining nitrification at new higher flow rates or loads or upgrading a plant to meet new nitrification requirements. It is accomplished by adding the media directly into the activated sludge reactors to enhance the growth of the autotrophic bacteria. The Hybas system is capable of meeting these new effluent requirements at low solids retention times (SRTs) and short hydraulic retention times (HRTs).

The mixing of the media within MBBR and Hybas reactors is provided by AnoxKaldnes' medium bubble aeration system in aerobic application, whereas specially designed submersible mixers are used in anoxic environments for denitrification.


AnoxKaldnes Airgrid

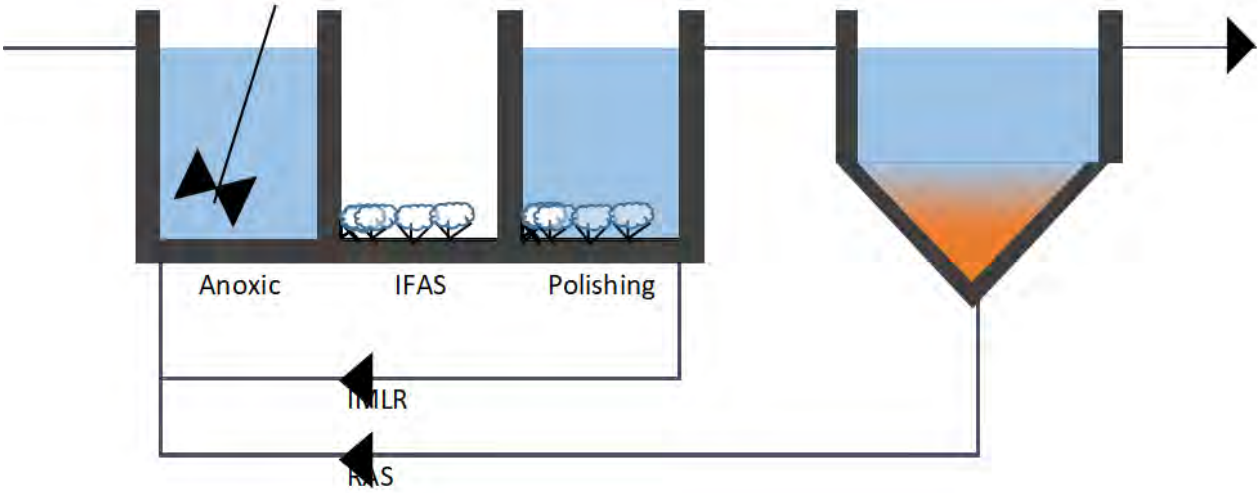
Kruger's minimum scope of supply for MBBR and Hybas systems includes the AnoxKaldnes media, screen assemblies (to keep media in each reactor), medium bubble aeration grid assemblies and submersible mixers for the anoxic zones. In cases where they are needed, Kruger also provides the blowers, instrumentation and controls, SCADA, and field instruments (dissolved oxygen, nitrate, ammonia, etc.) for single source responsibility.

AnoxKaldnes IFAS System Configuration

Kruger looked at an IFAS design for the Tooele WWTP, UT using the two existing ditches.

This preliminary design uses the volume of the two existing ditches and reconfigures each ditch into one IFAS Train. The flow direction will be from the influent end of the ditch to the effluent. Each Train consists of one (1) Pre DN reactor for denitrification and removal of nitrate followed by two (2) HYBAS media reactors for nitrification in series followed by one (1) polishing zone to ensure low ammonium in the effluent as well as low DO in the IMLR flow going to the Pre-DN reactor. The IFAS reactors have to be divided into two reactors as otherwise the flux allowed in the system will be significantly reduced.

Each Pre-DN reactor will have submersible mixers, the IFAS reactors will have AK airgrids and the media retention screens and the polishing reactor will have AK airgrids.



AnoxKaldnes Hybas Nitrification and Denitrification System in a Three-stage configuration

Design Summary

The proposed design is based on the following influent wastewater characteristics and incorporating peak flow conditions for screen design purposes only. The design assumes that the raw influent wastewater is biodegradable, no toxic compounds are present, sufficient alkalinity is available to avoid pH depressions, that the COD/BOD ratio is between 1.7 and 2.3, and that none of the equipment provided would be used in a classified area (e.g. Class 1, Division 1 or Class 1, Division 2).

The headworks should be designed to prevent the passage of unscreened or poorly screened wastewater into the media reactors, including during maintenance or high-flow bypass events. The use of bar or step screens is discouraged, since they can allow passage of fibrous material that can blind the media retention screens.

To provide the best compatibility with the AnoxKTM5 media and sieves, the plant's headworks should include perforated mesh screens with a maximum of 6 mm (1/4 inch) diameter openings for removal of particulate matter (rags, debris, etc.) prior to entering the AnoxKaldnes MBBR/IFAS reactors.

Table 1: Influent Design Basis

	IFAS System	
Parameter	**Average**	**Max Month Design**
Influent Flow (MGD)	4.9	6.12
Peak flow Flow, (MGD)	12.94	
BOD_5 (mg/L) (Lbs/day)	 165 6,733	 186 9,494
TSS (mg/L) (Lbs/day)	 147 6,023	 175 8,914
TKN (mg/L)	30*	35*
TP (mg/L)	5*	7*
Elevation* (ft AMSL)	4,450	
Min/Max Temperature (˚C)	10/25	

Effluent Objectives (30 - day average)

Parameter	Value
$CBOD_5$ (mg/L)	< 10
TSS (mg/L)	< 25
TN (mg/L)	< 15
NH4-N (mg/L)	< 0.5

*Listed values represent anticipated performance; guaranteed values may be different.
**BOD and TSS values dependent on secondary clarifier performance

Table 3: Process Design Summary

Parameter	Units	Stage 2
Number of Process Trains	-	2
Number of DN Reactors per Train	-	1
Number of Hybas Reactors per Train	-	2
Number of Polishing Reactors per Train	-	1
Pre-DN Reactor		
SWD (Each)	ft	12
Volume (Each)	ft^3	33,422
Total Volume (All Reactors, All Trains)	ft^3	66,845
Discharge Pressure (From Top of Drop Pipe)	psi	7.1
Hybas Reactor #1		
SWD (Each)	ft	12
Volume (Each)	ft^3	36,765
Total Volume (All Reactors, All Trains)	ft^3	73,530
Media Type:	-	AnoxK™5
Media Protected Surface Area	ft^2/ft^3	243.3
Fill of Biofilm Carriers	%	35
Media Volume (All Reactors, All Trains)	ft^3	25,735
Total Effective Surface Area (All Reactors, All Trains)	ft^2	5,414,900
Aeration System Type	-	Medium Bubble
Residual DO, Max. Month	mg/L	4
Hybas Reactor #2		
SWD (Each)	ft	12
Volume (Each)	ft^3	36,765
Total Volume (All Reactors, All Trains)	ft^3	73,530
Media Type:	-	AnoxK™5
Media Protected Surface Area	ft^2/ft^3	243.3
Fill of Biofilm Carriers	%	35
Media Volume (All Reactors, All Trains)	ft^3	25,735
Total Effective Surface Area (All Reactors, All Trains)	ft^2	5,414,900
Aeration System Type	-	Medium Bubble
Residual DO, Max. Month	mg/L	4

Polishing Reactor		
SWD (Each)	ft	12
Volume (Each)	ft^3	14,305
Total Volume (All Reactors, All Trains)	ft^3	28,610
Aeration System Type	-	Medium Bubble
Residual DO, Max. Month	mg/L	2
MLSS, Max. Month	mg/L	~3,500
IMLR Flow	%	200-300
RAS, Max. Month	%	50-100
Recommended Freeboard	ft	2-3

Construction

In order to retrofit the two ditches into two IFAS Trains the sequence of construction would be to take one of the ditches off line and keep the second ditch in operation during the first phase of construction.

The performance of the second ditch at the load during construction needs to be evaluated, to determine if the process volume and aeration capacity will be sufficient to meet the effluent requirements during Phase 1. If the plant is already in aeration deficiency it will be potentially difficult to meet the effluent quality set for the plant during this period

In the second phase, the first ditch that has been converted into an IFAS system, will operate as a single train. Effluent quality will be improved compared to the first phase as this system will be able to treat a higher load, but this scenario needs to be evaluated as well. A bypass option needs to be in place as the IFAS system has a max hydraulic capacity that cannot be exceeded.

Hydraulic capacity

The existing ditches configured into two IFAS trains will be able to hydraulic pass 17 MGD in each train or a total of 34 MGD . This is mainly because of the low SWD of 12 ft. The 34 MGD is the total flow consisting of the Influent flow, the RAS flow as well as the IMLR flow. This will equal an absolute maximum hourly influent flow of 20 MGD with no IMLR and 100% RAS (based on 6.12 MGD at max month).

Relative O&M costs

The O&M cost in an IFAS system will be significantly higher than the existing ditch system. The primary reason is that the energy consumption in an IFAS system is substantially higher as it is operated at a higher DO setpoint. The fact that the SWD is only 12 ft and the IFAS system requires a minimum of 2 ft freeboard the cost of aeration will be high. Shallow systems also have a tendency to have a high airflow ratio to volume ratio that potentially will limit the load of the system.

The IFAS system also has IMLR pumps that the BIODENIPHO system doesn't have.

Sludge settling performance

The Sludge settling properties will be comparable to the existing system.

Ease of operation/complexity of the process

An IFAS System is comparable in operation and complexity of a BIODENIPHO system. The BIODENIPHO system will however be much more flexible in terms of adapting to different loads and seasonal variations as it is possible to change the ratio between oxic/anoxic process conditions.

Potential impacts to upstream processes

An IFAS system will require a perforated plate fine screen with a maximum opening of 6 mm to prevent any debris from building up in the IFAS reactor and potentially clog the media retention screens. Otherwise it is comparable with the ditch system.

Appendix E: City Financial Data

Account Summary

Account	Name	Fiscal Budget	Beginning Balance	Total Activity	Ending Balance	Budget Remaining	% Remaining
52 - SEWER FUND							
Expense							
52-5200-111000	REGULAR EMPLOYEES	720,106.00	275,793.13	54,405.01	330,198.14	389,907.86	54.15 %
52-5200-112000	OVERTIME	40,108.00	7,087.78	573.25	7,661.03	32,446.97	80.90 %
52-5200-115000	ON CALL PAY	9,128.00	3,675.00	700.00	4,375.00	4,753.00	52.07 %
52-5200-121000	TEMPORARY EMPLOYEES	18,782.00	6,956.24	0.00	6,956.24	11,825.76	62.96 %
52-5200-131000	EMPLOYEE BENEFITS	224,763.00	83,186.20	16,014.67	99,200.87	125,562.13	55.86 %
52-5200-132000	MEDICAL & LIFE INSURANCE	238,095.00	88,846.29	8,013.46	96,859.75	141,235.25	59.32 %
52-5200-211000	SUBSCRIPTIONS & MEMBERSHIPS	3,000.00	1,568.94	0.00	1,568.94	1,431.06	47.70 %
52-5200-213000	RETIRED EMPLOYEES INSURANCE	17,252.00	7,781.27	2,887.80	10,669.07	6,582.93	38.16 %
52-5200-231000	TRAVEL & TRAINING	19,000.00	6,911.99	0.00	6,911.99	12,088.01	63.62 %
52-5200-241000	OFFICE EXPENSE	6,000.00	1,672.48	0.00	1,672.48	4,327.52	72.13 %
52-5200-252000	OPERATION & MAINTENANCE	600,000.00	195,875.36	10,276.57	206,151.93	393,848.07	65.64 %
52-5200-253001	SHOP ALLOCATION	47,925.00	15,975.00	0.00	15,975.00	31,950.00	66.67 %
52-5200-253002	ELECTRICAN ALLOCATION	37,078.00	12,359.32	0.00	12,359.32	24,718.68	66.67 %
52-5200-253003	CIVIL INSPECTOR ALLOCATION (10 FUND)	85,024.00	28,341.32	0.00	28,341.32	56,682.68	66.67 %
52-5200-253004	UTILITY SERVICE TECHNICIAN (10 FD)	28,304.00	9,434.68	0.00	9,434.68	18,869.32	66.67 %
52-5200-253006	PW INSPECTOR/CROSS CONNECT	112,311.00	37,437.00	0.00	37,437.00	74,874.00	66.67 %
52-5200-254000	SEWER LINE/MANHOLE MAINTENANCE	5,000.00	4,114.69	0.00	4,114.69	885.31	17.71 %
52-5200-271000	BUILDING OPERATION & MAINT.	5,000.00	1,505.65	165.55	1,671.20	3,328.80	66.58 %
52-5200-281000	ROCKY MOUNTAIN POWER	290,000.00	128,920.00	135.77	129,055.77	160,944.23	55.50 %
52-5200-282000	QUESTAR GAS	25,000.00	7,340.79	0.00	7,340.79	17,659.21	70.64 %
52-5200-292000	WIRELESS COMMUNICATIONS	9,500.00	3,587.76	129.92	3,717.68	5,782.32	60.87 %
52-5200-311000	PROFESSIONAL & TECHNICAL	100,000.00	53,421.53	37,037.89	90,459.42	9,540.58	9.54 %
52-5200-311019	IMPACT FEE UPDATES (IF)	3,000.00	0.00	0.00	0.00	3,000.00	100.00 %
52-5200-481000	SPECIAL DEPT SUPPLIES	50,000.00	41,327.13	2,218.67	43,545.80	6,454.20	12.91 %
52-5200-511000	INSURANCE	21,100.00	21,100.00	0.00	21,100.00	0.00	0.00 %
52-5200-550000	DEPRECIATION EXPENSE	1,100,000.00	366,666.68	0.00	366,666.68	733,333.32	66.67 %
52-5200-551000	ADMIN/ACCOUNTING FEES(10 FUND)	236,963.00	78,987.68	0.00	78,987.68	157,975.32	66.67 %
52-5200-560000	BAD DEBTS EXPENSE	2,000.00	3,551.29	0.00	3,551.29	-1,551.29	-77.56 %
52-5200-610000	MISCELLANEOUS EQUIPMENT	750.00	0.00	0.00	0.00	750.00	100.00 %
52-5214-252000	OPERATION & MAINTENANCE	5,000.00	0.00	0.00	0.00	5,000.00	100.00 %
52-5214-281000	ROCKY MOUNTAIN POWER	500.00	-446.51	0.00	-446.51	946.51	189.30 %
52-5214-311013	LAKES AT OVERLAKE MAINTENANCE	50,000.00	10,100.00	1,466.45	11,566.45	38,433.55	76.87 %
52-5214-481000	SPECIAL DEPT SUPPLIES	1,000.00	0.00	0.00	0.00	1,000.00	100.00 %
52-5214-731218	SECONDARY WTR PROJ PHASE 1	50,000.00	31,008.20	18,991.80	50,000.00	0.00	0.00 %
52-5220-721200	TREATMENT PLANT UPGRADES PH 1 (25%IF)	20,000.00	13,425.80	0.00	13,425.80	6,574.20	32.87 %
52-5220-721202	HEADWORKS BUILDING (%IF)	8,616,800.00	1,694,769.63	541,054.30	2,235,823.93	6,380,976.07	74.05 %
52-5220-731202	CDBG GRANT- BROADWAY SEWER LINES	625,572.00	0.00	0.00	0.00	625,572.00	100.00 %
52-5220-731204	SEWER LINE REPLACEMENT	230,000.00	0.00	6,200.00	6,200.00	223,800.00	97.30 %
52-5220-731730	IRON STREET PROJECT	356,600.00	331,872.80	0.00	331,872.80	24,727.20	6.93 %
52-5220-741000	MACHINERY & EQUIPMENT	25,000.00	25,000.00	0.00	25,000.00	0.00	0.00 %

Account Summary

Account	Name	Fiscal Budget	Beginning Balance	Total Activity	Ending Balance	Budget Remaining	% Remaining
52-5220-741001	EQUIPMENT - LEASE PURCHASE	45,000.00	42,010.29	0.00	42,010.29	2,989.71	6.64 %
52-5750-810000	BOND PRINCIPAL	167,000.00	0.00	0.00	0.00	167,000.00	100.00 %
52-5750-820000	BOND INTEREST	96,428.00	95,628.66	0.00	95,628.66	799.34	0.83 %
52-5750-830000	TRUSTEE FEES	1,500.00	0.00	0.00	0.00	1,500.00	100.00 %
	Expense Totals:	**14,345,589.00**	**3,736,794.07**	**700,271.11**	**4,437,065.18**	**9,908,523.82**	**69.07 %**
	52 - SEWER FUND Totals:	**14,345,589.00**	**3,736,794.07**	**700,271.11**	**4,437,065.18**	**9,908,523.82**	**69.07 %**

(52) SEWER FUND REVENUES

ACCT NUMBER	SOURCE OF REVENUE	ACTUAL FY 6/2022	ESTIMATED FY 6/2023	BUDGET FY 6/2023	REQUEST FY 6/2024	RECOMMEND FY 6/2024	APPROVED FY 6/2024
	NON OPERATING REVENUES:						
3380100	CDBG GRANT				400,000	400,000	400,000
3610000	INTEREST INCOME	22,597	127,803	15,000	130,000	130,000	130,000
3640000	SALE OF FIXED ASSETS	43,142	0	2,000	0	0	0
3650000	SALE OF MATERIALS AND SUPPLIES	2,912	0		0	0	0
3690000	MISCELLANEOUS REVENUE	77,385	28,000	35,000	30,000	30,000	30,000
3690500	SEWER IMPACT FEES	1,372,268	650,345	1,400,000	650,000	650,000	650,000
3600	TOTAL NON-OPERATING REVENUE	1,518,304	806,148	1,452,000	1,210,000	1,210,000	1,210,000
	OPERATING REVENUE:						
3731000	SALES	3,309,275	3,465,548	3,300,000	3,500,000	3,500,000	3,500,000
3731001	EFFLUENT SALES	7,117	13,253	10,000	13,500	13,500	13,500
3731002	CITY SEWER FEES	4,726	4,728	4,728	4,728	4,728	4,728
3733000	WASTEWATER CONNECTION FEES	1,870	1,360	2,500	2,000	2,000	2,000
3700	TOTAL OPERATING REVENUE	3,322,988	3,484,889	3,317,228	3,520,228	3,520,228	3,520,228
	CONTRIBUTIONS AND TRANSFERS:						
3813000	TRANSFER FROM GENERAL FUND (10)	2,600,000		226,580			
3816075	TRANSFER FROM 75 FUND				130,020	130,020	130,020
3870000	CONTRIBUTIONS / PRIVATE SOURCES	846,953					
3890520	APPROPRIATION - RET EARNING / (INCREASE)	(2,806,462)	1,633,163	3,882,815	3,635,341	3,635,341	3,635,341
3891520	APPROPRIATION - IMPACT FEE RESERVE		(806,148)	3,400,000	5,850,000	5,850,000	5,850,000
3800	TOTAL CONTRIBUTIONS & TRNSFRS	640,491	827,015	7,509,395	9,615,361	9,615,361	9,615,361
3000	TOTAL SEWER FUND REVENUES	5,481,783	5,118,053	12,278,623	14,345,589	14,345,589	14,345,589

(52) SEWER FUND EXPENDITURES

DEPT NUMBER	DEPARTMENT	ACTUAL FY 6/2022	ESTIMATED FY 6/2023	BUDGET FY 6/2023	REQUEST FY 6/2024	RECOMMEND FY 6/2024	APPROVED FY 6/2024
	OPERATIING EXPENSES:						
111000	REGULAR EMPLOYEES	476,061	537,945	671,907	720,106	720,106	720,106
112000	OVERTIME	9,231	15,928	37,476	40,108	40,108	40,108
115000	ON CALL PAY	9,117	8,580	9,479	9,128	9,128	9,128
121000	TEMPORARY EMPLOYEES	7,020		17,568	18,782	18,782	18,782
131000	EMPLOYEE BENEFITS	12,968	162,827	213,864	224,763	224,763	224,763
132000	MEDICAL & LIFE INSURANCE	127,875	127,332	222,071	238,095	238,095	238,095
211000	SUBSCRIPTIONS & MEMBERSHIPS	3,163	0	3,000	3,000	3,000	3,000
213000	RETIRED EMPLOYEES INSURANCE	13,080	16,857	16,870	17,252	17,252	17,252
231000	TRAVEL & TRAINING	7,700	9,171	15,000	19,000	19,000	19,000
241000	OFFICE EXPENSE	523	1,156	6,000	6,000	6,000	6,000
252000	OPERATION & MAINTENANCE	719,251	676,583	600,000	600,000	600,000	600,000
253001	SHOP ALLOCATION (10 FUND)	45,000	45,000	45,000	47,925	47,925	47,925
253002	ELECTRICIAN ALLOCATION (10 FUND)	24,120	34,471	34,471	37,078	37,078	37,078
253003	LINE LOCATOR/DIRECTOR	104,558	120,201	120,201	85,024	85,024	85,024
253004	UTILITY SERVICE TECHNICIAN (10 FUND)				28,304	28,304	28,304
253006	PUBLIC WORKS INSPECTOR/CROSS CONNECTION		68,346	68,346	112,311	112,311	112,311
254000	SEWER LINE/MANHOLE MAINTENANCE	5,000	0	50,000	5,000	5,000	5,000
271000	BUILDING OPERATION & MAINTENANCE	1,913	0	10,000	5,000	5,000	5,000
281000	ROCKY MOUNTAIN POWER	221,725	309,825	290,000	290,000	290,000	290,000
282000	QUESTAR GAS	66,012	103,060	25,000	25,000	25,000	25,000
292000	WIRELESS COMMUNICATIONS	7,633	8,347	8,500	9,500	9,500	9,500
311000	PROFESSIONAL & TECHNICAL	184,561	100,701	100,000	100,000	100,000	100,000
311019	IMPACT FEE UPDATES (IF)	11,055	3,100	3,000	3,000	3,000	3,000
481000	SPECIAL DEPARTMENTAL SUPPLIES	100,193	79,440	50,000	50,000	50,000	50,000
511000	INSURANCE AND BONDS		21,100	21,100	21,100	21,100	21,100
550000	DEPRECIATION EXPENSE	1,118,025	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000
551000	ADMIN/ACCOUNTING FEES (10 FUND)	222,500	222,500	222,500	236,963	236,963	236,963
560000	BAD DEBTS EXPENSE	(7,122)		2,000	2,000	2,000	2,000
610000	MISCELLANEOUS EQUIPMENT			750	750	750	750
5200	TOTAL OPERATING EXPENSES	3,491,162	3,772,470	3,964,103	4,055,189	4,055,189	4,055,189
	SECONDARY WATER SYSTEM						
252000	OPERATION AND MAINTENANCE	2,647	0	5,000	5,000	5,000	5,000
281000	ROCKY MOUNTAIN POWER	(511)	115	500	500	500	500
311013	LAKES AT OVERLAKE MAINTENANCE	41,957	44,979	150,000	50,000	50,000	50,000
481000	SPECIAL DEPARTMENTAL SUPPLIES		0	1,000	1,000	1,000	1,000
731218	SECONDARY WATER PROJECT PHASE 1	6,620	0	50,000	50,000	50,000	50,000
5214	TOTAL SECONDARY WATER SYSTEM	50,713	45,093	206,500	106,500	106,500	106,500

(52) SEWER FUND EXPENSES:

DEPT NUMBER	DEPARTMENT	ACTUAL FY 6/2022	ESTIMATED FY 6/2023	BUDGET FY 6/2023	REQUEST FY 6/2024	RECOMMEND FY 6/2024	APPROVED FY 6/2024
	CAPITAL EXPENDITURES:						
721200	TREATMENT PLANT UPGRADES PHASE 1 (% IF)	1,027,958	171,331	1,000,000	20,000	20,000	20,000
721201	SOCK & FILTERS FOR PLANT	528,685	484,223	1,050,000			
721202	HEADWORKS BUILDING REPLACEMENT	30,853	263,660	**4,800,000**	**8,616,800**	**8,616,800**	**8,616,800**
731202	BROADWAY SEWER LINE PROJECT - CDBG GRANT				625,572	625,572	625,572
731204	SEWER LINE REPLACEMENT	21,398	24,836	250,000	230,000	230,000	230,000
731219	CALDWELL SEWER PROJECT		0				
731221	GREENHOUSE CONVEYOR EXPANSION		0				
731222	OXIDATION DITCH ROTORS			400,000			
731730	IRON STREET PROJECT			226,580	356,600	356,600	356,600
741000	MACHINERY & EQUIPMENT	14,830	0	25,000	25,000	25,000	25,000
741001	EQUIPMENT - LEASE PURCHASE	44,570	45,000	45,000	45,000	45,000	45,000
748000	AUTOS AND TRUCKS	16,206					
5220	TOTAL CAPITAL EXPENDITURES	1,684,500	989,049	7,796,580	9,918,972	9,918,972	9,918,972
	DEBT SERVICE						
	2010 C.I.B. SEWER BONDS	**Acct # 8501555 & 555A**					
810000	BOND PRINCIPAL	153,000	160,000	160,000	167,000	167,000	167,000
820000	BOND INTEREST	100,908	149,940	149,940	96,428	96,428	96,428
830000	TRUSTEE FEES	1,500	1,500	1,500	1,500	1,500	1,500
5750	TOTAL 2010 C.I.B SEWER BONDS	255,408	311,440	311,440	264,928	264,928	264,928
5000	TOTAL EXPENSES/EXPENDITURES	5,481,783	5,118,053	12,278,623	14,345,589	14,345,589	14,345,589

TOOELE CITY CORPORATION

RESOLUTION 2024-22

A RESOLUTION OF THE CITY COUNCIL (THE "COUNCIL") OF TOOELE CITY, UTAH (THE "CITY"), PROVIDING FOR THE CREATION OF 10TH AND MAIN PUBLIC INFRASTRUCTURE DISTRICT (THE "DISTRICT") AS AN INDEPENDENT DISTRICT, AUTHORIZING AND APPROVING A GOVERNING DOCUMENT AND AN INTERLOCAL AGREEMENT; APPOINTING A BOARD OF TRUSTEES; AUTHORIZING OTHER DOCUMENTS IN CONNECTION THEREWITH; AND RELATED MATTERS.

WHEREAS, a petition (the "Petition") was filed with the City requesting adoption by resolution the approval of the creation of a Public Infrastructure District pursuant to the Public Infrastructure District Act, Title 17D, Chapter 4, Utah Code Annotated 1953, as amended (the "PID Act") and relevant portions of the Limited Purpose Local Government Entities - Special Districts, Title 17B (together with the PID Act, the "Act") within the City and the annexation or withdrawal of any portion of the boundaries of the District therefrom without further approval or hearings of the City or the Council, as further described in the Governing Document (as hereinafter defined) for the purpose of financing public infrastructure costs; and

WHEREAS, pursuant to the terms of the Act, the City may create one or more public infrastructure districts by adoption of a resolution of the Council and with consent of 100% of all surface property owners proposed to be included in the District (the "Property Owners"); and

WHEREAS, the Petition, containing the consent of such Property Owners has been certified by the Recorder of the City pursuant to the Act and it is in the best interests of the Property Owners that the creation of the District be authorized in the manner and for the purposes hereinafter set forth; and

WHEREAS, the City, prior to consideration of this Resolution, held public hearings after 6:00 p.m. to receive input from the public regarding the creation of the District and the Property Owners have waived the 60-day protest period pursuant to Section 17D-4-201 of the PID Act; and

WHEREAS, the hearing on the Petition was held at the City Hall because there is no reasonable place to hold a public hearing within the District's boundaries, and the hearing at the City Hall was held as close to the applicable area as reasonably possible; and

WHEREAS, the City properly published notice of the public hearing in compliance with Section 17B-1-211(1) of the Act; and

WHEREAS, none of the Property Owners submitted a withdrawal of consent to the creation of the District before the public hearing on the Petition; and

WHEREAS, according to attestations filed with the City, each board member appointed under this Resolution is registered to vote at their primary residence and is further eligible to serve as a board member of the District under Section 17D-4-202(c) of the PID Act because they are agents of property owners within the District's boundaries (as further set forth in the Petition); and

WHEREAS, it is necessary to authorize the creation of the District under and in compliance with the laws of the State of Utah and to authorize other actions in connection therewith; and

WHEREAS, the governance of the District shall be in accordance with the PID Act and the terms of a governing document (the "Governing Document") attached hereto as Exhibit B and an Interlocal Agreement between the City and the District, attached to the Governing Document as Governing Document Exhibit D; and

WHEREAS, pursuant to the requirements of the Act, there shall be signed, authenticated, and submitted to the Office of the Lieutenant Governor of the State of Utah the District a Notice of Boundary Action attached hereto as Exhibit C (the "Boundary Notice") and a Final Entity Plat attached as Boundary Notice Appendix B (or as shall be finalized in accordance with the boundaries approved hereunder) (the "Plat").

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL, AS FOLLOWS:

1. Terms defined in the foregoing recitals shall have the same meaning when used herein. All action heretofore taken (not inconsistent with the provisions of this Resolution) by the Council and by officers of the Council directed toward the creation and establishment of the District, are hereby ratified, approved and confirmed.

2. The District is hereby created as a separate entity from the City in accordance with the Governing Document and the Act. The boundaries of the District shall be as set forth in the Governing Document and the Plat.

3. Pursuant to the terms of the PID Act, the Council does hereby approve the annexation or withdrawal of any area within the Annexation Area (as defined in the Governing Document) into or from the District, as applicable, without any further action, hearings, or resolutions of the Council or the City, upon compliance with the terms of the PID Act and the Governing Document.

4. The Council does hereby authorize the District to provide services relating to the financing and construction of public infrastructure within and without the Annexation Area upon annexation thereof into the Districts without further request of the Districts to the City to provide such service under 17B-1-407, Utah Code Annotated 1953 or resolutions of the City under 17B-1-408, Utah Code Annotated 1953.

5. It is hereby found and determined by the Council that the creation of the District is appropriate to the general welfare, order and security of the City, and the organization of the District pursuant to the PID Act is hereby approved.

6. The Governing Document and the Interlocal Agreement in the form presented to this meeting and attached hereto as Exhibit B is hereby authorized and approved and the District shall be governed by the terms thereof and applicable law.

7. The Trustees of the Board of the District shall be initially composed of the same members. The initial Board of the District is hereby appointed as follows:

(a) Trustee 1 – Victor M. Kimball, for an initial 6-year term;

(b) Trustee 2 – Justin M. Kimball, for an initial 6-year term; and

(c) Trustee 3 – Jayd Peterson, for an initial 4-year term.

(d) Trustee 4 – David M. Kimball, for an initial 4-year term.

(e) Trustee 5 – Ryan V. Kimball, for an initial 4-year term.

(f) Such terms shall commence on the date of issuance of a Certificate of Creation by the Office of the Lieutenant Governor of the State of Utah.

8. The Council does hereby authorize the Mayor or a Councilmember to execute the Boundary Notice in substantially the form attached as Exhibit C, the Plats, and such other documents as shall be required to accomplish the actions contemplated herein on behalf of the Council for submission to the Office of the Lieutenant Governor of the State of Utah.

9. Prior to recordation of certificates of creation for the District, the Council does hereby authorize the Mayor, a Councilmember, or the City Attorney, to make any corrections, deletions, or additions to the Governing Document, the Interlocal Agreement, and the Boundary Notice or any other document herein authorized and approved (including, but not limited to, corrections to the property descriptions therein contained) which may be necessary to conform the same to the intent hereof, to correct errors or omissions therein, to complete the same, to remove ambiguities therefrom, or to conform the same to other provisions of said instruments, to the provisions of this Resolution or any resolution adopted by the Council or the provisions of the laws of the State of Utah or the United States.

10. The Board of Trustees of the District (the "District Board") is hereby authorized and directed to record such Governing Document with the recorder of the Tooele County within thirty (30) days of the issuance of the Certificate of Creation by the Office of the Lieutenant Governor of the State of Utah.

11. If any section, paragraph, clause or provision of this Resolution shall for any reason be held to be invalid or unenforceable, the invalidity or unenforceability of such section, paragraph, clause or provision shall not affect any of the remaining provisions of this Resolution.

12. All acts, orders and resolutions, and parts thereof in conflict with this Resolution be, and the same are hereby, rescinded.

13. This resolution shall take effect immediately provided that, in the event that the Plat is not finalized for submission to the Office of the Lieutenant Governor until a date that is more than thirty (30) days after adoption of this Resolution, the effective date of this Resolution will be deemed to be the date the Plat is finalized, as certified in writing by any one of the Mayor, a Councilperson, or the City Attorney.

IN WITNESS WHEREOF, this Resolution is passed by the Tooele City Council this 20 day of March, 2024.

TOOELE CITY COUNCIL

(For) (Against)

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

ABSTAINING: _____

TOOELE CITY MAYOR

(Approved) (Disapproved)

_____ _____

ATTEST:

_____

Michelle Y. Pitt, City Recorder

S E A L

Approved as to Form: _____

Roger Evans Baker, Tooele City Attorney

Exhibit A

Certificate of Compliance with Open Meeting Law

CERTIFICATE OF COMPLIANCE WITH OPEN MEETING LAW

I, Michelle Pitt, the undersigned City Recorder of Tooele City, Utah (the "City"), do hereby certify that I gave written public notice of the agenda, date, time and place of the regular meeting held by the Council (the "Council") on March 20, 2024, not less than twenty-four (24) hours in advance of the meeting. The public notice was given in compliance with the requirements of the Utah Open and Public Meetings Act, Section 52-4-202, Utah Code Annotated 1953, as amended, by:

(a) causing a Notice to be posted at the City's principal offices at least twenty-four (24) hours prior to the convening of the meeting, said Notice having continuously remained so posted and available for public inspection until the completion of the meeting;

(b) causing a copy of such Notice to be published on the Utah Public Notice Website (http://pmn.utah.gov) at least twenty-four (24) hours prior to the convening of the meeting; and

(c) causing a copy of such notice to be posted on the City's official website at least twenty-four (24) hours prior to the convening of the meeting.

In addition, the Notice of 2024 Annual Meeting Schedule for the Council was given specifying the date, time and place of the regular meetings of the Council of the City to be held during the year, by causing said Notice to be posted at least annually (a) on the Utah Public Notice Website created under Section 63A-16-601, Utah Code Annotated 1953, as amended, (b) on the City's official website and (c) in a public location within the City that is reasonably likely to be seen by residents of the City.

IN WITNESS WHEREOF, I have hereunto subscribed my official signature this March 20, 2024.

By:_____
City Recorder

Exhibit B

Governing Document

GOVERNING DOCUMENT
FOR

10TH AND MAIN PUBLIC INFRASTRUCTURE DISTRICT

TOOELE CITY, UTAH

Prepared

by

York Howell, LLC
South Jordan, Utah

March 14, 2024

TABLE OF CONTENTS

LIST OF EXHIBITS

I. INTRODUCTION

A. Purpose and Intent.

The District is an independent unit of local government, separate and distinct from the City, and, except as may otherwise be provided for by state or local law or this Governing Document, its activities are subject to review by the City only insofar as they may deviate in a material matter from the requirements of the Governing Document. It is intended that the District will provide a part or all of the Public Improvements for the use and benefit of all anticipated inhabitants and taxpayers of the District. The primary purpose of the District will be to finance the construction of these Public Improvements. The District is not being created to provide any ongoing operations and maintenance services.

B. Need for the District.

There are currently no other governmental entities, including the City, located in the immediate vicinity of the District that consider it desirable, feasible, or practical to undertake the planning, design, acquisition, construction installation, relocation, redevelopment, and financing of the Public Improvements needed for the Project. Formation of the District is therefore necessary in order for the Public Improvements required for the Project to be provided in the most economic manner possible.

C. Objective of the City Regarding District's Governing Document.

The City's objective in approving the Governing Document for the District is to authorize the District to provide for the planning, design, acquisition, construction, installation, relocation, and redevelopment of the Public Improvements from the proceeds of Debt to be issued by the District. All Debt is expected to be repaid by taxes imposed and collected for no longer than the Maximum Debt Mill Levy Imposition Term for residential properties and at a tax mill levy no higher than the Maximum Debt Mill Levy for commercial and residential properties, and/or repaid by Assessments. Debt, which is issued within these parameters and, as further described in the Financial Plan, will insulate property owners from excessive tax burdens to support the servicing of the Debt and will result in a timely and reasonable discharge of the Debt.

This Governing Document is intended to establish a limited purpose for the District and explicit financial constraints that are not to be violated under any circumstances. The primary purpose is to provide for the Public Improvements associated with development and regional needs. Operational activities are allowed, but only through an Interlocal Agreement with the City or relevant public entity.

It is the intent of the District to dissolve upon payment or defeasance of all Debt incurred or upon a determination that adequate provision has been made for the payment of all Debt, and if the District has authorized operating functions under an Interlocal Agreement, to retain only the power necessary to impose and collect taxes or Fees to pay for these costs.

The District shall be authorized to finance the Public Improvements that can be funded from Debt to be repaid from Assessments or from tax revenues collected from a mill levy which

shall not exceed the Maximum Debt Mill Levy on taxable properties and which shall not exceed the Maximum Debt Mill Levy Imposition Term on taxable properties (or repaid from a combination of Assessments and a mill levy). It is the intent of this Governing Document to assure to the extent possible that no taxable property bear an economic burden that is greater than that associated with the Maximum Debt Mill Levy in amount and that no taxable property bear an economic burden that is greater than that associated with the Maximum Debt Mill Levy Imposition Term in duration even under bankruptcy or other unusual situations. Generally, the cost of Public Improvements that cannot be funded within these parameters are not costs to be paid by the District.

D. Applicability. This Governing Document is not intended to and does not create any rights or remedies in favor of any party other than the City. Failure of the District to comply with any terms or conditions of this Governing Document shall not relieve any party of an obligation to the District or create a basis for a party to challenge the incorporation or operation of the District, or any Debt issued by the District.

II. DEFINITIONS

In this Governing Document, the following terms shall have the meanings indicated below, unless the context hereof clearly requires otherwise:

Annexation Area Boundaries: means the boundaries of the area described in the Annexation Area Map which have been approved by the City for annexation into or withdrawal from the District upon the meeting of certain requirements.

Annexation Area Boundary Map: means the map attached hereto as **Exhibit C**, describing the property proposed for annexation within the District.

Approved Development Plan: means a preliminary development plan or other process established by the City for identifying, among other things, Public Improvements necessary for facilitating development for property within the District Area as approved by the City pursuant to the City Code and as amended pursuant to the City Code from time to time.

Assessment: means the levy of an assessment secured by a lien on property within a District to pay for the costs of Public Improvements benefitting such property, as may be levied pursuant to the Assessment Act.

Assessment Act: means Title 11, Chapter 42, Utah Code as may be amended from time to time.

Board: means the board of trustees of the District.

Bond, Bonds, or Debt: means bonds or other obligations, including loans of any property owner, for the payment of which the District has promised to impose an ad valorem property tax mill levy, and/or collect Assessments.

City: means Tooele City, Utah.

City Code: means the City Code of Tooele City, Utah.

City Council: means the City Council of Tooele City, Utah.

C-PACE Act: means Title 11, Chapter 42a of the Utah Code, as amended from time to time and any successor statute thereto.

C-PACE Bonds: means bonds, loans, notes, or other structures and obligations of the District issued pursuant to the C-PACE Act, including refunding C-PACE Bonds.

C-PACE Assessments: means assessments levied under the C-PACE Act.

Developer: means collectively Tally Three, LLC, MRI Investment, LLC, Golden Heights, LLC and 1030 Salt Lake City, LLC.

District: means 10th and Main Public Infrastructure District.

District Act: means the Special District Act and the PID Act.

District Area: means the property within the Initial District Boundaries Map and the Annexation Area Map.

End User: means any owner, or tenant of any owner, of any taxable improvement within the District, who is intended to become burdened by the imposition of ad valorem property taxes subject to the Maximum Debt Mill Levy. By way of illustration, a resident homeowner, renter, commercial property owner, or commercial tenant is an End User. The business entity that constructs homes or commercial structures is not an End User.

Fees: means any fee imposed by the District for administrative services provided by the District.

Financial Plan: means the Financial Plan described in Section VIII which describes (i) the potential means whereby the Public Improvements may be financed; (ii) how the Debt is expected to be incurred; and (iii) the estimated operating revenue derived from property taxes for the first budget year.

General Obligation Debt: means a Debt that is directly payable from and secured by ad valorem property taxes that are levied by the District and does not include Limited Tax Debt.

Governing Document: means this Governing Document for the District approved by the City Council Commission.

Governing Document Amendment: means an amendment to the Governing Document approved by the City Council in accordance with the City's ordinance and the applicable state law and approved by the Board in accordance with applicable state law.

Initial District Boundaries: means the boundaries of the area described in the Initial District Boundaries Map and more particularly described by the legal descriptions found in **Exhibit A**.

Initial District Boundary Map: means the map attached hereto as **Exhibit C**, describing the District's initial boundaries.

Limited Tax Debt: means a debt that is directly payable from and secured by ad valorem property taxes that are levied by the District which may not exceed the Maximum Debt Mill Levy.

Maximum Debt Mill Levy: means the maximum mill levy the District is permitted to impose for payment of Debt as set forth in Section VIII.C below.

Maximum Debt Mill Levy Imposition Term: means the maximum term for imposition of a mill levy for any given series of bonds as set forth in Section VIII.D below.

Municipal Advisor: means a consultant that: (i) advises Utah governmental entities on matters relating to the issuance of securities by Utah governmental entities, including matters such as the pricing, sales and marketing of such securities and the procuring of bond ratings, credit enhancement and insurance in respect of such securities; (ii) shall be an individual listed as a public finance advisor in the Bond Buyer's Municipal Market Place; and (iii) is not an officer or employee of the District.

Project: means the development or property commonly referred to as 10th and Main.

PID Act: means Title 17D, Chapter 4 of the Utah Code, as amended from time to time and any successor statute thereto.

Public Improvements: means a part or all of the improvements authorized to be planned, designed, acquired, constructed, installed, relocated, redeveloped, and financed as generally described in the District Act, except as specifically limited in Section V below to serve the future taxpayers and inhabitants of the District Area as determined by the Board.

Special District Act: means Title 17B of the Utah Code, as amended from time to time.

State: means the State of Utah.

Taxable Property: means real or personal property within the District Area subject to ad valorem taxes imposed by the District.

Trustee: means a member of the Board.

Utah Code: means the Utah Code Annotated 1953, as amended.

III. BOUNDARIES

The area of the Initial District Boundaries includes approximately 33 acres, and the Annexation Area Boundaries includes approximately 33 acres (including the entirety of the Initial District Boundaries). A legal description of the Initial District Boundaries and the Annexation Area Boundaries is attached hereto as **Exhibit A**. A vicinity map is attached hereto as **Exhibit B**. A map of the Initial District Boundaries and Annexation Area Map is attached hereto as **Exhibit C**. It is anticipated that the District's boundaries may change from time to time as it undergoes annexations and withdrawals pursuant to Section 17D-4-201, Utah Code, subject to Article V below.

IV. PROPOSED LAND USE/POPULATION PROJECTIONS/ASSESSED VALUATION

The District Area consists of approximately 33 acres of unimproved land.

Approval of this Governing Document by the City does not imply approval of the development of a specific area within the District, nor does it imply approval of the number of the total site/floor area of commercial or industrial buildings identified in this Governing Document or any of the exhibits attached thereto, unless the same is contained within an Approved Development Plan.

V. DESCRIPTION OF PROPOSED POWERS, IMPROVEMENTS, AND SERVICES

A. Powers of the District and Governing Document Amendment.

The District shall have the power and authority to provide the Public Improvements within and without the boundaries of the District as such power and authority is described in the District Act, and other applicable statutes, common law and the Constitution, subject to the limitations set forth herein.

1. Operations and Maintenance Limitation. The purpose of the District is to plan for, design, acquire, construct, install, relocate, redevelop, and finance the Public Improvements. The District shall dedicate the Public Improvements to the City or other appropriate public entity or owners association in a manner consistent with the Approved Development Plan and other rules and regulations of the City and applicable provisions of the City Code. The District shall be authorized, but not obligated, to own, operate, and maintain Public Improvements not otherwise required to be dedicated to the City or other public entity, including, but not limited to, street improvements (including roads, curbs, gutters, culverts, sidewalks, bridges, parking facilities, paving, lighting, grading, landscaping, and other street improvements), traffic and safety controls, retaining walls, park and recreation improvements and facilities, trails, open space, landscaping, drainage improvements (including detention and retention ponds, trickle channels, and other drainage facilities), irrigation system improvements (including wells, pumps, storage facilities, and distribution facilities), and all necessary equipment and appurtenances incident thereto.

2. Reserved.

3. Construction Standards Limitation. The District will ensure that the Public Improvements are designed and constructed in accordance with the standards and specifications of the City and of other governmental entities having proper jurisdiction. The District will obtain the City's approval of civil engineering plans and will obtain applicable permits for construction and installation of Public Improvements prior to performing such work.

4. Procurement. The District shall be subject to the Utah Procurement Code, Title 63G, Chapter 6a. Notwithstanding this requirement, the Districts may acquire completed or partially completed improvements for fair market value as reasonably determined by an engineer who certifies as part of such fair market value determination that they are independent of such District.

Prior to the issuance of any privately placed Debt, the District shall obtain the certification of a Municipal Advisor substantially as follows:

> We are [I am] a Municipal Advisor within the meaning of the District's Governing Document.
>
> We [I] certify that (1) the net effective interest rate to be borne by [insert the designation of the Debt] does not exceed a reasonable current [tax-exempt] [taxable] interest rate, using criteria deemed appropriate by us [me] and based upon our [my] analysis of comparable high yield securities; and (2) the structure of [insert designation of the Debt], including maturities and early redemption provisions, is reasonable considering the financial circumstances of the District.

6. Annexation and Withdrawal.

(a) The District shall not include within any of their boundaries any property outside the District Area without the prior written consent of the City. The City, by approval of this Governing Document, has consented to the annexation of any area within the Annexation Area Boundaries into the District. Such area may only be annexed upon the District obtaining consent of all property owners and registered voters, if any, within the area proposed to be annexed and the passage of a resolution of the Board approving such annexation.

(b) The City, by approval of this Governing Document, has consented to the withdrawal of any area within the District Boundaries from the District. Such area may only be withdrawn upon the District obtaining consent of all property owners and registered voters, if any, within the area proposed to be withdrawn and the passage of a resolution of the Board approving such annexation.

(c) Any annexation or withdrawal shall be in accordance with the requirements of the PID Act.

(d) Upon any annexation or withdrawal, the District shall provide the City a description of the revised District Boundaries.

(e) Annexation or withdrawal of any area in accordance with this Section shall not constitute an amendment of this Governing Document.

7. Overlap Limitation. Without the written consent of the City, the District shall not consent to the organization of any other public infrastructure district organized under the PID Act within the District Area which will overlap the boundaries of the District unless the aggregate mill levy for payment of Debt of such proposed districts will not at any time exceed the Maximum Debt Mill Levy of the District.

8. Initial Debt Limitation. On or before the effective date of approval by the City of an Approved Development Plan, the District shall not: (a) issue any Debt; nor (b) impose a mill levy for the payment of Debt by direct imposition or by transfer of funds from the operating fund to the Debt service funds; nor (c) impose and collect any Assessments used for the purpose of repayment of Debt.

9. Total Debt Issuance Limitation. The District shall not issue Limited Tax Debt in excess of Eighteen Million Dollars ($18,000,000). This amount excludes any portion of bonds issued to refund a prior issuance of debt by the District. For any capital appreciation Debt issued by the District, only the par amount of such Debt at issuance (and not the value at conversion) of such Debt shall count against this amount. Any Assessment Debt or C-PACE Bonds do not count against the foregoing limitation and there is no limit to the amount of Assessment Debt or C-PACE Bonds the District may issue so long as such issuances are in accordance with the provisions of the applicable Assessment Act.

10. Bankruptcy Limitation. All of the limitations contained in this Governing Document, including, but not limited to, those pertaining to the Maximum Debt Mill Levy, Maximum Debt Mill Levy Imposition Term, and the Fees have been established under the authority of the City to approve a Governing Document with conditions pursuant to Section 17D-4-201(5), Utah Code. It is expressly intended that such limitations:

(a) Shall not be subject to set-aside for any reason or by any court of competent jurisdiction, absent a Governing Document Amendment; and

(b) Are, together with all other requirements of Utah law, included in the "political or governmental powers" reserved to the state under the U.S. Bankruptcy Code (11 U.S.C.) Section 903, and are also included in the "regulatory or electoral approval necessary under applicable non-bankruptcy law" as required for confirmation of a Chapter 9 Bankruptcy Plan under Bankruptcy Code Section 943(b)(6).

(c) Any Debt, issued with a pledge or which results in a pledge, that exceeds the Maximum Debt Mill Levy and the Maximum Debt Mill Levy Imposition Term, shall be deemed a material modification of this Governing Document and shall not be an authorized issuance of Debt unless and until such

material modification has been approved by the City as part of a Governing Document Amendment.

11. Governing Document Amendment Requirement.

This Governing Document has been designed with sufficient flexibility to enable the District to provide required facilities under evolving circumstances without the need for numerous amendments. Subject to the limitations and exceptions contained herein, this Governing Document may be amended by passage of a resolution of the City and the applicable District approving such amendment.

B. Preliminary Engineering Survey.

The District shall have authority to provide for the planning, design, acquisition, construction, installation, relocation, redevelopment, maintenance, and financing of the Public Improvements within and without the boundaries of the District, to be more specifically defined in an Approved Development Plan. An estimate of the costs of the Public Improvements which may be planned for, designed, acquired, constructed, installed, relocated, redeveloped, maintained or financed was prepared based upon a preliminary engineering survey and estimates derived from the zoning on the property in the District Area and is approximately $15,000,000.

