HORROCKS
ENGINEERS

# TREMONTON
## TRANSPORTATION
## MASTER PLAN

# RESOLUTION NO. 18-40

## A RESOLUTION OF TREMONTON CITY CORPORATION ADOPTING THE TREMONTON CITY TRANSPORTATION MASTER PLAN MAY 2018

**WHEREAS,** Tremonton City made application to Box Elder County for the use of the Local Option Transportation Corridor Preservation Fund for creating a transportation master plan for Tremonton City in August 2016; and

**WHEREAS,** Box Elder County awarded Tremonton City with funds necessary to contract with a transportation engineering firm to analyze Tremonton City's future traffic patterns, refine the City's existing transportation map, and to create a transportation master plan; and

**WHEREAS,** Tremonton City enter into a professional service with Horrocks Engineering for the creation of the Tremonton City Transportation Master Plan with the approval of Resolution No. 17-12 on April 4, 2017; and

**WHEREAS,** in coordination with the Planning Commission and City staff, Horrocks Engineering has drafted the Tremonton City Transportation Master Plan May 2018; and

**WHEREAS**, Tremonton City has caused a notice of the public hearing to be published in *The Leader,* a newspaper of general circulation on May 30, 2018; and

**WHEREAS**, Tremonton City has caused a draft copy of the Tremonton City Transportation Master Plan May 2018 to be available for public inspection during regular business hours at the office of Tremonton City Corporation, 102 South Tremont Street, Tremonton, Utah; and

**WHEREAS,** on June 12, 2018, the Tremonton City Planning Commission held a Public Hearing regarding the Tremonton Transportation Master Plan May 2018; and

**WHEREAS**, the Tremonton City Planning Commission has considered all written and oral statements made at the public hearing objecting or supporting the Tremonton Transportation Master Plan May 2018 and recommends to the Tremonton City Council, the adoption of the aforementioned master plan.

**NOW, THEREFORE, BE IT RESOLVED** that the Tremonton City Council hereby adopts the Tremonton City Transportation Master Plan May 2018 as attached in Exhibit "A."

Adopted and passed by the governing body of Tremonton City Corporation this 7th day of August 2018.

TREMONTON CITY
A Utah Municipal Corporation

By _____
Roger Fridal, Mayor

ATTEST:

_____
Linsey Nessen, City Recorder

EXHIBIT "A"

TRANSPORTATION MASTER PLAN
May 2018

# Glossary of Terms

| | |
|---|---|
| AADT | Annual Average Daily Traffic |
| ADA | Americans with Disabilities Act |
| BRAG | Bear River Association of Governments |
| DZ | Development Zone |
| FHWA | Federal Highway Administration |
| GOPB | Governor's Office of Planning and Budget |
| HCM | Highway Capacity Manual |
| ITE | Institute of Transportation Engineers |
| LOS | Level of Service |
| MUTCD | Manual on Uniform Traffic Control Devices |
| RPO | Rural Planning Organization |
| STIP | Statewide Transportation Improvement Program |
| STP | Surface Transportation Program |
| TCM | Traffic Calming Measures |
| TIP | Transportation Improvement Program |
| TIS | Traffic Impact Study |
| TMP | Transportation Master Plan |
| TOD | Transit Oriented Development |
| TRB | Transportation Research Board |
| UDOT | Utah Department of Transportation |
| UTA | Utah Transit Authority |

TRANSPORTATION MASTER PLAN
May 2018

# Executive Summary

Tremonton City has experienced moderate growth and development throughout the years with growth of approximately 4,100 residents since 1990. With Tremonton City committed to continued growth, a Transportation Master Plan (TMP) has been implemented so the transportation system can accommodate the projected growth in the City for the next 50 years.

As part of the plan, the current roadway network was assessed using current traffic volumes. Current traffic volumes were projected for the next 50 years using the current roadway network to find the capacity improvements necessary for the roadway network to positively contribute to the local economy and quality of life in Tremonton City. The following sections are included in the Tremonton City TMP.

## Roadway Network Analysis

Transportation planning in the region is a cooperative effort of state and local agencies. This section includes a general discussion on the traffic demand modeling process used for this TMP, functional classification of streets, and level of service of streets and intersections. Also included are the existing and future conditions for the 20-Year and 50-Year scenarios.

### Traffic Demand Modeling

Traffic Demand Modeling was used to project existing traffic conditions into the future using the *PTV Vistro 5* software. This software works by assigning trips to the roadway network based on existing and future data included in *ITE's Trip Generation Manual*. Each trip includes an origin, destination, and path between the two. As there are a significant number of origin and destinations within Tremonton City, the City was split into eight Development Zones (DZ). This reduces the complexity of the model while maintaining the accuracy of future traffic demand in the City. Each Development Zone acts as an origin or destination. All trips generated within each zone are assigned to another development zone.

## Functional Classification

All trips include two distinct functions: mobility and land access. Mobility and land access share an inverse relationship, meaning as mobility increases land access decreases. Included in the TMP document is a summary of the functional classification included in Tremonton with an analysis of the typical cross-sections used.

## Level of Service

The adequacy of an existing street system can be quantified by assigning Levels of Service (LOS) to major roadways and intersections. As defined in the Highway Capacity Manual (HCM), a document published by the Transportation Research Board (TRB), LOS serves as the traditional form of measurement of a roadway's performance. Levels of service range from A (free flow where users are virtually unimpeded by other traffic on the roadway) to F (traffic exceeds the operating capacity of the roadway).

## Existing Roadway Network Conditions

The Traffic Demand Model was calibrated to fit existing traffic conditions in Tremonton City. The method used to calibrate the model was to use traffic counts throughout the City. Traffic counts were received from UDOT on State Roads and include annual average daily traffic (AADT) volumes as defined in Traffic on Utah Highways. Additionally, traffic counts were obtained by installing temporary electronic counters on City roads. Based on the existing traffic data in the City, all roadways in Tremonton function at adequate LOS, being LOS D or greater.

## Future Roadway Network Conditions

By calibrating the Traffic Demand Model to fit the existing traffic conditions in Tremonton City, the model can project traffic volumes into the future. There are three future models used for this TMP. The first model used was to identify potential capacity deficiencies, called the No Build Model. The other two models project traffic volumes 20 and 50 years into the future to create a 20-Year Model and 50-Year Model.

From the analysis, the No Build Model showed future deficiencies on Main Street for both the 20-Year Model and 50 Year Model if nothing was done to improve capacity. For the 50-Year Model, 1000 North and 2300 West also had deficiencies.

## Capital Project List

All deficiencies were documented and proposed improvements are included on the Capital Project List. New roadways and intersection improvements are also included on the project list to assist future growth in the City. A new highway south of I-15/I-84, new arterial connecting 1000 North to Main Street, and a new pedestrian HAWK signal highlight a few future capital projects.

## Alternative Modes of Transportation

### *Transit*

Previous planning efforts regarding transit were analyzed and included in the TMP document. Tremonton is also desirous to incorporate FrontRunner into the TMP. An analysis of four potential station locations indicated that a future FrontRunner station would be the best at 6400 West & 1600 South. This is not a final alternative location but will assist the City with future planning.

### *Pedestrian and Bicycles*

Pedestrian and bicycle safety is an important feature of any transportation master plan. Tremonton City is currently working on the *Tremonton City Bike Route & Non-Motorized Trail Plan*. People are more inclined to walk or ride their bicycle when the experience is pleasant, they feel safe, and distances are reasonable. High-density housing near high-traffic generators or main street type areas encourages people to use alternative travel options.

# Other Elements of the Transportation Master Plan

There are many other elements and guidelines to help improve and maintain the roadway network's LOS in Tremonton City. Future planning, especially where there is the potential for significant development, is vital to ensure the transportation network functions well as the City grows.

## Semi-Truck Routes

With existing semi-trucking companies located within the city the interchange of I-15 and I-84 as well as many industrial destinations, Tremonton City is a major origin and destination for semi-truck traffic. There is concern regarding the significant number of semi-trucks utilizing Main Street. Many semi-trucks accessing the P&G manufacturing plant south of Tremonton City utilizing Main Street to access I-15/I-84. It is recommended to build a commercial corridor roadway on the south side of I-15/I-84 connecting Iowa String Road and Main Street. This road acts as a way for trucks to bypass downtown as well as a commercial center for Tremonton City. This road is shown as Project 71 of **Figure 10**.

## School Zones

Many children are using all modes of transportation to travel to and from school. Without proper planning, students have a higher risk of injury during their commute. All guidelines for traffic control in school zones are found in Chapter 7 of the Utah MUTCD. Included in this TMP is an analysis regarding the school zone crossings for all existing schools in Tremonton City.

## Access Management

Access management is the process of establishing and enforcing road and driveway accesses within the City. This includes establishing the location, number, spacing, type, and design of city streets and accesses to minimize vehicle conflicts and maximize the traffic capacity and safety of a roadway. Access management is typically enforced based on the functional classification of mobility vs. access. Unmanaged or unorganized access management along travel corridors can result in poor and unsafe roadways. Included in this TMP are guidelines for Access Management practices.