All of the Public Improvements will be designed in such a way as to assure that the Public Improvements standards will be compatible with those of the City and/or any other applicable public entity and shall be in accordance with the requirements of the Approved Development Plan. All construction cost estimates are based on the assumption that construction conforms to applicable local, state, or federal requirements.

VI. THE BOARD OF TRUSTEES

A. Board Composition. The Board shall be composed of five (5) Trustees who shall be appointed by the City Council pursuant to the PID Act. All Trustees shall be at large seats. Trustee terms for the District shall be staggered with initial terms as follows: Trustees 3, 4, and 5 shall serve an initial term of four (4) years; Trustees 1 and 2 shall serve an initial term of six (6) years. All terms shall commence on the date of issuance of a Certificate of Creation by the Office of the Lieutenant Governor of the State of Utah. In accordance with the PID Act, appointed Trustees shall not be required to be residents of such Districts.

B. Transition to Elected Board. The Board shall continue to be appointed by the City Council and comprised of owners of land or agents and officers of an owner of land within the boundaries of the District. Any property owner owning at least one-fifth of the taxable value of the property within such District shall be entitled to nominate one trustee seat for each one-fifth value (provided that the City retains discretion to reject any nominee and request a new nominee from such property owner).

No transition pursuant to this Section shall become effective until the scheduled regular election of the District in conjunction with the expiration of the then current term.

C. Reelection and Reappointment. Upon the expiration of a Trustee's respective term, the Board shall continue to be appointed by the City Council and comprised of owners of land or agents and officers of an owner of land within the boundaries of the District. Any property owner owning at least one-fifth of the taxable value of the property within the District shall be entitled to nominate one trustee seat for each one-fifth value (provided that the City retains discretion to reject any nominee and request a new nominee from such property owner).

D. Vacancy. Any vacancy on the Board shall be filled pursuant to the Special District Act.

E. Compensation. Unless otherwise permitted by the PID Act, only Trustees who are residents of the District may be compensated for services as Trustee. Such compensation shall be in accordance with state law.

F. Conflicts of Interest. Trustees shall disclose all conflicts of interest. Any Trustee who discloses such conflicts in accordance with Section 17D-4-202 and Section 67-16-9, Utah Code, shall be entitled to vote on such matters.

VII. RESERVED

VIII. FINANCIAL PLAN

A. General.

The District shall be authorized to provide for the planning, design, acquisition, construction, installation, relocation, and/or redevelopment of the Public Improvements from its revenues and by and through the proceeds of Debt to be issued by the District. In addition, the District shall be permitted to finance the prepayment of impact fees for the Project. The Financial Plan for the District shall be to issue such Debt as the District can reasonably pay within the Maximum Debt Mill Levy Imposition Term from revenues derived from the Maximum Debt Mill Levy, Assessments and other legally available revenues. The total Limited Tax Debt that the District shall be permitted to issue shall not exceed Eighteen Million Dollars ($18,000,000) and shall be permitted to be issued on a schedule and in such year or years as the District determine shall meet the needs of the Financial Plan referenced above and phased to serve development as it occurs. This amount excludes any portion of bonds issued to refund a prior issuance of debt by the District. For any capital appreciation Debt issued by the District, only the par amount of such Debt at issuance (and not the value at conversion) of such Debt shall count against this amount. Any Assessment Debt or C-PACE Bonds do not count against the foregoing limitation and there is no limit to the amount of Assessment Debt or C-PACE Bonds the District may issue so long as such issuances are in accordance with the provisions of the applicable Assessment and/or C-PACE Acts. All bonds and other Debt issued by the District may be payable from any and all legally available revenues of the District, including general ad valorem taxes to be imposed upon all Taxable Property within the District and Assessments. The District may also rely upon various other revenue sources authorized by law. These will include the power to assess Fees, penalties, or charges, including as provided in Section 17D-4-304, Utah Code, as amended from time to time. In addition the District may also rely on the revenues generated by that certain Development and Participation Agreement dated February 5, 2020 ("D&P Agreement") between the developer and

the Redevelopment Agency of Tooele City ("Agency") whereby the Agency agreed to pay the developer (1) "Guaranteed Payments" of $150,000 per year for 15 years and (2) 95% of all Tax Increment Revenues generated by and received by the Agency annually under interlocal agreements between the Agency, City and the school district subject to certain limitations to repay the Debt.

B. Maximum Voted Interest Rate and Maximum Underwriting Discount.

The interest rate on any Debt is expected to be the market rate at the time the Debt is issued. In the event of a default, the proposed maximum interest rate on any Debt is not expected to exceed eighteen percent (18%). The proposed maximum underwriting discount will be five percent (5%). Debt, when issued, will comply with all relevant requirements of this Governing Document, state law, and federal law as then applicable to the issuance of public securities.

C. Maximum Debt Mill Levy.

(a) The "Maximum Debt Mill Levy" shall be the maximum mill levy the District is permitted to impose upon the taxable property within the District for payment of Limited Tax Debt shall be 0.0100 per dollar of taxable value of taxable property in the District. C-PACE Assessments are not subject to the foregoing limit. The foregoing limit shall be subject to adjustment as provided in Section 17D-4-301(8), Utah Code. Such Maximum Debt Mill Levy may also be used to pay administrative expenses of the District.

(b) Such Maximum Debt Mill Levy may only be amended pursuant to a Governing Document Amendment and as provided in Section 17D-4-202, Utah Code.

D. Maximum Debt Mill Levy Imposition Term.

Each bond issued by the District shall mature within thirty-one (31) years from the date of issuance of such bond. In addition, no mill levy may be imposed for the repayment of a series of bonds after a period exceeding forty (40) years from the year of the first imposition of a mill levy with respect to such bond (the "Maximum Debt Mill Levy Imposition Term").

E. Debt Repayment Sources.

The District may impose a mill levy on taxable property within its boundaries as a primary source of revenue for repayment of debt service. The District may also rely upon various other revenue sources authorized by law. At the District's discretion, these may include the power to assess Assessments, penalties, or charges, including as provided in Section 17D-4-304, Utah Code, as amended from time to time. Except as described in Section VIII.C(a), the debt service mill levy in the District shall not exceed the Maximum Debt Mill Levy or, the Maximum Debt Mill Levy Imposition Term, except for repayment of General Obligation Debt. The District may also rely on revenues generated from the D&P Agreement with the Agency as a source of revenue for repayment of debt service.

The District shall not be permitted to charge an End User the costs of any portion of a Public Improvement for which such End User has already paid or is presently obligated to pay

through any combination of mill levy, Assessment, or impact fee. This provision shall not prohibit the division of costs between mill levies, Assessments, or impact fees, but is intended to prevent double taxation of End Users for the costs of Public Improvements.

F. Debt Instrument Disclosure Requirement.

In the text of each Bond and any other instrument representing and constituting Debt, the District shall set forth a statement in substantially the following form:

> By acceptance of this instrument, the owner of this Bond agrees and consents to all of the limitations in respect of the payment of the principal of and interest on this Bond contained herein, in the resolution of the District authorizing the issuance of this Bond and in the Governing Document for creation of the District.

Similar language describing the limitations in respect of the payment of the principal of and interest on Debt set forth in this Governing Document shall be included in any document used for the offering of the Debt for sale to persons, including, but not limited to, a developer of property within the boundaries of the District.

G. Security for Debt.

The District shall not pledge any revenue or property of the City as security for the indebtedness set forth in this Governing Document. Approval of this Governing Document shall not be construed as a guarantee by the City of payment of any of the District's obligations; nor shall anything in the Governing Document be construed so as to create any responsibility or liability on the part of the City in the event of default by the District in the payment of any such obligation.

H. District's Operating Costs.

The estimated cost of acquiring land, engineering services, legal services and administrative services, together with the estimated costs of the District's organization and initial operations, are anticipated to be Fifty Thousand Dollars ($50,000), which will be eligible for reimbursement from Debt proceeds.

In addition to the capital costs of the Public Improvements, the District will require operating funds for administration and to plan and cause the Public Improvements to be constructed. The first year's operating budget is estimated to be approximately Fifty Thousand Dollars ($50,000) which is anticipated to be derived from property taxes and other revenues and may also be financed for a period of time until District revenues are anticipated to be sufficient to bear such costs. The District may also enter into a reimbursement agreement with the developer of the Project to reimburse such developer for any such administrative costs paid by developer.

I. Bond and Disclosure Counsel; Municipal Advisor.

It is the intent of the City that the District shall use competent and nationally recognized bond and disclosure counsel and Municipal Advisor with respect to District Bonds to ensure proper issuance and compliance with this Governing Document.

IX. ANNUAL REPORT

A. General.

The District shall be responsible for submitting an annual report to the City Administration's Office no later than 210 days following the end of the District's fiscal year, beginning with fiscal year 2024.

B. Reporting of Significant Events.

The annual report shall include information as to any of the following:

1. Boundary changes made or proposed to the District's boundary as of the last day of the prior fiscal year, if changed.

2. List of current interlocal agreements, if changed (to be delivered to the Creating Entity upon request);

3. Names and terms of Board members and officers;

4. District office contact information, if changed;

5. Rules and regulations of the District regarding bidding, conflict of interest, contracting, and other governance matters, if changed;

6. A summary of any litigation which involves the District Public Improvements as of the last day of the prior fiscal year, if any;

7. Status of the District's construction of the Public Improvements as of December 31 of the prior year and listing all facilities and improvements constructed by the District that have been dedicated to and accepted by the City as of the last day of the prior fiscal year;

8. A summary of the total debt authorized and total debt issued by the District as well as any presently planned debt issuances;

9. Current year budget including a description of the Public Improvements to be constructed in such year;

10. Financial statements of the District for the most recent completed fiscal year (such statements shall be audited if required by bond documents or statute);

11. Notice of any uncured events of default by the District, which continue beyond a ninety (90) day period, under any Debt instrument; and

12. Any inability of the District to pay its obligations as they come due, in accordance with the terms of such obligations, which continue beyond a ninety (90) day period.

X. DISSOLUTION

Upon an independent determination of the District Board that the purposes for which the District was created has been accomplished, the District shall file a petition for dissolution, pursuant to the applicable state statutes. In no event shall a dissolution occur until the District has provided for the payment or discharge of all of their outstanding indebtedness and other financial obligations as required pursuant to state statutes and disbursed of all assets of the District.

XI. DISCLOSURE TO PURCHASERS

Within thirty (30) days of the Office of the Lieutenant Governor of the State of Utah issuing a Certificate of Creation, the Board shall record a notice with the recorder of Tooele County. Such notice shall (a) contain a description of the boundaries of the District, (b) state that a copy of this Governing Document is on file at the office of the City, (c) state that the District may finance and repay infrastructure and other improvements through the levy of a property tax; (d) state the Maximum Debt Mill Levy of the District; and (d) if applicable, stating that the debt may convert to general obligation debt and outlining the provisions relating to conversion. Such notice shall further be filed with the City.

In addition, the Developer and the Board shall ensure that the Developer, homebuilders, commercial developers, and commercial lessors, as applicable, disclose the following information to initial resident homeowners, renters, commercial property owners, and/or commercial tenants:

(1) All of the information in the first paragraph of this Section XI;

(2) A disclosure outlining the impact of any applicable property tax, in substantially the following form:

> "Under the maximum property tax rate of the District, **for every $100,000 of taxable value**, there would be an **additional annual property tax of $1,000** for the duration of the District's Bonds."

(3) Such disclosures shall be contained on a separate-colored page of the applicable closing or lease documents and shall require a signature of such end user acknowledging the foregoing.

XII. INTERLOCAL AGREEMENT

The form of the Interlocal Agreement required by the City Code, relating to the limitations imposed on the District's activities, is attached hereto as **Exhibit D**. The District shall approve the Interlocal Agreement in the form attached as **Exhibit D** at its first Board meeting after its creation. Failure of the District to execute the Interlocal Agreement as required herein shall constitute a material modification and shall require a Governing Document Amendment. The City Council shall approve the Interlocal Agreement in the form attached as **Exhibit D** at the public hearing approving the Governing Document.

EXHIBIT A

Legal Descriptions

A parcel of land, situated in the Northeast Quarter of Section 21, Township 3 South, Range 4 West, Salt Lake Base and Meridian, said parcel also located in Tooele City, Tooele County, Utah more particularly described as follows:
Beginning at a point which is located South 89°43'20" West 1393.04 feet along the section line, and South 0°16'40" East 188.60 feet to the Point of Beginning from the Northeast Corner of Section 21, Township 3 South, Range 4 West, Salt Lake Base and Meridian, and running:
thence North 89°20'34" West 308.78 feet;
thence South 0°35'42" West 303.70 feet;
thence South 89°20'34" East 68.04 feet;
thence South 0°39'26" West 25.00 feet;
thence South 89°20'34" East 180.00 feet;
thence North 0°39'26" East 25.00 feet;
thence South 89°20'34" East 60.68 feet to the Westerly Right of Way line of Utah State Highway No. 36;
thence South 1°32'46" West 712.55 feet along said Westerly line;
thence North 89°14'12" West 301.31 feet;
thence South 1°43'18" West 163.83 feet;
thence South 89°45'23" West 916.84 feet;
thence North 0°12'04" West 569.90 feet along Centerline of 200 West;
thence North 89°47'24" East 41.78 feet to Easterly Right of Way line of 200 West Street;
thence North 0º12'21" West 732.95 feet along said Right of Way line;
thence North 89º45'57" East 1187.58 feet;
thence Southeasterly 25.84 feet along the arc of a 39.00 foot radius curve to the right (center bears South 20°23'41" West and the chord bears South 50°37'27" East 25.37 feet with a central angle of 37°57'44");
thence South 0°35'17" East 112.15 feet to the Point of Beginning.
Contains 1,426,323 square feet or 32.93 acres

Annexation Area Boundaries

A parcel of land, situated in the Northeast Quarter of Section 21, Township 3 South, Range 4 West, Salt Lake Base and Meridian, said parcel also located in Tooele City, Tooele County, Utah more particularly described as follows:
Beginning at a point which is located South 89°43'20" West 1393.04 feet along the section line, and South 0°16'40" East 188.60 feet to the Point of Beginning from the Northeast Corner of Section 21, Township 3 South, Range 4 West, Salt Lake Base and Meridian, and running:
thence North 89°20'34" West 308.78 feet;
thence South 0°35'42" West 303.70 feet;
thence South 89°20'34" East 68.04 feet;
thence South 0°39'26" West 25.00 feet;
thence South 89°20'34" East 180.00 feet;
thence North 0°39'26" East 25.00 feet;
thence South 89°20'34" East 60.68 feet to the Westerly Right of Way line of Utah State Highway No. 36;
thence South 1°32'46" West 712.55 feet along said Westerly line;
thence North 89°14'12" West 301.31 feet;
thence South 1°43'18" West 163.83 feet;
thence South 89°45'23" West 916.84 feet;
thence North 0°12'04" West 569.90 feet along Centerline of 200 West;
thence North 89°47'24" East 41.78 feet to Easterly Right of Way line of 200 West Street;
thence North 0º12'21" West 732.95 feet along said Right of Way line;
thence North 89º45'57" East 1187.58 feet;
thence Southeasterly 25.84 feet along the arc of a 39.00 foot radius curve to the right (center bears South 20°23'41" West and the chord bears South 50°37'27" East 25.37 feet with a central angle of 37°57'44");
thence South 0°35'17" East 112.15 feet to the Point of Beginning.
Contains 1,426,323 square feet or 32.93 acres

EXHIBIT B

Tooele City Vicinity Map

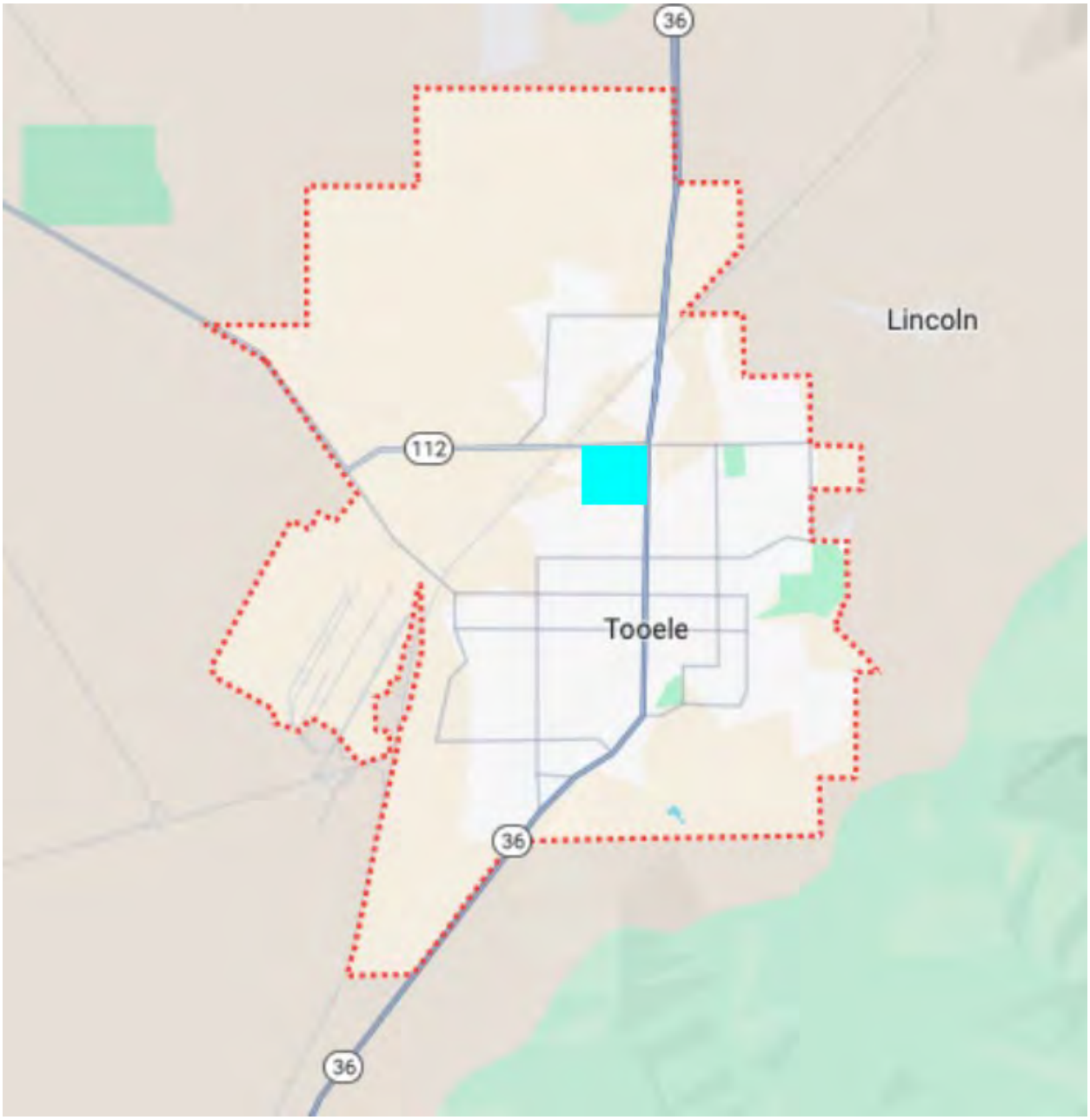


EXHIBIT C

Initial District Boundaries Map and Annexation Area Map

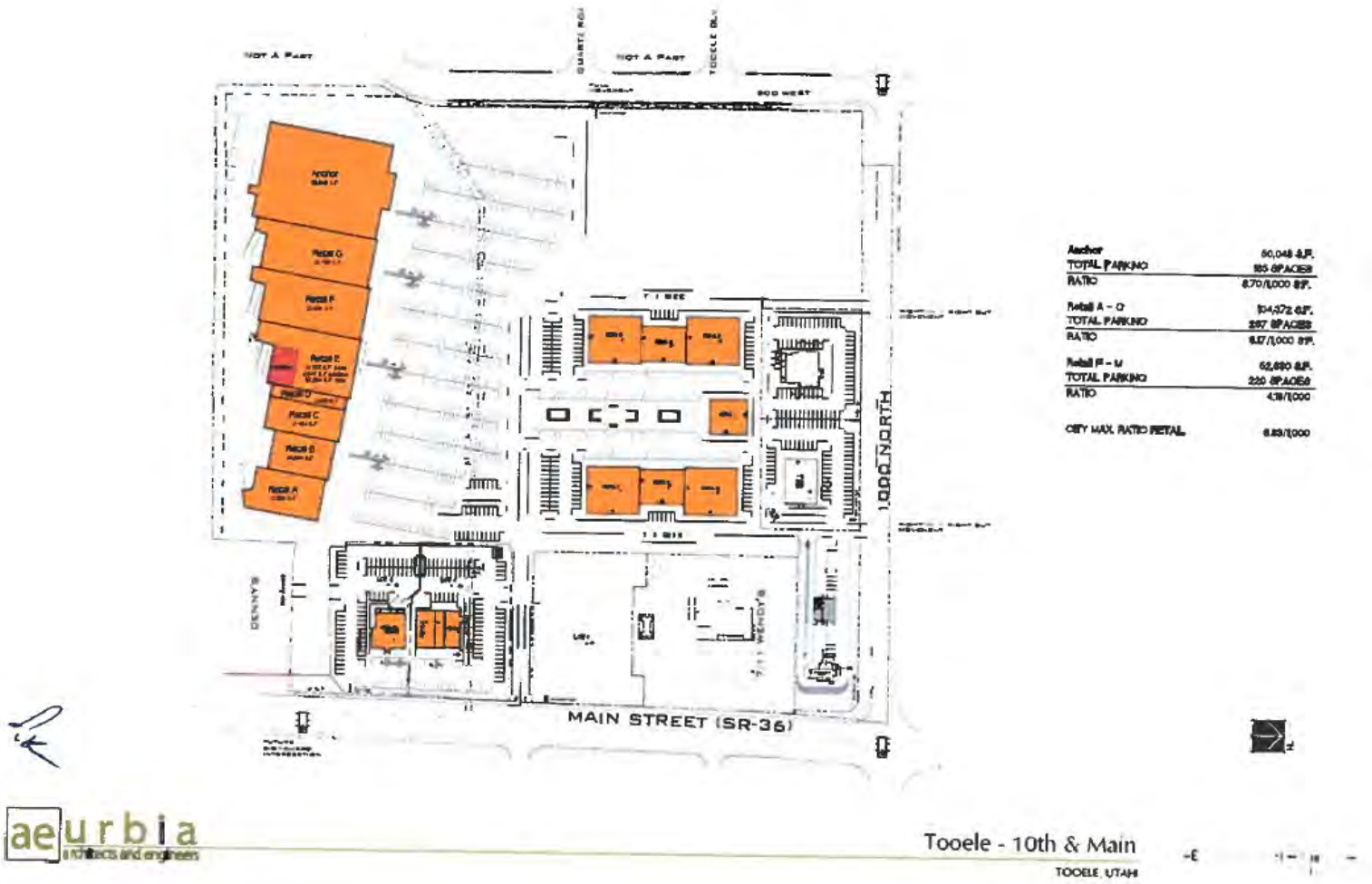


EXHIBIT D

Interlocal Agreement between the District and Tooele City

INTERLOCAL AGREEMENT BETWEEN

TOOELE CITY, UTAH
AND
10TH AND MAIN PUBLIC INFRASTRUCTURE DISTRICT

THIS AGREEMENT is made and entered into as of this ___ day of _____, 2024, by and between TOOELE CITY, a municipal corporation of the State of Utah ("City"), and 10th AND MAIN PUBLIC INFRASTRUCTURE DISTRICT, a political subdivision of the State of Utah (the "District"). The City and the District are collectively referred to as the Parties.

RECITALS

WHEREAS, the District was organized to provide to exercise powers as are more specifically set forth in the District's Governing Document approved by the City on _____ ("Governing Document"); and

WHEREAS, the Governing Document makes reference to the execution of an Interlocal Agreement between the City and the District; and

WHEREAS, the City and the District have determined it to be in the best interests of their respective taxpayers, residents and property owners to enter into this Interlocal Agreement ("Agreement").

NOW, THEREFORE, in consideration of the covenants and mutual agreements herein contained, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereto agree as follows:

COVENANTS AND AGREEMENTS

1. Operations and Maintenance. The District shall dedicate the Public Improvements (as defined in the Governing Document) to the City or other appropriate jurisdiction in a manner consistent with the Approved Development Plan and other rules and regulations of the City and applicable provisions of the City Code. The District shall be authorized, but not obligated, to own Public Improvements not otherwise required to be dedicated to the City or other public entity, and all necessary equipment and appurtenances incident thereto.

2. Reserved.

3. Construction Standards. The District will ensure that the Public Improvements are designed and constructed in accordance with the standards and specifications of the City and of other governmental entities having proper jurisdiction, as applicable. The District will obtain the City's approval of civil engineering plans and will obtain applicable permits for construction and installation of Public Improvements prior to performing such work.

4. Issuance of Privately Placed Debt/Municipal Advisor Certificate. Prior to the issuance of any privately placed Debt, the District shall obtain the certification of a Municipal Advisor substantially as follows:

We are [I am] a Municipal Advisor within the meaning of the District's Governing Document.

We [I] certify that (1) the net effective interest rate to be borne by [insert the designation of the Debt] does not exceed a reasonable current [tax-exempt] [taxable] interest rate, using criteria deemed appropriate by us [me] and based upon our [my] analysis of comparable high yield securities; and (2) the structure of [insert designation of the Debt], including maturities and early redemption provisions, is reasonable considering the financial circumstances of the District.

5. Inclusion Limitation. The District shall not include within any of their boundaries any property outside the District Area without the prior written consent of the City. By the Governing Document, the City has consented to the annexation or withdrawal of any area within the Annexation Area into or from the District Boundaries. The District shall not include within any of its boundaries any property inside the inclusion area boundaries without the prior written consent of the City except upon petition of the surface property owners of 100% of such property and/or 100% of registered voters within the area to be included, as applicable, as provided in Section 17D-4-201(3), Utah Code.

6. Overlap Limitation. Without the written consent of the City, the District shall not consent to the organization of any other public infrastructure district organized under the PID Act within the District Area which will overlap the boundaries of the District unless the aggregate mill levy for payment of Debt of such proposed districts will not at any time exceed the Maximum Debt Mill Levy of the District.

7. Initial Debt. On or before the effective date of approval by the Cityof an Approved Development Plan (as defined in the Governing Document), the District shall not: (a) issue any Debt; nor (b) impose a mill levy for the payment of Debt by direct imposition or by transfer of funds from the operating fund to the Debt service funds; nor (c) impose and collect any fees used for the purpose of repayment of Debt.

8. Total Debt Issuance. The District shall not issue Debt in excess of Eighteen Million Dollars ($18,000,000). This amount excludes any portion of bonds issued to refund a prior issuance of debt by the District. For any capital appreciation Debt issued by the District, only the par amount of such Debt at issuance (and not the value at conversion) of such Debt shall count against this amount.

9. Bankruptcy. All of the limitations contained in this Governing Document, including, but not limited to, those pertaining to the Maximum Debt Mill Levy and the Maximum Debt Mill Levy Imposition Term have been established under the authority of the City to approve a Governing Document with conditions pursuant to Section 17D-4-201(5), Utah Code. It is expressly intended that such limitations:

(a) Shall not be subject to set-aside for any reason or by any court of competent jurisdiction, absent a Governing Document Amendment; and

(b) Are, together with all other requirements of Utah law, included in the "political or governmental powers" reserved to the state under the U.S. Bankruptcy Code (11 U.S.C.) Section 903, and are also included in the "regulatory or electoral approval necessary under applicable non-bankruptcy law" as required for confirmation of a Chapter 9 Bankruptcy Plan under Bankruptcy Code Section 943(b)(6).

Any Debt, issued with a pledge or which results in a pledge, that exceeds the Maximum Debt Mill Levy and the Maximum Debt Mill Levy Imposition Term, shall be deemed a material modification of this Governing Document and shall not be an authorized issuance of Debt unless and until such material modification has been approved by the City as part of a Governing Document Amendment.

10. Dissolution. Upon an independent determination of the District Board that the purposes for which the District was created have been accomplished, the District agrees to file a petition for dissolution, pursuant to the applicable state statutes. In no event shall a dissolution occur until the District has provided for the payment or discharge of all of its outstanding indebtedness and other financial obligations as required pursuant to state statutes.

11. Disclosure to Purchasers. Within thirty (30) days of the Office of the Lieutenant Governor of the State of Utah issuing a Certificate of Creation for the District, the Board shall record a notice with the recorder of Tooele County. Such notice shall (a) contain a description of the boundaries of the District, (b) state that a copy of this Governing Document is on file at the office of the City, (c) state that the District may finance and repay infrastructure and other improvements through the levy of a property tax; (d) state the Maximum Debt Mill Levy of the District; and (d) if applicable, stating that the debt may convert to General Obligation Debt and outlining the provisions relating to conversion. A copy of the notice shall further be provided to the City.

In addition, the Developer and the Board shall ensure that the Developer, homebuilders, commercial developers, and commercial lessors, as applicable, disclose the following information to initial resident homeowners, renters, commercial property owners, and/or commercial tenants:

(1) All of the information in the first paragraph of this section;

(2) A disclosure outlining the impact of any applicable property tax, in substantially the following form:

> "Under the maximum property tax rate of the District, **for every $100,000 of taxable value**, there would be an **additional annual property tax of $1,000** for the duration of the District's Bonds."

(3) Such disclosures shall be contained on a separate colored page of the applicable closing or lease documents and shall require a signature of such end user acknowledging the foregoing.

12. Governing Document Amendment Requirement. Actions of the District which violate the limitations set forth in Section V.A.1-9 or Section VIII.B-G of the Governing Document

shall be deemed to be material modifications to the Governing Document and the City shall be entitled to all remedies available under state and local law to enjoin such actions of the District.

13. Annual Report. The District shall be responsible for submitting an annual report to the City Manager's Office no later than 210 days after the close of the District's fiscal year, commencing fiscal year 2024, containing the information set forth in Section VIII of the Governing Document.

14. Reserved.

15. Maximum Debt Mill Levy.

(a) The "Maximum Debt Mill Levy" shall be the maximum mill levy the District is permitted to impose upon the taxable property within the District for payment of Limited Tax Debt shall be 0.0100 per dollar of taxable value of taxable property in the District; provided that such levy shall be subject to adjustment as provided in Section 17D-4-301(8). Such Maximum Debt Mill Levy may also be used to pay administrative expenses of the District.

(b) Such Maximum Debt Mill Levy may only be amended pursuant to a Governing Document Amendment and as provided in Section 17D-4-202.

16. Maximum Debt Mill Levy Imposition Term. Each bond issued by the District shall mature within thirty-one (31) years from the date of issuance of such bond. In addition, no mill levy may be imposed for the repayment of a series of bonds after a period exceeding forty (40) years from the year of the first imposition of a mill levy with respect to such bond (the "Maximum Debt Mill Levy Imposition Term").

17. Notices. All notices, demands, requests, or other communications to be sent by one party to the other hereunder or required by law shall be in writing and shall be deemed to have been validly given or served by delivery of same in person to the address or by courier delivery, via United Parcel Service or other nationally recognized overnight air courier service, or by depositing same in the United States mail, postage prepaid, addressed as follows:

To the District: 10th and Main Public Infrastructure District
c/o York Howell
Attn: M. Thomas Jolley, Esq.
10610 South Jordan Gateway, Suite 200
South Jordan, Utah 84095
tom@yorkhowell.com
(801) 527-1040

To the City: Tooele City
c/o Office of Economic Development
Attn: Economic Development Director
90 North Main Street

Tooele, Utah 84074
Phone: (435) 843-2169

All notices, demands, requests, or other communications shall be effective upon such personal delivery or one (1) business day after being deposited with United Parcel Service or other nationally recognized overnight air courier service or three (3) business days after deposit in the United States mail. By giving the other party hereto at least ten (10) days written notice thereof in accordance with the provisions hereof, each of the Parties shall have the right from time to time to change its address.

18. Amendment. This Agreement may be amended, modified, changed, or terminated in whole or in part only by a written agreement duly authorized and executed by the Parties hereto and without amendment to the Governing Document.

19. Assignment. Neither Party hereto shall assign any of its rights nor delegate any of its duties hereunder to any person or entity without having first obtained the prior written consent of the other Party, which consent will not be unreasonably withheld. Any purported assignment or delegation in violation of the provisions hereof shall be void and ineffectual.

20. Default/Remedies. In the event of a breach or default of this Agreement by any Party, the non-defaulting Party shall be entitled to exercise all remedies available at law or in equity, specifically including suits for specific performance and/or monetary damages. In the event of any proceeding to enforce the terms, covenants or conditions hereof, the prevailing Party in such proceeding shall be entitled to obtain as part of its judgment or award its reasonable attorneys' fees.

21. Term. This Agreement shall terminate upon the earlier to occur of dissolution of the District or fifty (50) years from the date hereof.

22. Governing Law and Venue. This Agreement shall be governed and construed under the laws of the State of Utah.

23. Inurement. Each of the terms, covenants, and conditions hereof shall be binding upon and inure to the benefit of the Parties hereto and their respective successors and assigns.

24. Integration. This Agreement constitutes the entire agreement between the Parties with respect to the matters addressed herein. All prior discussions and negotiations regarding the subject matter hereof are merged herein.

25. Parties Interested Herein. Nothing expressed or implied in this Agreement is intended or shall be construed to confer upon, or to give to, any person other than the District and the City any right, remedy, or claim under or by reason of this Agreement or any covenants, terms, conditions, or provisions thereof, and all the covenants, terms, conditions, and provisions in this Agreement by and on behalf of the District and the City shall be for the sole and exclusive benefit of the District and the City.

26. Severability. If any covenant, term, condition, or provision under this Agreement shall, for any reason, be held to be invalid or unenforceable, the invalidity or unenforceability of

such covenant, term, condition, or provision shall not affect any other provision contained herein, the intention being that such provisions are severable.

27. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall constitute an original and all of which shall constitute one and the same document.

28. Paragraph Headings. Paragraph headings are inserted for convenience of reference only.

29. Defined Terms. Capitalized terms used herein and not otherwise defined shall have the meanings ascribed to them in the Governing Document.

[SIGNATURE PAGE TO INTERLOCAL AGREEMENT]

10TH AND MAIN PUBLIC
INFRASTRUCTURE DISTRICT

By: _____
President

Attest:

_____
Secretary

APPROVED AS TO FORM: _____

TOOELE CITY

By: _____
_____, Chair

Attest:

By: _____

Its: _____

APPROVED AS TO FORM: _____

Exhibit C

Notice of Boundary Action

NOTICE OF IMPENDING BOUNDARY ACTION

(10th and Main Public Infrastructure District)

TO: The Lieutenant Governor, State of Utah

NOTICE IS HEREBY GIVEN that the City Council of Tooele City, Utah (the "Council"), acting in its capacity as the creating entity for 10th and Main Public Infrastructure District (the "District"), at a regular meeting of the Council, duly convened pursuant to notice, on March 20, 2024 adopted a *Resolution Providing for the Creation of a Public Infrastructure District*, a true and correct copy of which is attached as APPENDIX "A" hereto and incorporated by this reference herein (the "Creation Resolution").

A copy of the Final Local Entity Plat satisfying the applicable legal requirements as set forth in Utah Code Ann. §17-23-20, approved as a final local entity plat by the Surveyor of Tooele County, Utah, is attached as APPENDIX "B" hereto and incorporated by this reference. The Council hereby certifies that all requirements applicable to the creation of the District, as more particularly described in the Creation Resolution, have been met. The District is not anticipated to result in the employment of personnel.

WHEREFORE, the Council hereby respectfully requests the issuance of a Certificate of Incorporation pursuant to and in conformance with the provisions of Utah Code Ann. §17B-1-215.

DATED this March 20, 2024.

CITY COUNCIL OF TOOELE CITY, UTAH, acting in its capacity as the creating authority for 10TH AND MAIN PUBLIC INFRASTRUCTURE DISTRICT

By:_____
AUTHORIZED REPRESENTATIVE

VERIFICATION

STATE OF UTAH)
:ss.
COUNTY OF TOOELE)

SUBSCRIBED AND SWORN to before me this ___ day of _____, 2024.

_____
NOTARY PUBLIC

Tooele City
Active Transportation Plan

2023

Tooele City Est. 1853

alta

TOWNSHIP + RANGE

WASATCH FRONT REGIONAL COUNCIL

Acknowledgments

Tooele City

Jared Stewart, Tooele Economic Development Director + Grant Administrator

Wasatch Front Regional Council

Marcia White, Regional Economic Development Planner

Alta Planning + Design

Paulo Aguilera, Project Manager

David Foster, Principle-in-Charge

Zoey Mauck, Assistant Project Manager

Township + Range

Tim Sullivan, Principle

Sophie Bellina, Planner

Steering Committee

Leena Chapman, Tooele Health Department (Community Health Equity Coordinator)

Jamie Grandpre, Tooele City Public Works Director

Tiffany Day, Tooele City Public Works

Maresa Manzione, Tooele City Council

Clint Campbell, UTA

Cissy Morton, Tooele County Mobility Manager

Leland Roberts, Tooele Trails Committee

Darwin Cook, Tooele City Parks and Rec Director

Table of Contents

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The Vision

- About This Plan

The Vision

About This Plan

The City of Tooele is in the process of developing an Active Transportation Plan (ATP) to improve safety and access for walking, biking, and rolling throughout the community. The plan will identify actions that the City can take through both physical infrastructure changes and the implementation of new or updated policies and programs related to active transportation. Funded by the Wasatch Front Regional Council's (WFRC) Transportation Land Use Connection (TLC) program, the Tooele ATP will serve as a guide to city staff, commissions, and elected officials on how to prioritize projects and allocate funding to these projects and related policies & programs.

Tooele 5K 2022

What is Active Transportation?

Active transportation is human-powered mobility, such as walking, biking, or using a personal mobility device such as an electric bicycle, wheelchair, or scooter. Providing safe and comfortable facilities for the use of these modes has the potential to improve access to local destinations and recreational areas, reduce the need for short car trips, improve community health, and provide numerous additional benefits.

Why is the Plan Important for Tooele?

Like many Utah communities, Tooele's historic development and land use patterns have grown alongside a reliance on motor vehicles as the primary mode of transportation. This growth strategy has left minimal consideration for active transportation modes, including disconnected street network patterns and numerous high-volume, high-speed roads and highways that bisect neighborhoods and commercial centers and limit safe access for those traveling via non-car modes.

- 02 -

Tooele Today

- Introduction
- Previous Plans Review
- Getting Around Tooele
- Active Transportation in Tooele Today
- Active Transportation Challenges and Opportunities

Tooele Today

Introduction

Tooele City, a community of nearly 38,000 people west of Salt Lake City and the Oquirrh Mountains, is a dynamic, continuously-growing community with a projected population of 66,000 by 2050 (Wasatch Front Regional Council). With this projected growth in mind, Tooele has a great opportunity to begin putting the building blocks in place to continue to build a safe, accessible, and welcoming community to accommodate a growing population.

One critical building block to consider in successfully growing the community is forward-thinking transportation infrastructure, including a robust active transportation network. Providing a broad and approachable network will allow residents to recreate within the community as well as travel to work, run errands, or reach regional destinations without need for a car.

This Active Transportation Plan (ATP) will serve as a guide to city staff and elected officials on how to allocate funding and properly develop roadways that are conducive to multiple modes of transportation. The Plan will provide both infrastructure and program/policy recommendations that support a high quality of life, increase community visibility, awareness, and support of active transportation, and provide strategic implementation resources to support well-informed project decisions.

While the recommendations in this plan may change over time as the population changes and priorities shift, the overarching goals will hold strong in making Tooele a welcoming and approachable community for those using all modes of transportation.

Previous Plans Review

A critical first step in the planning process is analyzing existing plans that have been developed for Tooele. This allows the planning team to understand projects and plans that are currently in the works, and what has been proposed but not yet studied in depth or taken forward into design and implementation.

To understand where Tooele is currently with planning related to active transportation, the following existing plans were reviewed:

Transportation-Based Plans

- Tooele City Transportation Master Plan (2021)
- Tooele County Active Transportation Implementation Plan (2019)
- WFRC Regional Transportation Plans (2019)
- Tooele County Trails map (ongoing)

Supporting Plans

- Economic Development Strategic Plan (2021)
- Tooele City General Plan (2020)

The key points from each of these plans is summarized on the following pages, and **Map 2.1** identifies the planned facilities from each plan.

Transportation-Based Plans

Tooele City Transportation Master Plan

The Tooele City Transportation Master Plan recommends expanding on the existing shared roadways, bike lanes, and trails to *increase the number of trails and active transportation/ recreation facilities in Tooele City*. To accomplish this, *Tooele should work with the State's Office of Outdoor Recreation, Bike Utah, and other agencies to apply for grants to fund projects.*

Tooele County Active Transportation Implementation Plan

The primary goals, and linked performance measures for implementing the Tooele County Active Transportation Plan include:

Goal 1: *Integrating active transportation into new and improved major transportation facilities*

- Street standards include proper active transportation infrastructure.
- Public streets/roads are compatible for bicyclists and pedestrians.
- Intersection treatments support pedestrians and bicyclists.

Goal 2: *Build core active transportation routes through the valley*

- Progress toward active transportation trunk routes through the valley.

Goal 3: *Connect active transportation routes to key destinations*

- Connectivity to key destinations.
- Frequency and quality of bike and pedestrian connections across identified barriers.

Goal 4: *Keep pedestrians and cyclists comfortable and safe*

- Pedestrian and bicyclist volumes at key locations
- Pedestrian and bicycle activity among the community
- Number and type of bicycle and pedestrian-related crashes.

Goal 5: *Increase community visibility, awareness, and support for active transportation*

- Awareness and confidence of the greater community of active transportation as an option
- Support by the greater community of active transportation improvements.
- Tangible, positive examples of active transportation infrastructure in Tooele Valley.

Branching from these goals include an additional set of desired outcomes, including *walkable activity centers, good active transportation access to transit, a trail network around the valley, and regional active transportation connectivity.*

2019-50 WFRC Regional Transportation Plan

The 2019-2050 WFRC Regional Transportation Plan provides a guide for transportation growth in the Salt Lake City-West Valley City and Ogden-Tooele Urbanized Areas. While Tooele City does not fall into this region, a recommended Express Bus between Tooele and downtown Salt Lake City is included as part of the plan.

Tooele County Trails map

The Tooele County Trails Map, available digitally, includes the 20 trails and routes for walking, hiking, running, and biking in Tooele County. These trails and routes are recreational in nature, but are important destinations for active transportation network connections.

Supporting Plans

Economic Development Strategic Plan

The Economic Development Strategic Plan provides a vision for future economic growth in Tooele. Part of this growth involves enhanced community access via a variety of transportation options, including active transportation.

The plan suggests fostering community and tourism through connections to recreational facilities, linking residential and non-residential areas through expanded infrastructure, and partnering with regional organizations to advance transportation options

Tooele City General Plan

The Tooele City General Plan sets the stage for future growth and development in the community. The goal of ***expanding transportation options*** to link major destinations and accommodate a variety of modes, including pedestrian facilities and bikeways, is included in several sections- Land Use (LU), Transportation (TR), and Economic Vitality (EV). Specific goals and objectives related to active transportation include:

LU 3: *Develop land use patterns that are compatible with/support a variety of mobility opportunities, choices, and service provisions*

- Encourage non-motorized access and circulation, provide a balance of land uses and development intensities that enable convenient non-automotive trips

LU 5: *Promote land use patterns that conserve resources (land, clean air, water, etc.)*

- Integrate land use/transportation policies to promote a decrease in vehicle miles traveled and increase interaction among citizens

LU 7: *Encourage land uses that create a sense of community among those who work, live, and play within local neighborhoods*

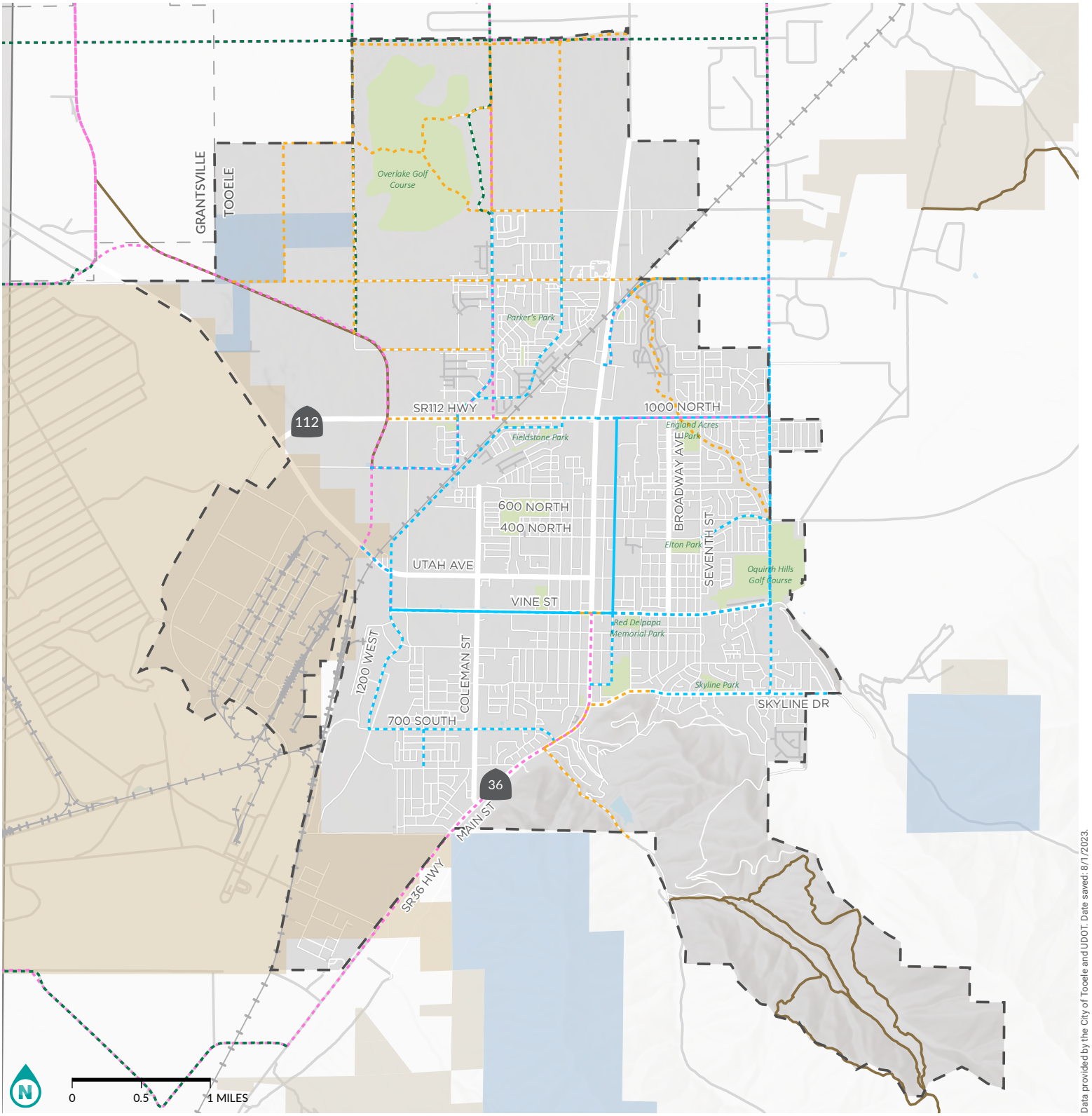
EV Goal 5: *Promote non-motorized transportation improvements; provide options for alternative modes of transportation to access commercial, retail, and entertainment centers*

TR Goal 1: *Develop a trail system that connects to parks, destinations, and major open spaces*

- Require new developments to provide connectivity of trails with existing and potential adjacent development, support other agencies in the development of regional active transportation connections, promote school site design that encourages active travel

TR Goal 2: *Trails should be well maintained; crosswalks where feasible*

- Formalize policies to ensure street crossings are safe/well-marked, develop trails with private development through required fees, land dedication, and construction of facilities; ensure that there are bicycle/pedestrian links to parks and community/recreational facilities



Map 2.1

EXISTING/PLANNED ACTIVE TRANSPORTATION FACILITIES

Tooele City
Active Transportation Plan

Base Map

- Tooele City Boundary
- Tooele City Parks
- Water
- Dept of Defense
- State Trust Lands
- Bureau of Land Management
- Railroad

Existing Facilties

- Buffered Bike Lane
- Shared Roadway
- Unpaved Trail

Planned Facilities

- Bike Lane
- Shared Roadway
- Bike Routes

Active Transportation in Tooele Today

Existing Bike Facilities

Tooele City currently has **6.3 miles** of active transportation facilities, including 0.4 miles of shared lanes and 5.9 miles of buffered bike lanes. These facilities are shown previously in **Map 2.1**.

Shared Lane - 0.4 Miles

A shared lane facility provides a shared space for biking and driving indicated through pavement markings and signage. When a bicyclist is on a shared roadway, they have the right of way, and vehicles must yield to them. A green stripe on some roadways, such as Vine Street, give heightened visibility to bicyclists.