## Traffic Calming

Street patterns are typically developed at the time of construction. In Utah, the history of using a grid system for planning and development purposes started with the first settlers and has proven efficient for moving people and goods throughout a network of surface streets. However, the nature of a grid system with wide and often long, straight roads can result in excessive speeds. For that reason, traffic calming measures (TCM) can be implemented to reduce speeds on residential roadways. Tremonton also follows the Utah grid system with some interruptions due to I-15, I-84, railroad tracks, and geologic features of rivers and hillsides. This TMP includes guidance for different Traffic Calming measures which can be implemented.

## Corridor Preservation

Corridor preservation is an important transportation implementation tool that agencies should use and apply to all known future transportation corridors. Perhaps the most important elements of corridor preservation are ensuring that the corridors are preserved in the correct location and that they meet the applicable design and right-of-way standards for the type of facility being preserved. The 50-year build roadway network acts as a corridor plan for Tremonton City as seen in **Figure 12**. Included in this TMP is techniques for Corridor Preservation.

## Traffic Impact Studies

As growth occurs throughout the City, the City needs to evaluate the impacts of proposed developments on the surrounding transportation networks prior to giving approval to build. This ongoing evaluation may be accomplished by requiring that a Traffic Impact Study (TIS) be performed for any development in the City based on city staff recommendations. A TIS allows the City to determine the site-specific impacts of a development including internal site circulation, access issues, and adjacent roadway and intersection impacts. Included in this TMP is guidance and requirements for the City to use for Traffic Impact Studies.

## Railroad Crossings

There are a number of railroad crossings in the City. Railroad line runs north/south through the City and crosses Main Street at approximately 250 West. On the north side of the City are connections to manufacturing plants which cross city streets. Each of these rail crossings must be treated with extreme

caution when planning the roadway network for safety reasons. Vehicle/train or pedestrian/train accidents are catastrophic when they occur at at-grade rail crossings. Additionally, it is extremely difficult to get new crossing at railroads from UDOT. Included in this TMP is a railroad inventory for all existing and future railroad crossings in the City.

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# Introduction

This Transportation Master Plan (TMP) contains an analysis of the existing transportation network and conditions. Any major deficiencies are itemized, and possible improvement or mitigation alternatives are discussed. An analysis of the future transportation network is also included for the 50-year horizon of 2067. Any major UDOT projects and improvements within the city are reflected in the future network. Any deficiencies in the future transportation network that are expected to exist and would not be accommodated by projects that are currently planned will be discussed. A list of recommended improvements and projects are given to aid Tremonton City in planning for future transportation projects as well as in working with other agencies such as UDOT or neighboring cities. This TMP is intended to be a useful tool to aid Tremonton City in taking a proactive effort in planning and maintaining the overall transportation network within the city. The following is a comprehensive list of topics discussed in this chapter:

1. **Tremonton History**
2. **Previous Tremonton Planning Efforts**
    - Tremonton Transportation Master Plan (UDOT)
    - Box Elder Emerging Area Plan (UDOT)
    - Tremonton City Trails, Parks, and Open Spaces Master Plan
    - Cache Valley Short-Range Transit Plan – Interim Report #2
    - Transportation Master Plan Implementation

# Tremonton History

Mr. John Petty, at the age of 28, took up a homestead of 160 acres in Tremonton in the year 1888. His farm covered the present south half of Tremonton town, all south of Main Street, now within the city limits. Toward the beginning of the new century, land agents went east to induce more people to settle in the Bear River Valley, and as a result, a number of families settled to Tremonton from Nebraska.

After tapping the Bear River and building the great canal system, water began to flow over the sterile thirsty soil. In 1892, possibilities for Bear River Valley began to look promising for many new settlers. Settlers soon came from a German colony in Illinois and also a number of families from Nebraska. The townsite of Tremonton was laid out early in the spring of 1903. Soon buildings were erected to attract business to the new townsite including a meat market, barber shop, saloon, and an office for "The Tremont Times" newspaper. Mail was distributed from the meat market. Following the first general business boom and for a year thereafter, businessmen were attracted from all parts of the county. A blacksmith shop, general merchandise store, drug store, millinery, boarding house, 2 more hotels, a livery stable, furniture store, and a wagon & machine company were among them. Very few homes were built during the first year as most families lived in the rear rooms of their places of business.

During the first weeks of its existence, the new town was without a name but was soon given the name Tremont after the Illinois hometown of one of the German settlers. Within three or four years, however, the name of Tremont, Utah was so frequently confused with Fremont, Utah, that postal authorities requested a name change for the newer town. By simply adding "on" to Tremont, the town became Tremonton and the identity problem was solved.

A town organization was effected January 6, 1906 and they began at once to make improvements. A city park was purchased, and in 1909 the old board sidewalks were replaced by cement walks. In 1910, a water system was installed using water from the canals, and in 1911, the electric light system was installed. The Midland Hotel was erected through the efforts of the Tremonton Commercial Club. The contractors soon learned that the underground water was too near the surface to make the building of foundations and basements either safe or possible. A drainage company was therefore organized in 1913, and by November of that year a sewer and drainage system was extended to the greater portion of the town.

From the summer of 1912 to the close of 1914, Tremonton experienced a building boom. May 6, 1918, Tremonton was incorporated as a City of the third class. This same year the City installed a new water system using water from the Johnson Spring located just east of Point Lookout. By 1925 the population of Tremonton numbered one thousand people.

Tremonton is a Twenty-First Century City. From 1906, when first incorporated as a town, to 1918 when designated a Third Class City, to 1992, growth has been steady and firm. Educational, recreational, civic,

health, medical, and religious services and facilities are updated and have expanded with the steady growth of the City. Economically, the City is a central shopping place for the Bear River Valley.

The full history used for the TMP was found online at *www.boxeldercounty.org/tremonton-history.htm*.

# Previous Tremonton Planning Efforts

Transportation planning is vital for future growth and development within a City. Development without planning causes negative impacts such as acquisition of developed property, improperly sized spacing of infrastructure, etc. Good planning minimizes these negative impacts and implements standards, policies and guidelines to ensure development occurs for the wellbeing of the City. The challenge of any planning effort is to capture the continuously changes that occur with development within a static document. This TMP is to be dynamic and updated as development occurs. As such, this TMP will supplement and add to previous transportation plans. The following previously completed plans were analyzed and are included as part of this TMP and are summarized below:

- Tremonton Transportation Master Plan – *UDOT* (2004)
- Box Elder Transit Studies – *InterPlan* (2004-2005)
- Box Elder Emerging Area Plan – *UDOT* (2008)
- Tremonton City Trails, Parks, and Open Space Master Plan – *Tremonton City* (2011)
- Cache Valley Short-Range Transit Plan, Interim Report #2 – *Lee Scott & Cleary* (2017)

## Tremonton Transportation Master Plan

The *Tremonton Transportation Plan* was completed in 2004 by UDOT as a supplement to the Tremonton General Plan. This became the first plan specifically for transportation in Tremonton City. As this plan was completed by UDOT, the plan focused on the UDOT roadways located within and surrounding the City. Included are specific guidelines and policies regarding Access Management, Context Sensitive Solutions (CSS), roadway cross-sections, bicycle and pedestrian, enhancements program, and corridor preservation. A review summary is included to assist the City to request and receiving additional funding for projects. Recommendations for the roadway network and bicycle and pedestrian are included in the plan, and a summary is included below:

### Roadway Network

- New Road – 2000 West (Main Street to 1000 North) (which has since been completed)
- Traffic Signal/Warrant – Main Street & 1000 West (which has since been completed)
- Interchange Improvements to Improve Site Distance – I-84 & Main Street (SR-102)
- Semi-Truck or Passing Lanes – SR-30 (SR-38 to SR-23)
- Bicycle and Walking Trail – Iowa String Road (1000 North to Rocket Road)
- Transit Study to tie-in Tremonton to Commuter Rail
- Traffic Signal/Warrant – 1000 North & 300 East (which has since been completed)

**Bicycle and Pedestrian**

- Conduct sidewalk inventory
- Continue to require developers to install sidewalk
- Develop routing plan for safe routes to schools

## Box Elder Transit Studies (2004-2005)

The *Box Elder County Transit Feasibility Study* evaluated the existing conditions of transit services in Tremonton, Brigham City and Box Elder County. The report provides for policy planning in order to assess the types of transit services desired by the community and the range of costs associated with various levels of transit service. The report concludes that transit services could be significantly improved through improved coordination of existing services. Among the conclusions is a three phase plan to improve transit services throughout the area. The three phases are detailed below:

**1. Short-Term Expansion of Transit Service**

- Intra-County Transit Service
- Could be provided within 6 months to one year depending on taxpayer willingness and the ability of a service provider to bring in the necessary capital equipment
- Most likely would be a ¼ cent sales tax increase Countywide

**2. Mid-Term Expansion of Transit Service**

- Expansion to Cache County
- Scheduled transit service to and from Cache County could be operating with six months to three years, again depending on taxpayer willingness and the ability to coordinate with various service providers.

**3. Commuter Rail Service**

- Commuter rail service to the existing UTA service areas
- Should follow, not precede, intra-county transit service

According to the report all phases of transit implementation would require a taxpayer approval ballot measure. A comprehensive transit system would require approximately ¾ of one percent sales tax Countywide dedicated to transit, which includes the existing ¼ cent dedicated to transit in the cities of Brigham City, Perry, and Willard.

An additional study was completed in 2005 which refined transit service alternatives, estimated ridership, costs and revenues. There are four transit routes which travel through Tremonton connecting to Brigham City, Elwood, Deweyville, Honeyville, Corinne, Bear River City and Logan.

## Box Elder Emerging Area Plan

The *Box Elder Plan Emerging Area Plan* was completed in 2008 by UDOT with coordination with Bear River Association of Governments (BRAG), Box Elder County, and Box Elder Cities and Towns. Cities in Box Elder County are primarily rural communities. Although future growth and development will occur, the desire

is to maintain current quality of life within these cities and towns. Residents stated that an important aspect to maintaining a rural community feel is to preserve the cities' main streets. Included in the plan are three scenarios which offer different development patterns for the county as described below:

***Scenario 1 – Inter-Regional Connections***

The inter-regional connections scenario improves transportation facilities for both roads and transit which serve long-distance travel. The scenario prioritizes principal arterials over smaller arterials and collector streets. It assumes FrontRunner extends to Brigham City with additional services to Tremonton via commuter bus, Bus Rapid Transit (BRT), or fixed guideway system.

***Scenario 2 – Connecting Local Activity Centers***

The connecting local activity centers scenario improves efficiency for connections to key activity centers such as Brigham City and Tremonton City. This ensures efficient travel for residents for work, shopping or recreation. The roadway network is more balanced with more minor arterial and collector streets. This scenario improves and adds interchanges to the Interstate corridor. It also includes additional bus transit service connecting Brigham City and Tremonton City.

***Scenario 3 – Local Circulation Scenario***

The local circulation scenario focuses on smaller roads throughout the area which provides better circulation between cities and towns. The scenario prioritizes circulation on a local level and includes additional access to the interstate. This includes a bike/pedestrian trail connecting Brigham City and Tremonton City utilizing Iowa String Road. An additional trail which forms a loop in Tremonton is included to improve pedestrian and bicycle access. It is assumed Frontrunner will be extended to Brigham City with transit services connecting to Tremonton City.

## *The Common Transportation Vision*

All three scenarios were analyzed and the common transportation vision was created. The plan includes a list of Action Items which need to be addressed and the items pertaining to Tremonton City are included below:

### Transportation Connections to Cache Valley and the Wasatch Front

- Continued discussions with UTA to extend FrontRunner to Brigham City
- Coordination with Cache Valley Transit regarding bus service to and from Cache Valley
- Creating individual maps for cities and towns which show the Common Transportation Network

### Preserving Rural Community Character

- Develop city and town transportation plans
- Meet with UDOT to discuss corridor preservation, access management, and signal spacing
- Identify priority corridors in the area and determine which characteristics about the road should be maintained or improved
- Meet with UDOT on local governments to outline priority corridors

**Integrating Transit Service throughout the County**

- Continued discussions with UTA to extend FrontRunner to Brigham City
- Revisit recommendations outlined in the Box Elder Transit Study

**Providing Bicyclists and Pedestrians Safe and Desirable Transportation Options**

- Examine and coordinate city and town general plans and transportation plans to determine how bicycle and pedestrian routes fit into their overall circulation plan
- Encourage local elementary and middle schools to create and submit to UDOT their School Neighborhood Access Plan (SNAP)

**Providing Safe and Efficient Routes for Semi-Truck Traffic**

- Begin discussions with UDOT and local governments to preserve access control, built to semi-truck related pavement/design standards and maintain high speed function on Iowa String Road
- Identify current state routes where increased local control might provide advantages to local governments in development approval
- Work with UDOT to create a semi-truck route plan to allow for appropriate development standards on designated semi-truck routes

**Unresolved Issues**

- The connections to I-15 and I-84 in Tremonton need to be further discussed. There is currently high semi-truck traffic on local commercial areas and discussion is needed to determine if this is adequate

## Tremonton City Trails, Parks, and Open Spaces Master Plan

The *Tremonton City Trails, Parks and Open Spaces Master Plan* was developed in 2011 as a cooperative effort of the National Park Service Rivers, Trails, and Conservation Assistance Program (RTCA), BRAG, and Tremonton City. The document defines trails as a hard surface with generally non-motorized users. Included in the plan are goals for existing trails, opportunities for existing trails, and future trails.

**Future Trails**

- Malad River Loop Trail
- Right-of-Way Trail System
- Trails in Canal Right-of-Way
- Tremonton Rail Corridor

The master plan also includes goals and opportunities for existing and new parks and open spaces. These are vital to the future growth of Tremonton City as the trail network acts as an alternative mode of transportation. The full plan is included online and can be accessed using the following link: *Tremonton City Trails, Parks & Open Spaces Master Plan*.

## Cache Valley Short-Range Transit Plan – Interim Report #2

The *Cache Valley Short-Range Transit Plan – Interim Report #2* evaluates service changes in the Cache Valley Transit District (CVTD) completed in 2017. The primary purpose of the study was to improve efficiency of CVTD and effectively meet the needs of the community. Planning with CVTD is important for as there is a significant number of commuters from Tremonton to Cache Valley. This study prepared a five-year working plan to identify unmet transportation needs, develop service options to meet those needs to improve service delivery, and provide recommendations for implementing services changes. The following are the items included in the report which pertain to Tremonton City:

**Transit Service**

- Bus Service - Tremonton to Logan
  - Route time: 1.5 Hours – Required 1 small bus
  - Monday-Saturday: two morning runs and two afternoon runs
  - Annual operating cost: $272,460
  - Annual estimated ridership: 15,584
  - Average cost per passenger: $17.48

**Vanpool Service**

- Vanpool Service - Tremonton to Logan
  - Annual operating cost: $3,500 to $10,000

## Transportation Master Plan Implementation

Although these plans were completed a number of years ago, elements of the plans still apply today. This TMP will analyze and ensure the recommendations from previous planning efforts are still valid and any updates to these recommendations will be included in the plan.

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May 2018

# Roadway Network Analysis

Transportation planning in the region is a cooperative effort of state and local agencies. The Bear River Association of Governments (BRAG) is responsible for coordinating this transportation planning process in the Box Elder, Cache, and Rich County areas and is the Rural Planning Organization (RPO). RPO's are agencies responsible for transportation planning in rural areas throughout the United States. This section includes a general discussion on the traffic demand modeling process used for this TMP, functional classification of streets, and level of service of streets and intersections. Also included are the existing and future conditions for the 20-Year and 50-Year scenarios. The following is a comprehensive list of topics discussed in this chapter:

1. **Traffic Demand Modeling**
   - Land Use Planning
   - Trip Generation
2. **Functional Classification**
3. **Level of Service**
   - Roadway
   - Intersection
4. **Existing Roadway Network Conditions**
5. **Future Roadway Network Conditions**
   - No-Build Analysis
   - 2037 Analysis
   - 2067 Analysis
6. **Capital Project List**
7. **Alternative Modes of Transportation**
   - Transit
   - Pedestrians and Bicycles

# Traffic Demand Modeling

Traffic Demand Modeling was used to project existing traffic conditions into the future using the *PTV Vistro 5* software. This software works by assigning trips to the roadway network based on existing and future data based on *ITE's Trip Generation Manual*. Each trip includes an origin, destination and path between the two. As there are a significant number of origin and destinations within Tremonton City, the City was split into eight Development Zones (DZ) as shown in **Figure 1**, which reduces the complexity of the model while maintaining the accuracy of future traffic demand in the City. Each Development Zone acts as an origin or destination. All trips generated within each zone are assigned to another development zone. **Appendix A: Traffic Demand Model Methodology** includes a description of all assumptions and methodology of the Traffic Demand Model.

## Land Use Planning

The majority of the socioeconomic data used in this plan is based on the best available statewide data provided by the Governor's Office of Planning and Budget (GOPB). This data was supplemented and verified using the data provided by the City in the form of the currently adopted zoning map as shown in **Figure 2** (the most recent version can be found on Tremonton City's website at *http://tremontoncity.org*).

The information is considered to be the best available data for predicting future traffic demands. However, land use planning is a dynamic process and the assumptions made in this plan should be used as a guide and should not supersede other planning efforts especially when it comes to localized intersections and roadways.

## Socioeconomic Conditions

Currently, Tremonton City's population is estimated to be 8,426 residents with the median household income in the city is $46,739 (2015) and the average family size is 3.2 (2015). The median age of Tremonton City residents is 29.5 (2014) years. The 2000 to 2010 decade saw moderate growth in Tremonton, with an increase in population from 5,592 to 7,647 (36.7 percent or an average of 3.67 percent per year). The City has an unemployment rate of 3.4 (2015).

Based on the current land use, zoning, demographics, and growth patterns, Tremonton City is expected to grow to approximately 14,632 and 23,315 residents by the year 2040 and 2060 respectively. The forecasted growth within Tremonton City as well the surrounding cities will place increased pressure on the City's infrastructure, including the roadway network. Tremonton City is also committed to increasing commercial, office, and retail stores to provide greater opportunity for residents to live, work, and play in the City. This growth will therefore have considerable impact on traffic volumes in the City.