Buffered Bike Lane - 5.9 Miles

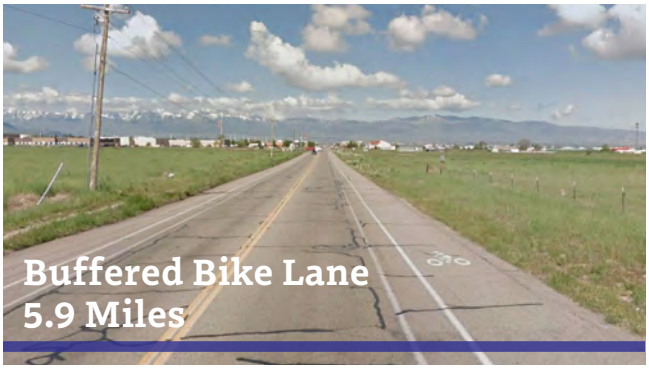
Buffered bike lanes are similar to a standard bike lane (4-7 ft wide and striped with a 6-inch stripe on either side, usually immediately adjacent to a vehicular travel lane), but include an additional striped buffer space (typically 18+ inches) between the bike lane and moving traffic. Buffered bike lanes can also include striped buffers alongside street parking to reduce the potential for doors opening right into the bike lane and causing conflict, though this type of buffer does not currently exist in Tooele.

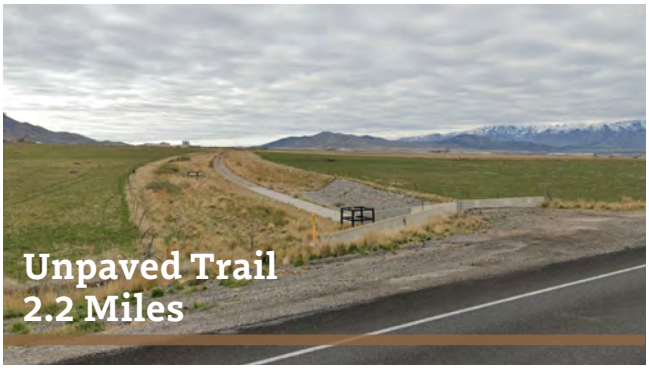
Unpaved Trail - 2.2 Miles

The Mid-Valley Trail in northwest Tooele is a cinder-packed trail that follows a former rail alignment. At 2.2 miles, this trail is short, but could potentially be extended further to the northwest. As an unpaved trail, the Mid-Valley Trail is not considered part of the active transportation network, but may be used by some individuals.

Previously-Planned Facilities

Additional active transportation facilities have been proposed through previous planning efforts. These planned facilities as well as those that are already existing should be critical pieces in the development of an active transportation network. Previous plans related to active transportation in Tooele are reviewed in greater detail later in this chapter and are highlighted on **Map 2.1**.





Getting Around Tooele

Mode Share

Mode share is the percentage of trips taken using a particular mode of transportation (car, transit, bicycle, etc.). The American Community Survey (2021 5-Year Estimates) is used to determine these numbers

American Community Survey (ACS)

The Census Bureau's American Community Survey (ACS) Journey to Work data measures only the primary transportation mode from home to work, so it excludes information about how people travel that are not in the workforce, those who combine multiple modes, or those who commute using different modes depending on the day, weather, or time of year. ACS data is collected and averaged throughout the year, meaning that rates of walking and bicycling may be higher than the data indicates. Despite its flaws, especially in smaller communities, the ACS is a consistent benchmark of mode choice over longer periods.

Figure 1 shows Tooele's mode share compared to the average mode share in both the state of Utah and the nation as a whole.

Figure 1. *2021 Mode Share in Tooele City, State of Utah, and the United States (Data: ACS 2021 5-Year)*

	Drive Alone	Carpool	Transit	Walk	Other	Telework
Tooele City	**70.3%**	**16.3%**	**2.4%**	**2.1%**	**1.5%**	**7.4%**
State of Utah	73.4%	9.1%	1.8%	2.1%	1.5%	12.1%
United States	75.7%	7.6%	2.7%	2.3%	1.6%	10%

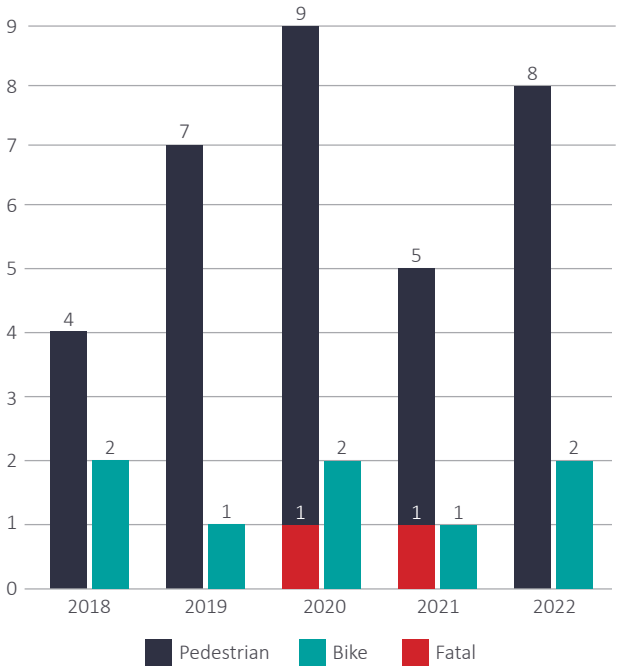
Collision History in Tooele

A total of 2,032 collisions were reported in Tooele City in the last five years (January 1st, 2018 to December 31st, 2022). Of these, 33 collisions involved pedestrians (1.6% of all collisions, two of which were fatal and 28 of which led to injuries) and nine involved bicyclists (0.4% total, none of which were fatal, and 8 of which led to injuries).

Bicyclists and Pedestrians comprised 2% of all Fatal Crashes in the City

Given these numbers, it is evident that pedestrian conflicts are much more frequent, but that bike-related collisions are still a cause for concern. Recorded bike and pedestrian-related collisions from 2018-2022 are shown in **Map 2.3.**

Figure 2. *Collisions Involving People Walking or Bicycling in Tooele, 2018-2022 (Data: UDOT, Numetric)*



Collision Trends

Intersections

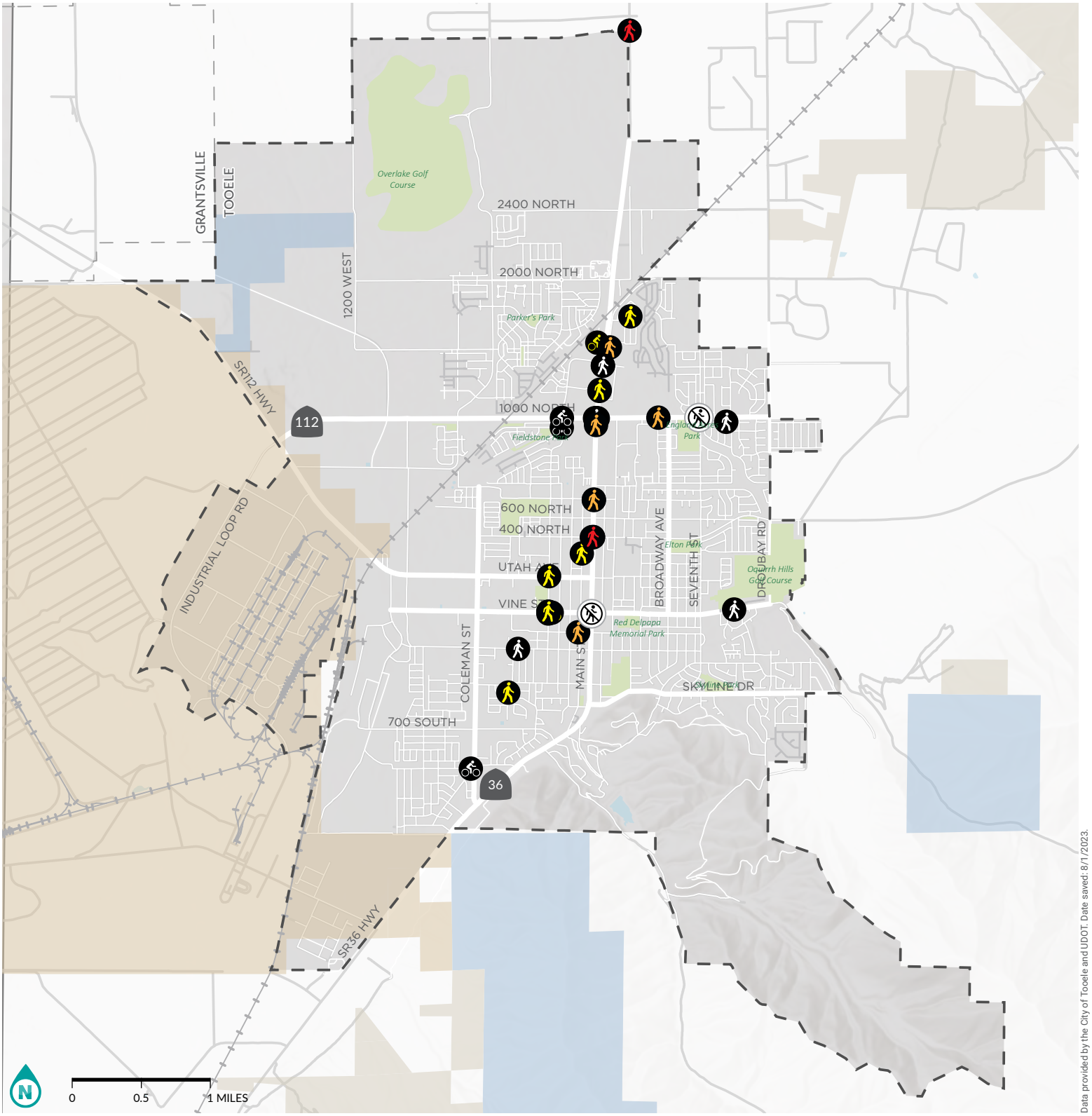
50% of active transportation-related collisions in Tooele occur at 4-leg intersections, and 52% occur as a pedestrian or bike is entering or crossing the roadway. 42% of pedestrian-related collisions occur where there is a marked crosswalk, and 39% occur where there is a traffic control signal. Since many collisions are happening in locations that are typically deemed as safe (marked crosswalk and traffic signal) improving visibility for pedestrians and bicyclists may reduce the likelihood of collisions in the future.

Travel Direction

38% of active transportation-related collisions occur when cars are traveling straight ahead, and 29% occur when cars are turning right. Traffic calming, limiting right turns on red, education about correct bicycle positioning, and pedestrian islands in the line of sight of motorists could help improve visibility and reduce the severity and number of these types of collisions.

Visibility

76% of active transportation-related collisions occur during daylight hours, and 85% occur during clear weather conditions. This indicates that factors other than naturally-occurring visibility limitations are leading to the majority of active-transportation-related collisions. As mentioned above, enhancing the visibility of those walking and biking through infrastructure improvements will help to lower the number of collisions.



Map 2.3

COLLISION ANALYSIS

Tooele City
Active Transportation Plan

Base Map

- Tooele City Boundary
- Tooele City Parks
- Water
- Dept of Defense
- State Trust Lands
- Bureau of Land Management
- Railroad

Collision Analysis

Pedestrian Crashes

- Fatal
- Suspected Serious Injury
- Possible Injury
- Suspected Minor Injury
- No injury/PDO

Bike Crashes

- Possible Injury
- Suspected Minor Injury

Active Transportation Challenges and Opportunities

Challenges and opportunities associated with creating a connected and safe active transportation network are explained below and visualized in **Map 2.4**.

Challenges

Existing Network Coverage/Access

With just 6.3 miles of active transportation facilities, Tooele is currently lacking substantial active transportation connections. This means many Tooele residents do not have comfortable access throughout their community using active modes.

Community Barriers

With Main Street/Hwy 36, a five-lane highway, bisecting Tooele into an east and west side, Hwy 112 bisecting Tooele into a north and south side and the railroad creating a northwest/southeast split, Tooele is broken up into various areas that are challenging to move between for those walking and biking.

Current Active Transportation Use

With limited existing active transportation facilities and historic development patterns that prioritize car access, current active transportation use in Tooele is minimal. This means that as recommendations from this plan are installed and applied, the community will need to learn about and adapt to these new facilities.

Opportunities

Future Development

As a rapidly-growing city, Tooele can partner with private developers to incorporate off-street trail connections and, from the beginning, construct street networks that are suitable for walking and biking. The City can leverage the rezoning and entitlements process to require infrastructure and amenities recommended in this plan as part of the approval process.

Vine Street

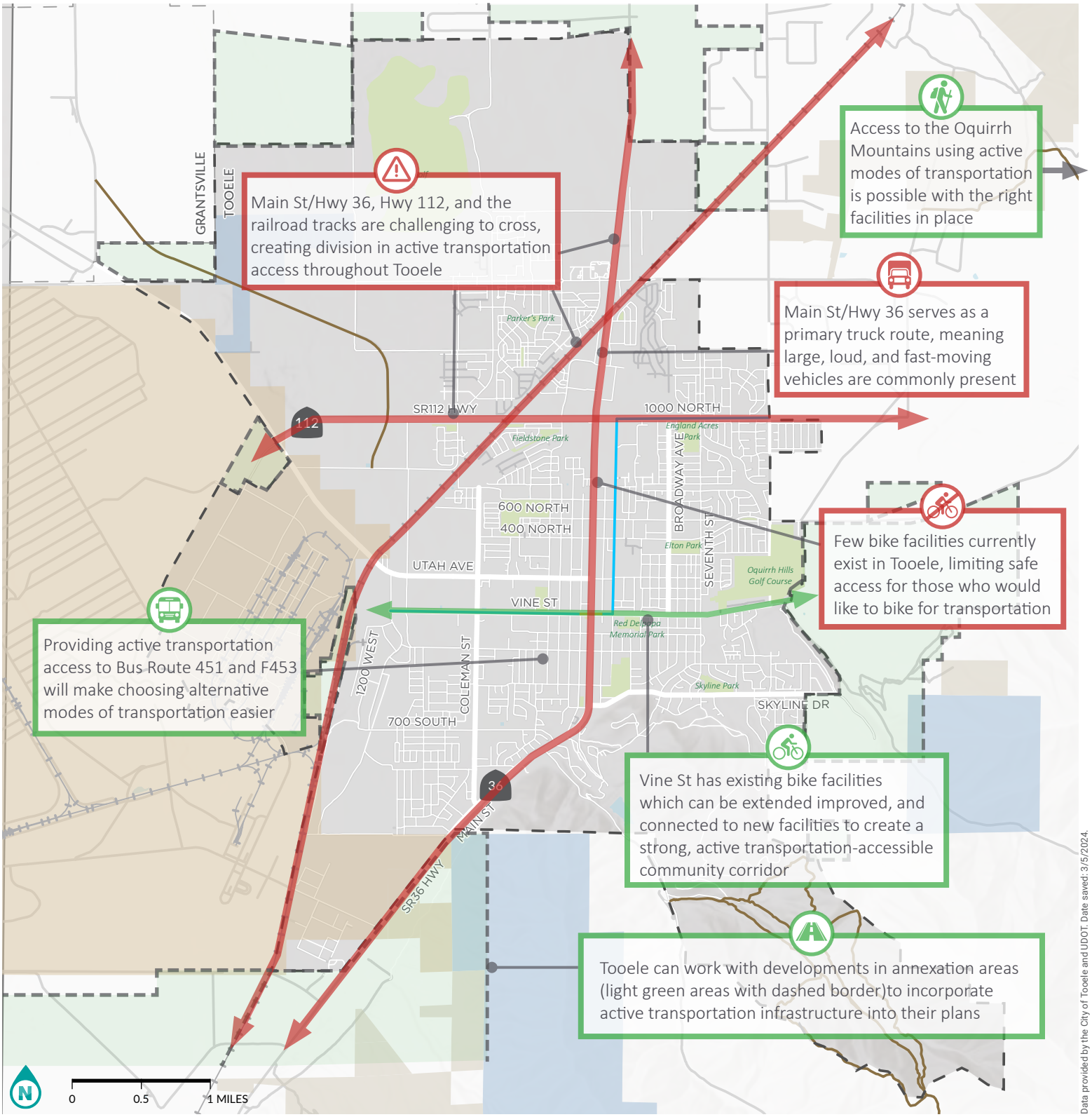
Green striped shared lanes were installed on Vine Street in 2019. This new facility type in Tooele has made active transportation more visible in the community. While this improvement has been successful, the City should look to create a dedicated bike facility that gives people biking their own space within the ROW.

Integration with Transit

Many individuals from Tooele commute into Salt Lake City and other surrounding communities for work, many on the commuter bus. Providing an active transportation network that connects from all areas of town to the commuter bus route would limit the need to drive to access this route.

Connections to Recreation

Tooele's proximity to the Oquirrh Mountains means access to recreational activities like hiking, trail running, and mountain biking are close by. However, to connect safely to trailheads in Tooele, most individuals are driving and parking. Providing a broader active transportation network would allow people to get from their home to the trailhead without needing to put their bike on the car bike rack or bring their hiking boots along for the drive. They could instead start their route directly from their home.



Map 2.4

CHALLENGES AND OPPORTUNITIES

Challenge
Opportunity
Annexation Area (Tooele General Plan)

Tooele City
Active Transportation Plan

Base Map

- Tooele City Boundary
- Tooele City Parks
- Water
- Dept of Defense
- State Trust Lands
- Bureau of Land Management
- Railroad

Existing Facilties

- Buffered Bike Lane
- Shared Roadway
- Unpaved Trail
- Future Roads

Active Transportation Gap Analysis

An active transportation network is most successful when facilities connect to destinations spread throughout the community instead of pockets of concentrated facilities in a few areas with gaps in-between. Identifying where active transportation gaps exist will help guide project recommendations, and, once facilities are installed, will make active transportation more accessible to people in all areas of Tooele.

Bike Network Gaps

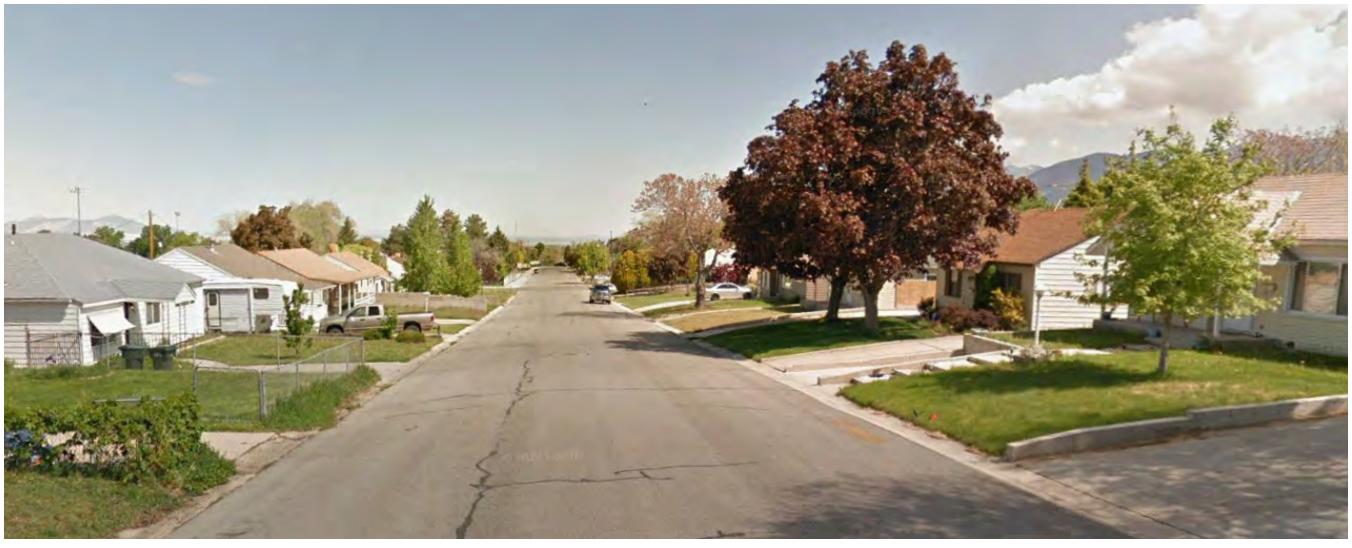
Currently, three streets in Tooele (Vine St, Main St, and 1000 N) have dedicated bike facilities. Additionally, an unpaved trail segment is located in northwest Tooele, but it doesn't connect to the city center or other major community destinations. With just these four facilities, the vast majority of Tooele neighborhoods experience a gap in connecting to bike-specific facilities.

These gaps are highlighted in **Map 2.5**, with red dotted lines indicating corridors that would provide direct access to community destinations, but that currently do not have bike facilities. When making recommendations for new facilities in Tooele, filling these gaps will be a major priority in the creation of a complete active transportation network.

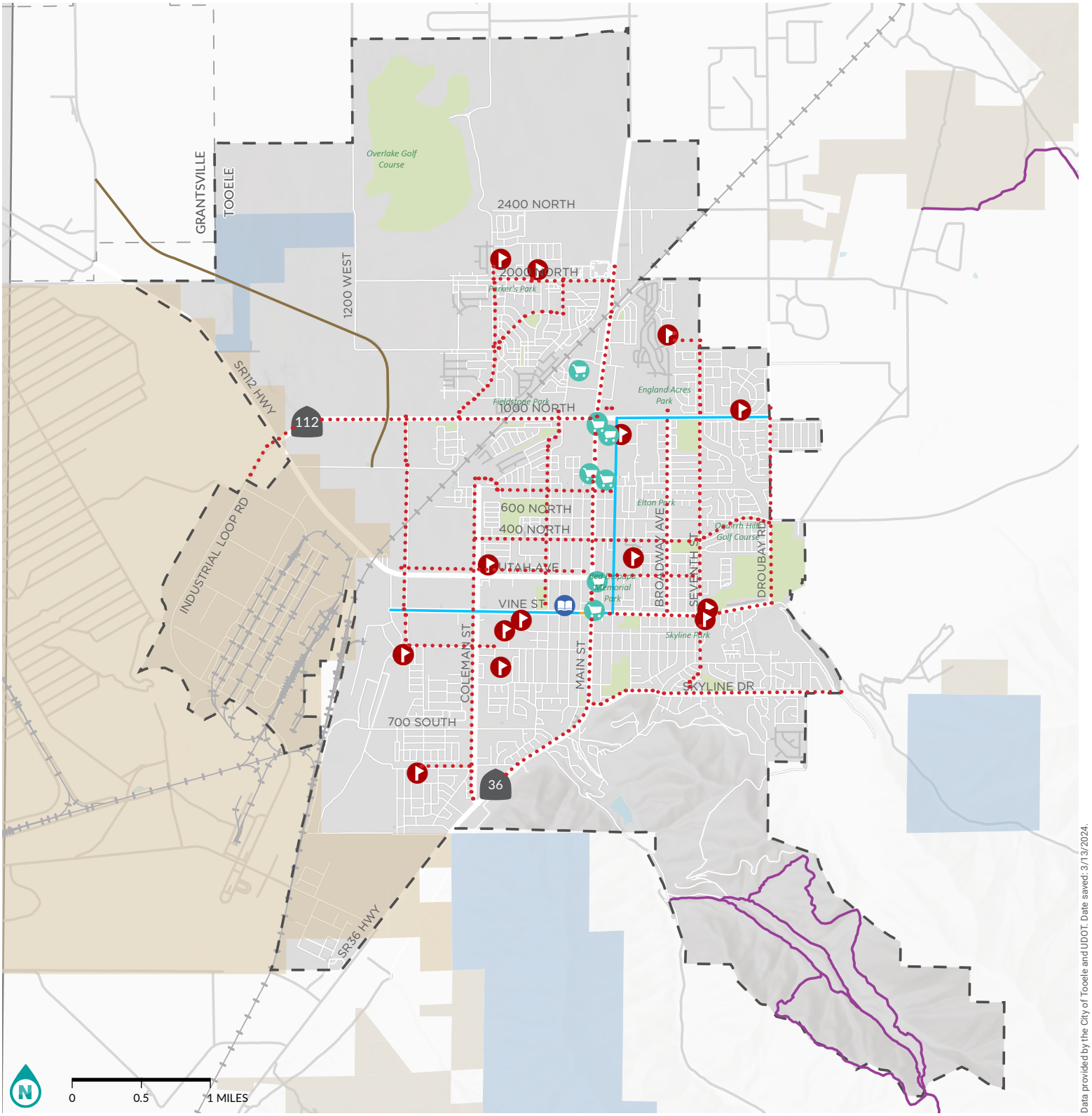
Walking Network Gaps

By reviewing sidewalk locations in Tooele, shown in **Map 2.6**, most neighborhood areas have sidewalks on one or both sides of the street. But when it comes to connecting between neighborhoods, many of these neighborhoods are sidewalk islands with limited or no external connections.

Sidewalk gaps are especially apparent in central and west Tooele, primarily in industrial areas, along corridors with new developments going in, and on smaller roads that serve primarily as alleyways between more major streets. However, there are also sidewalk gaps in fully-developed residential and commercial areas. These gaps, especially corridors without sidewalks on either side of the road (highlighted in red in **Map 2.6**), should be prioritized to connect all areas of town for those walking for transportation or recreation.



Residential street in Tooele, 1st St, with no sidewalks on either side of the road. Source: Google Earth



Map 2.5

BIKEWAY NETWORK GAP ANALYSIS

Facility Gap

Tooele City
Active Transportation Plan

Base Map

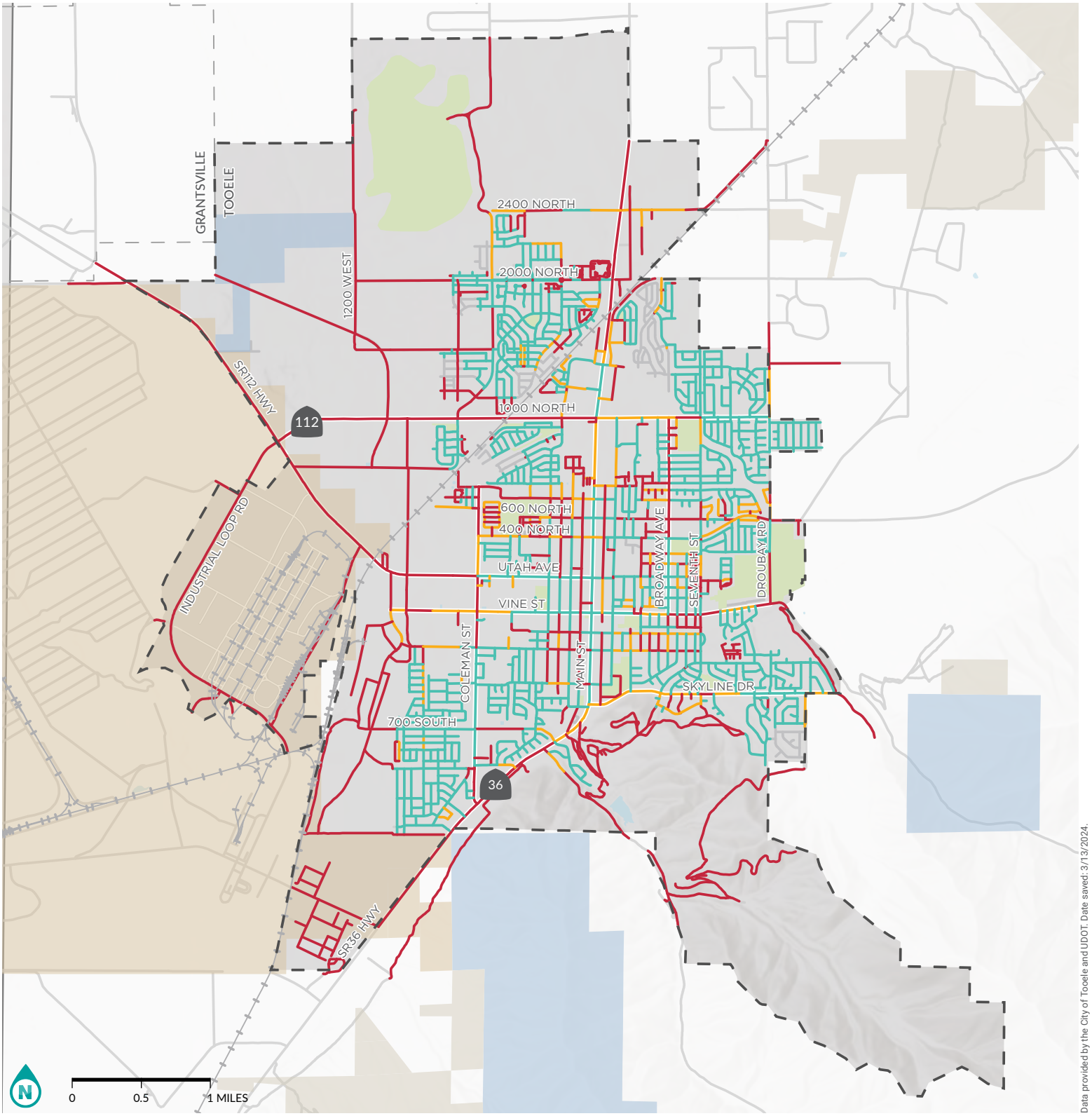
- Tooele City Boundary
- Tooele City Parks
- Water
- Dept of Defense
- State Trust Lands
- Bureau of Land Management
- Railroad

Destinations

- Grocery Stores
- Libraries
- Schools

Existing Facilities

- Buffered Bike Lane
- Shared Roadway
- Unpaved Trail



Map 2.6

PEDESTRIAN NETWORK GAP ANALYSIS

Tooele City
Active Transportation Plan

Base Map

- Tooele City Boundary
- Tooele City Parks
- Water
- Dept of Defense
- State Trust Lands
- Bureau of Land Management
- Railroad

Sidewalk Presence

- Complete on both sides
- Incomplete on one side
- Incomplete on both sides
- Future Roads

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The Case for Active Transportation

While cities across the American West, including Tooele, share a legacy of urban and transportation systems designed for optimal automobile use, this often results in driving alone being the dominant mode of travel. Active Transportation provides a myriad of benefits to the communittty including:

Benefits to the Community

Connectivity

A high-quality active transportation network helps connect people to their neighbors and community destinations such as schools, parks, and outdoor recreation opportunities.

Main Street

Creating a quality walking environment and bike access to Main Street often yields high returns on investment through economic diversification, recreational tourism, increased property values, and small business opportunities.

Safety

Speed management is important in reducing crashes and crash severity. Active transportation infrastructure, education, and programming can improve safety, comfort, academic performance, physical activity, and reduce traffic congestion.

Heritage, Culture, & Place

Walkable and bikeable communities can increase awareness of local heritage and provide a small town feeling which can help create a sense of belonging and desire for the preservation of places that are important to the local community.

Health

A connected active transportation network can provide safer and more comfortable travel options for all ages and abilities, which is linked to supporting mental and physical well-being.

Recreation

Active transportation infrastructure can be used for recreation, improving the appeal of an area as a destination and place to live, while also preserving natural capital critical to the local economy.

Plan Goals & Vision

Guided by a collaborative effort between community stakeholders, City staff, and City residents, the Tooele Active Transportation Plan (ATP) Steering Committee identified key goals to shape the future of active transportation in Tooele. These goals served as the compass, informing both specific recommendations and the overall vision of the plan:

- ***Goal 1 - Leverage and Expand existing active transportation assets:***
  - Tooele City has a good sidewalk network. Focus on addressing areas with sidewalk gaps and expanding bicycle infrastructure to create a connected active transportation network.
- ***Goal 2 - Intergrate active transportation into the culture an dpractices of the city***
  - All city departments can consider how decision-making can improve Tooele's active transportation environment.
- ***Goal 3 - Leverage private development to support active transporation an dhuman scale environemtns:***
  - Encourage high-quality active transportation infrastructure and connections that are accessible to the public as part of new developments.
- ***Goal 4 - Create key connections through priotity corridors and links to community destinations:***
  - Focus on connecting important locations such as schools, parks, and neighborhoods through safe active transportation infrastructure.
- ***Goal 5 - Engage the Community Through Active Transportation Promotion and Partnerships***:
  - Partner with community organizations, schools, and employers to encourage more active transportation participation in Tooele City.

Through extensive discussions and careful consideration of these key goals, the Steering Committee arrived at the following shared vision for Tooele's active transportation future:

Vision:

The Tooele Active Transportation Plan will shape a more accessible, connected, safe, and welcoming active transportation environment. The plan will create connections within Tooele City, to recreation opportunities, and to the county-wide active transportation network, while promoting Tooele's diverse heritage.

- 03 -

Community Outreach

- Outreach Overview
- Phase I: Listening
- Phase II: Feedback & Direction

Community Outreach

Outreach Overview

The Tooele Active Transportation Plan will only be successful if direction and recommendations are lead by the community. To accommodate this critical input, a two-phase community outreach process was planned to take place throughout the duration of the plan's creation.

A summary of what we heard from the community during each phase (Phase I: Listening and Phase II: Feedback & Direction) is included on the following pages, and a full breakdown of outreach responses is available in **Appendix C**.

Public Outreach Event at 2023 Women's Health Expo

Steering Comittee #1 - Visioning Workshop

Public Outreach Event at the Tooele July 4th Celebration

Phase I: Listening

Outreach Process

During Phase I of the community outreach process, a community survey and interactive map were created (available both in print and digitally) to gain an understanding for general community desires related to active transportation, as well as specific routes or ideas for establishing a successful active transportation network in Tooele. This section provides a summary of what we heard from these input tools.

Community Survey Summary

The Phase I Community Survey, completed by 64 individuals, collected information about feelings toward active transportation in general, as well as specifically in Tooele. This survey revealed that the majority of participants walk, bike, or roll for recreation ***weekly***, but ***rarely*** do so for transportation. The primary factors that hold them back from using active transportation more often include bikeways, trails, or sidewalks not connecting them to where they need to go, feeling unsafe interacting with vehicle traffic, and the fact that driving feels more convenient. However, they'd like to be able to walk, bike, or roll for transportation to stay active, have fun and socialize, and to spend more time outdoors.

Making improvements to the active transportation network is very important to 59% of participants. Some of the most desired improvements include improved street lighting, better crosswalks and other intersection improvements, and more designated bike and pedestrian facilities.

The main findings of this survey are illustrated in **Figure 3.1**, and full survey results are included in **Appendix A**.

Figure 3. *Community Outreach Phase I - Web Map Summary*

Survey 1 Results Summary

64 Unique Survey Participants

Relation to Tooele City (64 respondents)

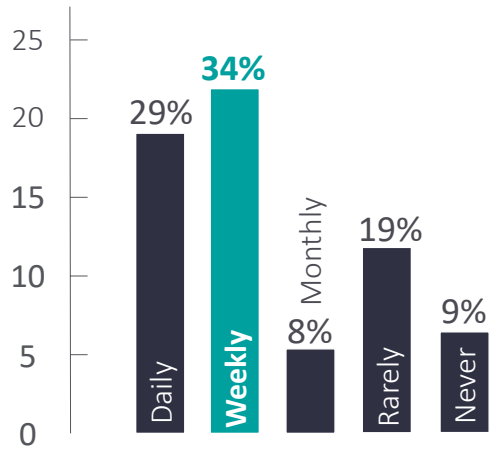
92% **Live in**

30% Work in

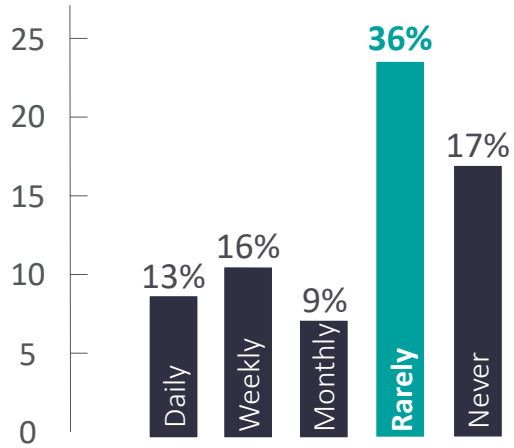
11% Visit Often

2% Visit Occasionally

Frequency of walking, biking, or rolling for **recreation** (64 respondents)



Frequency of walking, biking, or rolling for **transportation** (64 respondents)



Top Reasons Preventing the Use of Active Transportation (64 respondents)

58% **Bikeways, trails, or sidewalks do not connect to where I want to go**

50% **I feel unsafe interacting with vehicle traffic**

45% **Driving is more convenient**

36% I usually travel with kids

31% The distance I have to travel is too far

Have you ever felt **unsafe biking** in Tooele? (64 respondents)

Yes 67%

No 33%

Have you ever felt **unsafe walking** in Tooele? (64 respondents)

Yes 63%

No 37%

How would you generally **describe yourself when it comes to riding a bicycle**? (64 respondents)

6%

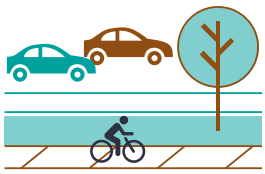
Strong & Fearless

I don't mind sharing the road with cars, even without a dedicated bike lane

33%

Enthused & Confident

I prefer separated bikeways, but I'm comfortable riding in regular bike lanes or on paved shoulders



44%

Interested but Concerned

I'm not very comfortable riding in bike lanes, and may choose to ride on the sidewalk even when bike lanes are present. I would like to ride a bike more, but I'm concerned about safety

17%

Not Interested

I'm not currently interested in using a bicycle to get around

Top 3 **desired uses for bikeways, paved trails, and sidewalks** (64 respondents)

#1 **Recreation & Exercise** **98%**

#2 Get to local parks, trailheads, or rec centers 80%

#3 Visit friends, social events, or entertainment 42%

Top 3 **reasons for wanting to walk, bike, or roll** (64 respondents)

#1 **Stay active and improve health/ fitness** **92%**

#2 Pleasure, fun, or socializing 80%

#3 Spend time outdoors 75%

How **important is it** to you that **Tooele City invests in improving active transportation infrastructure?** (64 respondents)

Very important	Somewhat important	Neutral	Somewhat unimportant	Not at all important
59%	23%	11%	2%	5%

Desired improvements to make walking, biking, or rolling more comfortable (64 respondents)

Improved street lighting - 69%

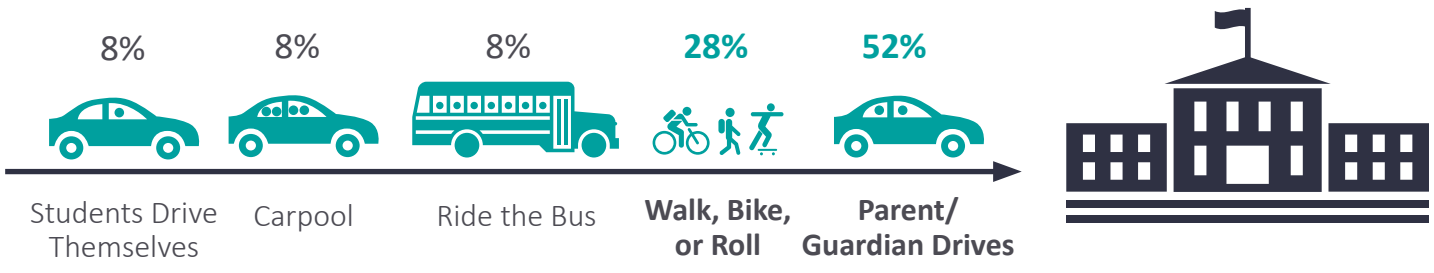
Better crosswalks and other intersection improvements - 68%

More designated bike and pedestrian facilities (ex. bike lanes, trails, sidewalks) - 66%

Increased enforcement of traffic laws- 44%

Education campaigns for drivers and cyclists/ pedestrians - 23%

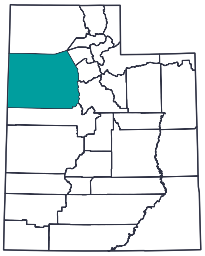
How children get to school (of participants with school-aged children) (35 respondents)



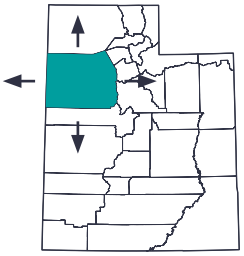
Survey 1 Demographics Summary

Where respondents **live** (64 respondents)

Tooele City
83%



Tooele County (Grantsville, Erda, Stansbury Park, Stockton, etc.)
14%

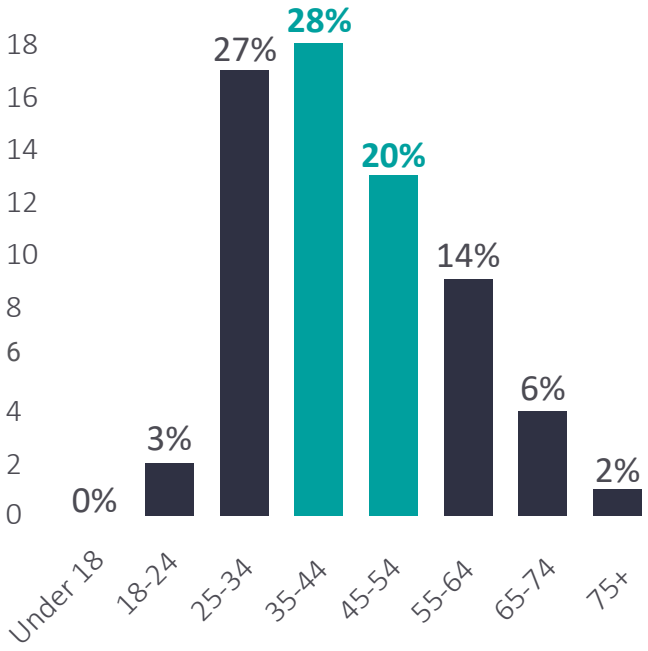


Outside of Tooele County
3%

How respondents describe themselves
(64 respondents)

White/Caucasian - 89%
Would rather not say - 8%
Hispanic/Latino - 3%
Black or African American - 0%
Asian - 0%
Native American or Alaska native - 0%
Native Hawaiian/Pacific Islander - 0%
Other- I describe myself as: 0%

Age Of respondents (64 respondents)



Gender
(64 respondents)

Female - 64%
Male- 36%

Housing Status
(64 respondents)

Homeowner - 91%
Renter - 8%
Other - 2%

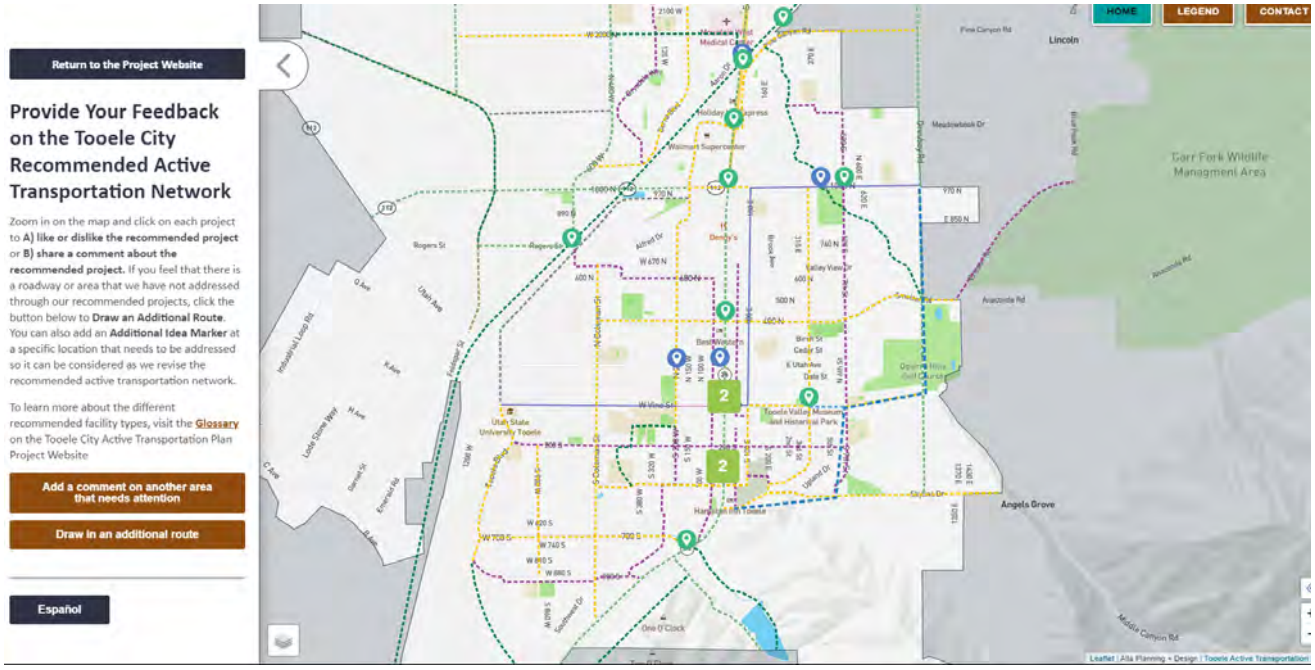
Phase I: Map Responses & Key Takeaways

Outreach Process

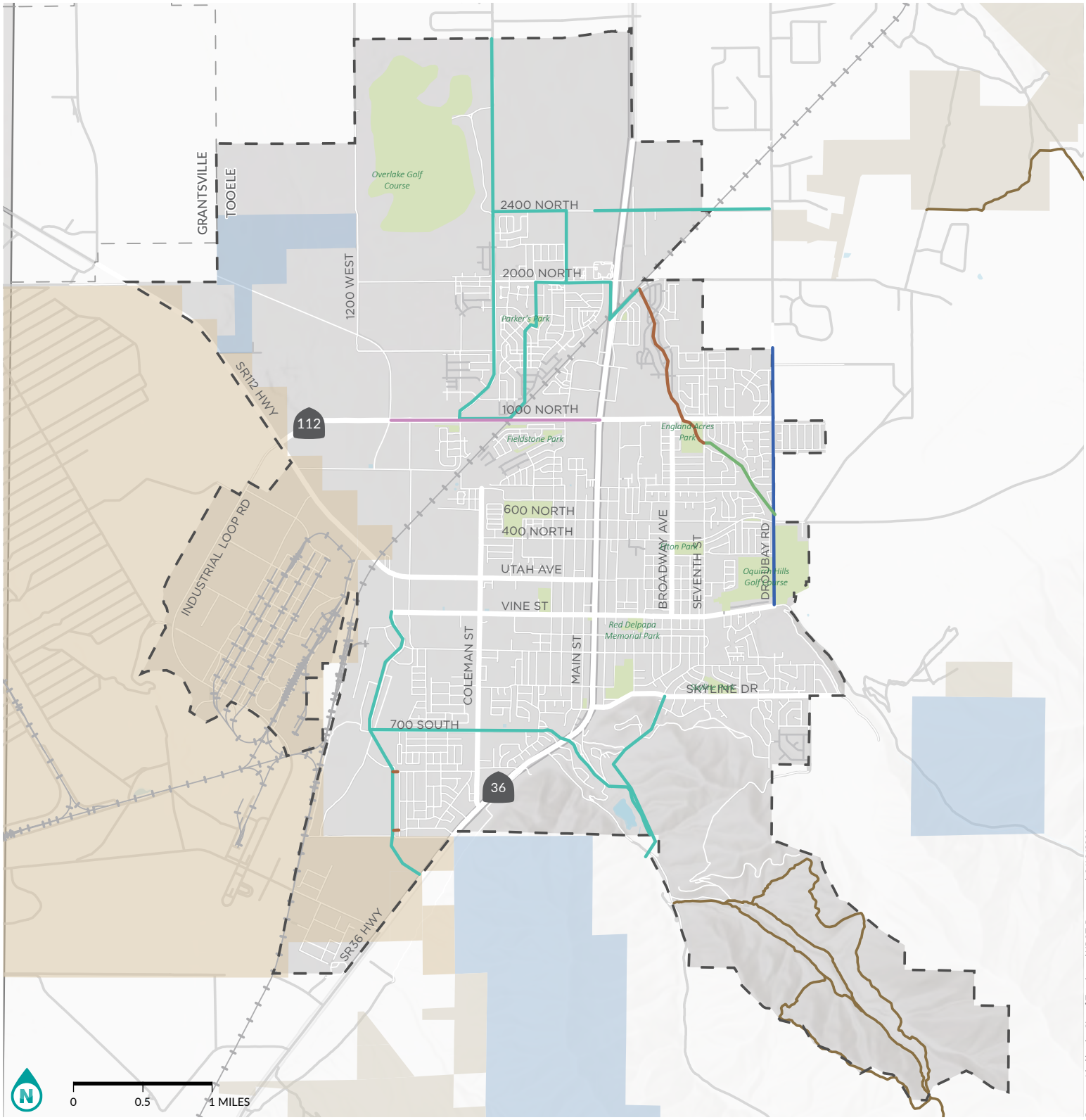
Interactive Map Summary

70 individuals provided input on the interactive map by adding desired routes, marking prominent destinations, and indicating where challenges and opportunities are present throughout Tooele City for establishing a successful active transportation network.

A map of the feedback provided is included in **Map 3.1**.



Interactive Webmap for Public Input



Map 4.1

PUBLIC INPUT

Tooele City
Active Transportation Plan

Base Map

- Tooele City Boundary
- Tooele City Parks
- Water
- Dept of Defense
- State Trust Lands
- Bureau of Land Management
- Railroad

Active Transportation Facilities

- Suggested Connection
- Suggested Bike Lane
- Suggested Sidepath
- Suggested Sidewalk
- Suggested Trail

Phase II: Feedback & Direction

Outreach Process

During the second phase of community outreach, the draft active transportation network was provided in a web map format and a second survey was developed.