# Transportation Master Plan

## Figure 01: Tremonton City Development Zones

1
2
3
4
5
6
7
8

**Legend**

**Roadway Network**

- Existing Interstate
- Future Interstate
- Existing Roadways
- Future Roadways
- Annexation Boundary
- Existing City Boundary

HORROCKS ENGINEERS

0 0.325 0.65 1.3 Miles

N

## LEGEND

| | | | | | |
|---|---|---|---|---|---|
| RR-1 | RURAL RESIDENTIAL DISTRICT | CN | NEIGHBORHOOD COMMERCIAL DISTRICT | MU | MIXED USE |
| R1-20 | RESIDENTIAL DISTRICT | CH | HIGHWAY COMMERCIAL DISTRICT | | CHURCH |
| R1-12 | RESIDENTIAL DISTRICT | CG | GENERAL COMMERCIAL DISTRICT | | PUBLIC FACILITIES |
| R1-10 | RESIDENTIAL DISTRICT | MD | MANUFACTURING - DISTRIBUTION DISTRICT | | PUBLIC PARKS |
| R1-8 | RESIDENTIAL DISTRICT | MG | GENERAL INDUSTRIAL DISTRICT | | SCHOOLS |
| R1-6 | RESIDENTIAL DISTRICT-PARK MEADOWS | CD | CENTRAL DEVLOPING DISTRICT | | CEMETERY |
| RM-8 | MULTIPLE RESIDENTIAL DISTRICT | SA | SENSITIVE AREA DISTRICT | TC-MU | TREMONT CENTER-MIXED USE |
| RM-16 | MULTIPLE RESIDENTIAL DISTRICT | MD-B | MANUFACTURING - DISTRIBUTION/ BUSINESS PARK DISTRICT | | |

## COUNTRY VIEW ESTATES

1. HIGH DENSITY 67.79 AC.
2. MODERATE DENSITY 147.26 AC.
3. LOW DENSITY 418.71 AC.
4. VERY LOW DENSITY 114.96 AC.
5. GENERAL COMMERCIAL 28.02 AC.
6. PARK/OPEN SPACE 57.66 AC.
7. TRANSITION 35.07 AC.

LEGEND

CURRENT CITY BOUNDARY

FUTURE ANNEXATION BOUNDARY

VERY LOW DENSITY (1/2 AC)

LOW DENSITY (1/3-1/2 AC)

LOW DENSITY (1/3-1/2 AC)

PARK/OPEN SPACE (57.66 AC)

MODERATE DENSITY (1/4-1/3 AC)

HIGH DENSITY (8,000-12,000 SF)

TRANSITION (35.07 AC)

GENERAL COMMERCIAL (28.02 AC)

JA

SCALE:
1" = 1000'

JA JONES & ASSOCIATES CONSULTING ENGINEERS
1716 East 5600 South
South Ogden, Utah 84403 (801) 476-9767

TREMONTON CITY CORPORATION

Figure 02: Tremonton City Zoning Map

### Trip Generation

In order to generate vehicle trips for each DZ, The Institute of Transportation Engineers (ITE) *Trip Generation Manual, 9th Edition* was used to estimate vehicle trips throughout the City. The ITE *Trip Generation Manual* estimates trip generation for different land uses based on factors such as per unit, per acre, and per 1,000 square feet of building. Based on the existing development, City input as well as the zoning map in **Figure 2**, the estimated trip generation for the existing, 20-year, and 50 year conditions was created.

### Traffic Demand Model Precautions

Tremonton City aims to plan for and encourage responsible and sustainable growth in the City. Part of the commitment to provide a sustainable system includes encouraging a reduction in vehicle trips by providing a balance of roads, trails and bikeways, and public transit facilities. Today's transportation system should not only accommodate existing traffic demands, but should also have built-in capacity to account for the demand that will be placed on the system in the future. While considering the socioeconomic data used in this report and the anticipated growth in the City, some precautions should be considered. First, the growth is based on existing and estimated development pressures throughout the City. As development occurs, it is recommended to revisit the TMP and update if necessary. Second, actual values may vary somewhat as a result of the study area, which includes the unincorporated areas around Tremonton City. Therefore, the recommendations in this TMP represent a planning level analysis and should not be used for construction of any project without review and further analysis. This TMP should also be updated regularly as development plans, zoning plans, and traffic patterns and trends change.

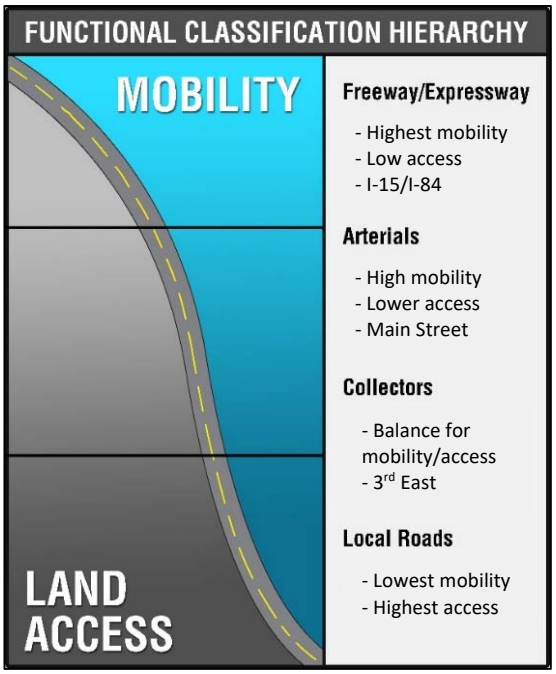
## Functional Classification

All trips include two distinct functions: mobility and land access. Mobility and land access share an inverse relationship, meaning as mobility increases land access decreases. Street facilities are classified by the relative amounts of through and land-access service they provide. There are four primary functional classifications: Interstate, Arterial, Collector and Local Streets. Each functional classification is explained in further detail in the following paragraphs and is also represented in **Table 3**.

**Interstate** – Interstate facilities provide service for long distance trips between cities and states. No land access is provided by these facilities.

**Arterials** – Arterial facilities provide service primarily through-traffic movements. All traffic controls and the facility design are intended to provide efficient through movement of vehicles. There are limited land access points provided by these facilities.

**Figure 3: Mobility vs Access Chart**




**Collectors** – Collector facilities are intended to serve both through movements of vehicles and land-access functions in relatively equal proportions. They are frequently used for shorter through movements associated with the distribution and collection portion of trips.

**Local Roads** – Local roads facilities primarily serve land-access functions. The design and control facilitates the movement of vehicles onto and off of the street system from land parcels.

## Roadway Classifications in Tremonton

Each of the primary classifications described above can be further subdivided. Currently in Tremonton City, arterials are divided into major and minor classifications. For each classification, major arterials have higher carrying capacity and provide more through movements than the minor arterials. For this TMP, the major and minor designations are determined based on the number of lanes on the roadway facility. Table 1 shows the number of lanes and the right of way for each functional class. This designation helps in identifying the appropriate cross-section as well as the carrying capacity of the roadway.

Figure 6 contains the roadway network with each of the roads labeled as interstates, major arterial, minor arterial, collector, and local roads. It should be noted that the boundaries of Tremonton City at the time of this TMP are shown on the map as well as the future boundaries. The future boundaries include the planned annexation area which will be included in all future traffic analyses.

**Table 1: Typical Cross Sections**

| Functional Classification | Number of Lanes | Right of Way Width (ft.) |
|---|---|---|
| Local | 2 | 60 |
| Collector | 2 | 66 |
| Minor Arterial | 3 | 80 |
| Major Arterial | 5 | 100 |

For this TMP, each functional classification is color coded based on the number of lanes on each street. Many of the city streets were constructed prior to the adoption of the typical street sections and therefore do not comply with the standards in Table 1. As such, designating the streets as arterials and collectors in the existing conditions analysis may be misleading. Private streets are rare in the City and should be used where public streets are not possible. However, if private streets are allowed they should meet the minimum cross-section design.

### *Typical Cross Section Review*

The City has adopted typical cross-sections which are used throughout the City. The typical cross-section number of lanes and ROW are included in **Table 1** . The cross-sections as currently used in Tremonton City invite future growth on the roadway network without widening the existing ROW. An example is the addition of 8-foot trail throughout the City. The curb and gutter are shifted in 2' on each side to get the additional 4' of ROW required to add the trail.

Included are a 66-foot ROW minor arterial and a Main Street widening typical cross-section. The 66' ROW minor arterial are indicated for arterials within the City where widening to the typical 80' will cause significant impact to the adjacent land uses. Examples of roadways which will utilize this cross-section are on 1000 North from I-80 to Iowa String Road and on Iowa String Road from 1000 North to Main Street.

There are no recommendations in this TMP for the City regarding any updates to the typical cross-sections. The current cross-sections meet and fulfill what is currently needed in the City. As development occurs throughout the City, it is recommended to revisit the typical cross-sections to determine if any updates are required.

## Roadway Characteristics

For all roadways, there are additional characteristics such as roadway and intersection spacing, access, speed limit, parking, pedestrian facilities and bicycle facilities which will improve traffic flow when followed. A description of these characteristics of the four primary functional classifications of streets are found in **Table 2**. The performance of the roadway network begins to degrade when the roadways are too close together or there are too many of one functional classification. The city's roadway network was analyzed as part of this TMP to determine where improvements can be made for roadway characteristics.

**Table 2: Street Functional Classification Characteristics**

| Characteristic | Functional Classification | | | |
|---|---|---|---|---|
| | Interstate | Arterial | Collector | Local Road |
| Function | Traffic Movement | Traffic movement, land access | Collect and distribute traffic between streets and arterials, land access | Land access |
| Typical % of Surface Street System Mileage | Not Applicable | 5-10% | 10-20% | 60-80% |
| Continuity | Continuous | Continuous | Continuous | None |
| Spacing | 4 miles | 1-2 miles | ½-1 mile | As needed |
| Typical % of Surface Street System Vehicle-Miles Carried | Not Applicable | 40-65% | 10-20% | 10-25% |
| Direct Land Access | None | Limited: major generators only | Restricted: some movements prohibited; number and spacing of driveways controlled | Safety controls access |
| Minimum Roadway Intersection Spacing | 1 mile | 660 feet – ½ mile | 300 feet – ¼ mile | 300 feet |
| Speed Limit | 55-75 mph | 40-50 mph in fully developed areas | 30-40 mph | 25 mph |
| Parking | Prohibited | Discouraged | Limited | Permitted |
| Pedestrian | Separated Trail | Sidewalk/Trail (Parkstrip desired) | Sidewalk/Trail (Parkstrip desired) | Sidewalk (Parkstrip desired) |
| Cyclist | Separated Trail | Bike Lane or Trail | Shared Bike, Bike Lane or Trail | Shared Bike Lane or Trail |
| Comments | Supplements capacity of arterial street system & provides high-speed mobility | Backbone of city's road network | Minimal mobility with significant access | Through traffic should be discouraged |

For instances where there is an interstate or railroad corridor, access to collector roadways are limited to the number of crossings. To maintain good traffic flow on both sides of these corridors, a collector road should be installed on both sides parallel to the corridor. Although it is recommended to space collector roadways according between ½ – 1 mile, collector roadways which have an interstate or railroad corridor between them should be spaced no closer than ¼ mile. When collector roads are spaced close together without a bisecting corridor, it is recommended to de-emphasize one of the two roadways. The following are methods to de-emphasize a roadway:

- **Reduce Speed Limit**
- **Traffic Calming**
- **Remove, Restrict, or Change Access to Roadway**

De-emphasizing is beneficial for roadways with a high number of residential driveways, where safety needs to be improved, where the roadway surface cannot support the traffic demand, where roadway spacing is an issue, and where reduced speed or traffic volumes are desired. As development occurs

throughout the City, especially in annexation areas, roadways should be analyzed to determine if they should be de-emphasized.

After analysis of the existing and future roadway network, the following are suggestions for Tremonton City to improve collector roadway spacing:

1. De-emphasize the following collector roadways
   - **Tremont Street** (Main Street to 600 North)
   - **2300 West** (Main Street to 1000 North)
2. Build North/South collector at approximately 3300 West

# Level of Service

The adequacy of an existing road network can be quantified by assigning Levels of Service (LOS) to major roadways and intersections. As defined in the Highway Capacity Manual (HCM), a document published by the Transportation Research Board (TRB), LOS serves as the traditional form of measurement of a roadway's performance. The TRB identifies LOS by reviewing elements, such as the number of lanes assigned to a roadway, the amount of traffic using the roadway and the time of delay per vehicle traveling on the roadway and at intersections. Levels of service range from A (free flow where users are virtually unimpeded by other traffic on the roadway) to F (traffic exceeds the operating capacity of the roadway) as shown in **Figure 4**

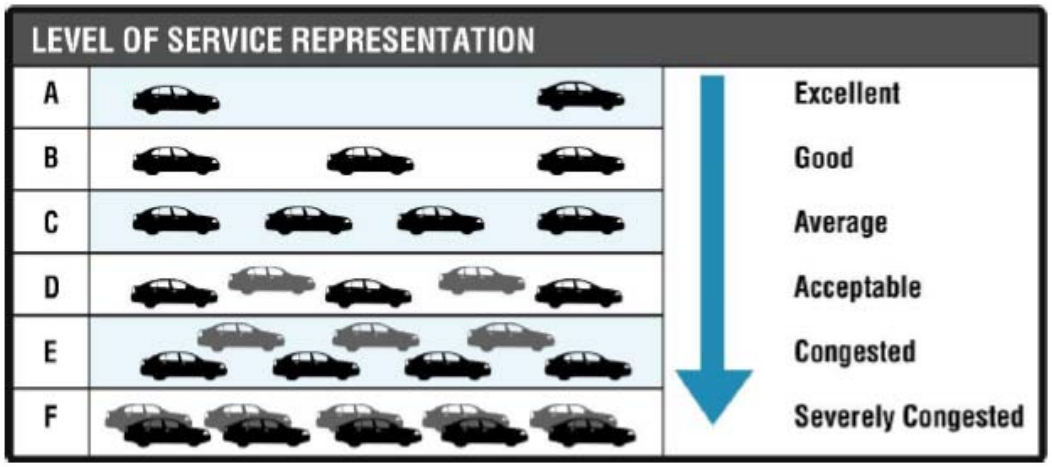



**Figure 4: Level of Service Representation**

## Roadway Level of Service

Roadway LOS is used as a planning tool to quantitatively represent the ability of a particular roadway to accommodate the traffic demand. **Table 3** shows LOS traffic volume thresholds for each of the major roadways in the City. These values are based on HCM principles and regional experience. Roadway segment LOS can be mitigated with geometry improvements, additional lanes, two-way-left turn lanes, and access management.

LOS D is approximately 80 percent of a roadway's capacity and is an acceptable LOS for the roadway network during peak hours. A standard of LOS D for system streets (collectors and arterials) is acceptable for future planning. Attaining LOS C or better on these streets would be potentially cost prohibitive and may present societal impacts, such as the need for additional lanes and wider street cross-sections. LOS D suggests that for most times of the day, the roadways will be operating well below capacity. The peak times of the day will likely experience moderate congestion characterized by a higher vehicle density and slower than free flow speeds.

### *Mitigations to Roadway Deficiencies*

There are multiple methods to mitigate roadway deficiencies. The most well-known mitigation is to add traffic lanes. This method significantly increases the roadway capacity but comes at a significant impact as well. There are locations where the impact is too large to justify additional lanes. An example in Tremonton City is Main Street. To add a lane, additional pavement width is required. This may require ROW acquisition, removal of on-street parking, and decrease the safety for pedestrians using the commercial properties along Main Street.

**Table 3: Interstate, Arterial and Collector LOS Capacity Criteria in Vehicles per Day**

| Lanes | LOS D | LOS E |
|---|---|---|
| **Interstate** | | |
| 4 | 63,000 | 80,000 |
| 6 | 91,000 | 115,000 |
| **Arterial** | | |
| 2 | 15,500 | 19,500 |
| 3 | 16,500 | 21,000 |
| 5 | 26,000 | 33,000 |
| 7 | 42,000 | 53,000 |
| **Collector** | | |
| 2 | 9,500 | 12,000 |
| 3 | 10,500 | 13,500 |
| 5 | 20,500 | 25,500 |

Other mitigation methods can be used to improve and mitigate roadway deficiencies. Where there is space, an additional roadway to bypass the deficient roadway can be built. This deemphasizes the deficient roadway and diverts the traffic to the new roadway. To improve traffic flow, access can be restricted to minimize conflict points for turning vehicles. Where roadway widths can accommodate, lane widths and shoulders can be reduced to fit additional travel lanes.

## Intersection Level of Service

Whereas roadway LOS considers an overall operation of a roadway to estimate operating conditions, intersection LOS looks at each individual movement at an intersection and provides a much more precise method for quantifying operations. Since intersections are typically a source of congestion in the roadway network, a detailed look into vehicle delay at each intersection should be performed on a regular basis. The methodology for calculating delay at an intersection is outlined in the Highway Capacity Manual (HCM) and the resulting criteria for assigning LOS to signalized and un-signalized intersections are outlined in Table 4. LOS D is considered the industry standard for intersections in Tremonton City during peak times. LOS D at an intersection corresponds to an average control delay of 35-55 seconds per vehicle for a signalized intersection and 25-35 seconds per vehicle for an un-signalized intersection.

**Table 4: Intersection Level of Service**

| LOS* | Signalized Intersection (sec) | Stop-Controlled/ Roundabout (sec) |
|---|---|---|
| A | ≤10 | ≤10 |
| B | >10-20 | >10-15 |
| C | >20-35 | >15-25 |
| D | >35-55 | >25-35 |
| E | >55-80 | >35-50 |
| F | ≥80 | ≥50 |

*LOS F when traffic volumes exceed capacity

At a signalized intersection under LOS D conditions, the average vehicle will be stopped for less than 55 seconds. This is considered an acceptable amount of delay during the times of the day when roadways are most congested. As a general rule, traffic signal cycle lengths (the length of time it takes for a traffic signal to cycle through each movement in turn) should be below 90 seconds. An average delay of less than 55 seconds suggests that in most cases, no vehicles will have to wait more than one cycle before proceeding through an intersection. Un-signalized intersections are generally stop-controlled. These intersections allow major streets to flow freely, and minor intersecting streets to stop prior to entering the intersection. In cases where traffic volumes are more evenly distributed or where sight distances may be limited, four-way stop-controlled intersections are common. LOS for an un-signalized intersection is assigned based on the average control of the worst approach (always a stop approach) at the intersection. An un-signalized intersection operating at LOS D means the average vehicle waiting at one of the stop-controlled approaches will wait no longer than 35 seconds before proceeding through the intersection. This delay may be caused by large volumes of traffic on the major street resulting in fewer gaps in traffic for a vehicle to turn, or for queued vehicles waiting at the stop sign. Roundabout LOS is also measured using the stopped controlled LOS parameters.