What we Heard

- Expand and improve active transportation assets into culture and practices of the city
- “Bikeways, trails, or sidewalks do not connect to where I want to go” / “I feel unsafe interacting with vehicle traffic”
- Desired uses for people include: Recreation/Health Fitness/ Accessing local parks or community centers

What we Proposed

Make it convenient

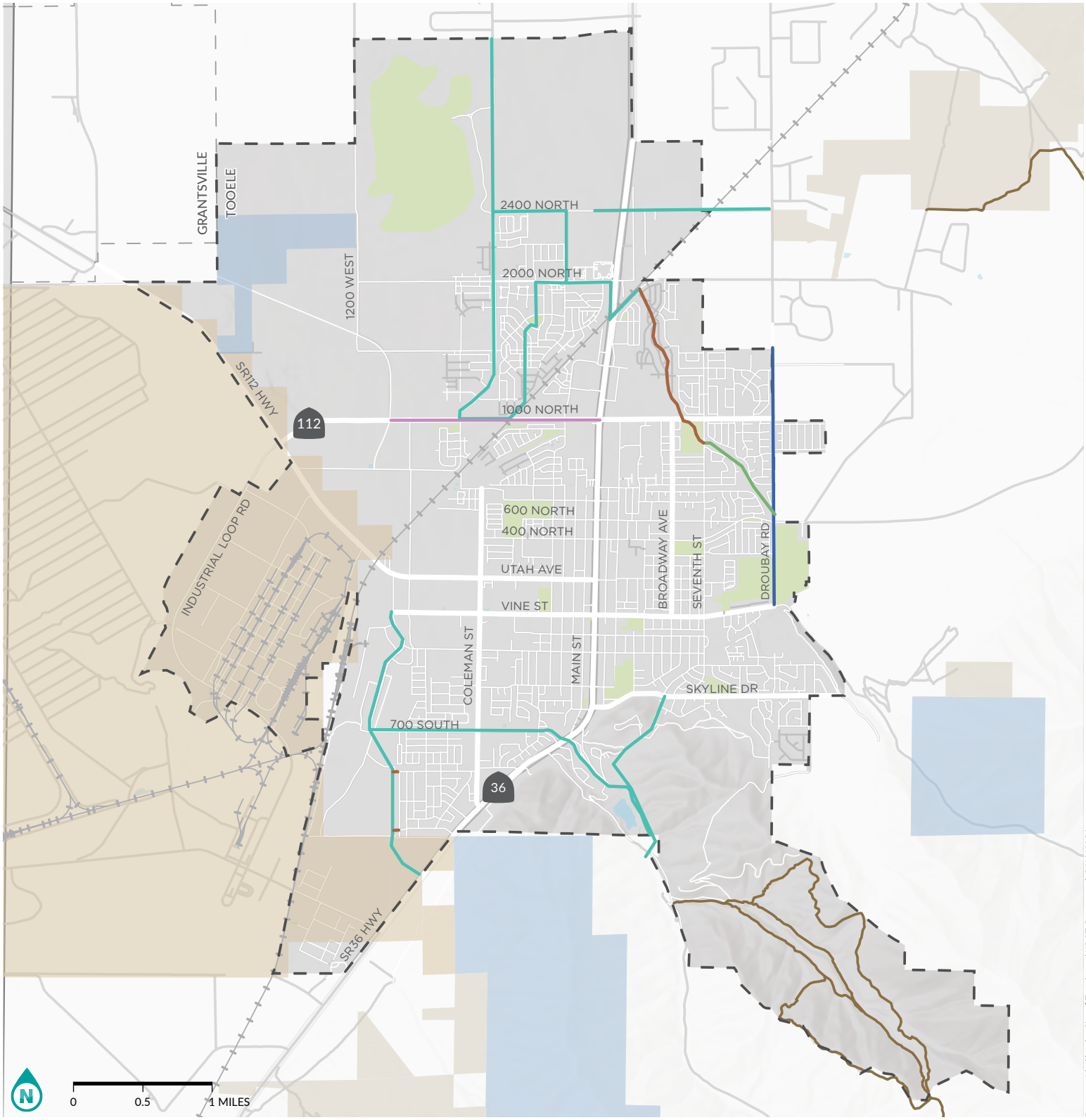
- Enhance network to grant people freedom of choice when it comes to exerciseing, recreating, and/or commuting.

Make it Connected and Safe

- Create key connections through priority corridors and links to community destinations
- Create a safe and connected active transportation network for Tooele City’s residents and visitor

Make it Accessible for All

- Increase health and activity by improving access to local and



Map 4.1

Base Map

- Tooele City Boundary
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- Dept of Defense
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- Bureau of Land Management
- Railroad

Active Transportation Facilities

- Suggested Connection
- Suggested Bike Lane
- Suggested Sidepath
- Suggested Sidewalk
- Suggested Trail

PUBLIC INPUT

Tooele City
Active Transportation Plan

Phase II: Active Transportation Tour

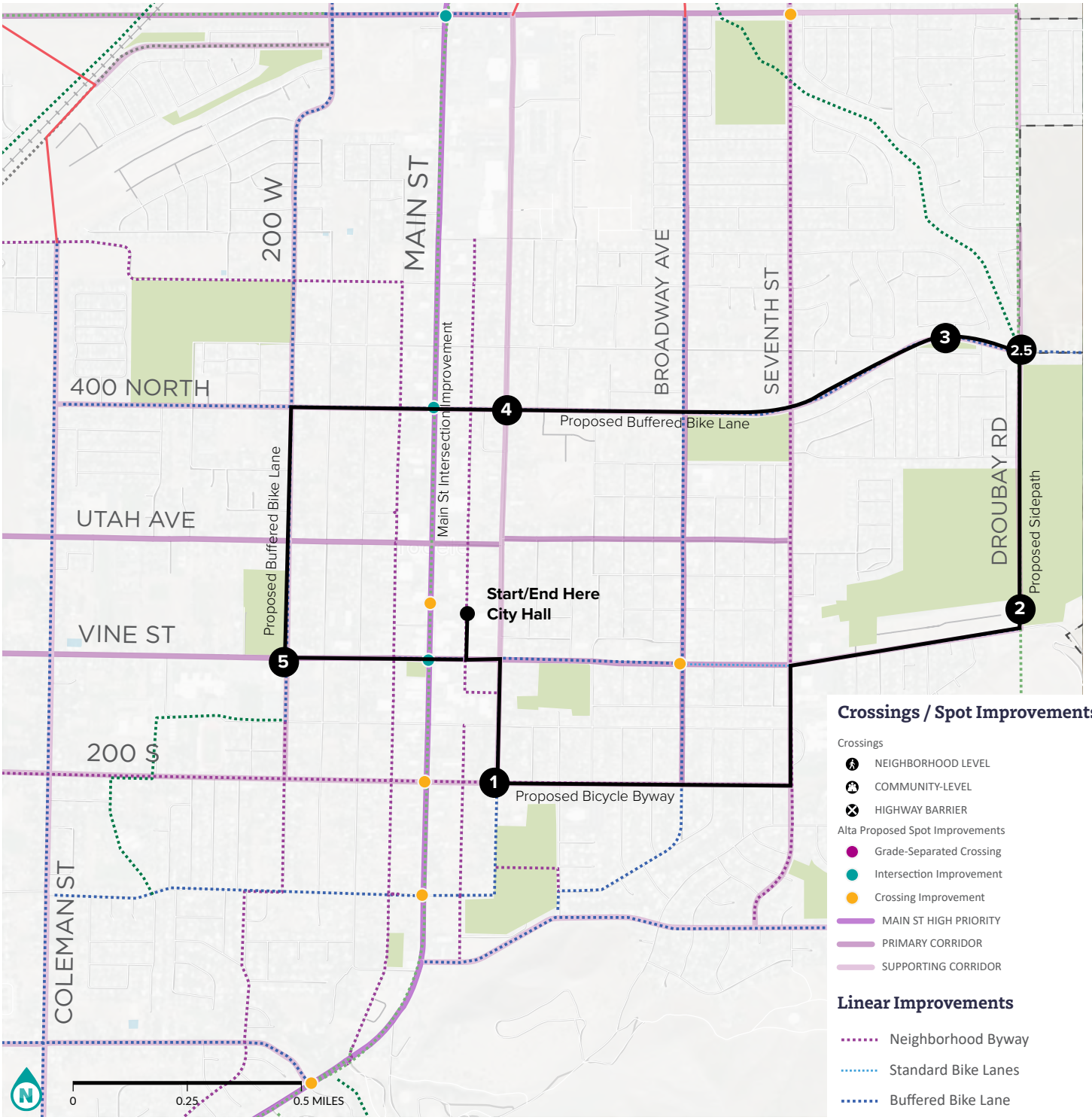
Tour & Workshop Details

In mid-2023, the project team hosted a day of engagement. Steering committee members embarked on a bike tour, exploring potential project sites and areas for improvement firsthand. This hands-on experience, highlighted in Map 3.1, helped identify key locations and opportunities.

The workshop further engaged participants through photo simulations, showcasing how proposed enhancements could transform real spaces in Tooele. These simulations are visualized on the following pages.

AT Tour - Debrief

AT Tour - Bike Ride



ACTIVE TRANSPORTATION TOUR

Tooele City

Active Transportation Plan

Stopping Points & Discussion

1. **200 S: Bike Facility - Proposed Bicycle Byway**
2. **Droubay Rd: Bike Facility - Sidepath**
2.5. **Droubay Rd: Start of England Acres Trail**
3. **Smelter Rd / 400 S: Bike Facility - New Sidewalks / Proposed Buffered Bike Lane**
4. **Main St / S.R.36 - Crossing and streetscape Enhancements**
5. **Vine St: Primary Corridor Significance for pedestrian connections**

NEIGHBORHOOD BYWAY - 200 S

Neighborhood Byways, also known as bicycle boulevards, are low volume, low speed neighborhood streets. Even though bicyclists share the street with cars, bicyclists are prioritized through the use of pavement markings, special signage, and traffic calming infrastructure that either reduces traffic volumes or slows speeds. more intensive than other crossing treatments, but may be necessary in certain conditions.

BUFFERED BIKE LANES - SMELTER RD / 400 N

Buffered Bike Lanes are similar to standard bike lanes, but they include additional striping that creates a buffer (18-36”) between motorists and bicyclists.

SIDEPATH- DROUBAY RD

Shared Use Paths, also known as pathways or trails, are multi-use, two-way facilities that are completely separated from motor vehicle traffic. They can run through parks, along streams and rivers, railroad corridors, or other off-street corridors.

Sidepaths are similar to shared use paths, but they run adjacent to roadways when appropriate and feasible.

- 04 -

Recommendations

- Introduction
- Methodology & Facility Guidance
- Recommended Bike Network
- Recommended Sidewalk Network Improvements
- Spot Improvements
- Recommended Policies & Programs

Recommendations + Prioritization

Introduction

The Tooele Active Transportation Plan envisions a city where walking, biking, and rolling are safe, accessible, and enjoyable for everyone. To realize this vision, the ATP presents a series of prioritized recommendations for infrastructure improvements and policy changes. These recommendations prioritize key connections, leverage existing assets, and promote active transportation as a central part of Tooele's culture. Recognizing the city's dynamic nature, these recommendations serve as adaptable guidelines, ready to evolve as Tooele grows and changes.

Methodology

The plan identifies five key goals to guide the development of the active transportation network.

Goal 1: Leverage and Expand Existing Assets:
Recommendations focus on addressing gaps in the sidewalk network and expanding bicycle infrastructure to seamlessly connect existing assets, creating a more robust and accessible network.

Goal 2: Integrate Active Transportation into City Culture:
Recommendations include policy changes encouraging city departments to prioritize active transportation in decision-making, fostering a culture that supports walking, biking, and rolling.

Goal 3: Leverage Private Development:
Recommendations encourage new developments to incorporate high-quality active transportation infrastructure and connections, promoting vibrant and human-scale environments that prioritize people over cars.

Goal 4: Create Key Connections:
Recommendations prioritize creating safe and reliable corridors linking schools, parks, neighborhoods, and other key destinations, promoting healthy and sustainable travel choices.

Goal 5: Engage the Community:
Recommendations include partnering with community organizations, schools, and employers to promote active transportation initiatives and encourage widespread participation, fostering a culture of health and well-being for all.

Types of Bicyclists

It is important to consider bicyclists of all skill levels when planning a network of bikeways. Infrastructure should allow for a comfortable experience for the greatest number of users and user types as possible.

There are four general types of bicyclists[1]

- "Highly confident" bicyclists will typically ride anywhere regardless of road or weather conditions, ride faster than other user types, prefer direct routes, and will typically choose to ride on the road, even if shared with vehicles, over separate bikeways like shared use trails.
- "Somewhat confident" bicyclists are fairly comfortable riding bike lanes with passing traffic, but typically prefer low traffic streets or physically separated bikeways or trails, when available.
- "Interested but Concerned" bicyclists comprise the majority of the population (approximately 60%) and are interested in using a bicycle for transportation, but concerned about safety, especially interacting with motor vehicles. This demographic will typically only ride on quiet neighborhood streets or physically separated routes. If they don't perceive conditions as safe, they choose not to ride.
- "Not currently interested" individuals will not ride a bicycle under any circumstances, either due to physical disability or overall lack of interest.

Highly Confident

1-3%

Comfortable riding with traffic; will use roads without bike lanes

Somewhat Confident

5-10%

Prefer more separated facilities, but comfortable riding in bike lanes or on paved shoulders

Interested but Concerned

50-60%

Often not comfortable with bike lanes - may prefer sidewalks even if bike lanes are provided; prefer separated facilities or quiet residential streets. May not bike at all if facilities do not meet perceived comfort.

Not Currently Interested

30%

Physically unable or not currently interested in using a bicycle to get around

1 According to a survey conducted by People for Bikes, nearly half of American adults (47 percent) would like to ride a bicycle more often, and 43 percent would be more likely to ride if bikeways were physically separated from motor vehicles, confirming that the potential for higher ridership is present, but that a lack of comfortable infrastructure is a major barrier.

Facility Selection

The process of bikeway selection involves an analytical process that considers the broader network and roadway context while drilling down on a specific corridor. It starts with identifying the desired bikeway type and then refines the selection based on real-world conditions like available right-of-way and budget. The chosen bikeway type significantly impacts the level of comfort and, consequently, the number of people who will benefit from it.

Figure 4 provides guidance on how motor vehicle volume and speed should be taken into account to determine the bikeway type that will best serve the "Interested but Concerned" bicyclist[1].

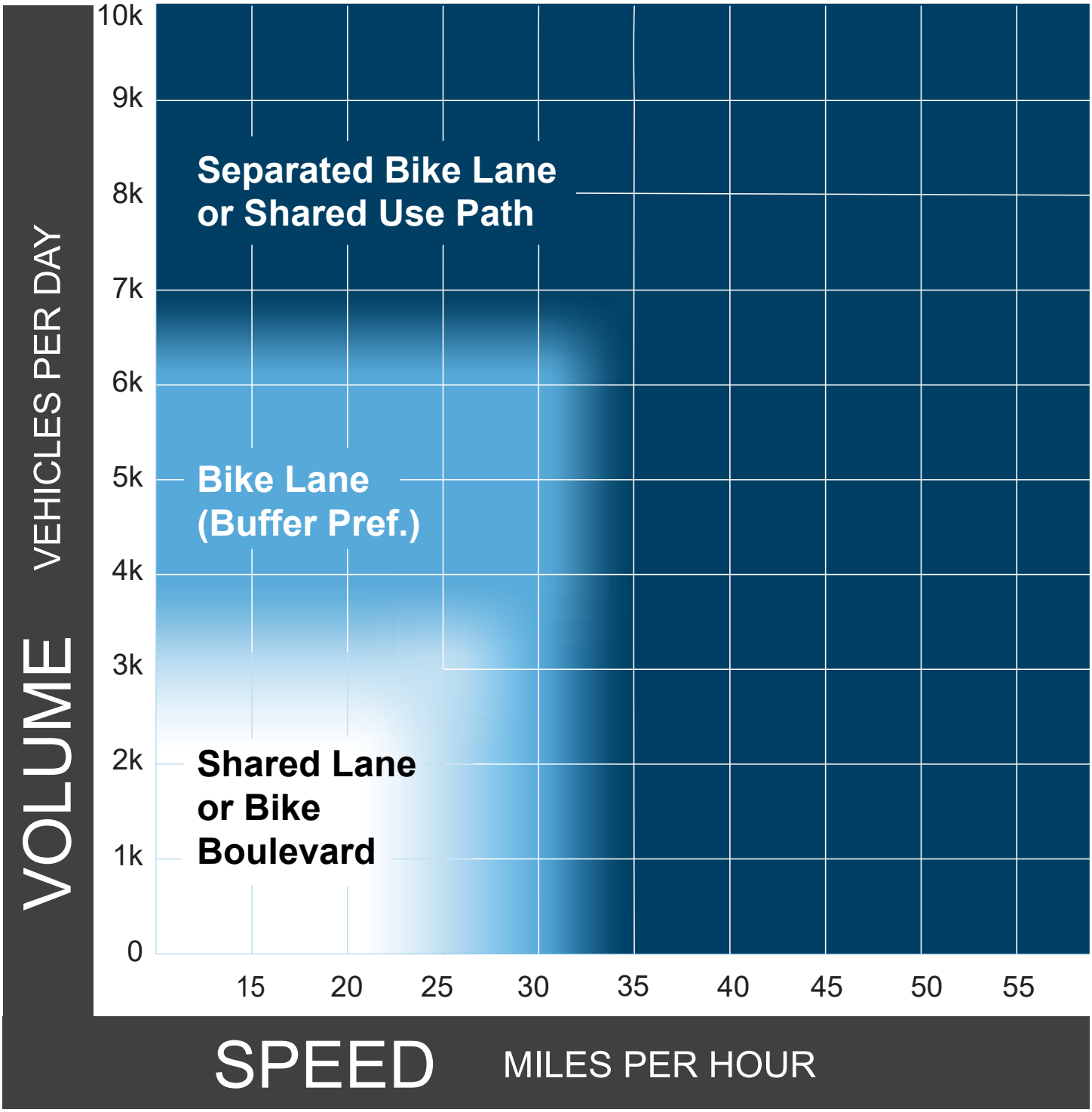
In general, the higher the speed and volume of a road, the more protective the recommended bikeway. The following recommendations are suggested based on speed and volume:

1. Shared lanes or bicycle boulevards are suitable for the lowest speeds and volumes.
2. Bike lanes are recommended for low speeds and low to moderate volumes.
3. Separated bike lanes or shared-use paths are suitable for moderate to high speeds and high volumes.

Since the design user is the "Interested but Concerned" cyclist, the most appropriate recommendation might be a more protective facility than necessary for a "Highly Confident" or "Somewhat Confident" design user.

1 For a more detailed discussion on selecting bikeway types based on traffic volume and speed, refer to the Federal Highway Administration (FHWA) Bicycle Facility Selection Guide FHWA Bicycle Facility Selection Guide. This guide is considered industry best practice for selecting safe and appropriate bicycle facilities.

Figure 4. *Preferred Bikeway Type for Urban, Urban Core, Suburban and Rural Town Contexts from FHWA 2019 Bikeway Selection Guide*



Note:
1. Chart assumes operating speeds are similar to posted speeds. If they differ, use operating speed rather than posted speed.
2. Advisory bike lanes may be an option where traffic volume is <3K ADT.
3. See page 32 for a discussion of alternatives if the preferred bikeway type is not feasible.

Recommended Bike Network

The following pages highlight the various types of new facility types recommended for Tooele and indicate where they will be located to form a strong bike network throughout the community. With an existing 6.3 miles of bike facilities, the total network mileage with all recommendations (put in place would total over 87 miles.

Existing facility types have been added onto, including:

- Buffered Bike Lanes: 21.5 Miles
- Unpaved Trail: 0.6 Miles

Additionally, there are a total of four miles of undetermined facilities recommended. This means there is further studies will need to be completed to determine which facility type would be most effective.

Proposed New Facility Types

The following facility types are included in the recommended network and are new to Tooele.

Standard Bike Lanes

While Tooele already has buffered bike lanes, standard bike lanes are the same but without a buffer. These are only used in constrained conditions where a buffer space will not fit.

Neighborhood Byway

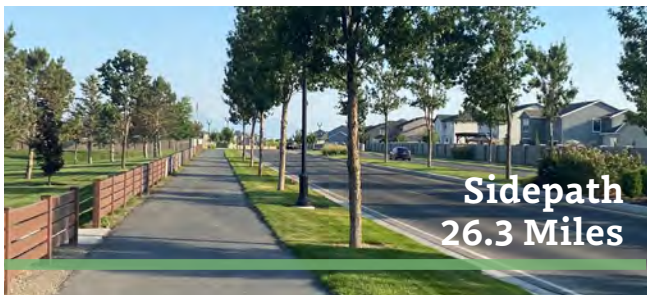
A neighborhood byway is a quiet neighborhood street with low vehicle volumes & speeds. Bicyclists are prioritized by managing speeds and volumes via traffic calming elements. Signage and pavement markings are also incorporated. These improvements will need to be determined on a case-by-case basis, studied, and recommended by the Engineering Department.

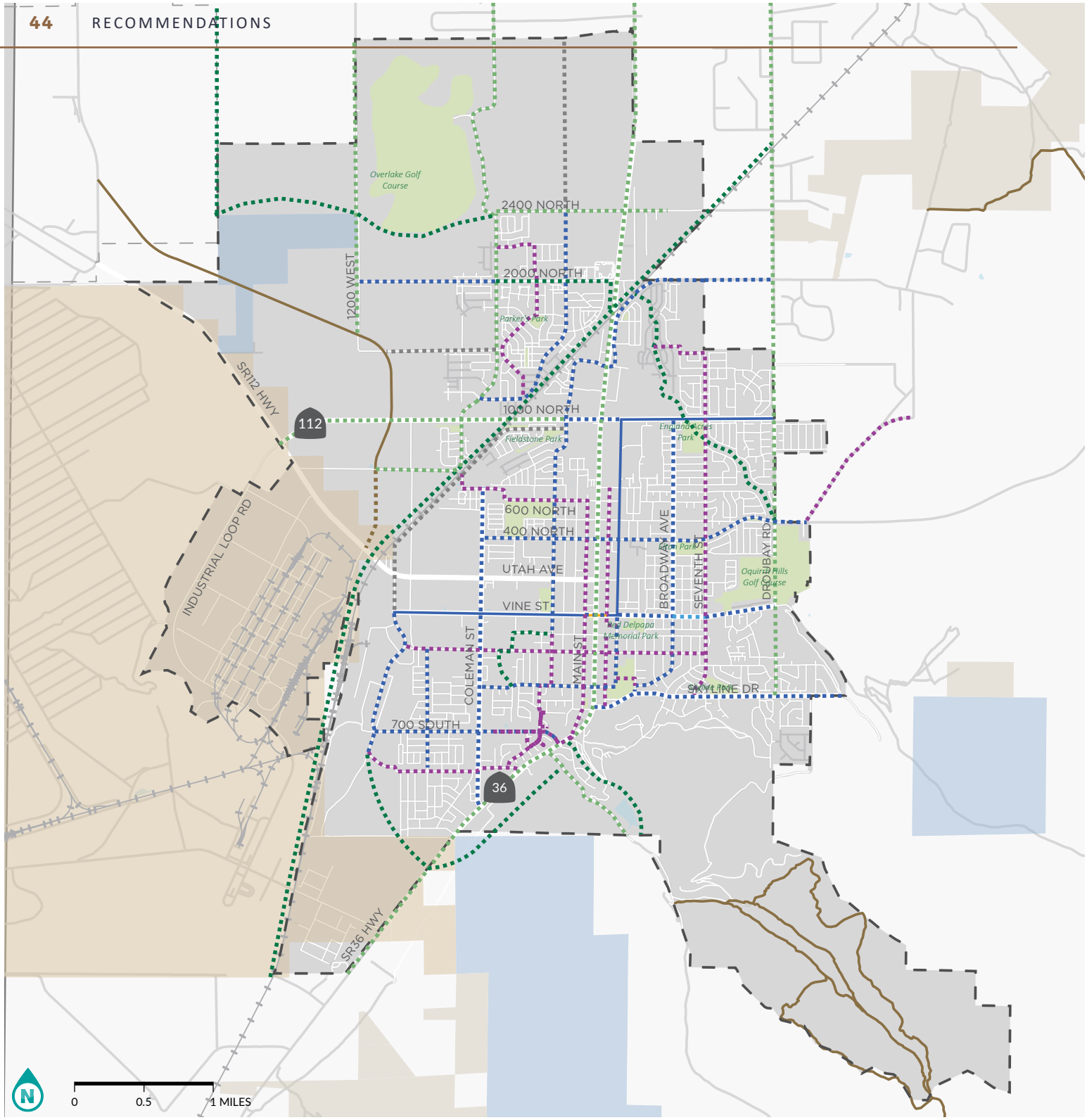
Sidepath

Sidepaths or trails, are paved off-street pathways that run alongside roadways and are designed to accommodate two-way, non-motorized travel.

Shared Use Path

Shared Use Paths or trails, are paved off-street pathways, completely separated from roadways and designed to accommodate two-way, non-motorized travel.





Map 4.1

RECOMMENDED FACILITIES

Tooele City
Active Transportation Plan

Base Map

- Tooele City Boundary
- Tooele City Parks
- Water
- Dept of Defense
- State Trust Lands
- Bureau of Land Management
- Railroad

Active Transportation Facilities

- Neighborhood Byway
- Standard Bike Lanes
- Buffered Bike Lane
- Sidepath
- Shared Use Path
- Unpaved Trail
- Undetermined Facility

Neighborhood byways, explained further

Neighborhood byways, also referred to as bicycle boulevards, are a shared street, or mixed traffic facility on which bicyclists and motor vehicles share the same space; however, they may require more investment than simply incorporating pavement markings (sharrows) and bicycle signage. In order to achieve a level of comfort for most people on a bicycle, neighborhood byways often employ vehicle speed and traffic management strategies (also known as traffic calming) to prioritize bicyclists and pedestrians along the corridor.

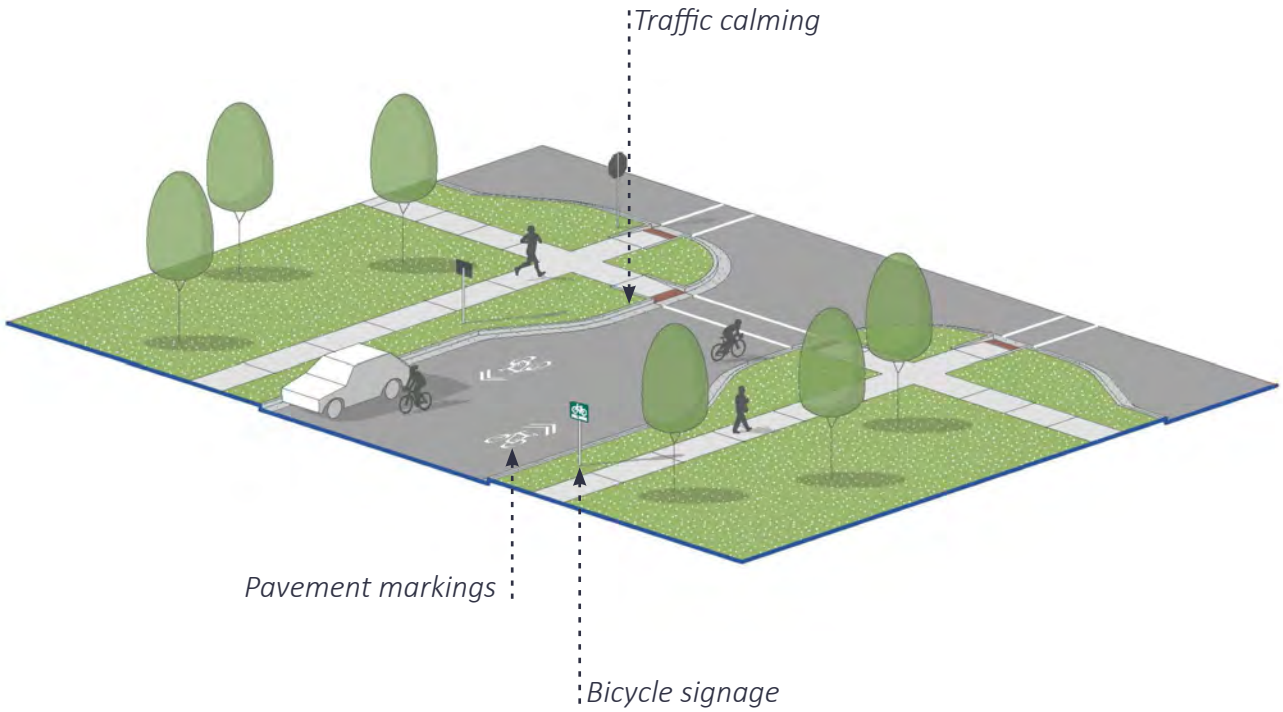
Neighborhood streets that already experience low vehicular speeds and volumes are good candidates for neighborhood byways. Special consideration is needed when neighborhood byways cross major streets, and will often require enhanced crossing treatments.

Some examples of traffic calming elements include:

- Curb bulbouts and pinch points
- Speed humps/bumps/cushions
- Neighborhood traffic circles
- Raised crosswalks and intersections
- Chicanes (lateral shifts in traffic flow)
- Traffic diverters
- Pedestrian refuge islands and raised medians
- Street narrowing
- Street trees

DESIGN GUIDANCE BASED ON:

NACTO Urban Street Design Guide: https://nacto.org/publication/urban-bikeway-design-guide/bicycle-boulevards/
AASHTO Guide for the Development of Bicycle Facilities P.4-33
FHWA Bikeway Selection Guide



Pedestrian Network - Potential Strategies

This section presents initial recommendations for prioritizing street corridors within the pedestrian network These corridors are categorized into three groups based on their significance to the overall network and potential for improvement:

MAIN STREET / S.R. 36

Main Street improvements should focus on providing safe crossings and buffering people from moving traffic; most pedestrian related crashes occur on this corridor. This corridor would also be treated differently among the highway, commercial, and historic Main Street segments.

Crossings with median and pedestrian refuge

Wide sidewalks and tree / landscape buffers

Pedestrian hybrid beacons

Downtown streetscape

PRIMARY PEDESTRIAN CORRIDORS

Primary Pedestrian Corridors are the streets that provide the most basic and important framework of walking connections around the Tooele community. Along with Main Street, these corridors connect the town's activity centers, as well as many other destinations, and provide links across barriers.

Wayfinding signs

Corridor traffic calming

Sidewalks with trees and landscape buffers

Directional curb ramps

High-visibility crossing with flashing beacon

SUPPORTING PEDESTRIAN CORRIDORS

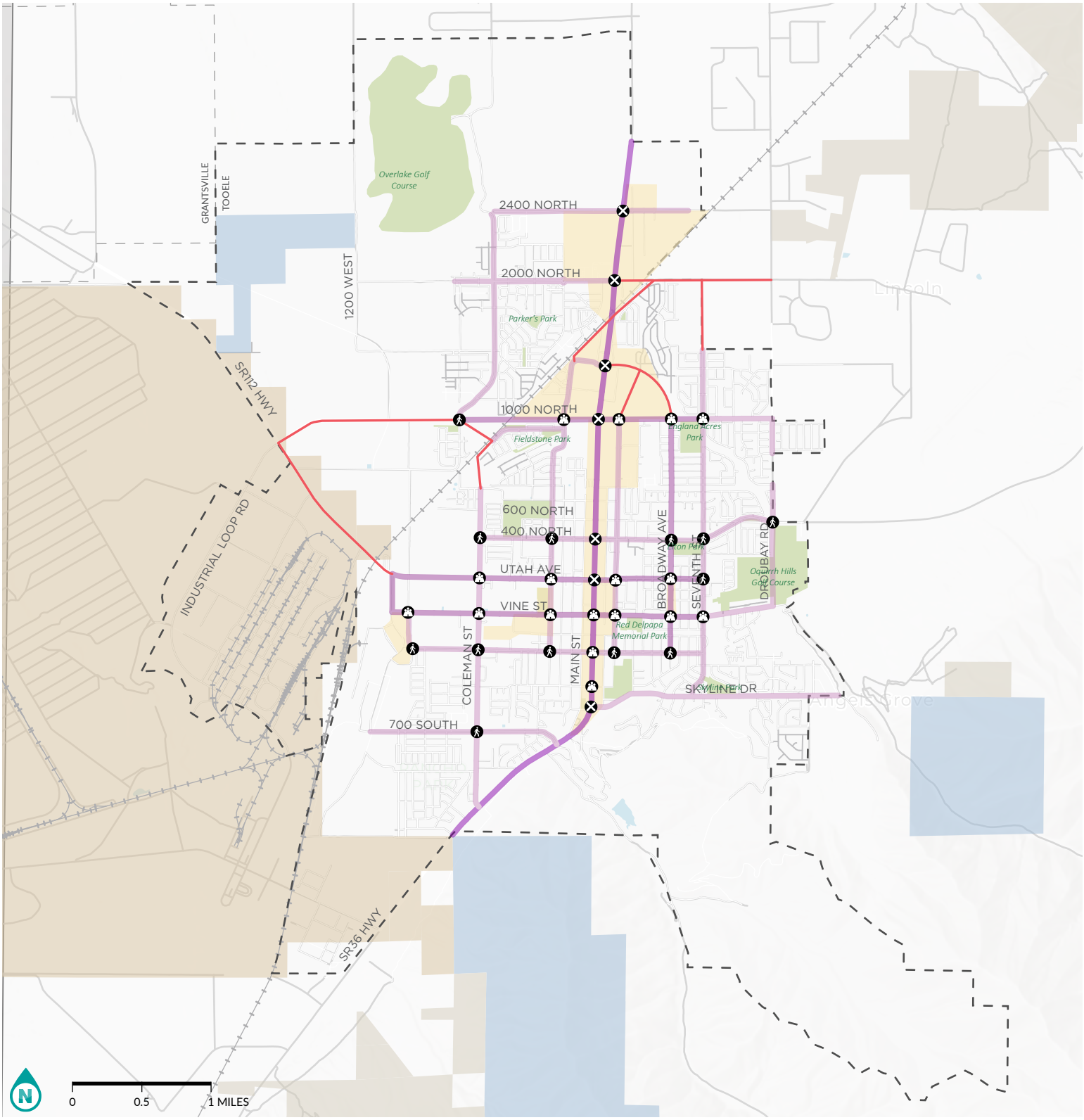
Supporting Pedestrian Corridors help fill out the network with viable, quieter streets to use to access other pedestrian links or destinations. They focus primarily on completing sidewalks and crossings and slowing traffic along them.

Raised crossings

Neighborhood Byways

Neighborhood traffic calming

Fill sidewalk gaps



Pedestrian Network - Potential Strategies

Tooele City
Active Transportation Plan

Crossings / Spot Improvements

Activity Centers

Activity Centers

Crossings

- NEIGHBORHOOD LEVEL
- COMMUNITY-LEVEL
- HIGHWAY BARRIER

Linear Improvements

- New Ped Connections

Tooele Pedestrian Corridors

- MAIN ST HIGH PRIORITY
- PRIMARY CORRIDOR
- SUPPORTING CORRIDOR

Recommended Pedestrian Network Improvements

This section recommends potential improvements to enhance the pedestrian experience in Tooele. The focus is on creating a safe, accessible, and attractive network for walking throughout the city. The proposed improvements include:

- Improved Infrastructure: Filling sidewalk gaps on major roads and high-traffic areas, upgrading crosswalks with better signage and lighting, and designating pedestrian zones in high-traffic areas.
- Enhanced Streetscapes: Incorporating landscaping, wider sidewalks, benches, shade trees, and decorative lighting to create a more inviting pedestrian environment.

A map outlining these proposed improvements is available (Map xx). Implementing these changes can encourage walking as a viable transportation option, improve public health, and revitalize the urban environment.

Spot Improvements

An active transportation network is only as successful and safe as the quality of its intersections. Unsafe intersections can make an otherwise safe, accessible, and continuous route dangerous and disconnected. For this reason, major intersections that are part of Tooele's recommended active transportation network was reviewed for optimal safety and comfort-enhancing improvements. **Map 4.3** identifies location-specific spot improvements that achieve connectivity where barriers may currently exist. These improvements will need to be determined on a case-by-case basis, studied, and recommended by the Engineering Department.

Spot Improvements by Type

Intersection Improvements (5 total)

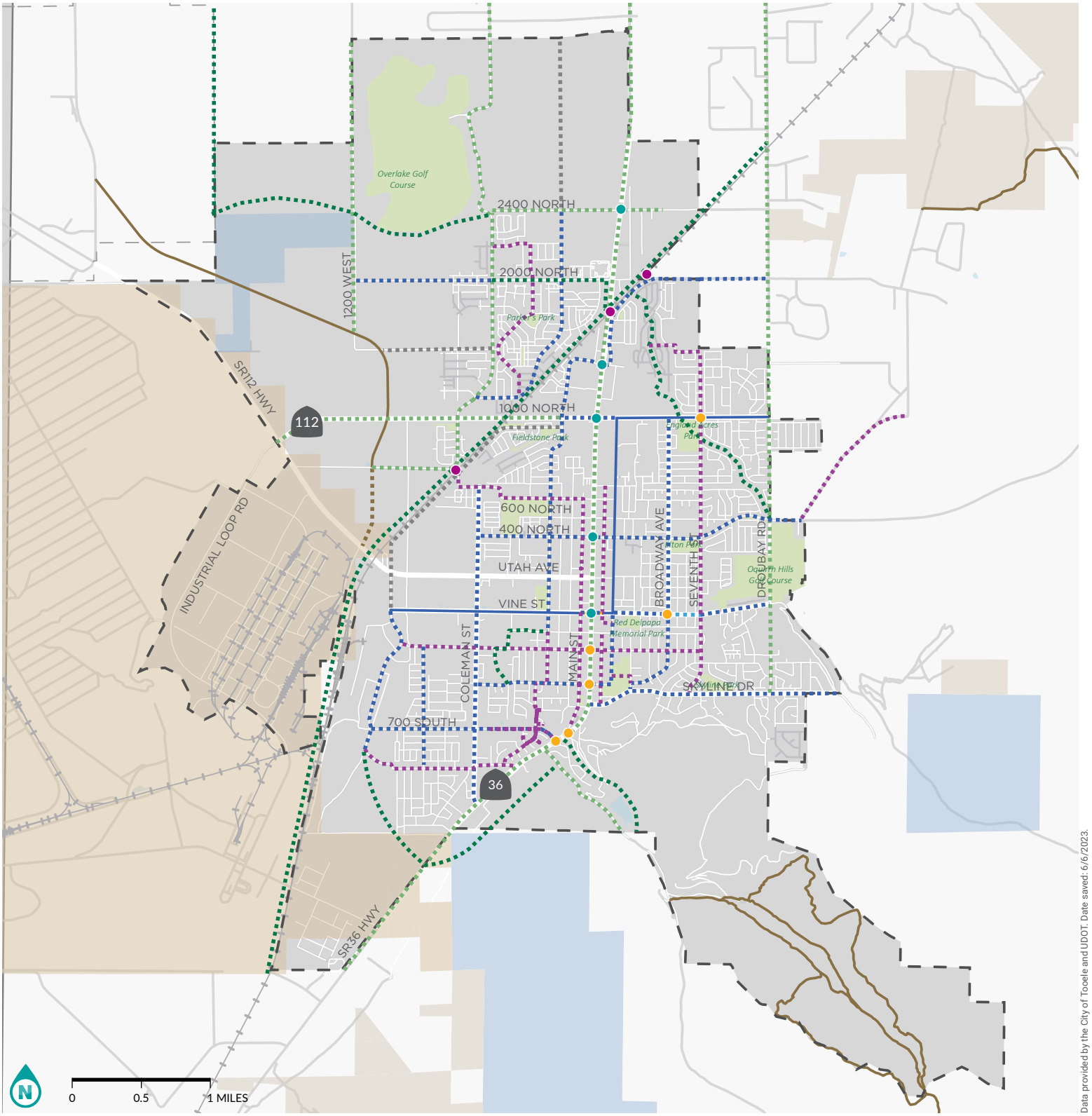
Intersection improvements are features like sidewalk bulbouts, traffic circles, added/updated signalization, etc. that make the crossing experience safer and more comfortable for bicyclists and pedestrians.

Crossing Improvements (6 total)

Crossing improvements can occur at all sizes of intersection and at mid-block locations. These improvements, including striping crosswalks, adding signage, and other treatments, bring greater visibility to pedestrians and bicyclists crossing the street.

Grade-Separated Crossings (3 total)

Underpasses (tunnels) or overpasses (bridges) remove possible conflicts caused by railroad tracks or busy roadways. These treatments are more intensive than other crossing treatments, but may be necessary in certain conditions.



Map 4.3

RECOMMENDED SPOT IMPROVEMENTS

Tooele City
Active Transportation Plan

Base Map

- Tooele City Boundary
- Tooele City Parks
- Water
- Dept of Defense
- State Trust Lands
- Bureau of Land Management
- Railroad

Recommended Active Transportation Facilities

- Grade-Separated Crossing
- Intersection Improvement
- Crossing Improvement
- Neighborhood Byway
- Standard Bike Lanes
- Buffered Bike Lane
- Sidepath
- Shared Use Path
- Unpaved Trail
- Undetermined Facility

Pedestrian Focused Spot Improvements

Map 4.3 identifies pedestrian-focused spot improvements, including:

- Pathway treatments to enhance existing walkways.
- New and enhanced crossings, such as upgraded striped crosswalks, for safer pedestrian movement.
- Bulbouts at intersections to shorten crossing distances and improve visibility for both pedestrians and drivers.

Contextual guidance for treatments at unsignalized intersections/Crossings

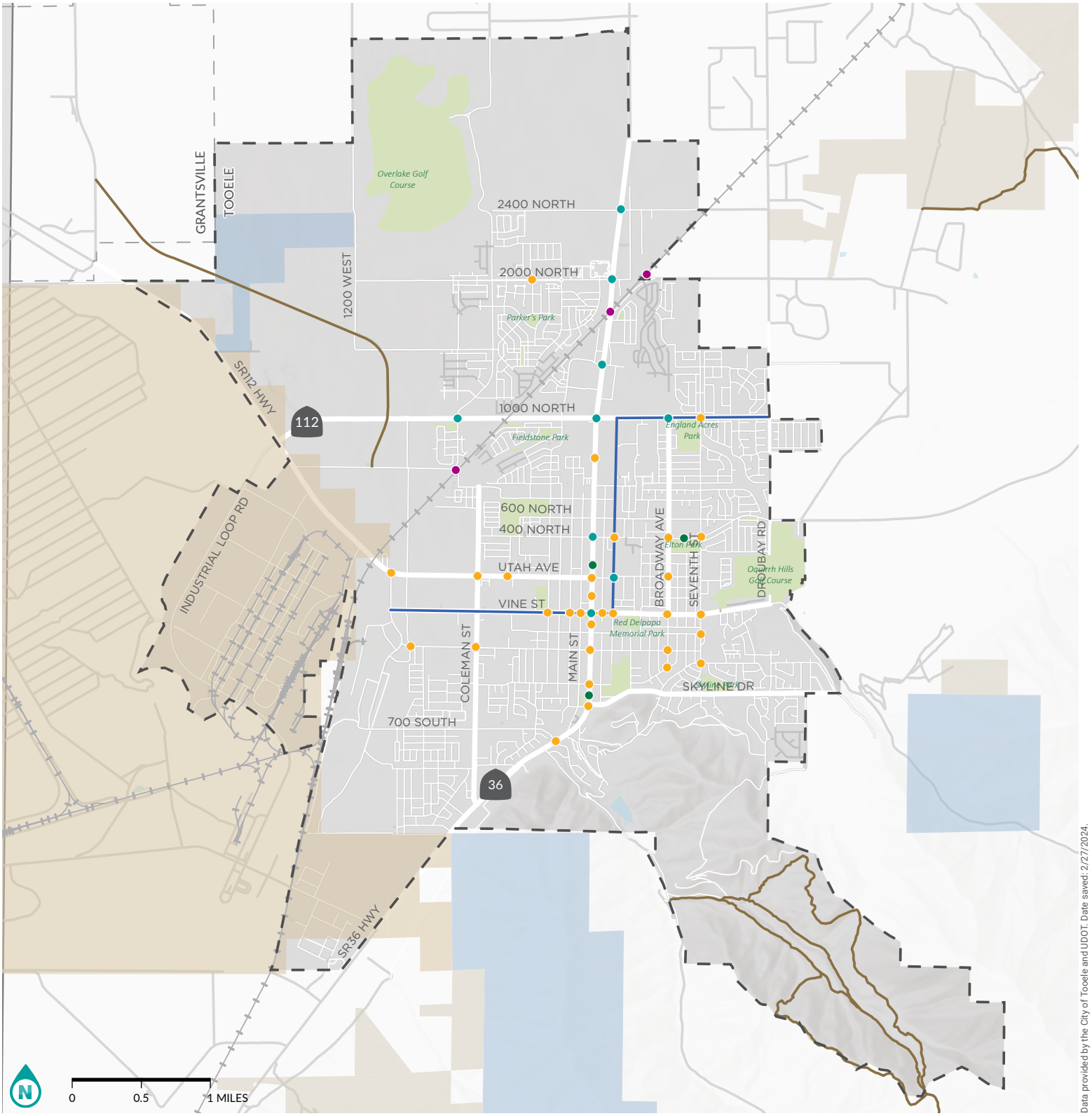
Guidance adapted from FHWA's Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations.

PEDESTRIAN CROSSING CONTEXTUAL GUIDANCE
At unsignalized locations

	Local Streets 15-25 mph		Collector Streets 25-30 mph			Arterial Streets 30-45 mph							
FACILITY TYPE	2 lane	3 lane	2 lane	2 lane with median refuge	3 lane	2 lane	2 lane with median refuge	3 lane	4 lane	4 lane with median refuge	5 lane	6 lane	6 lane with median refuge
Crosswalk Only (high visibility)	✓	✓	EJ	EJ	X	EJ	EJ	X	X	X	X	X	X
Crosswalk with warning signage and yield lines	EJ	✓	✓	✓	✓	EJ	EJ	EJ	X	X	X	X	X
Active Warning Beacon (RRFB)	X	EJ	✓	✓	✓	✓	✓	✓	X	✓	X	X	X
Hybrid Beacon	X	X	EJ	EJ	EJ	EJ	✓	✓	✓	✓	✓	✓	✓
Full Traffic Signal	X	X	EJ	EJ	EJ	EJ	EJ	EJ	✓	✓	✓	✓	✓
Grade Separation	X	X	EJ	EJ	EJ	X	EJ	EJ	EJ	EJ	EJ	✓	✓

LEGEND

Most Desirable	✓
Engineering Judgement	EJ
Not Recommended	X



Data provided by the City of Tooele and UDOT. Date saved: 2/27/2024.

Map 4.3

RECOMMENDED FACILITIES

Tooele City
Active Transportation Plan

Base Map

- Tooele City Boundary
- Tooele City Parks
- Water
- Dept of Defense
- State Trust Lands
- Bureau of Land Management
- Railroad

Active Transportation Facilities

Proposed Spot Improvements

- Grade-Separated Crossing
- Intersection Improvement
- Crossing Improvement
- Gateway Treatment

Existing Facilties

- Buffered Bike Lane
- Shared Roadway

Recommended Policies & Programs

Developing a robust active transportation network requires more than just infrastructure. Policy and program initiatives play a crucial role in fostering its usage and success within Tooele City. These non-infrastructure elements, encompassing policy adoption, participation-promoting programs, and other strategic actions, significantly impact the network's effectiveness.

Tooele City recognizes the benefits of active transportation and has implemented various policies and plans to promote it. This next section summarizes these efforts in seven policy areas that are each influenced by a range of plans, codes, programs, and other specific policies:

1. General Promotion of Active Transportation: The City of Tooele envisions promoting active transportation through collaboration with partner agencies, education, encouragement, and infrastructure development.
2. Connectivity: New developments must connect to existing and future trails, while the General Plan mandates sidewalks and street continuity.
3. Sidewalks & Pedestrian Environment: Sidewalks are required in new developments, but coverage varies across the city. Policies promote pedestrian safety and accessibility through sidewalk width, crosswalk presence, and quality design.
4. Bike Facilities: Limited existing facilities include shared lanes, buffered bike lanes, and a planned trail connection. The County's Active Transportation Plan prioritizes bike-supportive design and the City aims to expand its network.
5. Development Support: Policies encourage pedestrian-oriented development, mixed-use patterns, and on-street parking solutions. Quality development is emphasized, with discouraged elements like excessive asphalt and dominant structures.
6. Broader Network: Regional coordination for land use and transportation is prioritized. The City's transportation network is mostly local and minor collector streets, with upgrades planned for some. New developments maintain a grid-like pattern.
7. Programming: While the County plan lacks specifics, the City's Master Plan recognizes the importance of promoting active and multi-modal transportation.

This chapter outlines key initiatives that will not only help facilitate the construction of active transportation facilities, but also make them safer and more convenient for the Tooele City community. By implementing these strategies, we can move beyond pavement and paths to build a future where active transportation is a natural and enjoyable choice for all.

Recommended Policies & Programs

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Challenges to Navigate:

While the foundation is laid, several hurdles stand in the way:

- Limited existing network: Current infrastructure offers insufficient coverage and accessibility, a result of historical development patterns.
- Low current use: Active transportation remains underutilized across the city, requiring proactive measures to promote its benefits.
- Implementation gap: General Plan aspirations haven't yet fully translated into concrete action steps.
- Lack of partnership: Engaging a broader network of stakeholders could bolster efforts and resources.

Opportunities to Leverage:

Despite the challenges, exciting opportunities await:

- Future development: New projects can integrate active transportation facilities, creating a network as they grow.
- Existing street connectivity: Building upon established policy regarding connectivity within new developments holds promise.
- Planned County network: Integrating Tooele's network with planned county-wide infrastructure would create a wider system.
- Vine Street bike facilities: Expanding upon existing infrastructure like Vine Street's bike lanes paves the way for further progress.
- Transit network synergies: Active transportation facilities can complement and enhance the existing transit network.
- Recreation connections: Additional links to recreational areas encourage active modes of travel for leisure activities.
- "Complete Streets Policy": Implementing such a policy would ensure all streets consider the needs of all users, not just cars.

Policies

Street Connectivity Standards

Strong connections are crucial for a positive active transportation experience. Streets serve as the community's backbone, shaping its character and influencing how people move within it. While Tooele is on growth trajectory, prioritizing connected streets makes active travel more viable and convenient alongside new development.

While a strong street network is key for active transportation, its benefits extend far wider. Efficient street layouts can mean faster emergency response times, while improved connectivity allows residents to ditch their cars more often, leading to cleaner air and less traffic congestion. Easy connections between different areas also make reaching destinations by foot or bike more convenient, promoting healthy lifestyles and a more engaged community.

Communities such as Lehi have adopted similar street connectivity standards as part of their City development code. Links to the UDOT Street Connectivity Guide and Lehi Standards are included below:

- Utah Street Connectivity Guide
- Lehi Connectivity Standards (section 37.040)

Bike Parking

Bicyclists need a safe and convenient place to secure their bicycles when they reach their destination. This may be short- or long-term parking for employees, students, residents, and commuters.

Safe and convenient bike parking is crucial for cyclists, whether they're running errands, working, or studying.

General Tips:

- Place racks at least 2 feet from curbs to avoid car doors and allow easy access.
- Leave 4 feet between racks for comfortable maneuvering.
- Maintain a 6-foot buffer from property lines (ideally within the "amenity zone").
- See Figure xx for recommended rack styles.

Long-Term Parking:

- For extended stays (work, school, etc.), dedicated spaces offer additional security.
- Options include lockers, cages, and bike rooms.
- Recommended rates:
  - Offices: 1 space per 10,000 sq ft
  - Retail: 1 space per 12,000 sq ft
  - Apartments: 0.5 spaces per bedroom

For detailed guidelines, refer to the Association of Pedestrian & Bicycle Professionals' Bicycle Parking Guidelines (2nd edition).

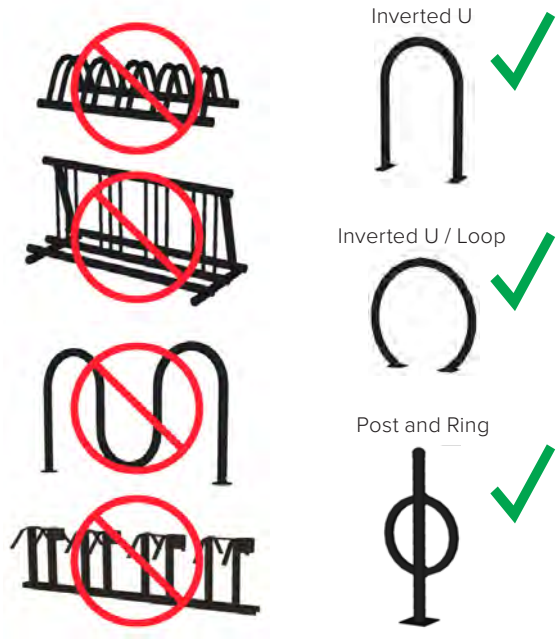

Figure 5. Association of Pedestrian & Bicycle Professionals Bicycle Parking Guidelines, 2nd edition Bike Rack Recommendations

Policies

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Funding Opportunities

A diverse range of funding sources exists at federal, state, regional, and local levels for Tooele to consider when implementing the projects recommended in this plan. Table xx provides a summary of many available options. Remember, most funding is competitive, requiring comprehensive applications. For multi-agency projects, collaborations with other local and regional entities can strengthen your proposals.

When appropriate, leverage private contributions towards project implementation. These contributions can vary greatly, ranging from right-of-way donations to financial sponsorships. Explore establishing a dedicated local funding source for active transportation improvements within the Tooele general fund. This could provide sustainable funding to attract additional resources and support project development.

NAME	DESCRIPTION	MORE INFORMATION
FEDERAL FUNDING SOURCES		
Safe Streets and Roads for All (SS4A) Grant Program	The new SS4A Grant Program funds the development or update of a comprehensive safety action plan (Action Plan), conducting planning, design, and development activities in support of an Action Plan, and/or carrying out projects and strategies identified in an Action Plan	Learn more: https://www.transportation.gov/SS4A
Transportation Alternatives (TA)	Transportation Alternatives (TA) is a funding source under the FAST Act that consolidates three formerly separate programs under SAFETEA-LU: Transportation Enhancements (TE), Safe Routes to School (SRTS), and the Recreational Trails Program (RTP). Funds are available through a competitive process. These funds may be used for a variety of pedestrian, bicycle, and streetscape projects including: SRTS programs (infrastructure and non-infrastructure programs Construction, planning, and design of on- and off-road trail facilities for pedestrians, bicyclists, and other non-motorized forms of transportation, including sidewalks, bikeways, pedestrian + bicycle signals, traffic-calming, lighting, and other safety-related infrastructure Construction, planning, and design of infrastructure-related projects and systems that will provide safe routes for children, seniors, and individuals with disabilities who cannot drive Construction of rail-trails Recreational trails program	Learn more: https://www.fhwa.dot.gov/environment/transportation_alternatives/
Congestion Mitigation and Air Quality (CMAQ) Improvement Program	The CMAQ program aims to reduce congestion or improve air quality in nonattainment or maintenance areas by shifting travel demand to non-automobile modes. This fund is administered through the MAG TIP.	Learn more: https://www.fhwa.dot.gov/environment/air_quality/cmaq/
Surface Transportation Block Grant Program (STBG)	The Surface Transportation Block Grant (STBG) program provides flexible funding that may be used by for projects aiming to preserve and improve the conditions and performance of public roads, pedestrian and bicycle infrastructure, and transit projects. Planning, research, and development are also eligible for STBG funds within certain types of projects.	Learn more: https://www.fhwa.dot.gov/fastact/factsheets/stbgfs.cfm

NAME	DESCRIPTION	MORE INFORMATION
FEDERAL FUNDING SOURCES (CONTINUED)		
Fixing America's Surface Transportation (FAST Act)	The FAST act provides a long-term funding source for surface transportation and planning. Overall, the FAST Act retains eligibility for big programs - Transportation Investments Generating Economic Recovery (TIGER - now called RAISE), Surface Transportation Program (STP), and Highway Safety Improvement Program (HSIP)	For more information: https://www.transportation.gov/fastact
Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grants	RAISE grants, which were originally created under the American Recovery and Reinvestment Act as TIGER grants, can be used for a wide variety of projects, including road, rail, and transit projects. These grants provide capital funding to any public entity, including municipalities and counties.	Learn more: https://www.transportation.gov/RAISEgrants
Federal Transit Administration (FTA) Grants	The FTA has several grant programs available to local and state governments to enhance active transportation connections to public transportation facilities.	Learn more: https://www.transit.dot.gov/funding/grants/grant-programs
The Active Transportation Infrastructure Investment	This is a competitive program for Active Transportation networks and spines, with $1B authorized but not yet appropriated as of spring 2022. This program would focus on improvements addressing walking and bicycling infrastructure.	Learn more: https://www.railstotrails.org/policy/funding/active-transportation-infrastructure-investment-program/
Reconnecting Communities Pilot Program (RCP)	RCP is a Federal program that aims to reconnect communities that were previously cut off from economic opportunities by transportation infrastructure. Funding from this program supports planning grants, capital construction grants, and technical assistance to restore community connectivity through the removal, retrofit, mitigation, or replacement of eligible transportation infrastructure facilities. Highways (including a road, street, or parkway) or other transportation facilities (such as rail lines), that have formed a barrier to community connectivity, including barriers to mobility, access, and economic development, due to high speeds, grade separations, or other design factors, are eligible for this program.	Learn more: https://www.transportation.gov/grants/reconnecting-communities
Healthy Streets	This is a $500M discretionary program that will address issues such as urban heat island/tree cover in low-income and minority communities. This funding source may address Vision Zero concerns by creating streetscapes and other measures to calm or slow traffic.	Learn more: https://bikeleague.org/sites/default/files/Fact%20Sheet%20Healthy%20Streets%20Program%20%2B%20Funding%20Support%20%20(3)%20(1).pdf
USDOT Federal Highway Administration (FHWA) Congestion Management and Air Quality (CMAQ) Improvement Program grants	The FAST Act continued the CMAQ program to provide a flexible funding source to State and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. Funding is available to reduce congestion and improve air quality for areas that do not meet the National Ambient Air Quality Standards for ozone, carbon monoxide, or particulate matter (nonattainment areas) and for former nonattainment areas that are now in compliance (maintenance areas).	Learn more: https://www.fhwa.dot.gov/bipartisan-infrastructure-law/cmaq.cfm

NAME	DESCRIPTION	MORE INFORMATION
STATE-LEVEL FUNDING SOURCES - UDOT		
State Class B and C Program fund	Class B and C funds can be used for maintenance and construction projects, including active transportation. For these projects, thirty percent of the funds must be used for construction or maintenance projects that exceed $40,000. The remainder of these funds can be used to match federal funds or pay the principal, interest, premiums, and reserves for issued bonds.	Learn more: https://www.udot.utah.gov/connect/business/public-entities/local-government-program-assistance View regulations: https://drive.google.com/file/d/10KwUcoo9En7H8yYulOWzZxi3QnFZ6g1K/view
Safe Sidewalk Program	The Safe Sidewalks Program, administered by UDOT, provides legislative funding for construction of new sidewalks where they are missing or where major construction or reconstruction of a route is not planned for ten or more years. For a proposed sidewalk location to be considered for the program, it must be: located adjacent to a state highway, within an urban area, have significant pedestrian traffic, and include a 25% local government match.	Learn more: https://www.udot.utah.gov/connect/business/public-entities/local-government-program-assistance/ View regulations: https://docs.google.com/document/d/1sfOQu5qictzKDAj0yDvSO48JFuYrZZbuYsyW4bbardY/edit
Highway Safety Improvement Program (HSIP)	HSIP funds are available for projects aimed at improving safety on all public roads to reduce traffic fatalities and serious injuries. Bike lanes, roadway shoulders, crosswalks, intersection improvements, underpasses, and improved signage are examples of eligible projects. These funds are administered through the UDOT Highway and Safety Division, and require a local match.	Learn more: https://www.udot.utah.gov/connect/about-us/operations/traffic-safety/
Safe Routes to School (SRTS)	UDOT administers Safe Routes to School (SRTS) funding - a $1.2 Million annual fund to fund active transportation safety improvements within two miles of Utah schools. Cities can apply for this funding (a reimbursement fund) without matching requirements. These funds can be used for improvements such as new trails or sidewalks, signals, crosswalks, and other related facilities.	Learn more: https://site.utah.gov/connect/business/public-entities/safe-routes-to-school-srts-program/
Active Transportation Investment Fund (ATIF)	TIF funds are awarded through the State Transportation Commission and administered through UDOT. Projects must be paved, part of the UDOT Active Transportation Plan, provide traffic congestion mitigation on a state highway system, and include 40% non-UDOT funds to match to be eligible for funding.	Learn more: https://www.udot.utah.gov/connect/about-us/commission/project-prioritization-process/
STATE-LEVEL FUNDING SOURCES - NON-UDOT		
Community Development Block Grant (CDBG)	The CDBG Program provides annual grants on a formula basis to states, cities, and counties to develop viable urban communities by providing decent housing and a suitable living environment, and by expanding economic opportunities, principally for low- and moderate-income persons. The State of Utah administers the funds for cities with fewer than 50,000 residents.	Learn more: https://jobs.utah.gov/housing/community/cdbg/index.html
Federal Lands Access Program (FLAP)	The FLAP is intended to improve transportation facilities that provide access to, are adjacent to, or are located within Federal lands. The fund is administered through UDOT in coordination with the Central Federal Lands Highway Division, which develops a Programming Decisions Committee. The Committee puts out the call for projects, establishes selection criteria, and prioritizes selected projects. The next call for projects is anticipated to be in 2025.	Learn more: https://highways.dot.gov/federal-lands/programs-access

NAME	DESCRIPTION	MORE INFORMATION
STATE-LEVEL FUNDING SOURCES -NON-UDOT (CONTINUED)		
Recreational Trails Program (RTP)	Administered by the Utah Division of State Parks and Recreation, the RTP requires that motor fuel tax revenues generated from motor fuel sales for off-highway recreational purposes be transferred from the Highway Trust Fund to the Trails Trust Fund for recreational trail and facility improvements. This program provides grants for non-motorized and motorized trails, including construction and maintenance of trails and facilities, staging areas, trailheads, restroom facilities, and trail signing.	Learn more: https://stateparks.utah.gov/resources/grants/recreational-trails-program/
Land and Water Conservation Fund	Administered by the Utah Division of State Parks and Recreation, the Land and Water Conservation Fund Act provides federal grants for the acquisition and/or development of public outdoor recreation areas. Any site/facility purchased, developed, or improved with funding from this grant is protected in perpetuity as a public outdoor recreation area.	Learn more: http://stateparks.utah.gov/resources/grants/land-and-water-conservation-fund/
Utah Outdoor Recreation Grant	Administered through the Office of Outdoor Recreation, the Utah Outdoor Recreation Grant project helps communities build trails and other recreation infrastructure by awarding matching grants. The grants help enhance recreational opportunities and amenities in Utah's communities.	Learn more: https://business.utah.gov/outdoor/uorg/
REGIONAL-LEVEL (WFRC) FUNDING SOURCES		
Wasatch Front Regional Council (WFRC) Transportation Improvement Program (TIP)	WFRC administers federal active transportation funding each year to local communities through a variety of programs, including the Congestion Mitigation and Air Quality (CMAQ) Program, Surface Transportation Program (STP), Transportation Alternatives Program (TAP), and Carbon Reduction Program (CRP).	Learn more: https://wfrc.org/programs/transportation-improvement-program/
Congestion Mitigation and Air Quality (CMAQ) Improvement Program	The CMAQ program aims to reduce congestion or improve air quality in nonattainment or maintenance areas by shifting travel demand to non-automobile modes. This fund is administered through the MAG TIP.	Learn more: https://www.fhwa.dot.gov/environment/air_quality/cmaq/
Surface Transportation Block Grant Program (STBG)	The Surface Transportation Block Grant (STBG) program provides flexible funding that may be used by for projects aiming to preserve and improve the conditions and performance of public roads, pedestrian and bicycle infrastructure, and transit projects. Planning, research, and development are also eligible for STBG funds within certain types of projects.	Learn more: https://www.fhwa.dot.gov/fastact/factsheets/stbgfs.cfm

NAME	DESCRIPTION
CITY FUNDING SOURCES	
Bond Financing	Bonds can be approved by voters to fund a range of projects. A local successful precedent is the 2012 Parks and Trails Bond in Salt Lake County, which authorized $47 million in bond funds to complete the Jordan River Parkway, Parley's Trail, and acquire land for/construct new parks throughout the County.
Sales Tax	It is possible to pass a specified sales tax that can be used to fund active transportation improvements. These taxes can be used to generate funds for highway, transit, and local road (including bicycle) projects.
Special Assessment or Taxing Districts	Local municipalities can establish special assessment districts for infrastructure improvements, like sidewalks, that are missing or in need of improvement in certain areas.
Parking Fees	Some cities have instituted parking fees that are then used to pay for infrastructure improvements.
Development Impact Fees	Development impact fees are one-time charges collected from developers for financing new infrastructure construction and operations and can help fund bicycle and pedestrian improvements. Impact fees are assessed through a city's impact fee program.
New Construction	Future road widening and construction projects are methods of providing improved bike and pedestrian infrastructure. To ensure that roadway construction projects provide these improvements, it is important that the review process includes a review of any relevant active transportation related plans. Tooele should also coordinate with UDOT to find opportunities for bike and pedestrian facilities on state road construction projects.
PRIVATE FUNDING SOURCES	
PeopleForBikes Community Grant Program	The PeopleForBikes Community Grant Program supports bicycle infrastructure projects and targeted advocacy initiatives that make biking safer for people of all ages and abilities. PeopleForBikes accepts requests for funding up to $10,000. Learn more: https://www.peopleforbikes.org/grant-guidelines
Private Developers	Developers should consider constructing local streets with bike- and pedestrian-oriented facilities within subdivisions, including dedicating right-of-way to trails and parks. Cities can encourage developers to include active transportation amenities during development review, and should require developers to show how the proposed development will accommodate or enhance active transportation connections.
In-Kind Donations	In-kind donations can be an effective way to reduce project costs and engage local organizations. The Tweetsie Trail, a 10-mile trail in Tennesee, dramatically reduced project costs through in-kind donations. Local construction companies donated labor to build bridges for the trail; a local quarry provided the rock for the trail's surface, and signage companies donated the trail signs.

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- 05 -

Prioritization + Implementation

- Project Prioritization/Methodology
- Top Projects
- Project Evaluation Criteria
- Implementaion Table by ranked Prioritized Projects
- Priority Project Cutsheets

Project Prioritization

With approximately 60 miles of newly-proposed active transportation facilities including bikeways and trails, and 14 proposed spot improvements, what are the next steps, and how should the City prioritize future investment? Chapter 5 details an approach for prioritizing projects, and outlines potential funding strategies for implementing them.

Project Prioritization

The project prioritization approach includes two evaluations of each project based on

- 1) project value, or benefit and
- 2) project readiness, or feasibility. “High” and “low” scores are assigned for both evaluations

This results in a project landing in one of four possible priority categories, as shown in Figure 5.1. This approach is intended to guide the City in understanding which projects to focus on first; however, the City should be flexible in its approach. Priorities may change based on further studies or as potential synergies arise with new development, road reconstruction, or other opportunities for cost savings. community during each phase (Phase I: Listening and Phase II: Feedback & Direction) is included on the following pages, and a full breakdown of outreach responses is available in Appendix C.

Project Prioritization Evaluation Part I: Project Value

Project value, or benefit, is determined by how well projects achieve the goals of the plan in Chapter 1. Table 2.1 lists the criteria that were used to evaluate project value based on those goals. Each project received a score of 0, 1, or 2.

- 0 = does not meet criteria
- 1 = somewhat meets criteria
- 2 = meets criteria

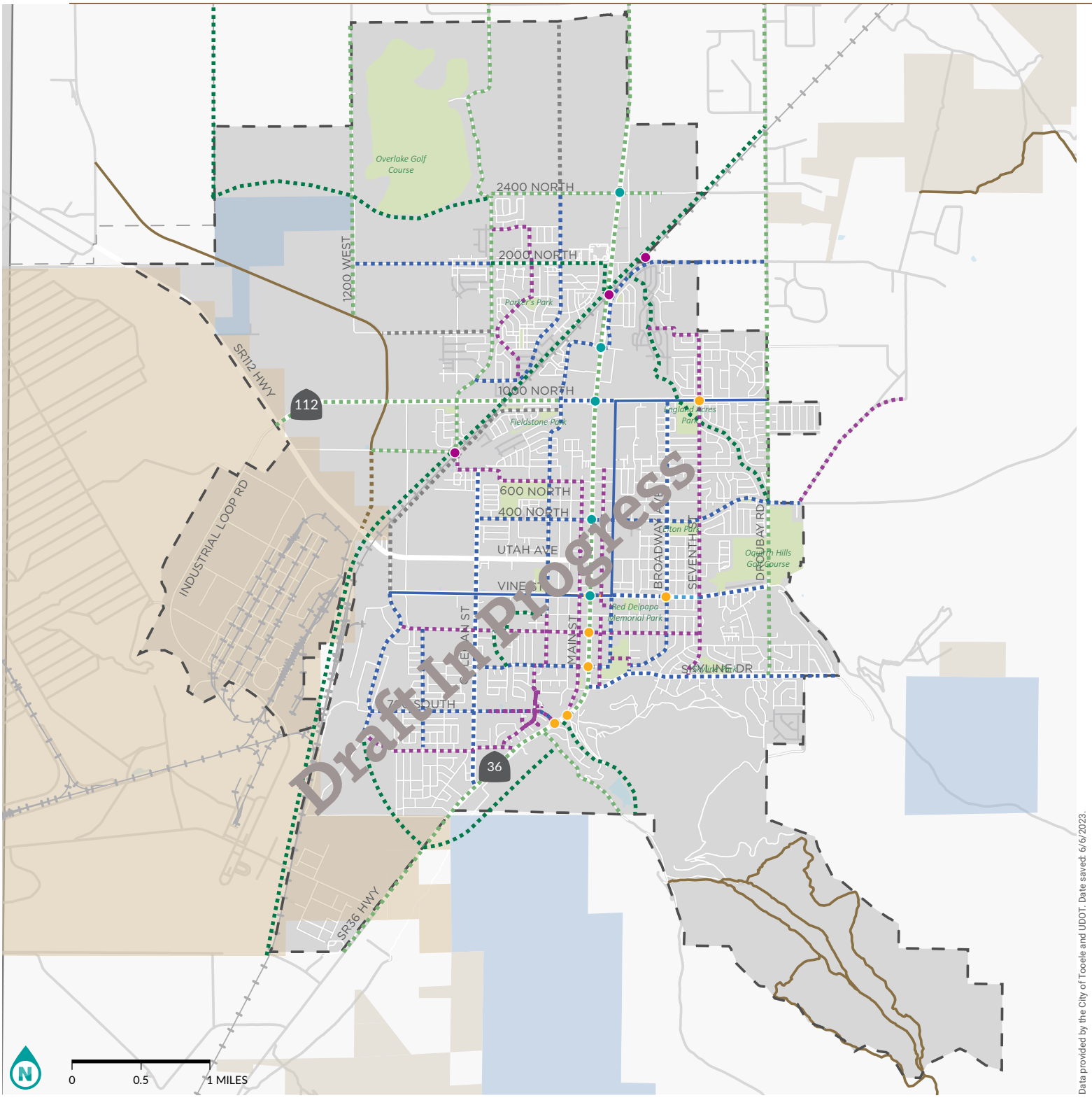
Because some criteria are more important than others, multipliers were applied to the evaluation criteria to reflect City priorities. For example, based on input from community stakeholders, facilties that enhance safety are considered a higher priority than connecting to parks or recreational facilities.

TOP 10 FACILITY PROJECTS (BASED ON VALUE CRITERIA)

- 1000 North (Central) (520 East to 600 West)
- S Main St Sidepath Southern (Tooele boundary to Village Blvd)
- North Main Street commercial Gateway Segment (1000 North to 200 North)
- Vine St Buffered Bike Lanes (50 W to Garden St)
- Vine Street (West) (Main Street to 1100 West)
- Core Main Street (200 North to 200 South)
- 2000 North (Droubay Road to Mantle Way)
- Tooele Rail with Trail (S Mountain Rd to Droubay Rd)
- 200 South (Tooele Blvd to 7th Street)

TOP 10 SPOT IMPROVEMENT PROJECTS

- County Building- New Crossing
- Vine & Main Street- Intersection Improvement
- City Hall- Crossing Improvement
- North Main Street - Crossing Improvement
- 200 S & Main St- Crossing Improvement
- 1000 N & Main St- Intersection Improvement
- Main St & RR Tracks by 1700 N- Grade-Separated Crossing
- 2400 N & Main St- Intersection Improvement
- 1000 North & Main- Intersection Improvement



Map 4.3

RECOMMENDED SPOT IMPROVEMENTS

Tooele City
Active Transportation Plan

Base Map

- Tooele City Boundary
- Tooele City Parks
- Water
- Dept of Defense
- State Trust Lands
- Bureau of Land Management
- Railroad

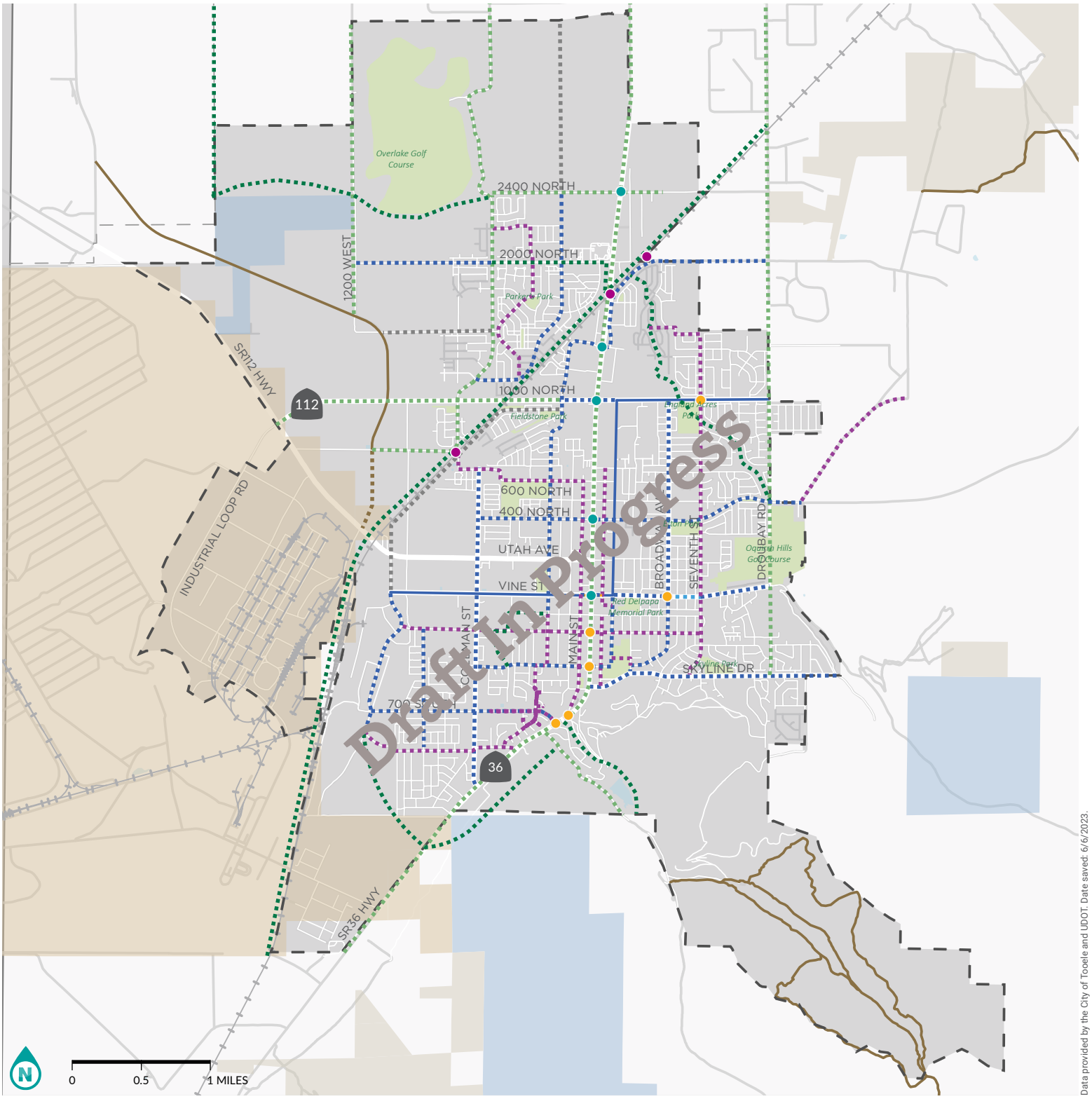
Recommended Active Transportation Facilities

- Grade-Separated Crossing
- Intersection Improvement
- Crossing Improvement
- Neighborhood Byway
- Standard Bike Lanes
- Buffered Bike Lane
- Sidepath
- Shared Use Path
- Unpaved Trail
- Undetermined Facility

Table 2. *Project Value Evaluation Criteria*

GOAL	CRITERIA	MULTIPLIER	SCORE	SCORE BREAKDOWN
1	Extends and/or connects to existing local active transportation facilities.	2	0	DOES NOT EXTEND A LOCAL FACILITY, FILL A GAP, NOR CREATE OR STRENGTHEN A NEW REGIONAL CONNECTION.
			1	REDUCES AN EXISTING GAP BUT DOES NOT ELIMINATE IT COMPLETELY; AND/OR MAKES A MINOR EXTENSION OF THE EXISTING NETWORK.
			2	SIGNIFICANTLY EXTENDS THE EXISTING TOOELE NETWORK; CONNECTS ACROSS A MAJOR BARRIER; AND/OR LINKS THE COMMUNITY TO OTHER COMMUNITIES OR TO REGIONAL TRAILS OR TRANSIT SYSTEMS.
	CONNECTS TO OTHER COMMUNITIES OR TO REGIONAL TRAILS OR TRANSIT SYSTEMS.	1.25	0	No bike/ped crashes recorded on this roadway
			1	One bike/ped-related crash on this roadway
			2	More than one bike/ped-related crashes on this roadway
2	CATALYTIC PROJECT THAT DEMONSTRATES THE BENEFITS OF ACTIVE TRANSPORTATION FOR CITY LEADERSHIP AND DEPARTMENTS.	1.5	0	STAND-ALONE, STANDARD OR MINIMUM TYPE PROJECT THAT WILL LIKELY HAVE LITTLE CATALYTIC EFFECT WITHIN THE CITY
			1	MODERATE CATALYTIC OPPORTUNITIES – A NEW TYPE OF PROJECT; A PROJECT INVOLVING SOME INTERDEPARTMENTAL COORDINATION.
			2	MAJOR CATALYTIC OPPORTUNITY – A NEW AND INNOVATIVE PROJECT INVOLVING COORDINATION OF MANY TYPES OF DEPARTMENTS; A POLICY THAT WILL SIGNIFICANTLY INCREASE INTERDEPARTMENTAL COORDINATION/COLLABORATION; A PROJECT THAT WILL SIGNIFICANTLY INCREASE VISIBILITY OF ACTIVE TRANSPORTATION WITHIN THE CITY GOVERNMENT.
3	PROJECT CONSTITUTING A NEW STREET OR PATHWAY LINK THROUGH AN AREA LIKELY TO BE DEVELOPED.	1.5	0	PROJECT WILL NOT SIGNIFICANTLY INFLUENCE THE PLACE QUALITIES OF THE COMMUNITY CONTEXT.
			1	PROJECT HAS AN OPPORTUNITY TO MAKE A MODERATE WALKABLE/HUMAN-SCALE IMPACT ON THE SURROUNDING PLACE, OR PROJECT LIES IN AN ACTIVITY CENTER, NEW GROWTH AREA, OR OTHER AREA LIKELY TO BE DEVELOPED.
			2	PROJECT WILL LIKELY MAKE A MAJOR WALKABLE/HUMAN-SCALE IMPACT ON THE PLACE IT SERVES, ESPECIALLY IF IT IS A NEW STREET OR PATHWAY LINK THROUGH AN AREA LIKELY TO BE DEVELOPED.
	PROJECT WITHIN AN IDENTIFIED ACTIVITY CENTER.	1.5	0	PROJECT IS NOT WITHIN AN IDENTIFIED ACTIVITY CENTER.
			1	PROJECT IS WITHIN AN IDENTIFIED ACTIVITY CENTER AND HAS THE POTENTIAL TO MAKE A MODERATE WALKABLE/HUMAN-SCALE IMPACT ON THE SURROUNDING PLACE.
			2	PROJECT IS WITHIN AN IDENTIFIED ACTIVITY CENTER AND IS LIKELY TO MAKE A MAJOR WALKABLE/HUMAN-SCALE IMPACT ON THE PLACE IT SERVES.
4	PROJECT WOULD CONNECT TO SCHOOLS AND EDUCATIONAL FACILITIES; OR PARKS, RECREATIONAL FACILITIES, OR TOOELE ATTRACTIONS; OR ACTIVITY CENTERS; OR TRAILHEADS.	1	0	NO CONNECTIONS
			1	CONNECTS TO ONE PARK, RECREATIONAL FACILITY, OR TOOELE ATTRACTION LISTED ABOVE.
			2	CONNECTS TO MULTIPLE PARKS, RECREATIONAL FACILITIES, OR TOOELE ATTRACTIONS
	PROJECT WOULD CREATE OR REINFORCE A PRIORITY PEDESTRIAN CORRIDOR.	1.75	0	PROJECT DOES NOT CREATE OR REINFORCE A PRIORITY PEDESTRIAN CORRIDOR.
			1	PROJECT MODERATELY ENHANCES AN EXISTING PRIORITY PEDESTRIAN CORRIDOR.
			2	PROJECT CREATES A NEW PRIORITY PEDESTRIAN CORRIDOR OR SIGNIFICANTLY ENHANCES AN EXISTING PRIORITY PEDESTRIAN CORRIDOR.
	PROJECT WOULD OVERCOME AN IDENTIFIED MAJOR BARRIER.	2	0	PROJECT DOES NOT OVERCOME AN IDENTIFIED MAJOR BARRIER.
			1	PROJECT MODERATELY ENHANCES AN EXISTING BARRIER CROSSING.
			2	PROJECT CREATES A NEW BARRIER CROSSING OR SIGNIFICANTLY ENHANCES AN EXISTING BARRIER CROSSING.

GOAL	CRITERIA	MULTIPLIER	SCORE	SCORE BREAKDOWN
5	PROJECT OR POLICY THAT WOULD LIKELY REDUCE PEDESTRIAN AND BICYCLIST-INVOLVED CRASHES.	2.5	0	No bike/ped crashes recorded on this roadway
			1	One to five bike/ped-related crashes on this roadway
			2	More than five bike/ped-related crashes on this roadway
	PROJECT OR POLICY THAT WOULD INCREASE SAFETY BY CREATING SEPARATION BETWEEN MOTOR VEHICLES AND PEOPLE WALKING AND BIKING.	2.5	0	Signed bike route
			1	Neighborhood byway, striped bike lane, or buffered bike lane
			2	Separated bike lane, sidepath, or shared use path
	PROJECT OR POLICY THAT WOULD INCREASE THE SAFETY OF AT USERS IN INTERSECTIONS	2	0	Project or policy does not address intersection safety for AT users.
			1	Project or policy addresses intersection safety for AT users in a limited way.
			2	Project or policy significantly addresses intersection safety for AT users.
6	Project or policy that would lead to a fundamental change in urban fabric toward slower vehicular environments.	2	0	PROJECT OR POLICY WOULD NOT SIGNIFICANTLY REDUCE VEHICLE SPEEDS OR INCREASE THE VISIBILITY OF ACTIVE TRANSPORTATION.
			1	PROJECT OR POLICY WOULD MODERATELY REDUCE VEHICLE SPEEDS OR INCREASE THE VISIBILITY OF ACTIVE TRANSPORTATION.
			2	PROJECT OR POLICY WOULD SIGNIFICANTLY REDUCE VEHICLE SPEEDS AND INCREASE THE VISIBILITY OF ACTIVE TRANSPORTATION, LEADING TO A FUNDAMENTAL CHANGE IN THE URBAN FABRIC.
	Project would be likely to lead to more people walking, biking, and rolling, due to its connection to destinations and potential for recreation.	1.75	0	No connections
			1	PROJECT CONNECTS TO DESTINATIONS OR HAS POTENTIAL FOR RECREATION, BUT IS LIMITED IN SCOPE OR POORLY DESIGNED.
			2	PROJECT CONNECTS TO MULTIPLE DESTINATIONS AND HAS SIGNIFICANT POTENTIAL FOR RECREATION, AND IS WELL-DESIGNED TO ENCOURAGE WALKING, BIKING, AND ROLLING.
	Project would or would create the opportunity for partnerships among other community and regional stakeholders.	1.75	0	PROJECT DOES NOT INVOLVE ANY PARTNERSHIPS OR CREATE OPPORTUNITIES FOR PARTNERSHIPS.
			1	PROJECT INVOLVES ONE OR A FEW PARTNERS, OR CREATES LIMITED OPPORTUNITIES FOR PARTNERSHIPS.
			2	PROJECT INVOLVES MULTIPLE PARTNERS OR CREATES SIGNIFICANT OPPORTUNITIES FOR PARTNERSHIPS AMONG COMMUNITY AND REGIONAL STAKEHOLDERS.
	Cost- Order of Magnitude:	1	0	HIGH-COST ESTIMATES, PROJECTS WITH COSTS EXCEEDING $200,000.
			1	MODERATE COST ESTIMATES, PROJECTS WITH COSTS BETWEEN $50,000 AND $200,000.
			2	LOW-COST ESTIMATES, PROJECTS WITH COSTS BELOW $50,000.
	Right-of-Way Access/ Ownership/Easement:	1	0	LIMITED OR NO ACCESS, COMPLEX OWNERSHIP, LEGAL HURDLES.
			1	ACCESS WITH MINOR CHALLENGES, OWNERSHIP CLARIFICATION NEEDED.
			2	CLEAR ACCESS, WELL-DEFINED OWNERSHIP OR EASEMENTS.
	Potential for Partnership:	1	0	LIMITED PARTNERSHIP OPPORTUNITIES, LACK OF INTEREST FROM STAKEHOLDERS.
			1	SOME POTENTIAL PARTNERS, INITIAL INTEREST, COLLABORATION CHALLENGES.
			2	STRONG PARTNERSHIP POTENTIAL, ENTHUSIASTIC STAKEHOLDERS, ALIGNMENT OF GOALS



Map 4.3

RECOMMENDED SPOT IMPROVEMENTS

Tooele City
Active Transportation Plan

Base Map

- Tooele City Boundary
- Tooele City Parks
- Water
- Dept of Defense
- State Trust Lands
- Bureau of Land Management
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- Neighborhood Byway
- Standard Bike Lanes
- Buffered Bike Lane
- Sidepath
- Shared Use Path
- Unpaved Trail
- Undetermined Facility

Table 3. AT Facilities Ranked by Project Value

LINEAR FACILITIES

Project #	Project Name	Extents: From	Extents: To	Facility Type	Project Notes	Mileage	Assoc. Spot Improvements	WEIGHTED TOTAL
63	1000 North (Central)	520 East	600 West	Sidewalks; Streetscape improvements; Traffic calming	Primary pedestrian corridor: 10 ft sidewalk, traffic calming, Bulbouts, streetscape improvements	1.101		44.25
32	S Main St Sidepath		Village Blvd	Sidepath	58’ wide roadway, 2 lanes; could stripe 11’ lanes, add 6’ bike lanes and 2’ buffer on each side and include planted medians like the segment east of 400 W includes; no need for on-street parking as no homes front this corridor	10.211		42.25
56	North Main Street commercial Gateway Segment	1000 North	200 North	Traffic Calming	Elements beyond listed spot improvements, including street trees, median, planted Bulbouts, etc.	5.491		40.25
9	Vine St Buffered Bike Lanes	50 W	Garden St	Buffered Bike Lane	Extend Berra Blvd facility to the north; depends on development of this roadway; work with Erda to create continuous north south connection, especially with Excelsior Academy in Erda	0.159		39.5
58	Vine Street (West)	Main Street	1100 West	Sidewalk; Streetscape Improvements; Traffic calming	Fill in sidewalk gaps with 6-7 ft sidewalks (2nd West to 1100 West); repair existing sidewalks where necessary; add streetscape improvements; add traffic calming features (e.g. landscaped Bulbouts)	0.843		37
55	Core Main Street	200 North	200 South	Streetscape Improvements	Add street trees, furniture, wayfinding signage, etc.	1.812		31.75
68	2000 North		Mantle Way	Sidewalks	Secondary pedestrian corridor: standard sidewalk with streetscape improvements; striped crosswalks on all neighborhood intersections	2.102		30
43	Tooele Rail with Trail	S	Droubay Rd	Shared Use Path	Consider incorporating crossing improvements on East/West roads with signalized intersections, specifically targeting locations such as Vine St, Utah Ave, 400 N, and 600 N.	7.280		29.5
69	200 South	Tooele Blvd	7th Street	Sidewalks	Fill in sidewalk gaps; update existing sidewalks and add landscape buffers as road or adjacent landuse gets updated	1.559		28.5
65	Broadway	1000 North	200 South	Sidewalks	Primary pedestrian corridor: fill in sidewalk gaps with 10 ft sidewalks; slowly update where possible	0.574		27.5
66	7th Street	1480 North	Skyline Drive	Sidewalks	Fill in sidewalk gaps	1.771		27
57	Vine Street (East)	7th Street	Main Street	Sidewalk; Streetscape Improvements; Traffic calming	Fill in sidewalk gaps with 6-7 ft sidewalk (Broadway to Pinehurst Ave); repair existing sidewalks where necessary; add street scape improvements; add traffic calming features (e.g. landscaped Bulbouts)	2.140		26.75
70	200 West	400 North	400 South	Sidewalks	Fill in sidewalk gaps	1.413		26.75

24	200 S Neighborhood Byway	1100 W	Seventh St	Neighborhood Byway	Extend buffered bike lanes from the east of Main St; provide improved crossing at Main St	2.161	26.625
26	200 W Buffered Bike Lanes		100 S	Buffered Bike Lane	Recommended as shared roadway in Tooele General Plan	3.134	26.5
12	1000 N Buffered Bike Lanes	200 W	100 E	Buffered Bike Lane	Continue facility on Vine St; recommend buffered bike lanes, but see many fronting properties that park on Vine	0.402	26.125
54	Midvalley Connector		Rogers St	Shared Use Path		2.230	25.5
61	Utah Avenue (West)	200 West	1100 West	Sidewalks; Streetscape improvements	Complete sidewalks from 530 West to 1100 West; add east/west crosswalk striping at intersections	0.856	25.25
3	East Tooele Trail	2000 N	E Smelter Rd	Shared Use Path	Extend 1000 N buffered bike lanes to the west; as traffic volumes increase, consider adding raised buffer to create protected bike lanes	2.140	25
62	1000 North (East)		520 East	Sidewalks, Streetscape improvements	Secondary pedestrian corridor: standard sidewalk with streetscape improvements	2.297	24.75
67	100 East	1000 North	200 South	Sidewalks	Primary pedestrian corridor: fill in sidewalk gaps with 10ft sidewalks where space permits	0.402	24.5
30	400 N Buffered Bike Lanes		Ericson Rd	Buffered Bike Lane	Add Sidepath on north side of road in place of winding sidewalk; constrained section approaching Main St;	2.365	24
23	Seventh St Neighborhood Byway	1480 N	Skyline Dr	Neighborhood Byway	Add Sidepath on east side of Main St where feasible; add markings where path crosses driveways	2.914	23.75
2	Droubay Rd	Erda Way	Skyline Dr	Sidepath	2-lane roadway, 60+ ft wide (no curb and gutter yet on east side), 560 AADT; Add buffered bike lanes; general plan recommended standard bike lanes	5.491	22.75
71	Coleman Avenue	400 North	Main Street	Sidewalks	Fill in sidewalk gaps	2.196	22.5
20	Vine St Buffered Bike Lanes	100 E		Buffered Bike Lane	Add traffic-calming features, signage, and intersection improvements to accommodate bikes and pedestrians; shift down to 400 N to cross with the recommended 400 N facility	0.388	21.625

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35	County Rd 634 Facility	Mid-Town Trail	400 W	Undetermined Facility	Trail noted at second steering committee meeting	0.790	20.75
47	School Connection	400 S	200 W	Shared Use Path		0.786	20.5
13	1000 N Sidepath	SR 112	200 W	Sidepath	Extend Vine St buffered bike lanes to connect to Droubay Rd buffered bike lanes; roadway widths (~32-40') should allow for striped buffered bike lanes	2.102	20
29	600 N Neighborhood Byway		400 N	Neighborhood Byway	Stripe bike lanes connecting to Droubay Rd	1.353	20
44	South Tooele City New Trail			Shared Use Path	Add Sidepath on west side of Main St to connect bike boulevard from 50 W south to future signalized intersection at Main St / 700 S.	2.181	20
19	Broadway Buffered Bike Lanes	1000 N	Skyline Dr	Buffered Bike Lane	Add traffic-calming features, signage, and intersection improvements to accommodate bikes and pedestrians	2.138	19.875
34	Future Roadway Facility	200 W	Vine St	Undetermined Facility	Add a rail with trail along rail corridor throughout Tooele City	2.058	19.75
46	Midvalley Hwy Trail		TBD	Shared Use Path		1.507	19.75
51	Main St	400 N	Main St	Neighborhood Byway		1.518	19.75
59	Utah Avenue (East)	7th Street		Sidewalks	Fill in minor sidewalk gaps & curb ramps; add east/west crosswalk striping at intersections	1.357	19.625
36	1200 W Sidepath	North	Mid-Valley Trail	Sidepath	Trail noted at second steering committee meeting	2.110	19.25
7	Coleman St Buffered Bike Lane	650 N	Main St/SR 36	Buffered Bike Lane	Add Sidepath along road; Sidepath recommended in Tooele General Plan, also suggested during public input	2.297	18.25
21	Vine St Bike Lanes		Seventh St	Standard Bike Lanes	Volumes range from 2,000- 4,100 AADT, widths allow for buffered bike lanes if parking is removed from one side; fronting properties have driveways; Add buffered bike lanes along 400 N; connects to existing bike lanes east of town	0.239	18.125
14	170 W & Drysdale Neighborhood Byway	2200 N	Berra Blvd	Neighborhood Byway	Add traffic-calming features, signage, and intersection improvements to accommodate bikes and pedestrians	1.559	17.5

8	1100 W Buffered Bike Lanes	Vine St	700 S	Buffered Bike Lane	Undetermined facility, based on how roadway develops; provides connection to business area in north Tooele- preference for Sidepath facility. Likely this should be a side path or a parking protected facility	1.101	17.25
53	Main St	50 W	700 S	Sidepath		0.125	17.25
64	1000 North (West)	600 West		Sidepath		0.159	17.25
45	Water Easement Trail		400 W	Shared Use Path	Enhance to paved shared use path	2.094	17
40	West of Main Street	2000 N	RR	Shared Use Path	3-lane roadway, 60', 3000 AADT; Recommend striping buffered bike lanes; recommended as standard bike lanes in UDOT Unified Plan	0.211	16.5
16	Overlake Links Sidepath	Erda	2400 N	Sidepath	Add signage to connect 400 S facilities to Skyline Dr and consider add crossing improvements on	2.196	16.25
22	Vine St Buffered Bike Lanes (East)			Buffered Bike Lane	Continue existing buffered bike lane facility south, then west to connect to Main St	0.507	16.25
28	900 S/Timipie Rd Neighborhood Byway	1100 W	Main St	Neighborhood Byway	Add signage to indicate bike route connecting to the Pine Canyon Trailhead	1.147	16.25
52	N Garden St	700 N	100 E	Neighborhood Byway		1.070	16
11	Berra Blvd Buffered Bike Lanes	2400 N	Franks Dr	Buffered Bike Lane	Continue striped buffered bike lanes to Broadway; consider shifting to standard bike lane by Red Delpapa Memorial Park to allow for parallel parking	1.771	15.625
15	400 W/Franks Dr Buffered Bike Lanes	2400 N	1000 N	Sidepath	Use wide roadway to create neighborhood byway; add traffic-calming features, signage, and intersection improvements to accommodate bikes and pedestrians	1.413	14.5
48	Settlement Canyon Creekside Trail	Main St	Dark Trail	Shared Use Path		0.906	14.5
31	100 E Buffered Bike Lanes	Vine St	Main St	Buffered Bike Lane	Connect trail from 2000 N to proposed crossing at the RR tracks	0.641	14.25
41	W 2000 N	1200 W	400 W	Buffered Bike Lane	Wide roadways and <2,000 AADT volumes will accommodate buffered bike lanes; could be adjusted to separated bike lanes in some instances, especially more heavily commercial areas	0.979	14.125
39	W 2000 N	400 W	Main St	Shared Use Path	Shared Use Path along creek where feasible, then around the reservoir; recommended on public input map	0.831	13.875
10	Extended Mid-Valley Trail		Utah Ave	Unpaved Trail	2-lane, 50' roadway, 1,100 AADT; stripe buffered bike lanes; could consider adding traffic calming and creating neighborhood byway as a less-intensive treatment	0.574	13.75

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17	2400 North	400 W	540 E	Sidepath	Wide roadways and <2,000 AADT volumes will accommodate buffered bike lanes. Two potential options- 1) Bike lanes with parallel parking configuration 2) Protected Bike Lane 5', 2' buffer; parking on west side of street.	1.235	13.75
4	Settlement Canyon Rd Trail	Main St		Sidepath	If land ownership shown on Tooele County GIS Interactive Web Map is accurate, space should be available to add a Sidepath along 1000 N on north or south side of road; tie in to mid-town trail; recommended as shared lane in general plan	0.843	13.25
25	Garden St Bike Route	100 S	Skyline Dr	Neighborhood Byway	Facility for new roadway recommended as part of Tooele general plan; standard bike lanes recommended; assess as roadway goes in and traffic volumes are recorded	0.139	13.25
18	Berra Blvd Extension		2400 N	Undetermined Facility	Connecting from proposed 200 W buffered bike lanes; add traffic-calming features, signage, and intersection improvements to accommodate bikes and pedestrians	1.215	12.75
38	2000 N/Droubay Rd bike lanes	520 E		Buffered Bike Lane	Provide trail/Sidepath connection through West Elementary campus, along north side of 200 S, up Tooele Junior High School driveway, and along 100 S to connect with 200 W.	0.496	12.5
27	200 W Neighborhood Byway	100 S	900 S/ Timpie Rd	Neighborhood Byway	Recommended as parallel bike path in UDOT Unified Plan- unfunded and a shared roadway in Tooele General Plan;	1.155	12.25
37	Ericson Rd/Blue Peark Dr Bike Route to Pine Canyon		2000 E	Neighborhood Byway	Trail noted at second steering committee meeting; UDOT hwy project, alignment not yet selected	1.114	12
49	400 W/Franks Dr Buffered Bike Lanes	2400 N	1000 N	Sidepath		1.132	11.875
33	400 S Buffered Bike Lanes		Main St	Buffered Bike Lane	Add signage indicating that bikers/walkers are present; add wayfinding to make a clear connection	0.809	11
42	Tooele City Cemetery Connection	100 E	200 E	Neighborhood Byway	Add signage indicating that bikers/walkers are present; add wayfinding to make a clear connection	0.188	10.5
1	Skyline Dr Buffered Bike Lanes	Main St	Dirt Rd	Buffered Bike Lane	Continue trail south; north part of land owned by Tooele County, south part privately owned; consider paving to create shared use path	1.812	9.75
6	900 W Buffered Bike Lanes	200 S	Timpie Rd	Buffered Bike Lane	3-lane roadway, 60', 3000 AADT; Recommend striping buffered bike lanes; recommended as standard bike lanes in UDOT Unified Plan / Parking prohibited (parking may be preserved add key location with buffered bike lanes).	0.856	9.25
5	700 S Buffered Bike Lanes	1100 W	Main St	Buffered Bike Lane	Recommend neighborhood byway; add traffic-calming features, especially narrowing features	1.357	8.875
50	200 W Buffered Bike Lanes		100 S	Buffered Bike Lane		0.267	7.25

Priority Project Concept Cut Sheets

This section explores preliminary plans for two projects identified as potential candidates for design or feasibility studies. These concept sheets aim to:

- Inform future scopes of work: The included elements provide a foundation for developing detailed proposals for design and engineering services.
- Enhance project understanding for Tooele: This information equips Tooele with insights into the opportunities, constraints, and estimated planning costs associated with each project.