Intersection and roadway segment LOS problems must be solved independently of each other, as the treatment required to mitigate the congestion is different in each case. Intersection problems may be mitigated by adding turn lanes, improving signal timing, and improving corridor signal coordination.

### *Intersection Deficiency Mitigations*

Mitigations at intersections depend on the existing intersection configuration. At signalized intersections, timing of the signal should be investigated to determine if the timing is the cause for excessive delay. It is recommended to investigate signal timing periodically to ensure intersection deficiencies are not being caused by improper timing. Other mitigations methods which apply to all intersection types involve separating specific movements which cause significant delay at the intersection. Typical mitigations include left turn pockets, right turn pockets, and increase storage lengths. There are other measures which can be implemented at unsignalized intersections based on the geometry and traffic flow. These should be investigated on a case by case basis. When all these methods at an un-signalized intersection are investigated and will not improve LOS to acceptable levels, then the intersection should be signalized.

# Existing Roadway Network Conditions

## Traffic Demand Model Calibration

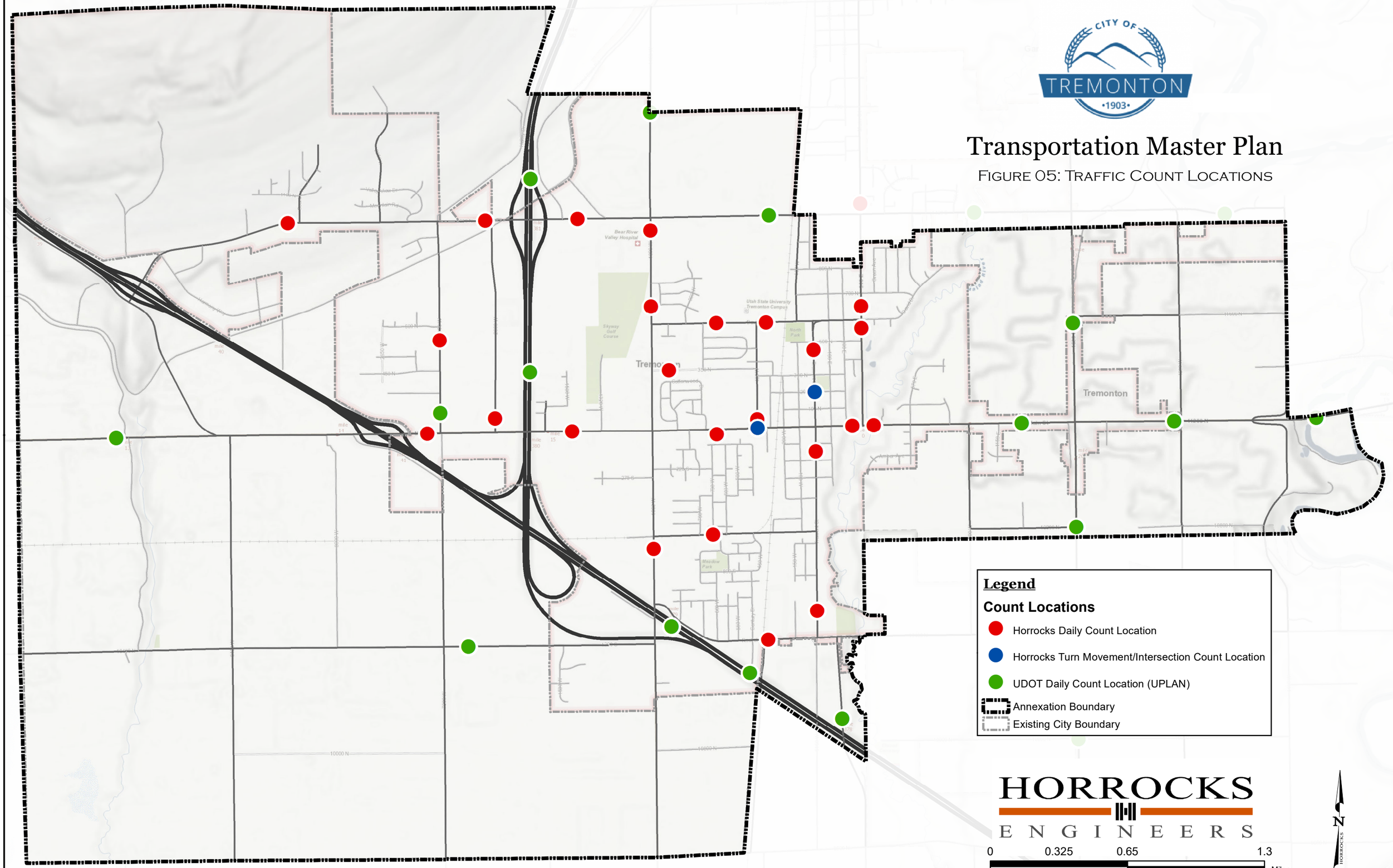
The Traffic Demand Model was calibrated to fit existing traffic conditions in Tremonton City. The method used to calibrate the model was to use traffic counts throughout the City. Traffic counts were received from UDOT and include annual average daily traffic (AADT) volumes as defined in Traffic on Utah Highways. Current and historical UDOT counts were obtained online at *www.udot.gov*. The historical count data on the UDOT website contain counts on many roadways, even roadways not under UDOT jurisdiction. On City owned roadways, traffic counts were either provided by Tremonton City or were manually counted using roadway tube counters as part of this TMP. **Figure 5** shows the count locations throughout the City used for model calibration.

## Existing Functional Classification and Level of Service

The existing functional classification used in the Traffic Demand Model is shown in **Figure 6**. The LOS was calculated for each roadway and intersection according to the guidelines explained in the Level of Service section and a LOS map is included in **Figure 7**. At present all roadways within the existing Tremonton City ROW function at acceptable LOS and is indicated for each roadway segment in **Figure 7**.