Selected Projects:

Based on public input (Chapter 2), project prioritization (Chapter 5), and discussions with City Staff, the following projects were chosen for further development:

P1: Main Street Sidepath

P2: Vine Street Buffered Bike Lanes

Project Need

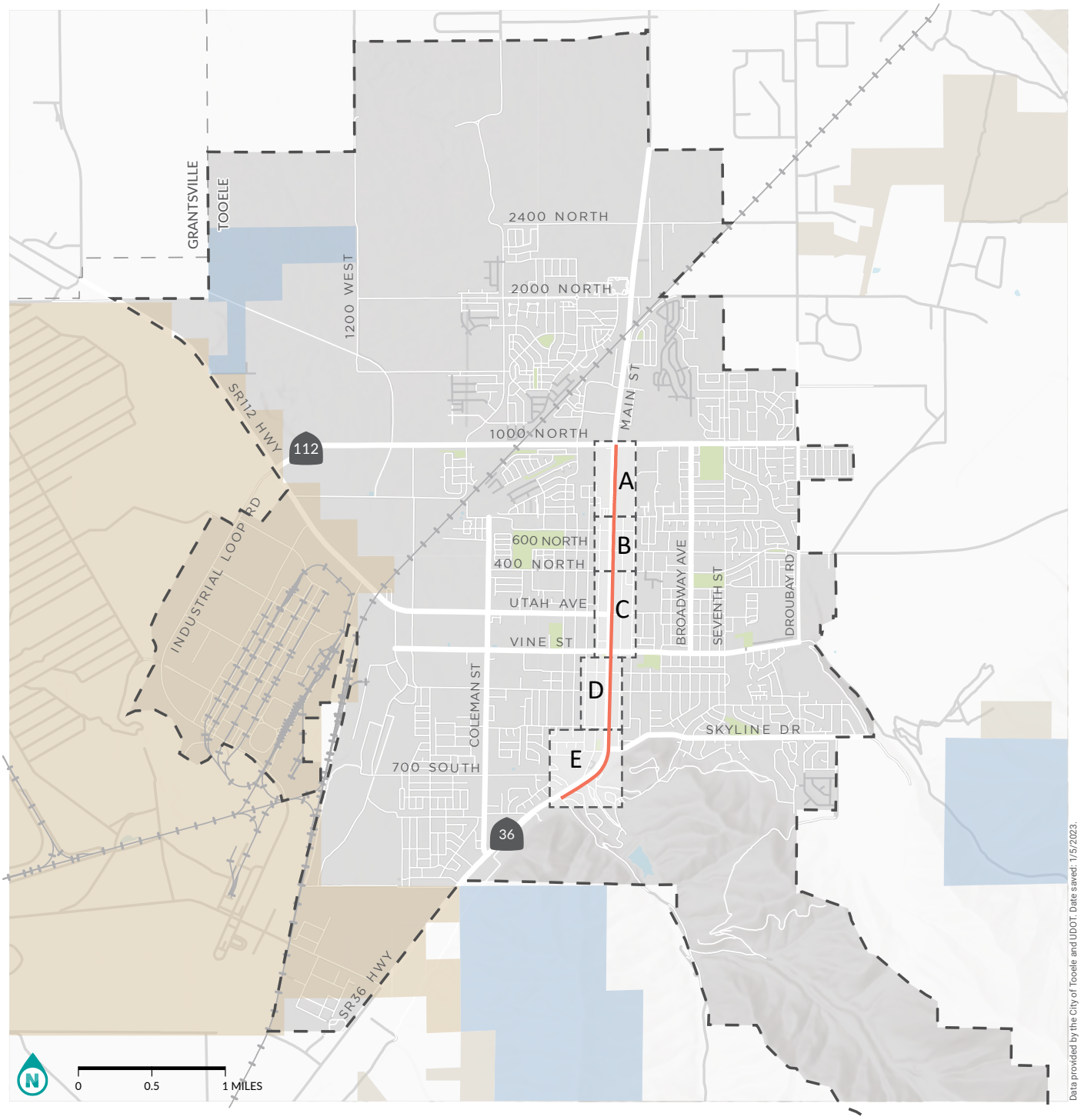
Main Street (Highway 36) presents a significant barrier for cyclists in Tooele. The high traffic volume, combined with the presence of Highway 112 and the railroad tracks, creates multiple challenging intersections that discourage safe and efficient bicycle travel across the corridor. This disrupts the overall connectivity of the city's active transportation network, hindering residents' ability to utilize bicycles for commuting and recreation.

Project Improvements

Project improvements include added a sidepath (12' pathway & 5' furnishing zone) on the East side of Main Street from 700 S to 1000 N. The following exhibits depicits various utility conflicts and proposed crossing enhancement locations to be consider for the impletemtnation of this project.

Next Steps and Implementation:

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Fermentum posuere urna nec tincidunt praesent semper feugiat nibh. Sed faucibus turpis in eu.



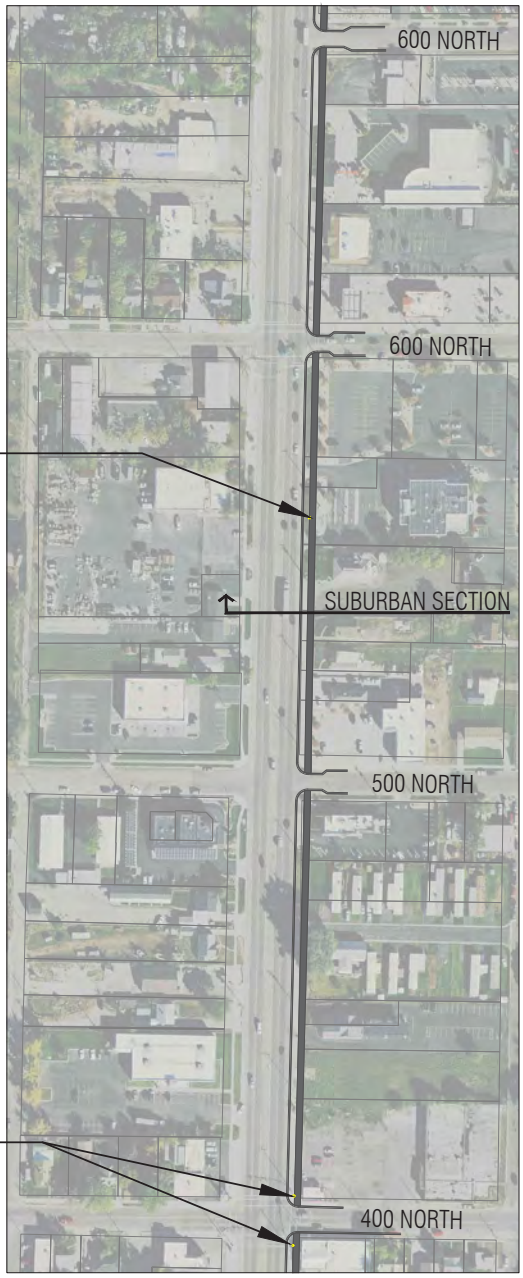
MAIN STREET SIDEPATH

Sidepath Alignment

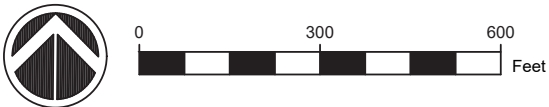
A Enlargement Area

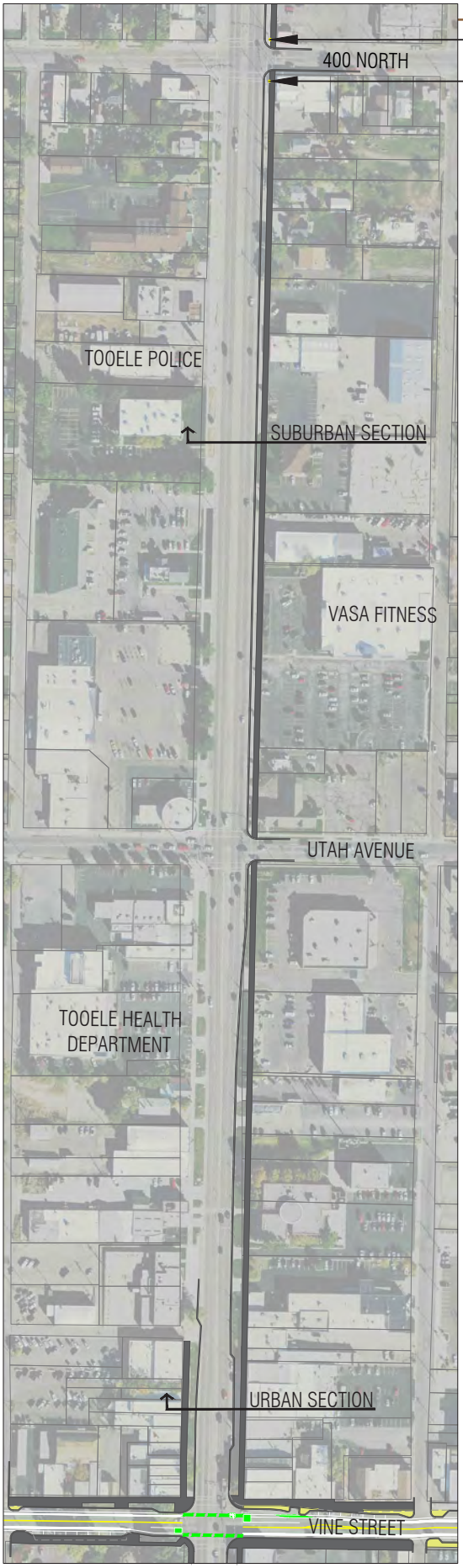
Tooele City
Active Transportation Plan

A: 1000 N - 700 N

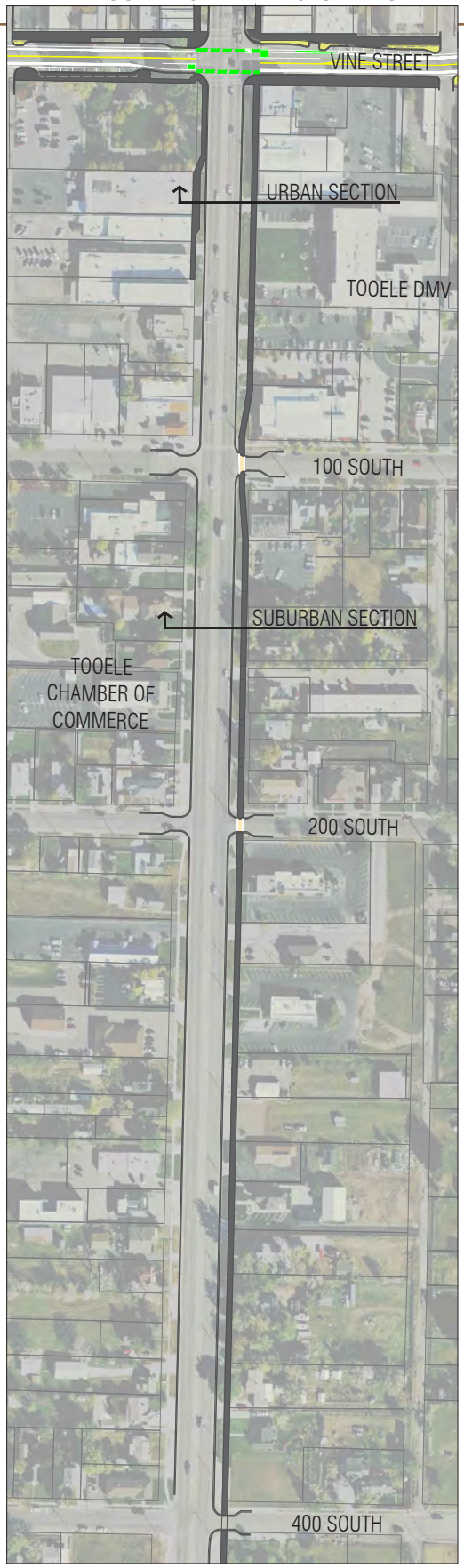


B: 700 N - 400 N

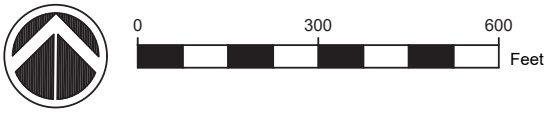




C: 400 N - VINE STREET



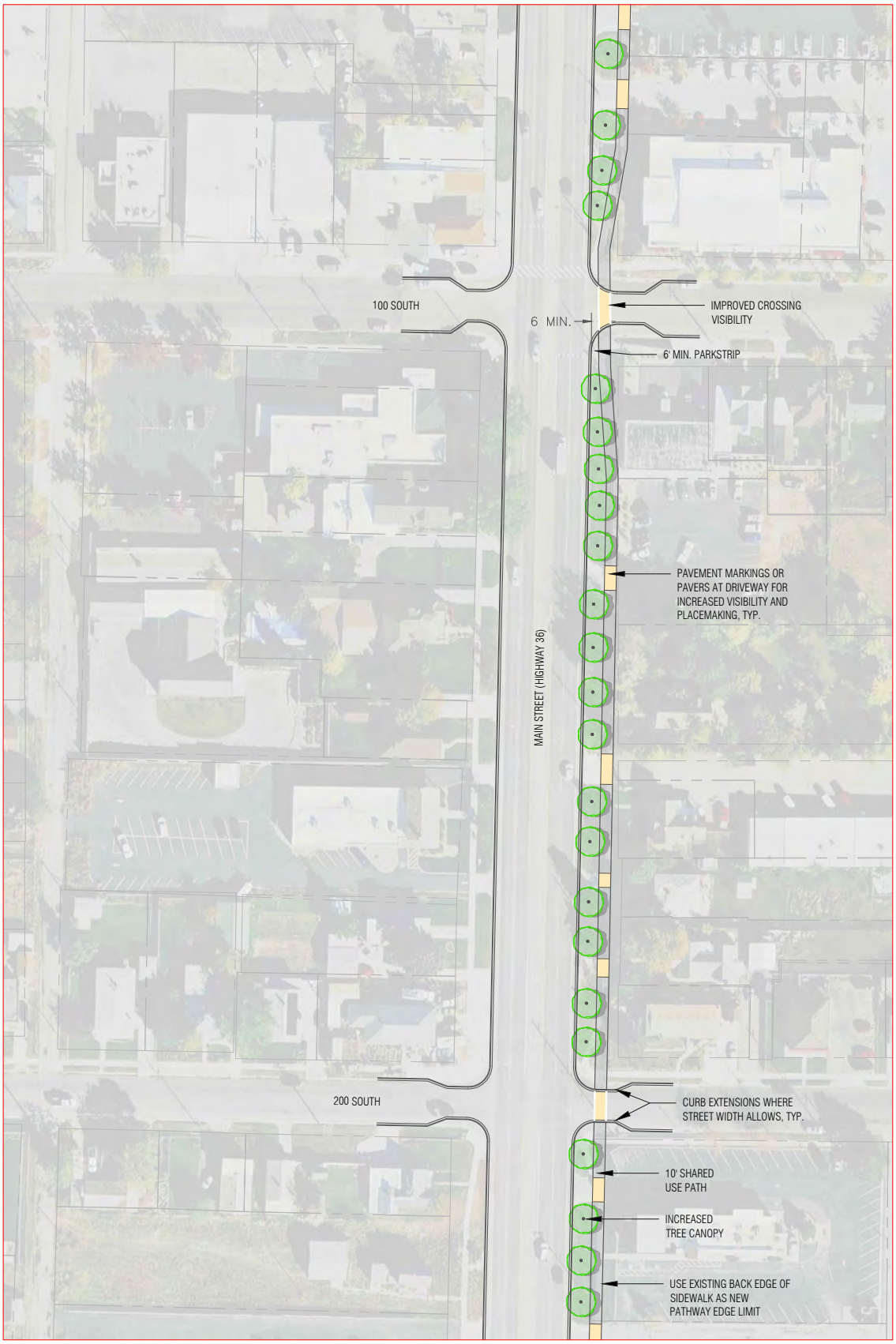
D: VINE STREET - 400 S




400 SOUTH
SUBURBAN SECTION
SKYLINE DRIVE
COORDINATE AROUND UTILITY POLE
UTILITY POLE CONFLICT
UTILITY POLE CONFLICT
700 SOUTH

E: 400 S - 700 S

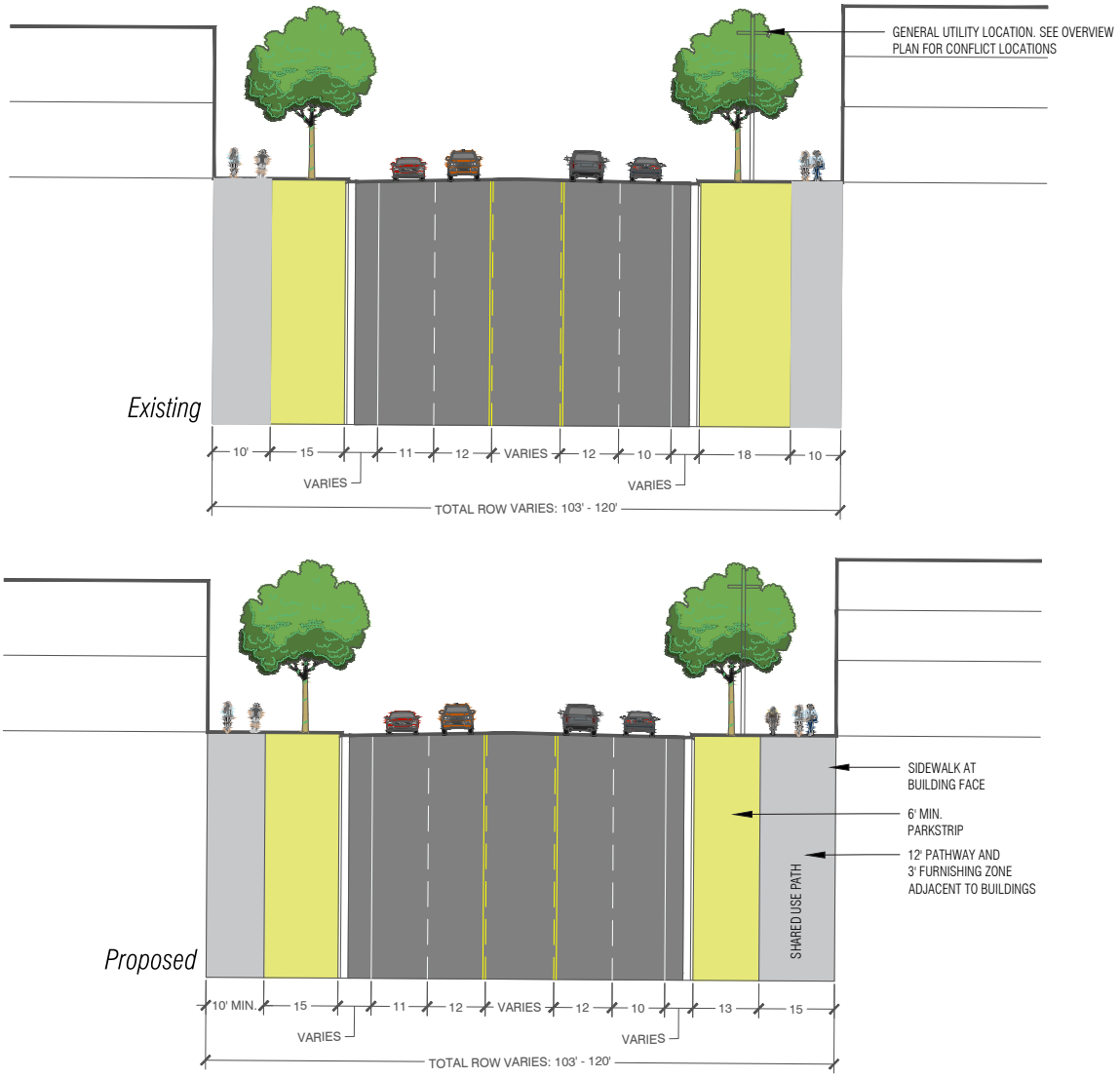
0
300
600
Feet



MAIN STREET SIDEPATH TYPICAL

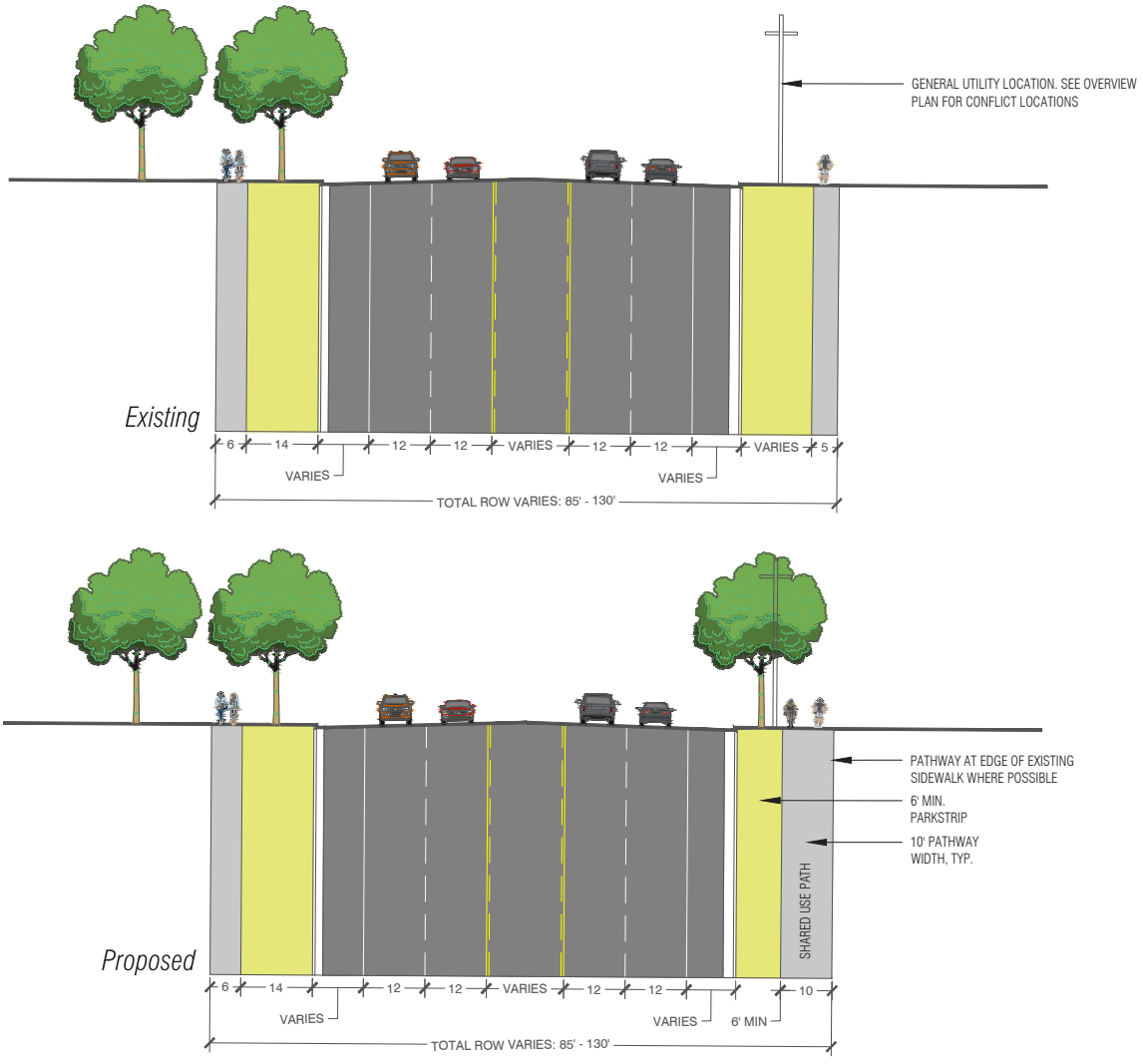
MAIN STREET SECTIONS

Downtown Condition



MAIN STREET SECTIONS

Suburban Condition



Project Need

Although Vine St has existing bike facilities, this facility can be improved considering it's inhereit strong west-east connection across Main St and proximity to commerical and vici desstinations. The current striping and paint on the road create a mixed traffic consitions in which cuculists and cars share the roadway and the lack of paint across the intersection may cause condutions.

Project Improvements

Removal of Green Shared Lane Markings:

Existing green shared lane markings will be removed to provide clearer distinction between vehicle and bicycle traffic.

Conversion of Shoulder to Buffered Bike Lanes: The existing shoulder area will be repurposed to create buffered bike lanes. These lanes will consist of a 5-foot designated travel lane for bicycles with an additional 3-foot buffer separating cyclists from vehicle traffic. This configuration will extend the existing buffered bike lane network westward and eastward.

Intersection Improvements: Paint markings will be extended through intersections to provide dedicated guidance for cyclists navigating these areas.

East Vine Street specific improvements include:

- Curb and Bulb Outs: The curb on the north side of the road will be extended at specific locations to create bulb outs.
- Parking Conversion and Parallel Parking Implementation: Four angled parking stalls will be converted to parallel parking spaces on the north side of the road. This will allow for the creation of dedicated space for the bulb outs.
- Curb Extension with Planter Integration: The curb will be extended and planters will be integrated on the northwest corner of the intersection. This design element will further enhance traffic calming and improve aesthetics.
- Bike Box and Potential Left Turn Box: A 15-foot bike box will be added at the intersection to provide cyclists with a designated waiting area at the traffic signal.

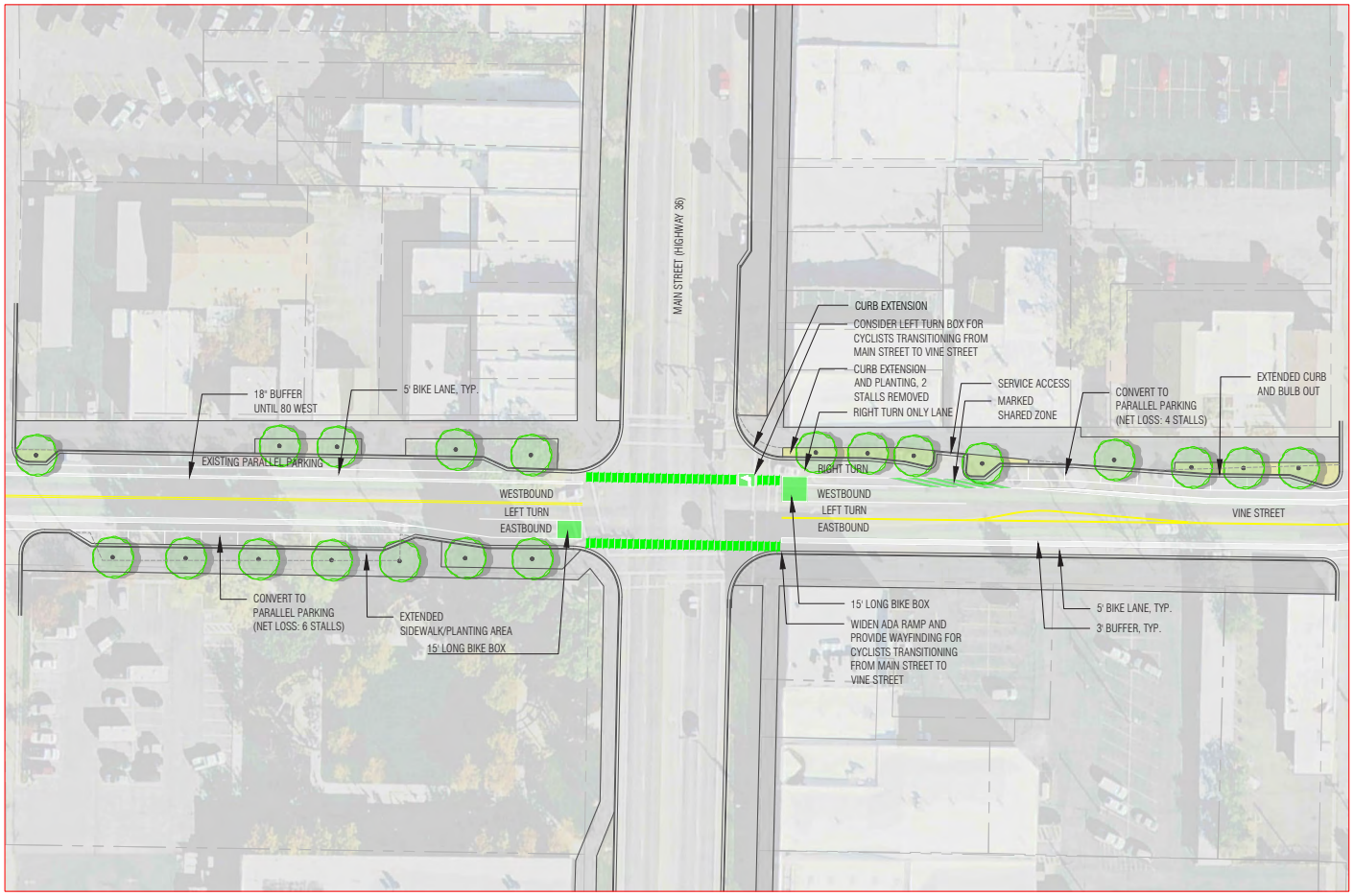
West Vine Street specific improvements include:

- Bike Box Addition: A 15-foot bike box will be added on the right-turn lane to provide a designated waiting area for cyclists turning right at the intersection.
- Parking Conversion and Parallel Parking Implementation: Angled parking stalls on the south side of the road will be converted to parallel parking spaces.
- Sidewalk and Planting Area Expansion: The existing sidewalk and planting area will be expanded in the space created by converting angled parking to parallel parking.

Next Steps and Implementation:

- To fully optimize this critical route for multiple users, a phased implementation recommendations and updated cost estimates will be developed to guide the future development of Main Street.

Buffered Bike Lanes on Vine St (project #9).



VINE STREET MODIFICATIONS

- A -

Appendix

- Equity Analysis
- Survey 1 Results
- Survey 2 Results

Equity Analysis

When considering the addition of active transportation facilities in a community, it is critical to consider historic inequities in the provision of adequate infrastructure. To determine equity priority areas, an equity analysis was conducted for the current conditions in Tooele.

An equity analysis seeks to discover where people with the highest need for transportation options live within Tooele by looking at the factors shown in **Figure 3**. Understanding where these individuals are most densely located will help to prioritize transportation improvements to address inequities and meet basic needs.

These equity priority areas may also be areas with poor health outcomes. Investing in active and public transportation in these areas also helps meet community goals for improvements in mental and physical health.[1] Working toward equity may mean prioritizing active and public transportation.

funding in areas with a greater concentration of disadvantaged populations instead of distributing funding equally based on geography.

Findings

Each factor was assessed relative to Tooele County and combined into a composite score. These results are mapped to identify areas of higher need (higher scores). These results are shown in **Map 2.2**. Based on the results of the equity analysis; the key takeaways include:

- High-need areas are located in central areas of the city, bounded south of the rail line west and east of Main Street.
- Over 28% of Tooele's population resides in areas identified as highest need. These same areas contain 19% of Tooele's overall roadway network.
- When compared in relation to the results of the collision analysis, 11% number of pedestrian-involved fatalities and severe injuries occurred in the highest-need area.

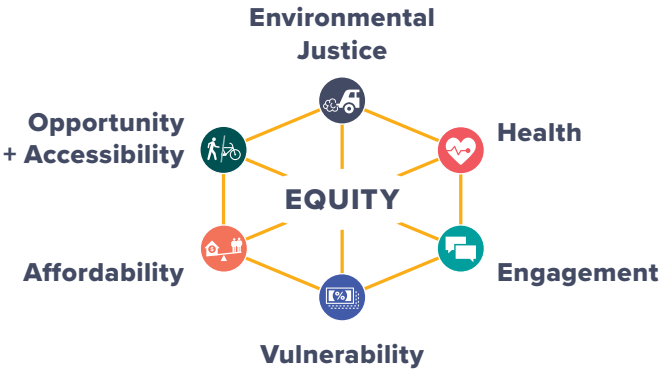
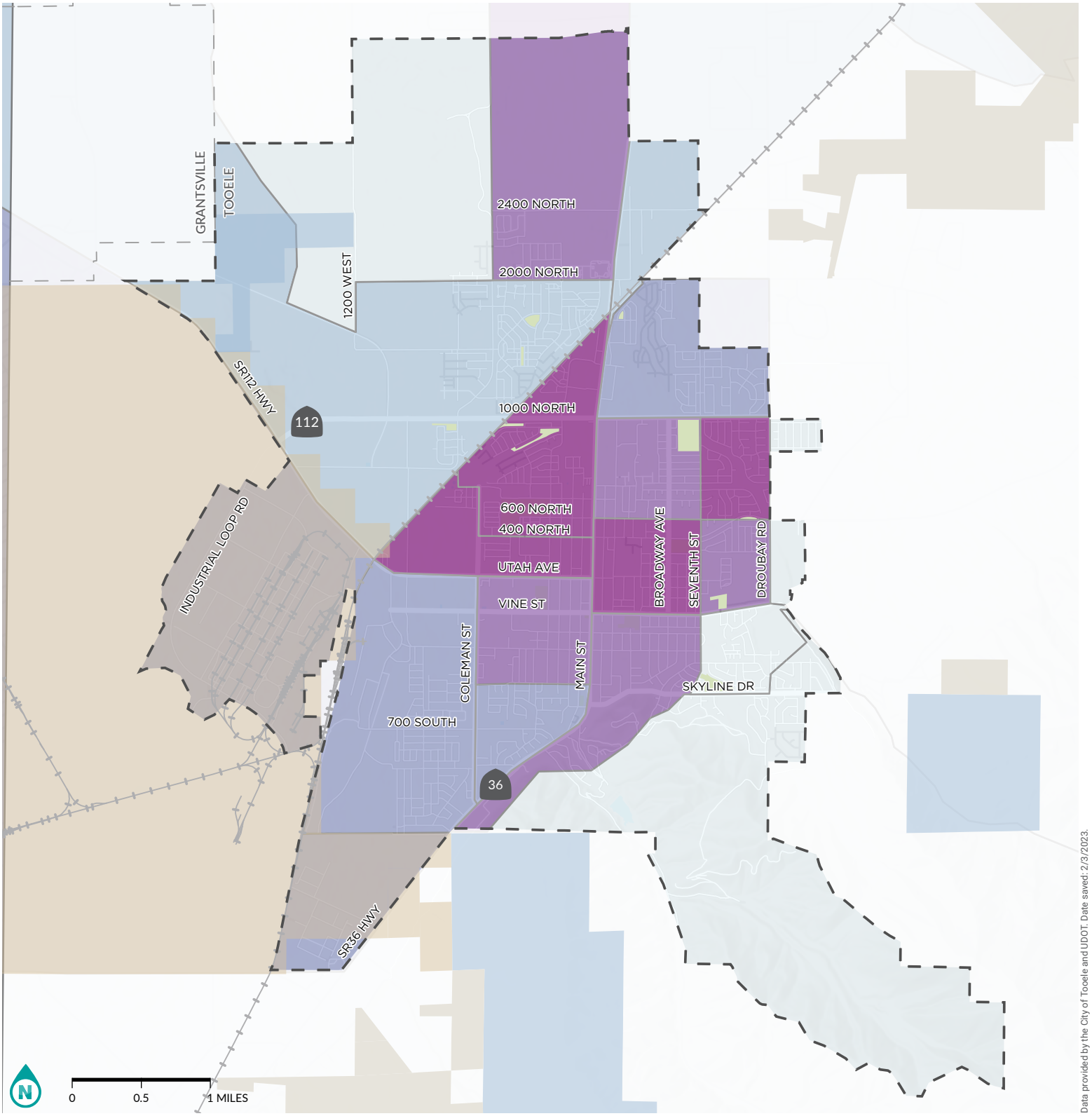


Figure 6. *Factors that are considered in an equity analysis*

1 Center for Infrastructure Equity. Transportation Equity. PolicyLink. 2016. http://www.policylink.org/focus areas/infrastructure-equity/transportation-equity



Map 2.2

EQUITY ANALYSIS

Base Map

- Tooele City Boundary
- Tooele City Parks
- Dept of Defense
- State Trust Lands
- Bureau of Land Management

Equity Composite Score

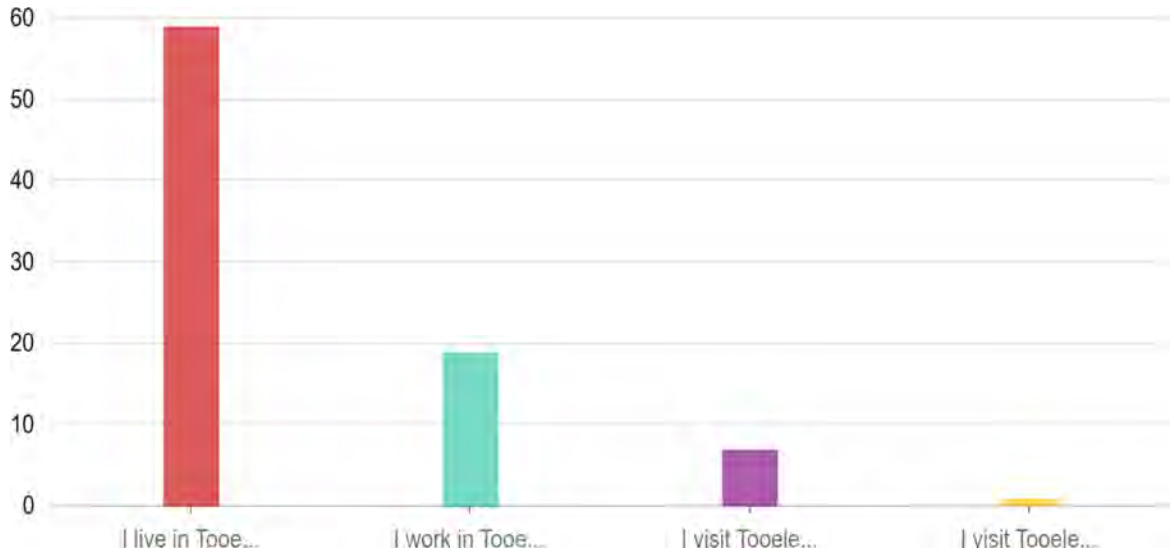
- Highest Need
- Lowest Need

Tooele City
Active Transportation Plan

Tooele Active Transportation Plan Survey

Active Transportation Survey

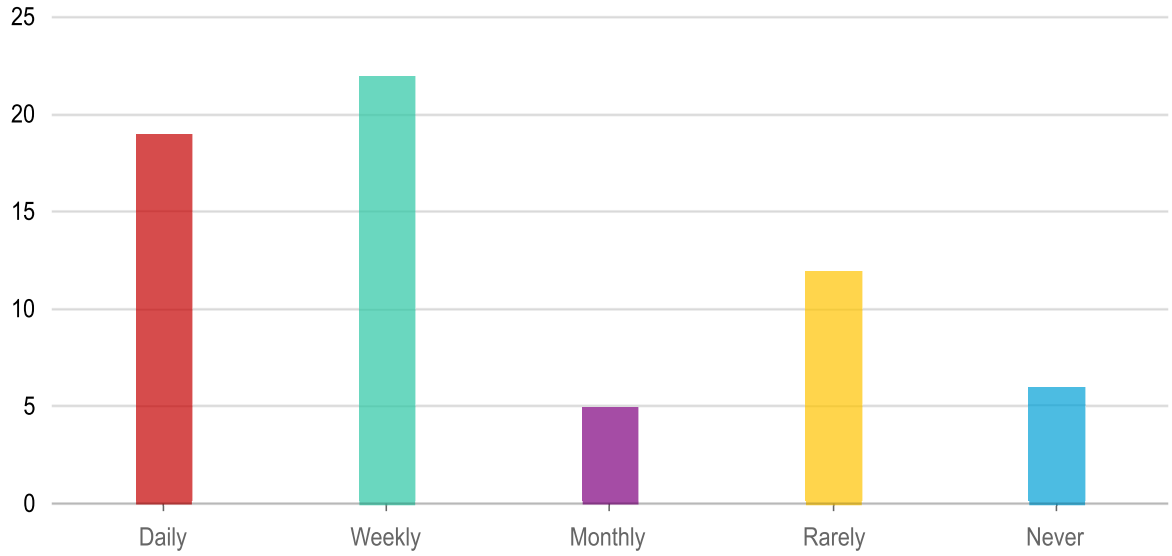
Please check all that apply: *



Answers	Count	Percentage
I live in Tooele	59	92.19%
I work in Tooele	19	29.69%
I visit Tooele often	7	10.94%
I visit Tooele occasionally	1	1.56%

Answered: 64 Skipped: 0

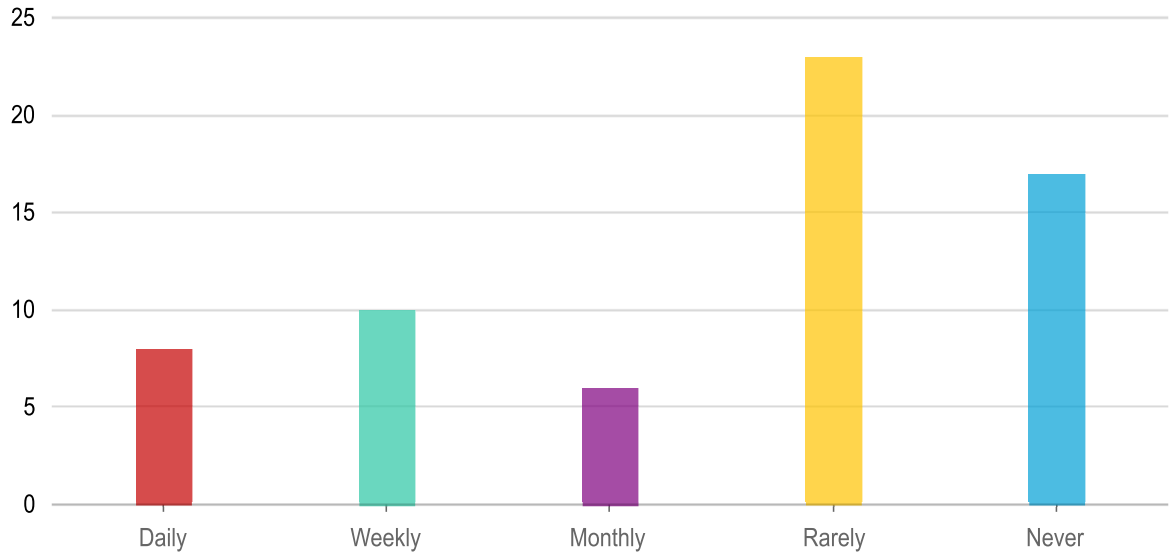
How often do you walk, bike, or roll for recreation or exercise in Tooele? *



Answers	Count	Percentage
Daily	19	29.69%
Weekly	22	34.38%
Monthly	5	7.81%
Rarely	12	18.75%
Never	6	9.38%

Answered: 64 Skipped: 0

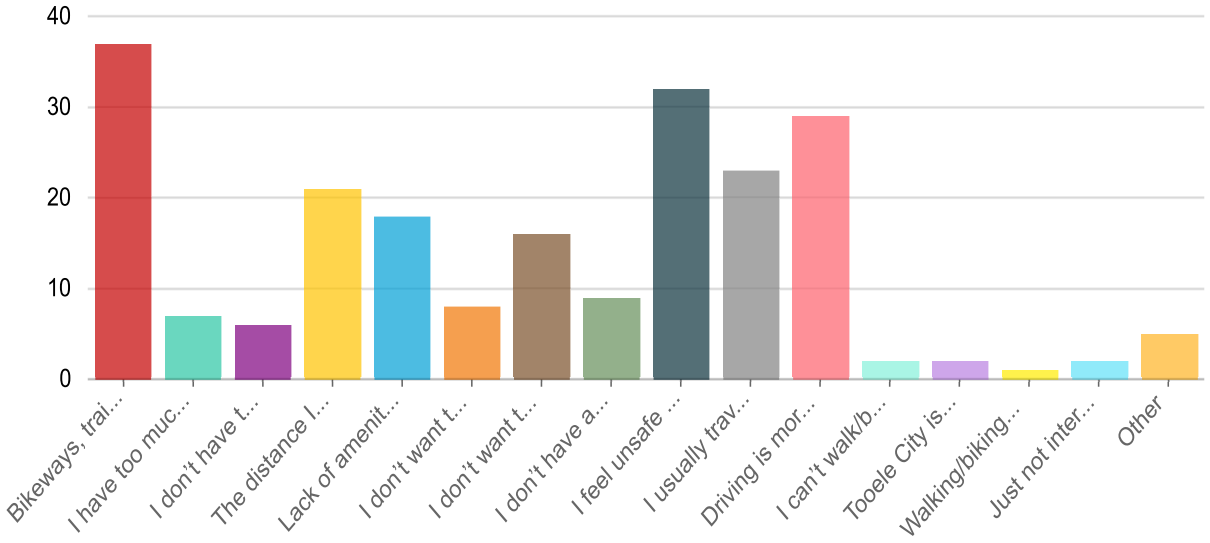
How often do you walk, bike, or roll for transportation in Tooele? *



Answers	Count	Percentage
Daily	8	12.5%
Weekly	10	15.63%
Monthly	6	9.38%
Rarely	23	35.94%
Never	17	26.56%

Answered: 64 Skipped: 0

If you don't use active transportation often, what are the main reasons? (check all… *

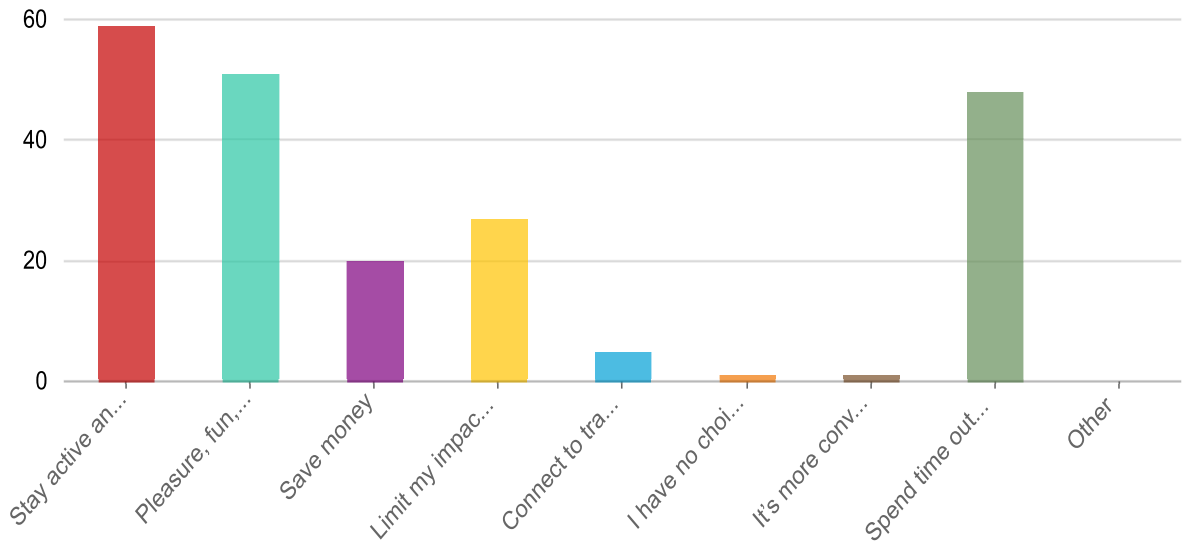


Answers	Count	Percentage
Bikeways, trails, or sidewalks do not connect to where I want t o go	37	57.81%
I have too much to carry	7	10.94%
I don't have time	6	9.38%
The distance I typically have to travel is too far	21	32.81%
Lack of amenities such as secure bike parking at destinations	18	28.13%
I don't want to arrive at my destination sweaty or disheveled	8	12.5%
I don't want to be exposed to the weather (rain, snow, cold, he at, etc.)	16	25%
I don't have access to a functioning bike or other personal mo bility device	9	14.06%
I feel unsafe interacting with vehicle traffic	32	50%
I usually travel with kids	23	35.94%
Driving is more convenient	29	45.31%
I can't walk/bike/roll for other reasons	2	3.13%

Tooele City is too hilly	2	3.13%
Walking/biking/rolling is my only option; I use it every day	1	1.56%
Just not interested in walking or biking	2	3.13%
Other	5	7.81%

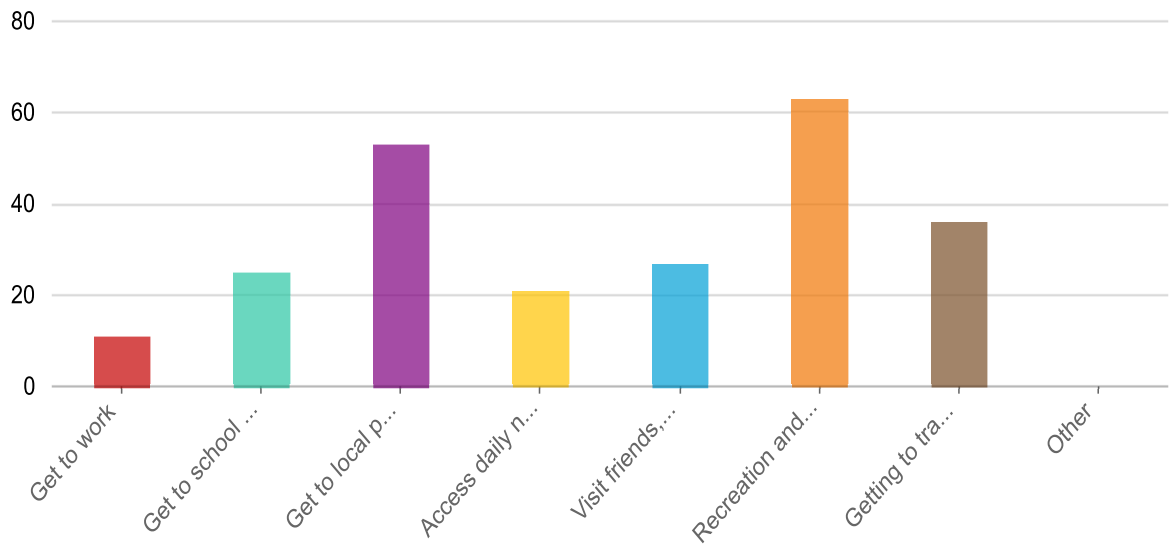
Answered: 64 Skipped: 0

What are (or would be) your reasons for walking, biking, or rolling? *



Answers	Count	Percentage
Stay active and improve health/fitness	59	92.19%
Pleasure, fun, or socializing	51	79.69%
Save money	20	31.25%
Limit my impact on the environment	27	42.19%
Connect to transit	5	7.81%
I have no choice; walking and/or biking is my only option	1	1.56%
It's more convenient than driving	1	1.56%
Spend time outdoors	48	75%
Other	0	0%

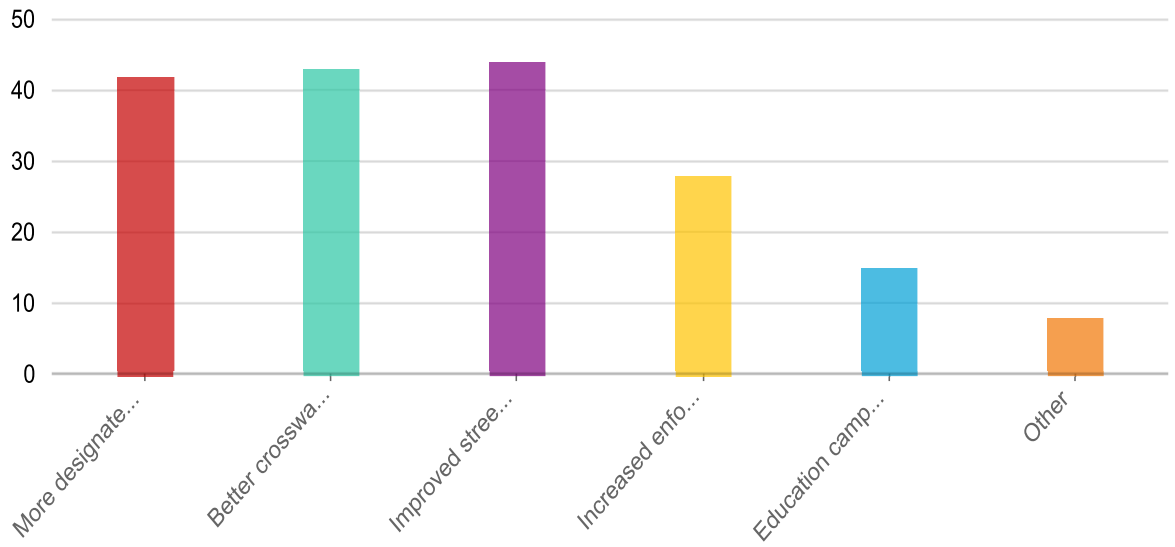
What would you like to use bikeways, paved trails, and sidewalks for in Tooele? *



Answers	Count	Percentage
Get to work	11	17.19%
Get to school (for myself or my children)	25	39.06%
Get to local parks, trailheads, or recreation centers	53	82.81%
Access daily needs like grocery stores, shopping, etc.	21	32.81%
Visit friends, social events/venues, or entertainment	27	42.19%
Recreation and exercise	63	98.44%
Getting to trailheads	36	56.25%
Other	0	0%

Answered: 64 Skipped: 0

What improvements would make walking, biking, or rolling in Tooele City more… *



Answers	Count	Percentage
More designated bike and pedestrian facilities (ex. bike lanes, trails, sidewalks)	42	65.63%
Better crosswalks and other intersection improvements	43	67.19%
Improved street lighting	44	68.75%
Increased enforcement of traffic laws	28	43.75%
Education campaigns for drivers and cyclists/pedestrians	15	23.44%
Other	8	12.5%

Answered: 64 Skipped: 0

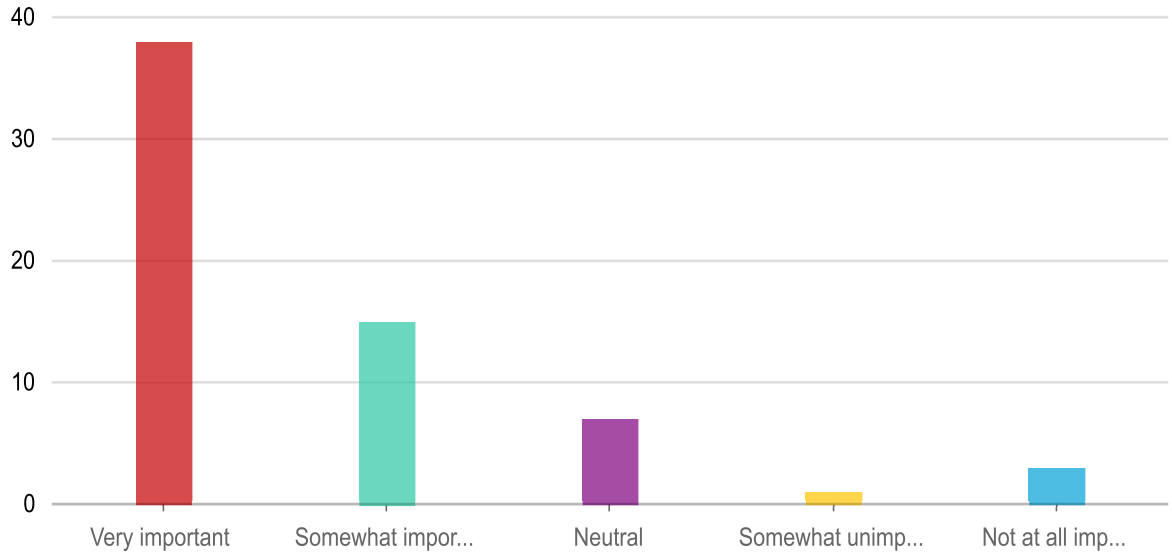
How would you generally describe yourself when it comes to riding a… *

- I'm not very comfortable riding in bike lanes, and may choose to ride on the sidewalk even when bike lanes are present. I would like to ride a bike more, but I'm concerned about safety, interacting with cars, and other issues I selected previously.
- I prefer separated bikeways, but I'm comfortable riding in regular bike lanes or on paved shoulders
- I'm not currently interested in using a bicycle to get

Answers	Count	Percentage
I'm not very comfortable riding in bike lanes, and may choose to ride on the sidewalk even when bike lanes are present. I would like to ride a bike more, but I'm concerned about safety, interacting with cars, and other issues I selected previously.	28	43.75%
I prefer separated bikeways, but I'm comfortable riding in regular bike lanes or on paved shoulders	21	32.81%
I'm not currently interested in using a bicycle to get around	11	17.19%
I don't mind sharing the road with cars, even without a dedicated bike lane	4	6.25%

Answered: 64 Skipped: 0

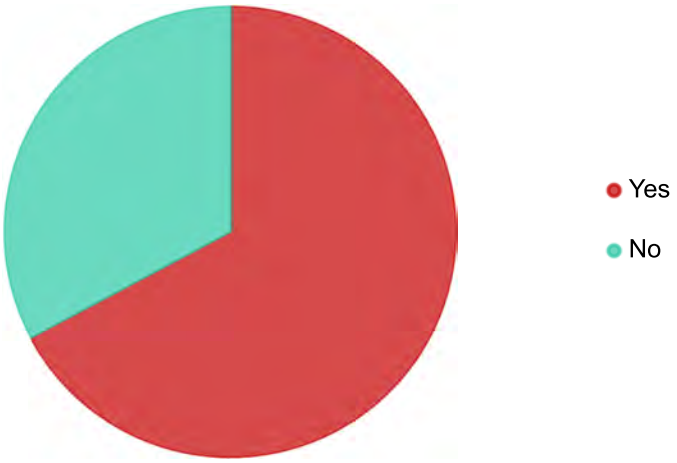
How important is it to you that Tooele City invests in improving active… *



Answers	Count	Percentage
Very important	38	59.38%
Somewhat important	15	23.44%
Neutral	7	10.94%
Somewhat unimportant	1	1.56%
Not at all important	3	4.69%

Answered: 64 Skipped: 0

Have you ever felt unsafe biking in Tooele? *



Answers	Count	Percentage
Yes	43	67.19%
No	21	32.81%

Answered: 64 Skipped: 0

Why and where did you feel unsafe biking in Tooele?

Word	Count
Drivers	9
1000	6
bike	6
Biking	4
attention	4
north	3
road	3
ride	3
paying	3
main	3
street	3
Cars	3
space	2
don’t	2
sidewalks	2
lights	2
roads	2
N.	2
Traffic	2
lot	2
feel	2
unsafe.	2

sidewalk	2
makes	2
narrow	2
unsafe	2
watch	2
unaware	2
people	2
drive	2
Droubey	1
sometimes.	1
Tooele	1
entitled	1
arrogant	1
care	1
knats	1
Stansbury	1
Taking	1
children	1
bikes	1
scary	1
neighborhood.	1
Really?	1
paths	1

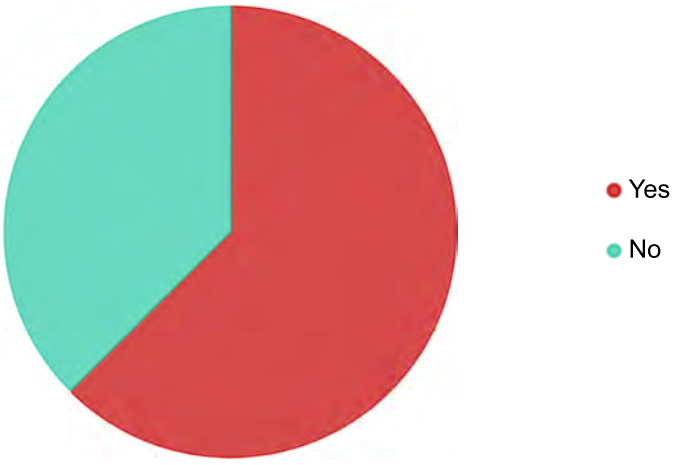
nuts!	1
Utah	1
Ave	1
section	1
traveling	1
heavy	1
lane.	1
trails-	1
shared	1
vechiles.	1
trails	1
home	1
Intersections	1
Intersection	1
England	1
Acres	1
Park	1
kids	1
thorns	1
stuck	1
tires.	1
riding	1
streets	1

option	1
nervous.	1
Northpoint	1
pass.	1
spot	1
vary	1
narrow.	1
Fence	1
there.	1
Everywhere.	1
baths.	1
roads.	1
pay	1
pedestrians	1
bikers.	1
limited	1
shoulder	1
Crossing	1
Crazy	1
bikes.	1
pathways/roads.	1
side	1
walk	1

Anywhere.	1
dedicated	1
space.	1
shoulders	1
vehicles	1
outright	1
hostile	1
share	1
road.	1
neighborhood	1
street…cars	1
lanes	1
additional	1
travel	1
lane	1
hwy36	1
1000N	1
speed	1
dangerously	1
droubay	1
pine	1
canyon	1
raceway	1
fast	1

Answered: 36 Skipped: 28

Have you ever felt unsafe walking in Tooele? *



Answers	Count	Percentage
Yes	40	62.5%
No	24	37.5%

Answered: 64 Skipped: 0

- **Why and where did you feel unsafe walking in Tooele?**

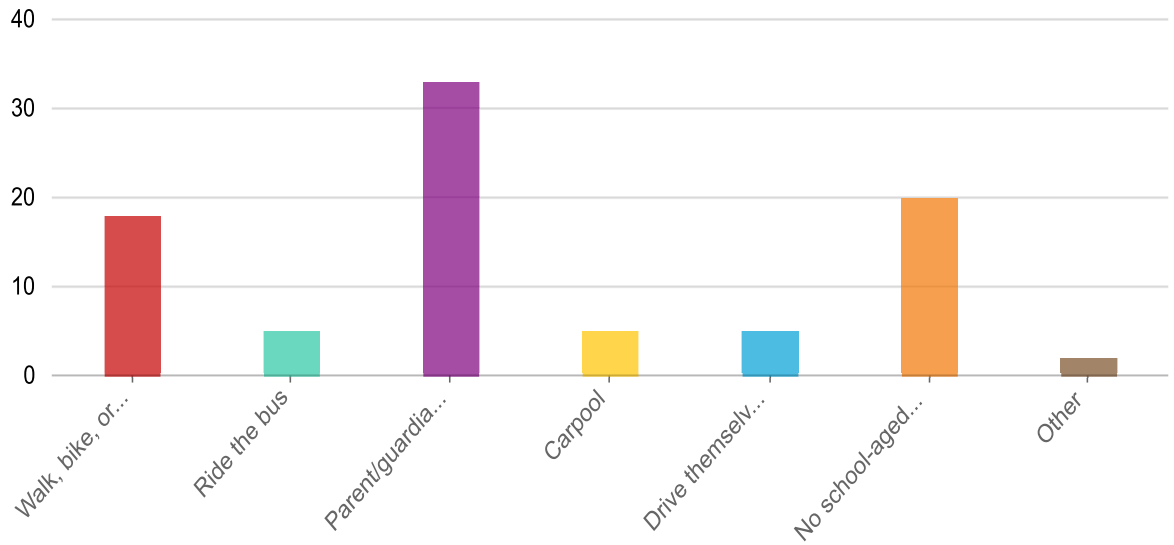
Response	Count
Utah Ave, West of main. The sidewalks are horrible and sometimes there is no sidewalk	1
Upper Upland Drive area, 100 West, 200 West between Vine & 200 North	1
Unlit areas	1
Tooele drivers are entitled and arrogant, don’t care about anything but themselves	1
Too many speeding everywhere	1
To many knats and no sidewalks or lights in Stansbury	1
The sidewalks are in poor condition or blocked by overgrown trees and weeds, it is usually safer to wa lk in the street if traffic is not busy. In the summer, sprinklers are often watering the sidewalks, making it necessary to walk in the street.	1
The lack of sidewalk on busy streets	1
Speeding cars on anaconda	1
Smelter Rd. Lack of sidewalks and many street lights are out.	1
Sidewalks end forces you to walk in street and drivers not paying attention	1
Same above	1
People let their dogs run loose and drivers not paying attention	1

People following me. In the 400 So. Area	1
No connecting sidewalks so forced to walk on the road.	1
Near Broadway. Tooele has allowed that area to become increasingly dilapidated. I feel unsafe in that area even when in my vehicle.	1
Main roads with lots of traffic	1
Limited lighting	1
It feels unsafe to walk alone after dark.	1
Intersection at England Acres Park	1
I walk with my small dog, and have been charged by loose dogs several times. Once it resulted in my dog needing stitches from the attack. We need penalties for people who are not in control of their dog s, or who do not follow laws.	1
I like to run all the way down Droubay Rd to Bates Canyon Rd and it is terrible. There are so many car s and no shoulder. When a car comes I basically stop running and get off the road until a car passes. I t's gotten especially bad the last 5 years or so.	1
I have been chased by many dogs while out, and bitten by one once before	1
Everywhere. Most neighborhoods do not have sidewalks or have sidewalks that randomly end and for ce you into the road. Traffic lights do not accommodate pedestrians and unsafe to cross major roads.	1
Everywhere to many people refuse to leash their dogs or secure them on their property.	1
Drivers don't watch and there aren't trails	1
Crossing Main Street - No cross walks	1
Crossing main any where there isn't a streetlight IE 100 south or top South end of main street.	1
Crossing cross walks	1
Besides sidewalks there are no walking paths	1
At night. It is very dark. And this winter when the sidewalks were covered with snow and all the kids h ad to walk to school in the road.	1
Anywhere there isn't space for a shoulder or a sidewalk.	1

Any street without a sidewalk	1
1000N no sidewalks. Cars speed bad	1
1000 N, highway 36	1

Answered: 35 Skipped: 29

If there are school-aged children in your household, how do they typically get to… *



Answers	Count	Percentage
Walk, bike, or roll	18	28.13%
Ride the bus	5	7.81%
Parent/guardian drives them	33	51.56%
Carpool	5	7.81%
Drive themselves	5	7.81%
No school-aged children in my household	20	31.25%
Other	2	3.13%

Answered: 64 Skipped: 0

- **Do you have any other suggestions for improving active transportation in Tooele…**

Response	Count
Yes extend improvements to Stansbury	1
We need sidewalks for kids to walk to school safely!	1
We need a bike path on Droubay. There are always people walking and running and cycling on that ro ad. I was crossing the crosswalk on 1000 North near England acres with two kids on bikes and two ki ds in a stroller. A car came to the crosswalk and stopped to wait for us to cross but then the car behin d passed the car that had stopped, the car passed the stopped car on the right side like happens all th e time in Tooele. We were very close to being hit by that car. They never even looked for us.	1
There is too much traffic for the the flashing left turn arrows. I feel as though the would green arrows would make all forms of transportation safer, in addition to widening the intersections, especially ones such as 1000 N and 600 W.	1
Speed enforcement on Main Street and all major roads. Heavy speed enforcement. Slow drivers dow n	1
Really it's just getting the drivers to be more aware. I am mostly concerned about my kids safety with t he cars around.	1

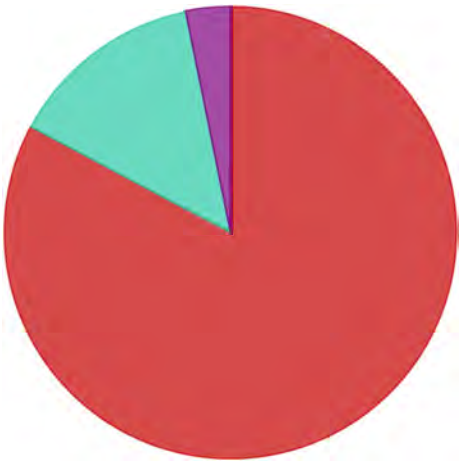
Please improve the condition of the sidewalks. Add sidewalks where there are none. Enforce laws ab out snow removal, watering sidewalks, and trees and weeds obstructing sidewalks. We love to walk fo r exercise, but the poor conditions of the sidewalks and rundown appearance of our city makes it an a dventure. Dogs are also sometimes a problem.	1
Other methods of transportation from tooele to salt lake	1
More walking trails would be nice	1
More sidewalks. Left turn arrows at all traffic lights need to be solid green arrows, not flashing yellow arrows. Separate turning lanes at intersections.	1
More focus needs to be made on transportation in general. You've allowed way too many homes to be built in the area without addressing the already limited infrastructure. Incredibly poor planning.	1
Many sidewalks go unshoveled in the winter, making the street the only pathway to walk/bike on. This is dangerous for kids walking/biking to school.	1
Make 700 N and 100 E a 4-wau stop to ease getting across when not in a car	1
It would be nice to have some more dedicated walking paths around the city and make them safe. I h ave used the Midvale trail, but there have been some people under the overpass doing drugs and I di dn't feel safe.	1
I would love to have more designated biking trails that are not connected to roadways that cars drive on.	1
I would love some better biking/running trails to get from here to erda and from here to Grantsville. It would be fun to have a mountain bike trail system like they do in draper.	1
I would love options for longer distances outside of the trails. The more we can connect, the better! A half bike, half walking/running trail from Tooele to Grantsville and/or Stansbury would be great.	1
I would love more walking trails/parks. More paths through neighborhoods for kids to get to school. (E specially north of 2000 north)	1
I love vacationing in cities where I can run or bike on miles of pavement separate from roads for auto mobiles.	1
Front runner/tracks. Separate walking paths for bikes and walkers. The paths should be more scenic, so they are enjoyable for exercise, but also be used to the place to place.	1
Fix the timing of the traffic lights. They are terrible and contribute to the majority of the congestion in T ooele.	1

Enforcement!	1
Enforce neighborhood speeding; speed bumps	1
Elimination of goat head thorns and construction of dedicated bike paths would be the biggest investment Tooele could make towards making our community bikable, walkable, etc. Look at the paved trail system in comparably sized Cedar City as an example. Most of the city is connected and the foothills and mountains have trails and trailheads worth getting out to see. Developing our outdoors for citizen enjoyment should be a high priority for Tooele, rather than destroying our resources and views by allowing unsightly powerlines or other infrastructure to impact our visual resources.	1
Designated bike paths. Not just paint on the street! Build the first mile along the Middle Canyon wash from the golf course to the Highway 36 overpass (8'-10' wide asphalt path, not concrete) and watch the response!!!	1
Dedicated Bike and walking and recreation paths like Jordan River Parkway	1
Better side walks. Often forced to walk in the road instead of sidewalk because side walk is unsafe to walk on.	1
Better lighting at parks on paths. A walking trail through town	1
Be more proactive in planning roads. Tooele seems to plan after the fact instead of preparing the roads and then the buildings, should be the opposite!	1
Another road (2000 n or 2400 n) that can take vehicles to droubay. Droubay also needs to be redone to handle extra traffic.	1
4 way stop or traffic light or something at 1000 N 520 E to allow safe passage to England Acres Park	1

Answered: 31 Skipped: 33

Demographics

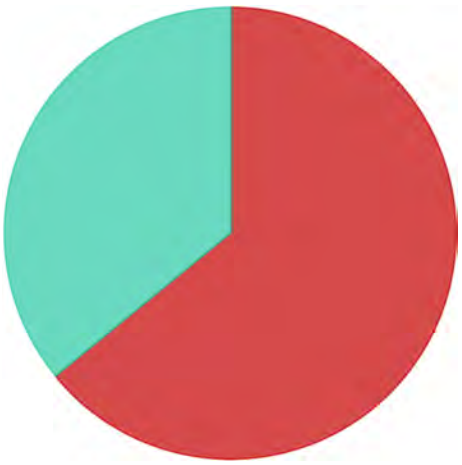
Where do you live?



Answers	Count	Percentage
Tooele City	53	82.81%
Tooele County (Grantsville, Erda, Stansbury Park, Stockton, etc.)	9	14.06%
Outside of Tooele County	2	3.13%

Answered: 64 Skipped: 0

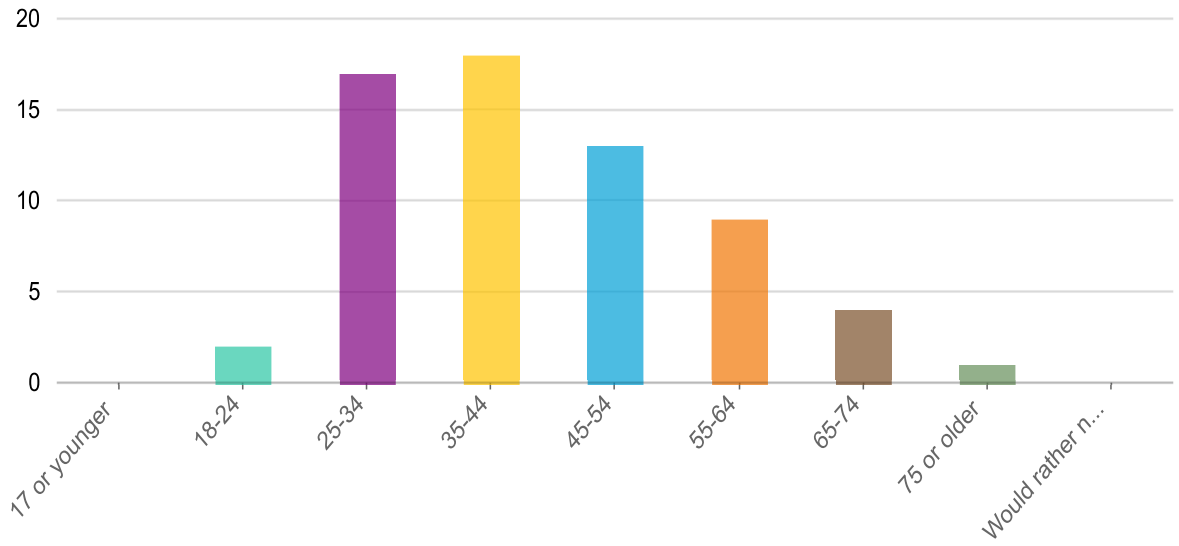
What is your gender?



Answers	Count	Percentage
Female	41	64.06%
Male	23	35.94%
Would rather not say	0	0%
I describe myself as...	0	0%

Answered: 64 Skipped: 0

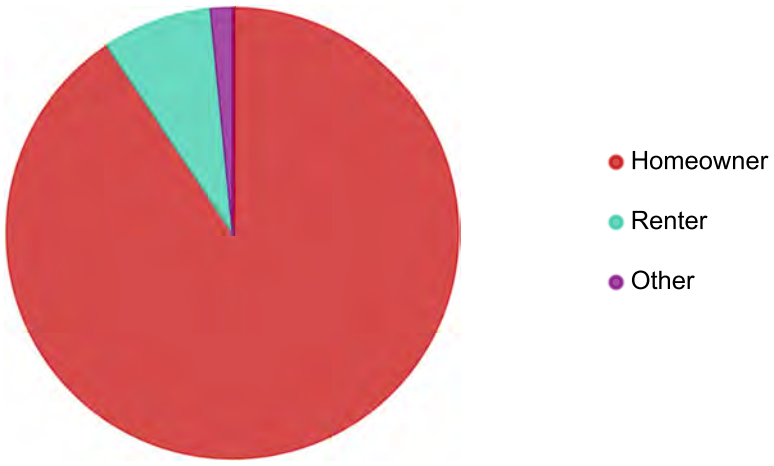
- **What is your age?**



Answers	Count	Percentage
17 or younger	0	0%
18-24	2	3.13%
25-34	17	26.56%
35-44	18	28.13%
45-54	13	20.31%
55-64	9	14.06%
65-74	4	6.25%
75 or older	1	1.56%
Would rather not say	0	0%

Answered: 64 Skipped: 0

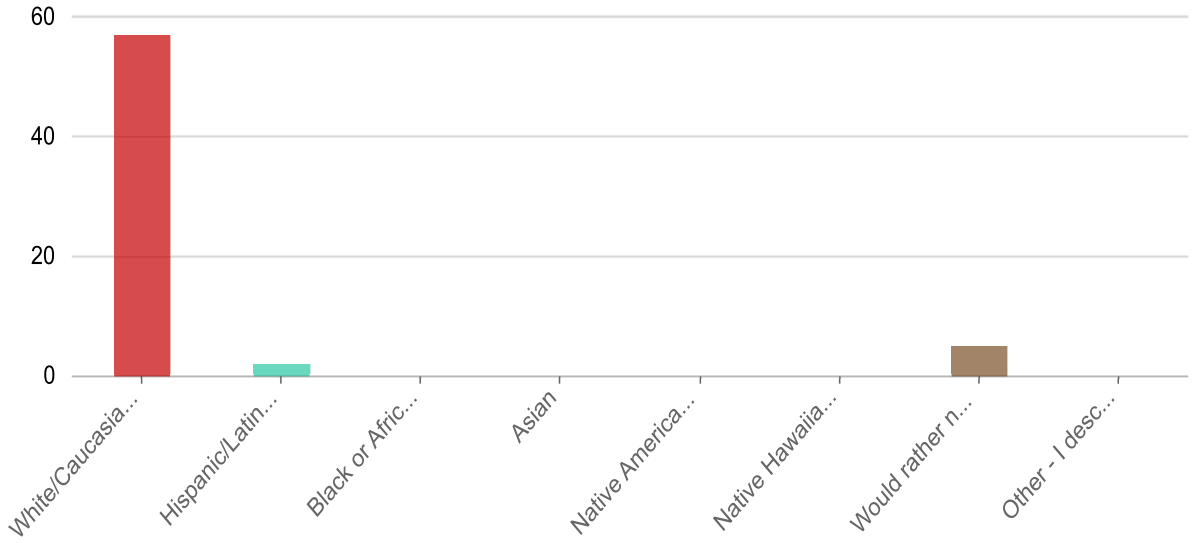
What is your housing status?



Answers	Count	Percentage
Homeowner	58	90.63%
Renter	5	7.81%
Other	1	1.56%

Answered: 64 Skipped: 0

How do you describe yourself?



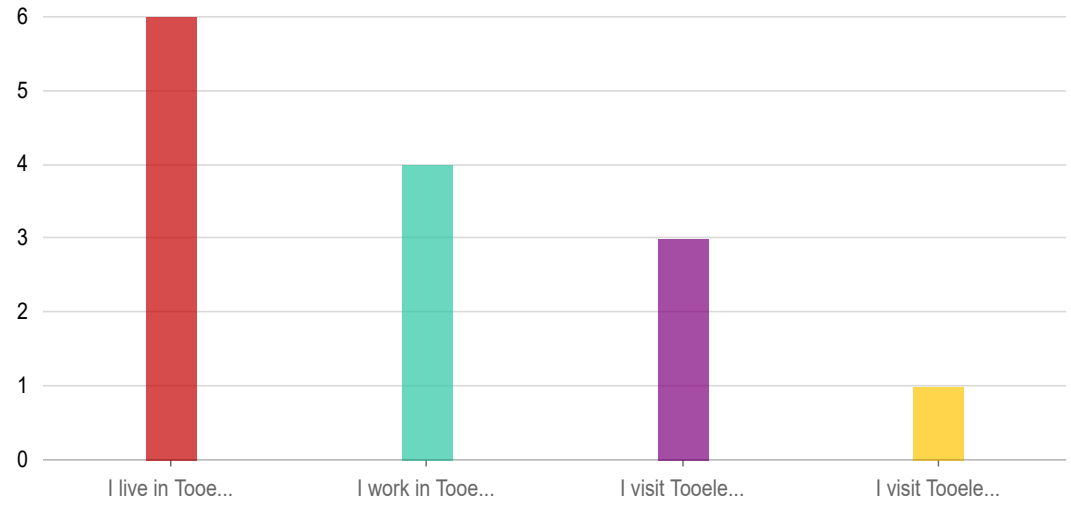
Answers	Count	Percentage
White/Caucasian	57	89.06%
Hispanic/Latino	2	3.13%
Black or African American	0	0%
Asian	0	0%
Native American or Alaska native	0	0%
Native Hawaiian and/or Pacific Islander	0	0%
Would rather not say	5	7.81%
Other - I describe myself as:	0	0%

Answered: 64 Skipped: 0

Phase 2 - Tooele Active Transportation Plan Survey

Tooele City Active Transportation Plan Survey

Please check all that apply: *

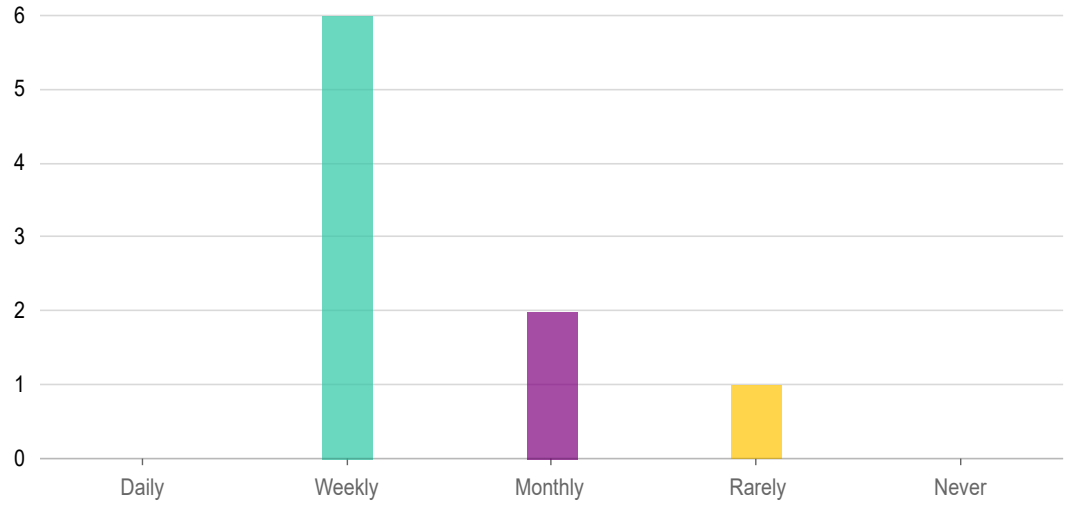


Answers	Count	Percentage
I live in Tooele	6	66.67%
I work in Tooele	4	44.44%
I visit Tooele often	3	33.33%
I visit Tooele occasionally	1	11.11%

Answered: 9 Skipped: 0

How often do you walk, bike, or roll for recreation or exercise in… *

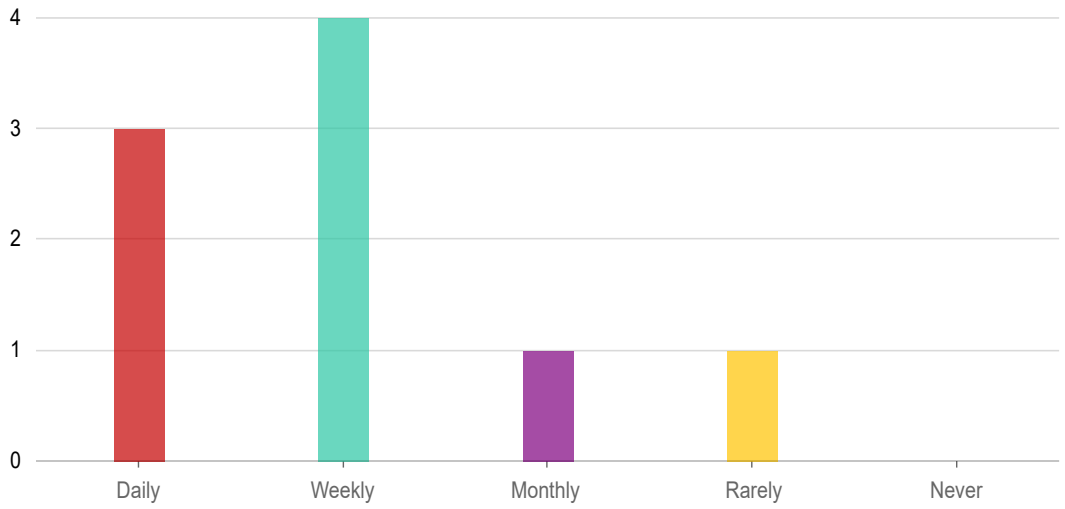
Phase 2 - Tooele Active Transportation Plan Survey https://survey123.arcgis.com/surveys/0b325ccfe8654346b0c4d728fe3b...



Answers	Count	Percentage
Daily	0	0%
Weekly	6	66.67%
Monthly	2	22.22%
Rarely	1	11.11%
Never	0	0%

Answered: 9 Skipped: 0

How often do you walk, bike, or roll for transportation in Tooele? *



Answers	Count	Percentage
Daily	3	33.33%
Weekly	4	44.44%
Monthly	1	11.11%
Rarely	1	11.11%
Never	0	0%

Answered: 9 Skipped: 0

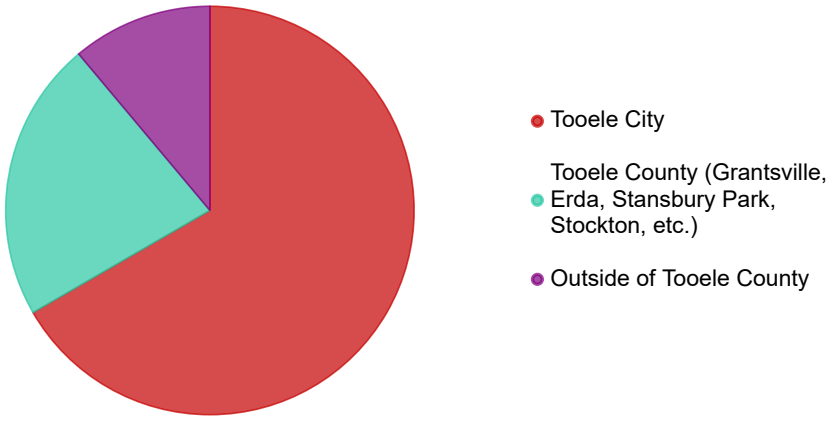
How would you generally describe yourself when it comes to riding a… *

- I prefer separated bikeways, but I'm comfortable riding in regular bike lanes or on paved shoulders
- I don't mind sharing the road with cars, even without a dedicated bike lane
- I'm not very comfortable riding in bike lanes, and may choose to ride on the sidewalk even when bike lanes are present. I would like to ride a bike more, but I'm concerned about safety, interacting with cars, and other issues I selected

Answers	Count	Percentage
I prefer separated bikeways, but I'm comfortable riding in regular bike lanes or on paved shoulders	3	33.33%
I don't mind sharing the road with cars, even without a dedicated bike lane	2	22.22%
I'm not very comfortable riding in bike lanes, and may choose to ride on the sidewalk even when bike lanes are present. I would like to ride a bike more, but I'm concerned about safety, interacting with cars, and other issues I selected previously.	2	22.22%
I'm not currently interested in using a bicycle to get around	2	22.22%

Answered: 9 Skipped: 0

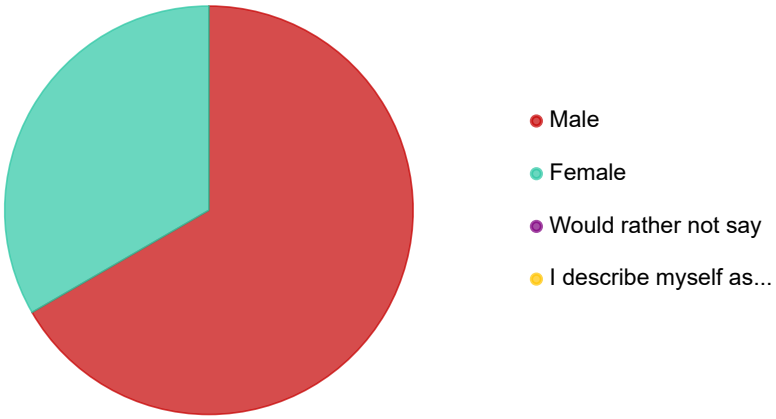
Where do you live?



Answers	Count	Percentage
Tooele City	6	66.67%
Tooele County (Grantsville, Erda, Stansbury Park, Stockton, etc.)	2	22.22%
Outside of Tooele County	1	11.11%

Answered: 9 Skipped: 0

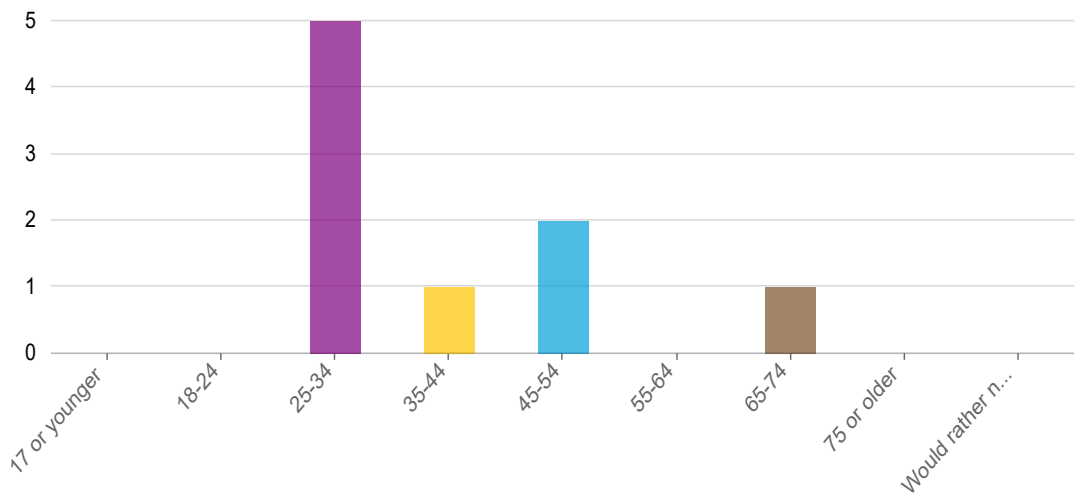
What is your gender?



Answers	Count	Percentage
Male	6	66.67%
Female	3	33.33%
Would rather not say	0	0%
I describe myself as...	0	0%

Answered: 9 Skipped: 0

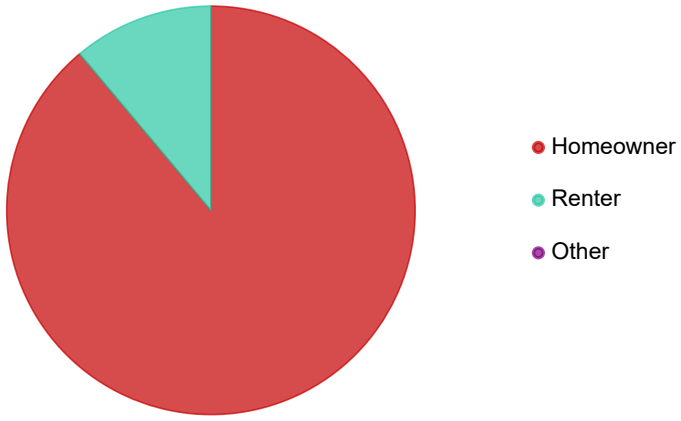
What is your age?



Answers	Count	Percentage
17 or younger	0	0%
18-24	0	0%
25-34	5	55.56%
35-44	1	11.11%
45-54	2	22.22%
55-64	0	0%
65-74	1	11.11%
75 or older	0	0%
Would rather not say	0	0%

Answered: 9 Skipped: 0

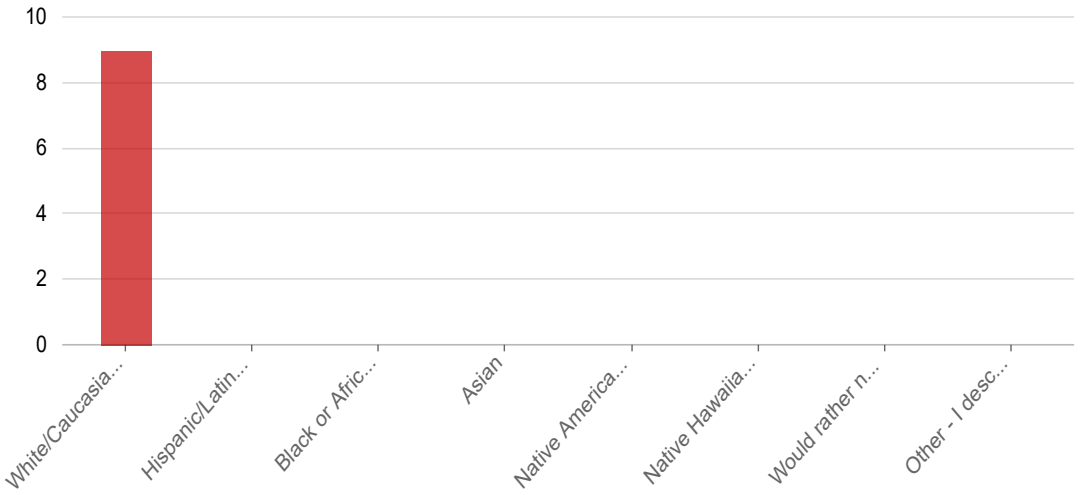
What is your housing status?



Answers	Count	Percentage
Homeowner	8	88.89%
Renter	1	11.11%
Other	0	0%

Answered: 9 Skipped: 0

How do you describe yourself?



Answers	Count	Percentage
White/Caucasian	9	100%
Hispanic/Latino	0	0%
Black or African American	0	0%
Asian	0	0%
Native American or Alaska native	0	0%
Native Hawaiian and/or Pacific Islander	0	0%
Would rather not say	0	0%
Other - I describe myself as:	0	0%

Answered: 9 Skipped: 0

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TOOELE MAIN STREET COLLABORATION

A Shared Vision for Main Street / S.R. 36

DRAFT | MARCH 2024

MOVE UTAH
ACTIVE • HEALTHY • CONNECTED COMMUNITIES

UDOT
Keeping Utah Moving

Tooele City
Est. 1853

TOOELE
DOWNTOWN
ALLIANCE

TOOELE MAIN STREET COLLABORATION

Thank you to all who participated from Tooele City, Tooele Downtown Alliance, UDOT Region Two, and the UDOT Move Utah Team.

A Shared Vision for Main Street / S.R. 36

1. INTRODUCTION

The Utah Department of Transportation (UDOT) Move Utah program, Tooele City, the Tooele Downtown Alliance, and the UDOT Region Two staff collaborated to create a vision to improve the City's Main Street. Tooele's Main Street is the center of its downtown, which the City and Downtown Alliance have been working to revitalize, beautify, and connect for the community. The street is also State Route (S.R.)36, managed by UDOT as part of the state highway network. S.R. 36 is the primary highway link through Tooele Valley and is important for truck traffic.

Because of this dual importance, Tooele Main Street was a good location for UDOT to explore how to balance community and state highway needs - an emerging issue throughout Utah. The timing was good for other reasons as well: Tooele City is one of several Utah communities participating in the new statewide Utah Main Streets Program and was identified to receive a Downtown Enhancement Grant. The City is also creating a new Active Transportation Plan and Downtown Plan.

The Main Street collaboration took place over about one year, from August 2022 to August 2023, and was focused on three workshops among the project partners to establish goals; create solutions; and refine a draft plan. This report first tells the story of the collaboration and then lays out the proposed improvements and strategies to implement them.

2. PROJECT BACKGROUND

2.1 UDOT and Main Streets

This effort is part of UDOT's broader effort to balance its charge to manage the state highway network with the needs of communities along it. The Move Utah program initiated an effort to provide more tools to communities, use a common language, and make coordination and collaboration easier.

At the same time as UDOT began seeking ways to provide more support for community Main Streets, Utah developed a Main Street program. This program was initially under The Governor's Office of Economic Opportunity (GOED) but has since moved to the Utah State Historic Preservation Office (USHPO). It is part of Main Street America, which aims to revitalize historic downtowns and commercial districts through preservation-based economic development and community revitalization.

2.2 Tooele City planning policy

At the onset of the collaboration, Tooele City had both adopted plans and ongoing planning efforts that helped inform the team's work.

Tooele General Plan

Tooele City's General Plan was adopted in December 2020. The plan has four main goals for the downtown Main Street area. First, making downtown more attractive to businesses and people by improving the streetscape, updating infrastructure like sidewalks, adding street lighting, and overall beautify the downtown area. Second, protecting the historic character of downtown by preserving historic buildings and landmarks, and creating a sense of place that reflects Tooele's history and the community's diverse culture. Third, making it easier and safer to move around downtown by addressing traffic congestion, providing safe pedestrian and bicycle infrastructure, and creating an overall, more walkable and bikeable downtown Main Street environment. Finally, the City wants to ensure that residents can use a variety of transportation modes to get to downtown by providing enough on and off-street parking, active transportation infrastructure, and improving transit services.

Downtown Element

Tooele City is currently updating the Downtown Element of the city's General Plan. Tooele's Downtown area has been serving residents as a business district with small shops and government services since the city's incorporation in 1853. The plan element identifies four full blocks as Tooele Downtown along Main Street, from 200 North to 200 South and from Garden Street on the east to 50 West with a small addition toward 100 West at Vine Street.

The Downtown Element's vision aligns well with the Main Street revitalization efforts:

> ***"Tooele's historic center and downtown will (re)develop into a vibrant center and become the heart of the community. Main Street and adjacent areas will be recognized as a local and regional destination. Downtown will be re-imagined as a significant place for business, living, entertainment, and gathering."***

In order to achieve this vision, the team working on the Downtown Element identified six goals with specific strategies:

1. **Main Street (Street and Streetscape):** Collaborate with UDOT to change downtown Main Street into a place that is safe, comfortable, and pleasant for people walking, biking, driving vehicles, and using transit.
2. **Visual Appearance:** Work with landowners, business leaders, and community members to invest in remodels and new construction to create a beautiful and unique Downtown character.
3. **Gathering Places:** Improve existing and develop additional outdoor gathering places that can host both large and small community events. Gathering places should be multi-functional and provide a sense of place to visitors and residents.
4. **Land Use:** Develop a vibrant, mixed-use Downtown with significant opportunities for businesses, residential living, and entertainment.
5. **Destination for Activities and Entertainment:** Develop Downtown as a regional destination with activities and entertainment for families, residents, and visitors.
6. **Parking and Alleys:** Improving existing parking areas and alleys to create a network of alleys and parking lots for both pedestrians and vehicles.

Active Transportation Plan

The Tooele Active Transportation Plan is another planning effort currently happening in Tooele City. This is the first Active Transportation Plan for the City of Tooele and aims to improve safety, identify where new or upgraded active transportation infrastructure is needed, and to better connect Tooele residents to destinations.