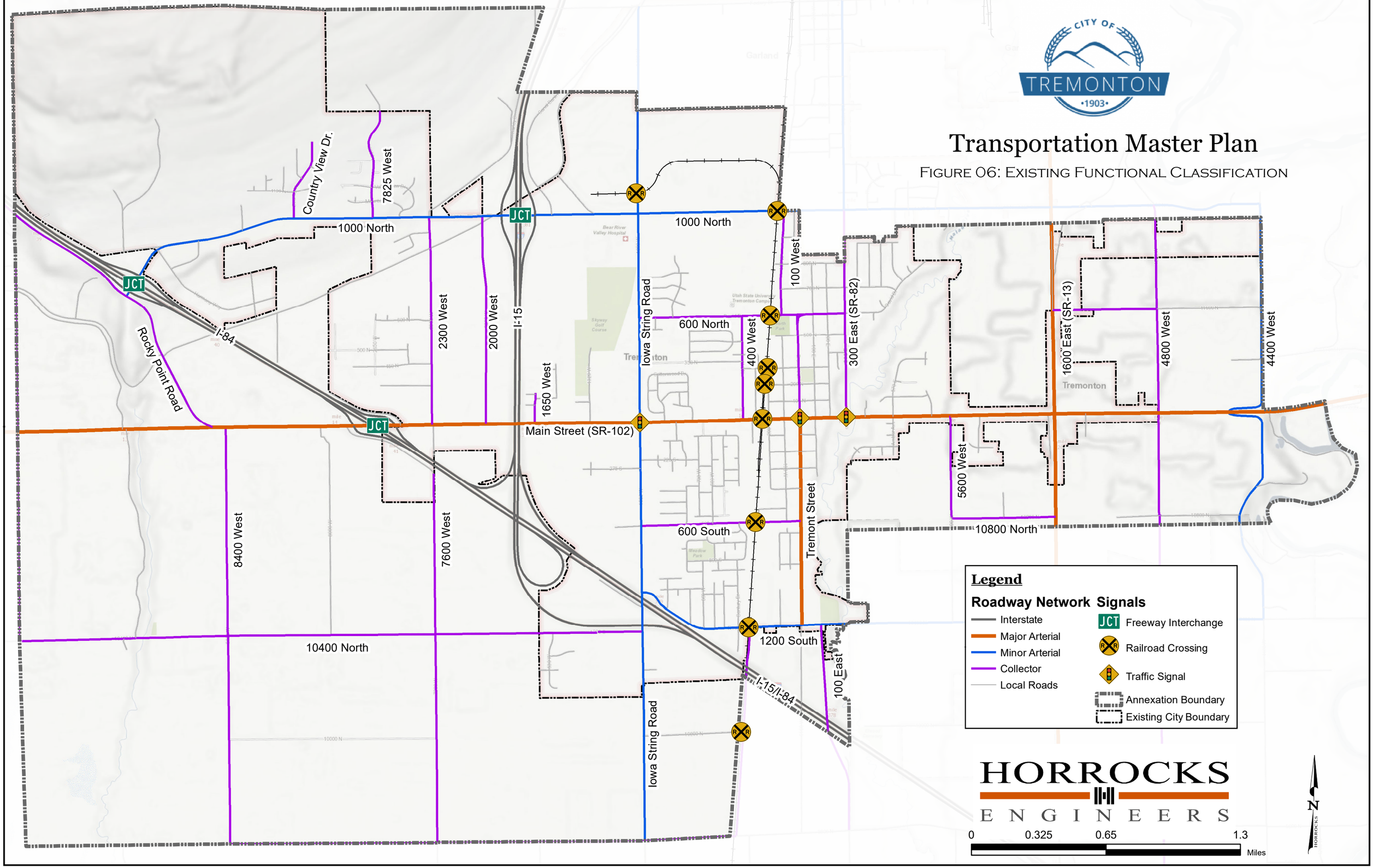
# Transportation Master Plan

## Figure 05: Traffic Count Locations



# Transportation Master Plan

## Figure 06: Existing Functional Classification



# Transportation Master Plan

## Figure 07: Existing Level of Service

< 1,000 (A)
2,600 (A)
4,900 (A)
2,000 (A)
< 1,000 (A)
5,800 (A)
5,900 (B)
1,800 (A)
2,700 (A)
2,600 (A)
2,000 (A)
5,100 (A)
2,600 (A)
1,200 (A)
6,800 (B)
4,300 (A)
1,000 (A)
6,900 (B)
9,600 (C)
9,800 (C)
10,300 (C)
6;500 (B)
2,300 (A)
1,500 (A)
2,900 (A)
2,100 (A)
6,200 (B)
4,000 (A)
< 1,000 (A)
< 1,000 (A)
1,600 (A)
< 1,000 (A)

**Legend**

**Level of Service**

- Acceptable (LOS C or Better)
- Interstate
- Annexation Boundary
- Existing City Boundary

1,700 (A) AADT (LOS)

HORROCKS ENGINEERS

0 0.325 0.65 1.3 Miles

N

# Future Roadway Network Conditions

By calibrating the Traffic Demand Model to fit the existing traffic conditions in Tremonton City, the model is prepared to project vehicle traffic volumes into the future. There are three future models used for this TMP. The first model used was to identify potential capacity deficiencies, called the No Build Model. The other two models project traffic volumes 20 and 50 years into the future to create a 20-Year Model and 50-Year Model.

## Future Trip Generation

Future trips generated within Tremonton City are based on the Institute of Traffic Engineers (ITE) *Trip Generation Manual, 9th Edition*. All trips within the manual are generated based on a unit of measurement (i.e., per residential unit, per 1,000 square feet gross floor area, per acre, etc.). As a significant amount of the City is not currently developed and in order to simplify and streamline the process to generate trips throughout the City, all units of measure were converted to be per acre. See **Appendix A: Traffic Demand Model Methodology** for detailed information regarding trip generation. Input from City staff as well as development pressures in the City were used to determine the appropriate proportion of development which will occur for the 2037 (20 year model) and 2067 (50 year model) Traffic Demand models.

## No Build Level of Service

A No-Build Model is intended to show what the roadway network would be like in the future if no action is taken to improve the City roadway network. A 20-year and 50-year No-Build Model are included in this analysis. The traffic demand model was again used to predict this condition by applying the future growth and traffic demand to the existing roadway network. As shown in **Figure 8** and **Figure 9**, the following roadways would perform at LOS E (which is an unacceptable LOS) or worse if no action were taken to improve the roadway network within a 20 year and 50 year period respectively:

**20 Year No-Build Model Deficiencies**

- **Main Street** (Iowa String Road to 1650 West)

**50 Year No-Build Model Deficiencies**

- **Main Street** (Iowa String Road to I-84)
- **Main Street** (400 West to 570 East)
- **1000 North** (Country View Drive to I-15)
- **2300 West** (1000 North to Main Street)

# Transportation Master Plan

## Figure 08: 20 Year Scenario No-Build Level of Service

1,899 (A)
1,805 (A)
6,714 (B)
10,358 (C)
9,890 (C)
3,796 (A)
8,530 (C)
< 1,000 (A)
6,049 (C)
6,949 (C)
4,820 (B)
3,093 (A)
4,252 (B)
2,497 (A)
7,822 (B)
3,175 (A)
7,708 (D)
5,023 (B)
1,404 (A)
4,009 (B)
1,071 (A)
4,587 (A)
14,374 (D)
16,600 (E)
13,533 (B)
13,700 (D)
11,617 (C)
9,818 (C)
8,055 (B)
1,416 (A)
1,412 (A)
< 1,000 (A)
5,512 (B)
1,579 (A)
4,090 (A)
1,800 (A)
8,404 (B)
< 1,000 (A)
1,047 (A)
1,306 (A)
1,715 (A)
6,548 (B)
< 1,000 (A)
6,600 (B)

**Legend**

**Level of Service**

- Acceptable (LOS C or Better)
- Acceptable (LOS D)
- Unacceptable (LOS E or Worse)
- Interstate
- Annexation Boundary
- Existing City Boundary

1,700 (A) AADT (LOS)

HORROCKS ENGINEERS

0 0.325 0.65 1.3 Miles

N

# Transportation Master Plan

Figure 09: 50 Year No-Build Model Level of Service

3,900 (B)
3,600 (B)
14,300 (D)
16,900 (E)
15,500 (D)
6,300 (B)
11,900 (C)
1,200 (A)
6,200 (C)
12,900 (F)
8,300 (D)
5,700 (C)
6,100 (C)
4,200 (B)
11,100 (C)
3,800 (B)
1,800 (A)
8,900 (D)
6,100 (B)
2,100 (A)
6,700 (C)
2,400 (A)
9,600 (C)
25,300 (F)
28,300 (F)
23,900 (D)
24,100 (F)
20,200 (E)
15,000 (D)
10,000 (C)
2,600 (A)
12,000 (D)
2,500 (A)
3,100 (A)
1,500 (A)
9,200 (C)
1,700 (A)
5,600 (B)
12,300 (D)
1,500 (A)
2,200 (A)
13,600 (D)
1,000 (A)
2,300 (A)
3,000 (A)
1,600 (A)
1,100 (A)
10,200 (C)

## Legend

### Level of Service

- Acceptable (LOS C or Better)
- Acceptable (LOS D)
- Unacceptable (LOS E or Worse)
- Interstate
- Annexation Boundary
- Existing City Boundary

1,700 (A) AADT (LOS)

HORROCKS ENGINEERS

0 0.325 0.65 1.3 Miles

N

## Capital Project List

As new development occurs in Tremonton City, the roadway network will need to be improved by constructing new roads, widening existing transportation corridors, and making intersection improvements to provide future residents of the city with an adequate transportation system. All capital projects listed in this TMP are included in **Table 5** and shown in **Figure 10**.

There are a significant number of projects included in **Table 5**. Many of these projects will be built as development occurs by the developers. All projects on UDOT roadways will be primarily funded by UDOT. Projects listed as new roads and local roads will generally be constructed by Developers, as an exaction, as development occurs. For all other roadways where the City is required to fund the projects, it is recommended to utilize all funding opportunities explained in this TMP document. Updating projects in **Table 5** and **Figure 10** regularly is recommended since project scopes change as new development occurs throughout the City. The projects in **Table 5** are organized by horizon year (20-Year and 50-Year) and denote projects that are anticipated to be funded solely by development. All costs are based on typical unit prices for asphalt, base course, ROW, etc. and are represented as 2017 total costs. See **Appendix B: Cost Estimates** for unit costs and individual project cost estimates. The numbers associated with the projects listed in **Table 5** is not relevant as they are just used to differentiate between the different projects.

**Table 5: Capital Project List**

| Project No. | Project Location | Cost (2017) |
|---|---|---|
| **20-Year Horizon Projects** | | |
| 4 | New Minor Arterial: 1000 North to 2300 West | $5,905,000 |
| 5 | New Minor Arterial: 2300 West to Main Street | $933,000 |
| 8 | 2650 West Extension to Project #4 | $201,000 |
| 10 | 2000 West Realignment to Project #4 | $344,000 |
| 11 | New Traffic Signal : 2000 West & Main Street | $300,000 |
| 14 | HAWK Pedestrian Signal: Intersection of Main Street & 400 West | $310,000 |
| 15 | Railroad Crossing: 800 North & 150 West | $465,000 |
| 23 | 1000 North: I-84 to 2300 West | $3,303,000 |
| 24 | 1000 North: 2300 West to 2000 West | $1,729,000 |
| 25 | 1000 North: 2000 West to 1500 West | $644,000 |
| 26 | 1000 North: 1500 West to Iowa String Road | $663,000 |
| 27 | Iowa String Road: 1000 North to Main St | $1,747,000 |
| 67 | Main Street Widening: Iowa String Road to 1650 West | $1,813,000 |
| **20-Year Horizon Projects Funded Solely by Development** | | |
| 1 | New Collector: 1000 North to Project #3 | $6,292,000 |
| 2 | New Collector: Country View Drive Extension to Project #1 | $572,000 |
| 3 | New Collector: Project #1 to 1000 North | $1,716,000 |
| 6 | New Collector (3040 West): 1000 N to Project #4 | $2,060,000 |
| 7 | New Collector: 2650 West Extension to 1000 North | $1,488,000 |
| 9 | New Local Road: Project #6 to Project #7 | $1,030,000 |
| 12 | Local Roads: South of 1000 North from Iowa String Road to 100 West | $4,010,000 |
| 13 | New Collector: 1000 North to 600 North | $1,545,000 |
| 16 | New Collector: 1000 North to Main Street | $3,318,000 |
| 17 | New Collector (11600 North): 1600 East to Project #16 | $1,087,000 |
| 18 | Local Roads: West of Project #16 | $2,556,000 |
| 19 | Local Roads: East of Project #16 | $4,661,000 |
| 20 | Local Roads: West of 5600 W | $3,083,000 |
| 21 | Local Roads: East of 5600 W | $2,123,000 |