Main Street is in the heart of the community and considered a major destination. Therefore, the Plan includes various active transportation improvement projects directly tied to Tooele's Downtown Main Street area that provide a safer pedestrian and cycling environment. Projects include a side path along Main Street, separated bike lanes on Vine Street, Neighborhood Byways on Garden Street and 50th West, crossing improvements at the Main Street and Vine Street and the Main Street and 200 South intersections, and improving the mid-block crossing in front of Tooele City Hall.

2.3 The Downtown Alliance

The Tooele Downtown Alliance is an organization committed to the revitalization and economic prosperity of Tooele City's Downtown, Main Street, and Broadway districts. Their mission is to restore, support, and promote economic development in Tooele City.

The Alliance actively engages in community events to promote local businesses and works to implement projects and programs that add value to the aesthetic, cultural, and economic appeal of the Downtown, Main Street, and Broadway districts.

A unique initiative by the Alliance is the Downtown Alliance Buffalo Arts Initiative which stated in 2023. The initiative introduced painted buffalo statues at various locations along Main Street in the Downtown Area. These statues not only add public art to the area but also serve as landmarks and points of interests, contributing to the aesthetic appeal of downtown Tooele and attracting residents and visitors to the area.

3. EXISTING CONDITIONS

The project team conducted a targeted analysis of existing conditions. The team focused on illuminating two issues that were of particular interest.

First, the team wanted to understand existing speed, safety and crash patterns in downtown Tooele.

Second, the team looked at existing truck traffic. Early conversations with stakeholders pointed to the importance of balancing the corridor's heavy truck traffic with livability - and the potential to manage trucks throughout the network in the future.

3.1 Speed and Crash Analysis

A Speed Management Study had been conducted in November 2022 by Hales Engineering on behalf of UDOT Region Two. The study evaluated the speed limit and speed management measures between 200 South and 400 North on State Route 36/ Main Street in Tooele. The current speed limit along this section of Main Street is 35 MPH.

Results of the speed profile analysis indicate the 85th percentile speeds are within or slightly exceed 5 MPH of the posted speed limit. The average speed on this section was between 35 - 38 MPH.

Based on the findings in this study and UDOT Policy 06C-25, no changes to the posted speed limit were recommended.

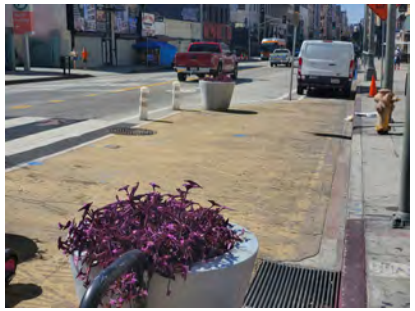
Although no changes to the posted speed limit were recommended, speed management measures could be considered to improve compliance with the posted speed limit from 200 South to Vine Street. These include:

Radar Speed Signs are interactive signs that display drivers' speed and alert them if they are going above the posted speed limit.

Pavement Speed Limit Markings display the posted speed limit. Marking can be placed at any location where additional emphasis is needed.

Landscaped Median Islands are raised center medians with trees and other vegetation.

Roadway Narrowing (including Curb Extensions) reduces the available space of the travel roadway. This can be accomplished by narrowing lanes, adding or widening bike lanes, adding street parking, or implementing additional measures to increase roadside friction.



Landscaping like trees and other vegetation can be planted along the side of the road or within center medians. Landscaping can provide a perceived sense of narrowing the road width.

Crashes

Between 2012 and 2021, crashes in Tooele City have roughly stayed the same. A total of 4,263 crashes were reported in the time frame. The most crashes were reported in 2020 (456 crashes) while the least crashes were reported in 2021 (357 crashes).

On the Main Street segment between 200 South and 400 North, a total of 98 crashes were reported between 2018 and 2022. None of the crashes was considered a severe crash but three crashes were speed-related.

3.2 Truck Traffic Analysis

To analyze truck traffic, the team looked at the commercial truck share of traffic. The team found that S.R. 36 in Downtown Tooele has 20-23% commercial truck traffic. The following are comparable segments of state highways, that have 20-23% of Average Annual Daily Traffic (AADT) comprised of trucks. 20-23% percent of AADT indicates that about one in every four or five vehicles is a truck.

- US 40 East of Heber City
- I-15 between Farmington interchange and Centerville.
- I-15 between Spanish Fork and Nephi.
- US 91 between Smithfield and Hyde Park (Cache County).
- SR 9 from La Verkin to Springdale/Zion NP.

The following segments have roughly the same AADT of trucks compared to Tooele Main Street:

North of Tooele (~5,200 truck AADT)

- Provo Center Street to I-15 in Provo
- SR 224 Kimball Junction to Canyons Resort near Park City
- SR 89 through the mountains between Brigham City and Logan

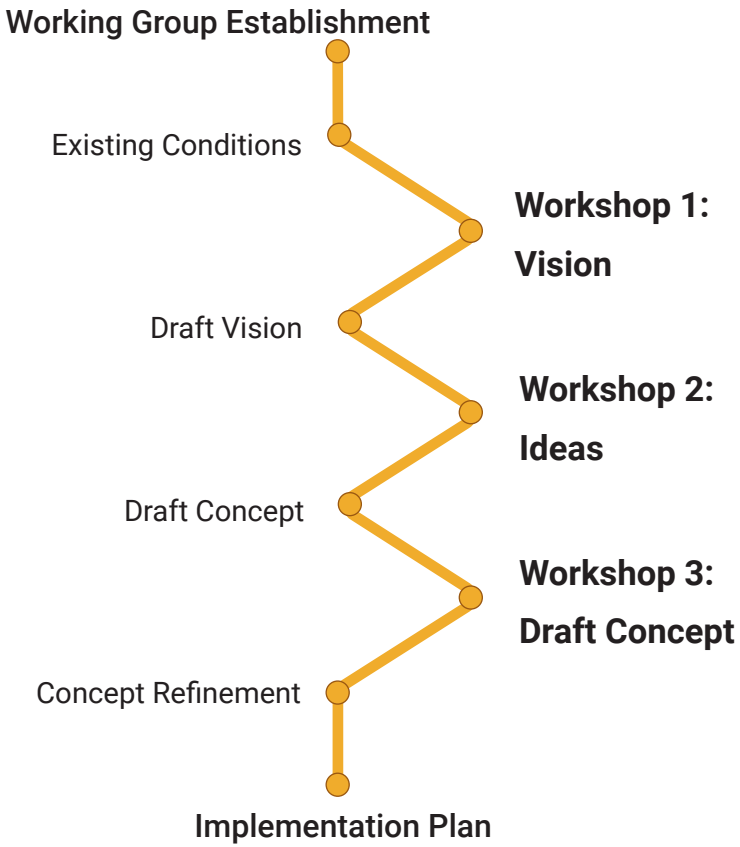
South of Tooele (~2,500 truck AADT)

- SR 68 Redwood Road via Pioneer Crossing in Lehi/Eagle Mountain
- US 89 in North Ogden
- SR 109 (Main Street) in Layton

4. VISIONING & CONCEPT DEVELOPMENT

Process was at the heart of the Tooele Main Street collaboration: A careful, collaborative process as a way to identify mutual goals, work through different perspectives, and create ideas together.

The development of the Tooele Main Street concept occurred in a series of three workshops, each representing a different step in the process. Before each workshop, the project team provided background information, carefully framed the questions for the group, and allocated the time of the meeting. After each workshop, the team collected, synthesized, and distilled the information provided by the group and built on that information to take the next step in the process.



4.1 Working Group

The first step for the collaboration process was to establish the core working group. The working group consisted of representation of three main perspectives: 1) Tooele City staff and elected officials; 2) members of the Tooele Downtown Alliance and 3) UDOT - primarily Region Two staff but also including Move Utah staff. Including these three basic perspectives created a dynamic collaboration environment with interest in a wide range of Main Street and state highway network goals.

The group was facilitated by a consultant team comprised of the firms Township + Range and Parametrix.

Throughout the planning process, additional organizations were involved in the project, including Main Streets America, the Utah State Historic Preservation Office, and other consultants who are concurrently working on related planning efforts on Tooele.

4.2 Workshop 1: Kickoff Tour and Visioning

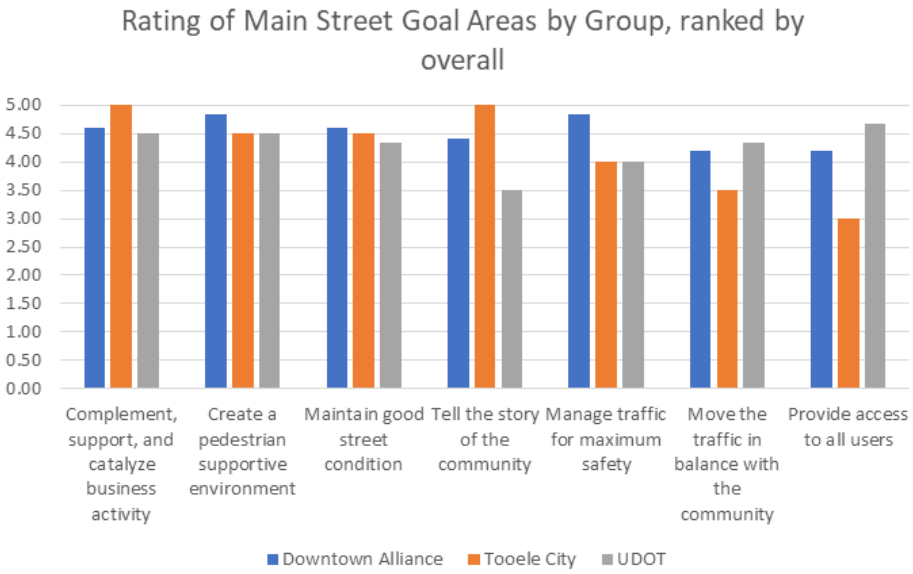
The first workshop was held on August 25th, 2022 at Tooele City Hall. In total, there were 17 participants, representing the range of affiliations discussed above. The focus of this workshop was to begin the collaboration on improving Tooele's Main Street. The workshop began with a welcome and short presentation to introduce the project. Then, the group took a walking tour of the core downtown Main Street area. The workshop concluded with a session of online polling and discussion focusing on creating a vision and goals for Tooele Main Street.

During the tour, participants identified several issues and opportunities related to the quality of the pedestrian environment and infrastructure along Main Street. They suggested improving the crossings, especially at 100 South and Main Street, where children and pedestrians need to cross safely. They also expressed a desire to enhance the park strip and the sidewalk with more amenities, such as benches, flowers, bike racks, and wayfinding signs. They noted that the grassy park strips waste too much water and that some trees were dying or have been removed leaving empty tree grates in the pedestrian realm. All participants said they would like to see more waterwise greenery, a consistent streetscape and architecturally historic look, as well as recognizing Main Street's history by preserving historic buildings and using Main Street to hold and promote events.

Participants also discussed how to slow down and manage the traffic on Main Street, especially the truck traffic that produces increased noise and reduces feelings of safety for pedestrians. They proposed slightly narrowing the street, adding rumble strips or planters, or creating a bypass road for trucks. However, they also want to avoid a road diet or shifting the traffic problem to another route or hurting the businesses on Main Street. Participants emphasized the need to make Main Street accessible and inviting for everyone, including people with disabilities, cyclists, children, and older adults. They mentioned that some sidewalks are missing bricks or ramps, that there was no bike parking anywhere along Main Street, and that transit use is low, especially after the commuter route was altered and now requires a transfer to get to Salt Lake City.

Following the walking tour, the group returned to City Hall and engaged in a set of online polling questions presented by the consulting team. The questions focused on the group members; assessment of Tooele Main Street within the context of seven broad goal areas for rural State Highway Main Streets that had been identified through a Move Utah survey of 75 rural communities throughout Utah as well as conversations with all four UDOT Regions. The goal areas are:

- Create a pedestrian supportive environment.
- Manage traffic for maximum safety.
- Tell the story of the community.
- Provide access to all users.
- Maintain good street conditions.
- Move the traffic in balance with the community.
- Complement, support, and catalyze business activity.



All participants rated each goal and its importance to Tooele Main Street through an online polling platform. Participants from the Tooele Downtown Alliance, Tooele City, and UDOT were given the same questions, but their responses were recorded separately.

After the goal rating exercise, it became clear that all goal areas were at least relatively popular will all three groups. Overall, the top goal was “Complement, support, and catalyze business activity.” Tooele City ranked this as well as “Tell the story of the community” as their top two goals. For the Downtown Alliance, the top priority goals were “Manage traffic for maximum safety” and “Create a pedestrian supportive environment”. UDOT’s top goal was to “Provide access to all users”. “Complement, support, and catalyze business activity” and “Create a pedestrian supportive environment” were equally important to UDOT staff as second-rated goal.

4.3 Draft Shared Vision

Based on the comments received during the walking tour along with the online polling results, the consultant team drafted the following shared vision statement with the consensus from the working group:

> ***"Create a top-quality pedestrian experience on Tooele Main Street, with streetscape improvements, slower traffic, safer and more convenient crossings, and activation and events.***
>
> ***This pedestrian experience will catalyze Main Street's business and community activity, mitigate the impacts of truck traffic while recognizing and addressing the regional need to move freight, and complement the efforts of the Downtown Alliance and City to revitalize Downtown Tooele."***

The following are specific considerations for contributing to this pedestrian experience:

- Streetscape elements that will activate the district and create comfort for people visiting Main Street
- Multi-modal community access, including universal access/ADA and bike infrastructure
- Maintenance of pedestrian infrastructure, roadway, landscape, and storm drain
- Truck traffic management and consideration of alternative corridors
- Events activating the pedestrian realm and Main Street
- Inclusion of Tooele community heritage elements
- Motor vehicle parking that supports businesses and the pedestrian realm and activity
- Promotion of the business district
- Balancing the pedestrian experience with traffic movement

4.4 Workshop 2: Ideas and Concept Development

The second workshop with the working group took place on January 26th, 2023, again at Tooele City Hall. This workshop started with a recap of the kick-off workshop, discussing the shared vision draft, and concluded with an exercise to brainstorm ideas for improvements. The purpose of this workshop was to develop ideas and strategies for improving the core Main Street area between Utah Avenue and 200 South by completing a “chips exercise” where participants were able to experiment with and propose Main Street improvements by placing paper chips representing a range of new transportation and placemaking elements on a large aerial printout.

Participants were divided into three groups, with at least one representative from Tooele City, the Tooele Downtown Alliance, and the Utah Department of Transportation in each group to encourage great discussions and incorporating the point of view of all three stakeholder groups.

After brainstorming desired Main Street improvements, each group shared its thoughts as part of a large group discussion. Some of the ideas that came from the group discussion include:

- **Traffic-calming measures** to discourage speeding and reduce the negative impacts of truck traffic on Main Street, without a road diet. The group suggested adding a median island at the north and south end of the core Main Street section which can also serve as gateways,
- Utilizing the park strip to provide more **amenities**, such as seating, street scape improvements, street lighting, and water-wise landscaping.
- Adding more trees or shrubbery along Main Street to add greenery and shade without needing a lot of water.
- Providing more **parking** - both on-street parking created by adding additional parking bays as well as utilizing existing surface parking lots behind Main Street buildings. The City could investigate a shared parking ordinance to let businesses share their surface parking lots with other businesses with different operating/peak hours.
- Creating more **gathering places** and opportunities for people to socialize in the heart of their community. The group was especially interested in improving Veterans Memorial Park by adding benches and picnic tables and using the park for programming such as food trucks and events.

The group also discussed the Mid-Valley Highway project, a highway that would bypass downtown Tooele, and how it could potentially impact Main Street visitors. Currently, UDOT is identifying the best alignment for the Mid-Valley Highway to move truck traffic from the Army Depot to State Route 112 and ultimately to Interstate 80. While this would divert truck traffic away from Main Street, it could also result in other drivers using this bypass route and reducing the number of potential Main Street visitors.

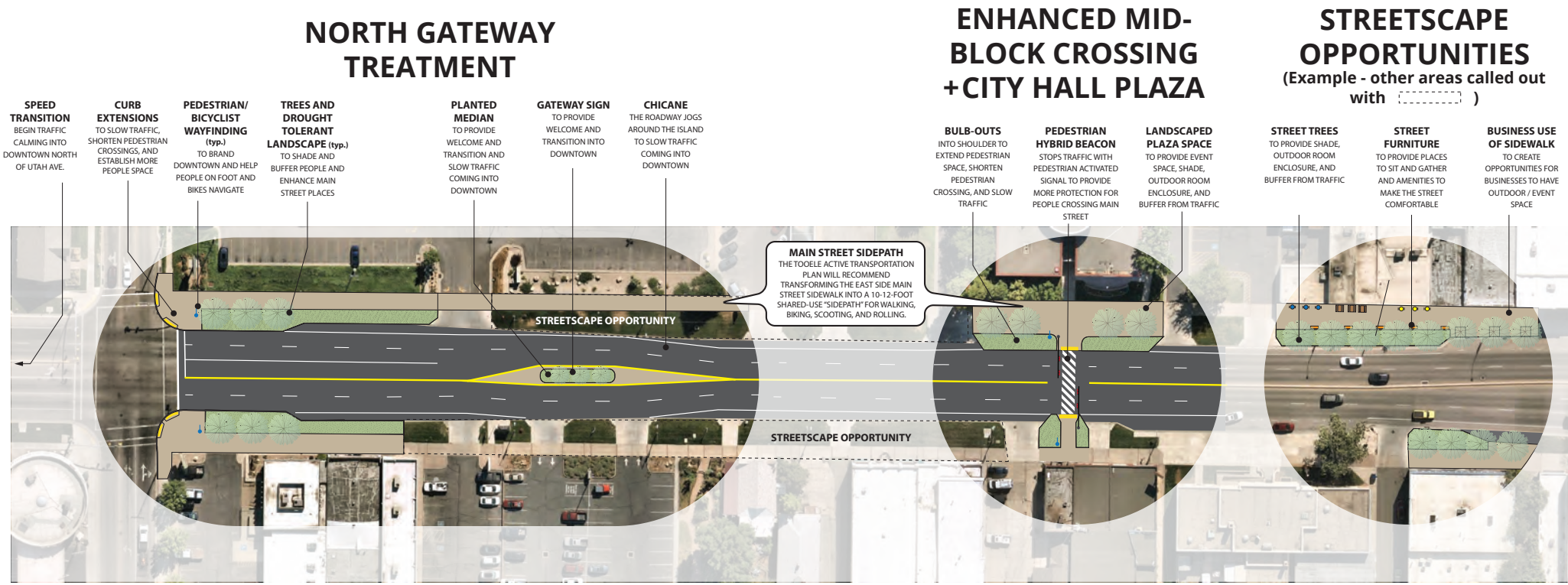
Ideas from Group 1

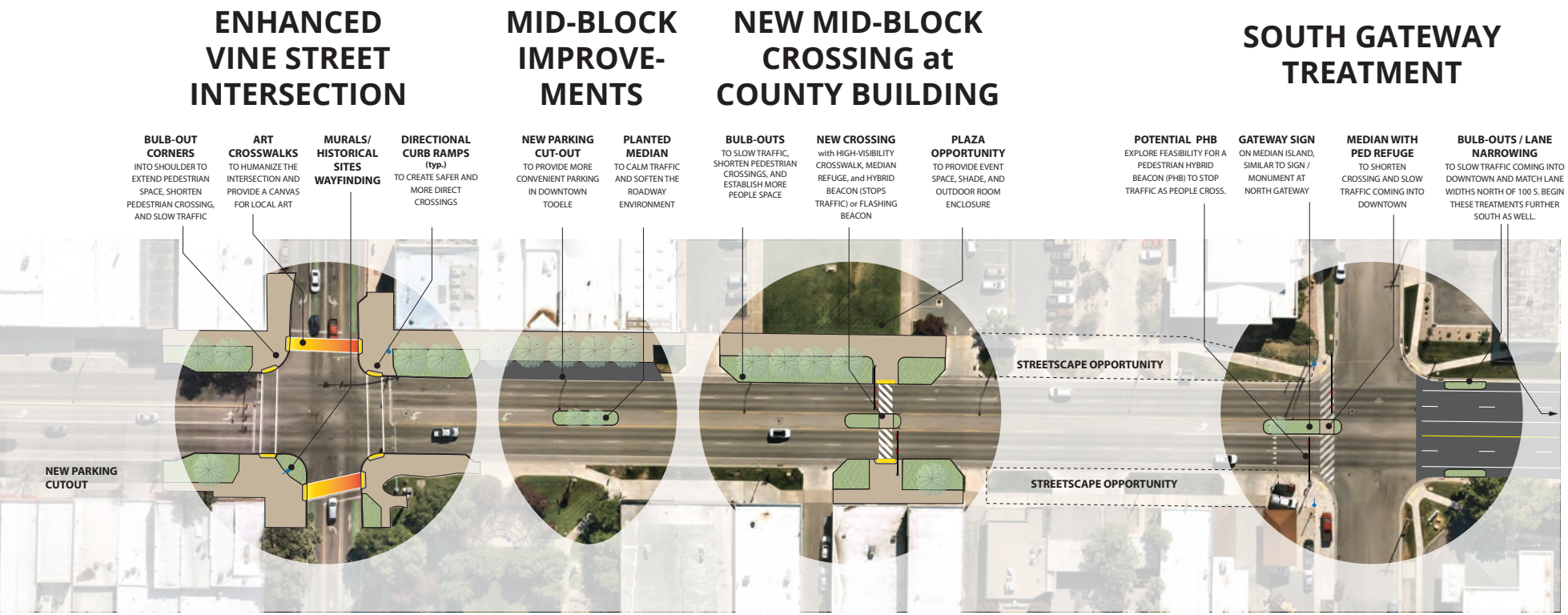
Ideas from Group 2

Ideas from Group 3

4.5 Draft Concept

Based on the feedback received on the walking tour during the first workshop and the design exercise as part of the second workshop, the project team developed a Draft Concept for Main Street improvements. The concept incorporated the desired safety and urban design upgrades on Main Street from Utah Avenue to 100 South.




ENHANCED VINE STREET INTERSECTION
BULB-OUT CORNERS
INTO SHOULDER TO EXTEND PEDESTRIAN SPACE, SHORTEN PEDESTRIAN CROSSING, AND SLOW TRAFFIC
ART CROSSWALKS
TO HUMANIZE THE INTERSECTION AND PROVIDE A CANVAS FOR LOCAL ART
MURALS/ HISTORICAL SITES WAYFINDING
DIRECTIONAL CURB RAMPS (typ.)
TO CREATE SAFER AND MORE DIRECT CROSSINGS
MID-BLOCK IMPROVE-MENTS
NEW PARKING CUT-OUT
TO PROVIDE MORE CONVENIENT PARKING IN DOWNTOWN TOOELE
PLANTED MEDIAN
TO CALM TRAFFIC AND SOFTEN THE ROADWAY ENVIRONMENT
NEW MID-BLOCK CROSSING at COUNTY BUILDING
BULB-OUTS
TO SLOW TRAFFIC, SHORTEN PEDESTRIAN CROSSINGS, AND ESTABLISH MORE PEOPLE SPACE
NEW CROSSING
with HIGH-VISIBILITY CROSSWALK, MEDIAN REFUGE, and HYBRID BEACON (STOPS TRAFFIC) or FLASHING BEACON
PLAZA OPPORTUNITY
TO PROVIDE EVENT SPACE, SHADE, AND OUTDOOR ROOM ENCLOSURE
SOUTH GATEWAY TREATMENT
POTENTIAL PHB
EXPLORE FEASIBILITY FOR A PEDESTRIAN HYBRID BEACON (PHB) TO STOP TRAFFIC AS PEOPLE CROSS.
GATEWAY SIGN
ON MEDIAN ISLAND, SIMILAR TO SIGN / MONUMENT AT NORTH GATEWAY
MEDIAN WITH PED REFUGE
TO SHORTEN CROSSING AND SLOW TRAFFIC COMING INTO DOWNTOWN
BULB-OUTS / LANE NARROWING
TO SLOW TRAFFIC COMING INTO DOWNTOWN AND MATCH LANE WIDTHS NORTH OF 100 S. BEGIN THESE TREATMENTS FURTHER SOUTH AS WELL.
NEW PARKING CUTOUT
STREETSCAPE OPPORTUNITY
STREETSCAPE OPPORTUNITY

4.6 Workshop 3: Draft Concept and Implementation

The working group met again on August 24th, 2023, for the third and final workshop to discuss the Draft Concept, potential refinements to it, and ways to implement it. 17 people attended the third workshop, representing Tooele City, the Tooele Downtown Alliance, UDOT Region Two, and the Utah State Historic Preservation Office. After a brief recap of the process thus far and presentation of the Draft Concept, participants separated into two groups to discuss the Concept.

Overall, the group was very supportive of the Concept as it addressed all the major concerns stakeholders had brought up in previous workshops. Both groups supported the repurposing of the grass strips to provide more opportunities to sit and gather as well as traffic calming treatments along the whole downtown section of Main Street.

Based on the small group discussion, both groups had suggestions to refine the design alternative.

- **Slightly expand the core area and move gateways further out:** Include the 200 South intersection and turn part of the current two-way center turn lane into a median that includes a gateway feature, signaling to drivers that they have entered a slower part of Main Street. Move the northern gateway slightly further north, past Utah Avenue.
- **Explore further options to improve the 100 South intersection:** potentially add a HAWK signal to provide a safe crossing opportunity for pedestrian, especially if warranted due to being on a safe route to school for East Elementary School, West Elementary School, and Tooele Junior High School.
- **Re-evaluate the need for a mid-block crossing in front of the Tooele County Building:** all participants agreed that while another signaled (hybrid beacon or flashing beacon) mid-block crossing in front of the county building would be nice, the group would prefer to see this kind of crossing infrastructure at the 100 South intersection. However, the median refuge island would remain to shorten the crossing distance of the proposed mid-block crossing.
- **Explore the addition of a pick up/ drop off parklet** in front of the Ritz theater as well as providing additional bike parking opportunities throughout the downtown area.
- **Other intersection operations refinements:** prohibit the right turn on red at the Vine Street and Utah Avenue intersections as these intersections see high numbers of pedestrian cross traffic. Potentially add left turn privatization to help address congestion at the intersections.

5. PREFERRED CONCEPT

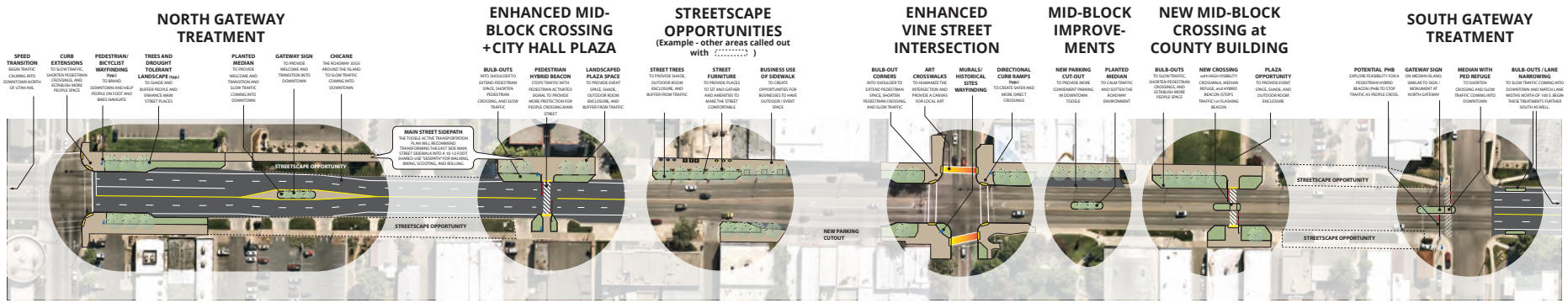
The project team took the comments from Workshop 3 and refined the Draft Concept into a Preferred Concept. The Concept is summarized in this section in four parts:

- Corridor-wide elements.
- The northern segment - a treatment for the northern gateway and improvements for the City Hall pedestrian crossing location.
- The middle segment - focusing on the Vine Street intersection
- The southern segment - with a potential future pedestrian-activated crossing at the Tooele County building and a treatment for the southern gateway.

5.1 Corridor-wide elements

There are several elements that will run along the entire Main Street corridor.

- **East-side sidepath:** The Tooele Active Transportation Plan recommends a multi-use pathway to replace the existing east-side sidewalk for the length of Main Street. This pathway will be used for walking, biking, and other non-motorized modes and is intended to increase community access to Main Street.
- **Wayfinding**: A system of wayfinding signs along Main Street will provide direction to destinations as well as helping to establish a human scale to the street and a consistent look or brand to the street.
- **Streetscape opportunities**: Tooele Main Street has a uniquely large amount of space between the sidewalk and roadway, much of it occupied only by turf. The Preferred Concept seeks to activate this space. The Preferred Concept identifies locations to place a coordinated series of streetscape elements such as seating and pedestrian-scale lighting.
- **Street trees**: While mature street trees lend character to Tooele Main Street in some places, many other segments lack any trees. The Concept adds trees into the wide park strip spaces.

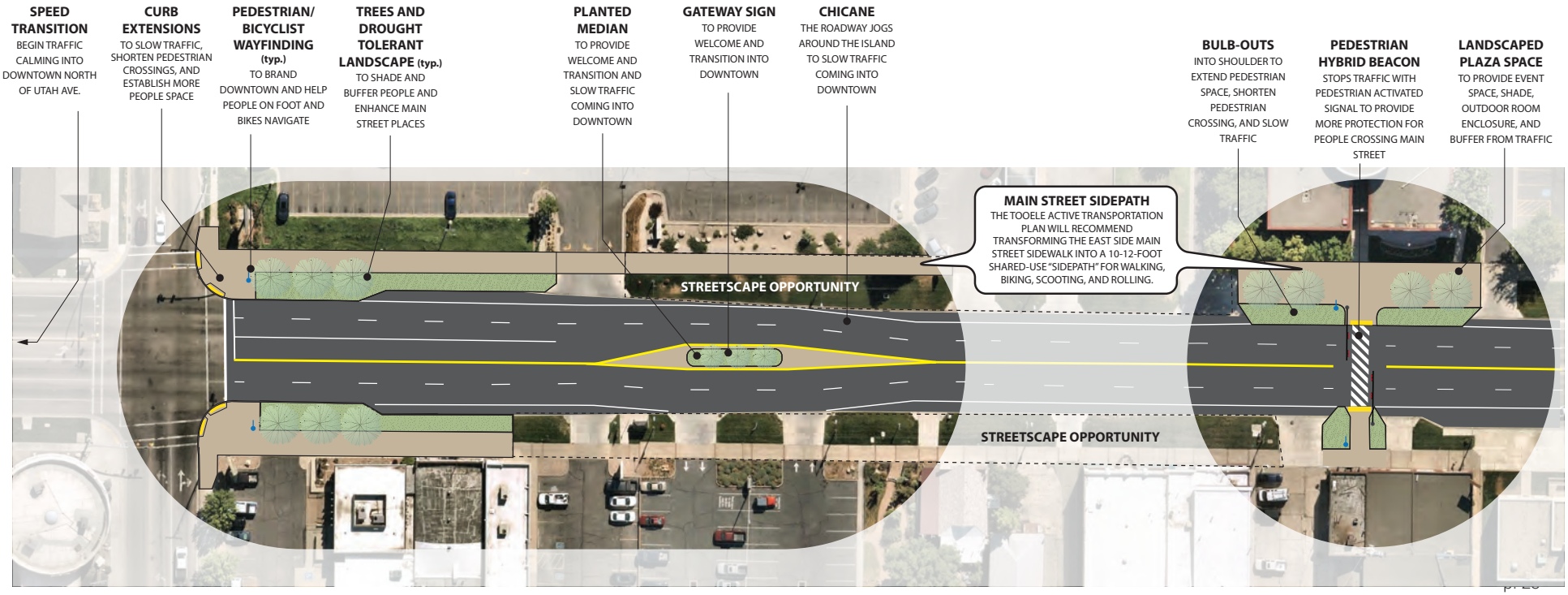


- **Drought-tolerant landscaping**: Water-wise landscaping should complement the street trees where appropriate.

5.2 Northern Gateway and City Hall Crossing

At the northern end of the corridor, the Preferred Concept envisions a gateway that welcomes people into Downtown and slows traffic, and improvements to the existing pedestrian crossing at City Hall.

- **Gateway**: The Concept includes curb extensions at the south side of the Utah Avenue intersection to increase pedestrian space, shorten the pedestrian crossing, and narrow the roadway. Further south, an island is envisioned to be placed in the median space. And, based on feedback from Workshop 3, the gateway should also begin further north, with curb extensions or median islands to begin transitioning speed down.
- **City Hall Crossing**: The Concept recommends improvements to the existing pedestrian crossing at City Hall, including a Pedestrian Hybrid Beacon (PHB) to stop traffic; curb extensions to shorten the crossing and to add space to an envisioned plaza in front of City Hall.

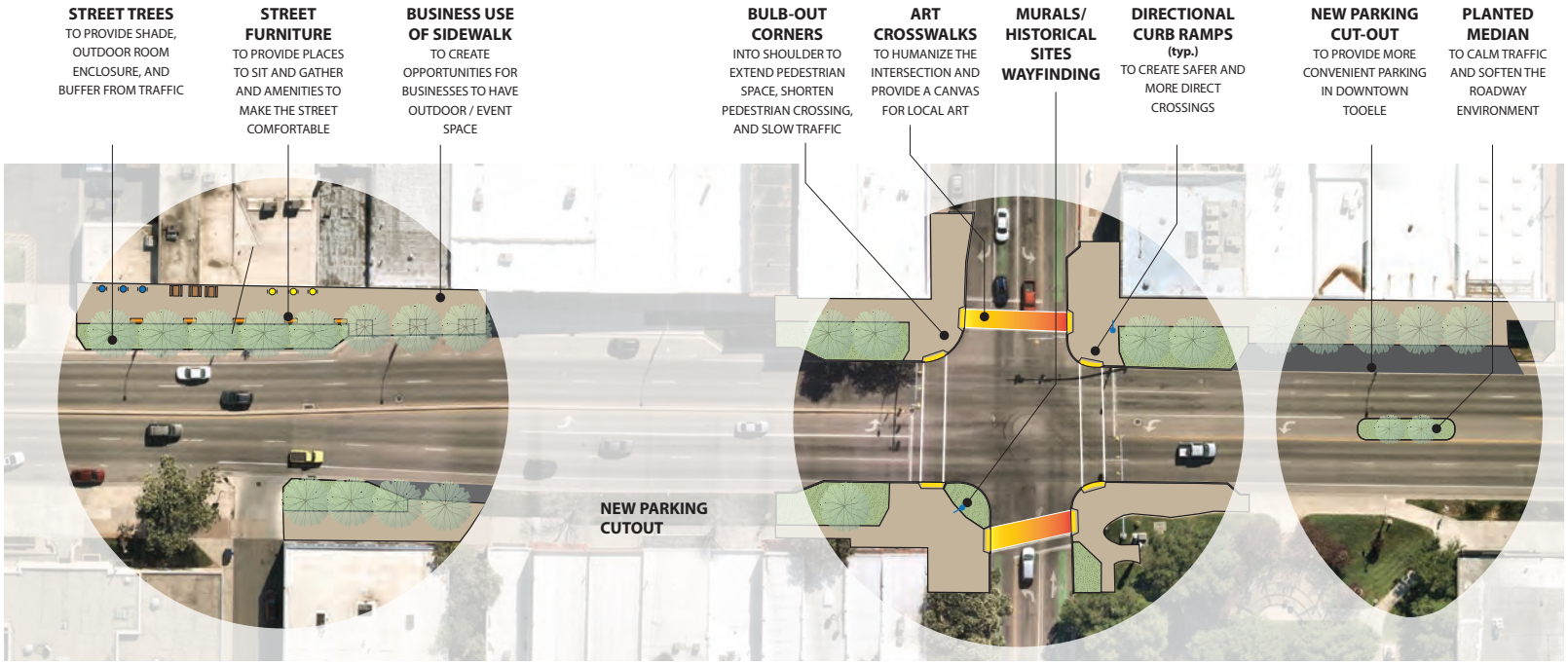


5.3 Vine Street Intersection and Surrounding Streetscape

The central segment of the Main Street corridor focuses on improvements to the Vine Street intersection. The intersection of Main and Vine is informally the center of downtown. It is the most walkable segment of Main Street, with consistent storefronts. The Preferred Concept envisions an expansion of pedestrian space at the intersection, streetscape elements, and public art opportunities. These elements include:

- **Curb extensions on Vine Street**: The curbs on Vine Street approaching Main Street can be extended into the roadway to shorten the pedestrian crossing and add more pedestrian space.
- **Walkable corners:** Smaller curb radii and directional curb ramps create more of a pedestrian orientation to this intersection.
- **Art opportunities:** The Concept envisions the Main-Vine intersection as a location for more public art. Opportunities include the Vine Street crosswalks, building facades, and locations alongside the sidewalk for sculptural elements like the Buffalo Arts Initiative.

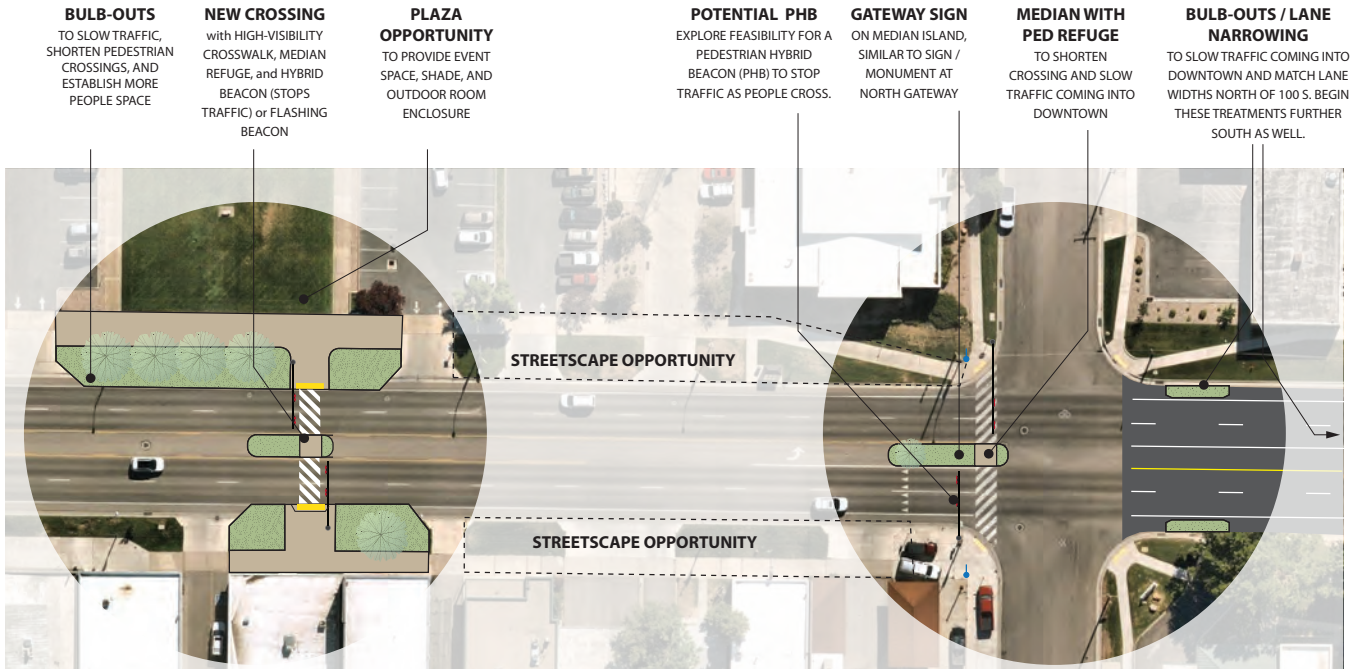
This segment of Main Street also presents opportunities for the types of streetscape additions discussed in Section 5.1, alongside complementary storefront businesses. In addition, opportunities to continue the traffic calming established at the gateways will be important to find - such as the median island shown below.



5.3 Southern Gateway and County Building Crossing

The southern segment of the corridor in the Preferred Concept mirrors the northern segment in that it focuses on a crossing and a gateway into downtown. However, this southern gateway, at 100 South, has a different character than the northern gateway - south of the Main Street core has lower traffic volumes and a calmer environment and so can be a more walkable segment of the corridor. At the same time, the crossing envisioned at the Tooele County complex would establish a new crossing.

- **Southern gateway:** The Concept envisions similar strategies to slow traffic and welcome people into the Main Street core as the northern gateway, with a combination of curb extensions and median island. in this case, the curb extensions are recommended to be narrow islands inserted between the gutter and narrowed travel lanes; and the median island is a refuge for the important 100 South crossing. In addition, similar to the northern gateway, feedback from Workshop 3 influenced the gateway to extend further south, to 200 South, to begin slowing traffic earlier. The Southern gateway should also be considered for a Pedestrian Hybrid Beacon (PHB).
- **County crossing:** The Concept envisions a pedestrian-activated crossing at the Tooele County complex, similar to the City Hall crossing. This crossing does not currently exist. It would include curb extensions, high-visibility markings, a beacon to stop traffic - whether a PHB or RRFBs - and a median refuge island. The crossing would improve pedestrian access at a key destinations as well as slow traffic and provide an opportunity for public space.



The two images on this and the following page provide a sense of the potential impact of the recommended changes at the intersection of Main and Vine Streets. The image below shows the Main-Vine intersection now; the next image shows a simulation of the same

Large curb radius allows traffic to maintain high speeds while turning and increases vehicle space at the expense of pedestrian space

Vine Street's width is about 60 feet across - could it be narrower, allowing for more pedestrian space and a shorter pedestrian crossing?

Poor bike environment on Main Street - There is no adequate bike facility on Main Street.

Street trees are present sporadically on Main Street but do not establish a consistent canopy.

Few places to sit and enjoy public space exist on Main Street.

Lack of wayfinding on Main Street and in Downtown specifically for pedestrians.

viewpoint with many of the recommended improvements - extended curbs; smaller curb radii; art on the crosswalk; wayfinding; more street trees, landscaping and planters; more outdoor seating; and bike improvements.

Planters are a flexible & inexpensive way to add greenery and color, if they can be maintained.

Smaller curb radius and directional curb ramps create more pedestrian space, direct crossings, and slow turning traffic.

Curb extensions on Vine Street create more pedestrian space shorter crossing, and traffic calming.

Public art opportunity includes crosswalks and building facades.

Shared use path provides a bike facility along Main St.

New street trees will eventually establish a consistent canopy and help create a comfortable scale of the street.

Drought-tolerant landscaping helps to green the street and establish a buffer between people and moving traffic.

Increased public space creates more places for people to sit and gather, as well as for businesses to use the space.

Pedestrian wayfinding orients people to destination reachable on foot and brands the district.

6. IMPLEMENTATION STRATEGY

The implementation strategy for the Preferred Concept includes four main categories:

1. **Project definition and estimated costs**: How is the concept divided into distinct projects that will be funded, designed, and constructed?
2. **Project priorities and phasing:** Which projects are of higher priority for the City and the community and will happen first?
3. **Roles and responsibilities:** Who will do what to get the project done?
4. **Potential funding sources:** How will the design, construction, and other costs for each project be covered?

6.1 Project Definition and Cost Estimates

The project team took the Preferred Concept and began to define it in terms of a series of projects, both corridorwide and tied to specific locations. These projects may be implemented separately or combined depending on the strategy and funding ultimately pursued and obtained. The overall cost estimate was approximately $2 million. The full estimate can be found in the Appendix.

Corridor-wide:

Multi-use path: $182,700 estimated cost

The Active Transportation Plan recommends to replace the sidewalk with a multi-use path on the east side of Main Street, with design features to establish the understanding that the facility is for bicycles, scooters, and other micromobility devices.

Streetscape Improvements along the Entire Corridor

Streetscape improvements along the entire corridor can include a variety of things. Project stakeholders expressed the desire to use waterwise landscaping and repurposing the wide park strips. Newly gained space from repurposing the park strips can be used for street furniture, gathering amenities, trees in street grates, and bike locks. Additionally, the City would like to add hanging planters to existing street lamps to further beautify the downtown Main Street corridor. Finally, murals, wayfinding, and historic marker signs are also great additions to improve Main Street's streetscape.

Parking cutout: $20,560 estimated cost

A parking cutout is identified as part of the concept on the east side of Main Street south of Vine Street; this estimate could be used for additional parking cutouts.

Specific locations:

North Downtown Gateway Treatment: $299,000 estimated cost

Create gateways at the North and South end to signal the entrance into Downtown Tooele. These gateways would be located in the roadway median to provide a welcome and signal the transition into the downtown area. The medians can be landscaped or not and would also provide traffic calming as they visually narrows the roadway. The North and South gateway signs would be similar.

City Hall Mid-block Crossing Upgrade: $373,550 estimated cost

Currently, the mid-block crossing in front of Tooele City Hall is a marked crosswalk. A crossing update would include adding bulbouts with waterwise landscaping on both sides of the road to shorten the crossing distance as well as adding a pedestrian hybrid beacon.

Vine Street Intersection Improvements: $284,600 estimated cost

The Vine Street intersection is often associated with the heart of the community as many events take place in Downtown Tooele and Veterans Memorial Park. Improving this intersection would include adding bulbouts to all four corners with directional curb ramps. Where space permits, the bulbout would be planted. Additionally, the north/south crosswalk legs can be used as a canvas for local artists to add public art to the area.

New Mid-block Crossing at the County Building: $405,200 estimated cost

A new mid-block crossing can be added in front of the Tooele County building. Currently, there is no safe crossing opportunity between Vine Street and 100 South, even though both sides of Main Street have multiple destinations, including a bus stop on the west side of the street.

South Downtown Gateway and 100 South Intersection: $82,180 estimated cost

Both Tooele City representatives and the Downtown Alliance stakeholders consider improving the 100 South intersection to be their top priority. Especially considering that this intersection is on a Safe Routes to School, an upgrade to the existing, unsignalized crossing is desired to provide a safe crossing opportunity for school children as well as manage traffic flow during school pick up and drop off hours. Stakeholders hope to complete a signal warrant study to determine the kind of intersection improvement most appropriate for this location.

6.2 Project Priorities and Phasing

At the third workshop, the project team shared the preferred concept with the stakeholder committee which was followed by a discussion about the stakeholders' priorities. The group generally agreed that the highest priority is the South Gateway/100 South Intersection project. Anecdotally, residents experienced difficulties safely crossing Main Street at 100 South, and since this intersection is a popular east-west connection, Tooele City staff members agreed that this intersection a top priority.

Another priority for the working group was to expand the core Main Street area further north and south to let drivers know earlier that they are entering a slower part of Main Street. According to participants, the norther gateway should be north of Utah Avenue, by the Vasa gym while the southern gateway should but past 200 South by Arby's restaurant.

Other project priorities are the Vine Street intersection improvements by adding bulbouts to shorten the Vine Street crossing distance, general streetscape improvements along the corridor including repurposing the grass strip, improving the mid-block crossing at City Hall, and adding a mid-block crossing at the Tooele County building.

While the project feasibility will depend heavily on warrant studies and available funding options, the following projects are in order of importance for general updates:

1. 100 South Intersection Improvements and South Gateway Treatment
2. North Gateway Treatment
3. Streetscape Improvements along the Entire Corridor
4. Vine Street Intersection Improvements
5. City Hall Mid-block Crossing Upgrade
6. New Mid-block Crossing at the County Building

The whole project can be phased in a number of different ways. It could be built as one large project, from the North Gateway to the South Gateway. Or, it could be divided into a few phases by focusing on one or two improvements at time, allowing each project to work independently as a functional project until the other projects are added.

6.3 Roles and Responsibilities

The Tooele Main Street Collaboration is precisely that - it must continue to be a partnership among Tooele City, the Tooele Downtown Alliance, and UDOT Region Two. These project partners will continue to work together, coordinating, and meeting as needed as the project progresses. Other organizations can be brought on as needed for specific projects outlined in section *6.1 Project Definition and Cost Estimates*.

Tooele City will continue convening the project partners and other stakeholders and the broader community to advance the preferred concept. The City will seek adoption of the Preferred Concept by the Mayor and City Council. Tooele City will continue to apply for grants and other funding for elements of the concept.

Tooele Downtown Alliance will continue working with Tooele City and updating Main Street business owners of the project progress. The Alliance will also be part of the planning and design process of streetscape improvements, programming and events held on Main Street. As the Downtown Alliance gains new members, the organization should consider what new opportunities it has to continue to implement and leverage the Main Street Concept with physical and programmatic improvements.

UDOT Region Two will continue to work with Tooele City to establish and further define the Main Street improvement projects as a distinct projects and add it to the Statewide Transportation Improvement Program (STIP). UDOT Region Two will also assist and work with Tooele City to identify and secure appropriate state and regional funding sources. Region Two will also continue to update Tooele City and the Downtown Alliance on new projects and planning that affect Tooele Main Street and the Preferred Concept, including broader network changes that could change, for example, the truck traffic on Main Street.

In case of desire to move or enhance the existing bus stops along this Main Street section, Tooele City and UDOT Region Two will seek to include Utah Transit Authority (UTA) as a partner.

6.4 Funding Sources

In order to fund the projects listed in the preferred concept and project definitions, several funding options exist:

Local Sources:
- Tooele City General Fund or Capital Improvements Program
- RDA/economic development funds
- Tooele County 3rd quarter sales tax transportation fund

UDOT Funding Sources:
- Transportation Investment Fund (TIF) Active
- Transportation Alternatives Program (TAP)
- Class B & C Road Funds

Other Funding Options:
- Utah Main Street Program funds
- Main Street America funds
- USDOT Safe Streets for All (SS4A) funds