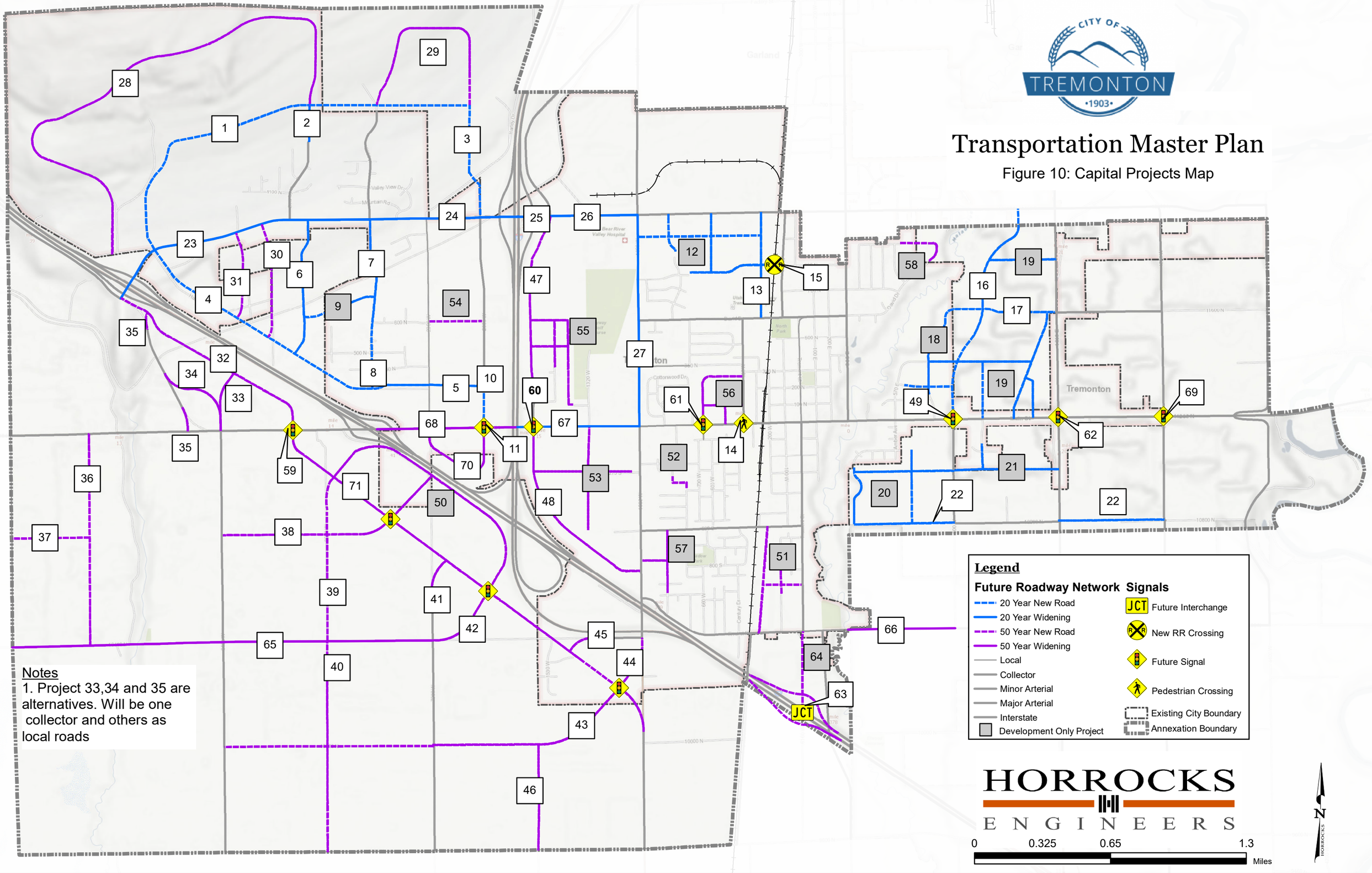
| Project No. | Project Location | Cost (2017) |
|---|---|---|
| 22 | New Collector: 10800 North Extension: 550 East to 1600 East | $1,578,000 |
| **Total Cost for 20-Year Horizon Projects** (Not Including Projects Funded Solely by Development) | | **$18,357,000** |
| **50-Year Horizon Projects** | | |
| 32 | Rocky Point Road Re-Alignment: I-84 to Main Street | $4,156,000 |
| 35 | Old Rocky Point Road: Re-Align to Connect to New Rocky Point Road and Main Street* | $744,000 |
| 42 | 10400 North Alignment to Project #71 (West) | $1,131,000 |
| 44 | Iowa String Road Alignment to Project #71 | $849,000 |
| 45 | New Collector: 10400 North Alignment to Project #71 (East) | $340,000 |
| 49 | New Traffic Signal: 5600 West & Main Street | $300,000 |
| 59 | New Traffic Signal: Main Street & Project #32 and #71 | $300,000 |
| 60 | New Traffic Signal: Main Street & 1650 West | $300,000 |
| 61 | New Traffic Signal: Main St & 600 West | $300,000 |
| 62 | New Traffic Signal: Main Street & 1600 East | $300,000 |
| 63 | I-15 JCT at Project 64 | $77,500,000 |
| 64 | New Minor Arterial (Tremont Street): Extension to I-15 Interchange (Project #64) | $2,116,000 |
| 65 | 10400 North Widening: 9200 West to 2300 West | $5,699,000 |
| 66 | 1200 South Widening: Malad River to 4700 West | $2,870,000 |
| 68 | Main Street Widening: 1650 West to I-84 | $2,220,000 |
| 69 | New Traffic Signal: Main Street & 4800 West | $300,000 |
| 71 | New Minor Arterial (Commerce Highway): Iowa String Road to Main Street | $8,420,000 |
| 72 | New Minor Arterial: I-15 Interchange to Iowa String Road | $3,135,000 |
| 73 | New Traffic Signal: Tremont Street & Rocket Road | $300,000 |
| **50-Year Horizon Projects Funded Solely by Development** | | |
| 28 | New Collector: 1000 N to Country View Dr (Project #1) | $8,008,000 |
| 29 | New Collector: Project #1 to Project #3 | $3,318,000 |
| 30 | New Collector (3300 West): 1000 North to Project #4* | $1,831,000 |
| 31 | New Collector (3450 West): 1000 North to Project #4* | $1,373,000 |
| 33 | New Collector: Main Street to Project #32* | $916,000 |
| 34 | New Collector: Main Street to Old Rocky Point Rd* | $1,001,000 |
| 36 | New Collector: Main Street to 10400 North | $3,089,000 |
| 37 | New Collector (10400 North): 9200 West to Project #36 | $1,202,000 |
| 38 | New Collector (10400 North): 8400 W to Project #32 and Project #71 | $2,489,000 |

| Project No. | Project Location | Cost (2017) |
|---|---|---|
| 39 | New Collector: 10400 North to Project #71 | $3,062,000 |
| 40 | New Collector: 10400 North to 9600 North | $3,053,000 |
| 41 | New Collector: 2300 West Alignment to Project #71 | $286,000 |
| 43 | New Collector: 10000 North Extension to Project #71 | $3,003,000 |
| 46 | New Collector: 9600 North to Project #43 | $1,545,000 |
| 47 | New Collector: 1650 West Extension to 1000 N | $2,717,000 |
| 48 | New Collector: Main Street to 850 South | $2,975,000 |
| 50 | Local Roads Northeast of Project #71 | $4,360,000 |
| 51 | Local Roads Southwest of Tremont St and 600 S | $2,674,000 |
| 52 | New Local Connection: 830 West to 760 West | $351,000 |
| 53 | Local Roads Southwest of Main St/Iowa String Rd | $3,308,000 |
| 54 | Local Road connecting 600 N to 2000 W | $702,000 |
| 55 | Local Roads East of Project #47 | $2,857,000 |
| 56 | Local Roads Northwest of Main St/4th W | $1,754,000 |
| 57 | Local Roads Southeast of 600 S/6800 W | $1,003,000 |
| 58 | Local Rd connecting 875 N to David Dr. | $652,000 |
| 70 | New Loop Road: 2300 West to 2000 West | $1,716,000 |
| **Total Cost for 50-Year Horizon Projects Only (Not Including Projects Funded Solely by Development)** | | **$111,280,000** |
| **Total Cost for All Projects through 50-Year Horizon (Not Including Projects Funded Solely by Development)** | | **$129,637,000** |

*Projects included are alternatives. Decision of which alternative will occur during design of the roadway

# Transportation Master Plan

Figure 10: Capital Projects Map



## 20-Year and 50-Year Scenario Roadway Network

If all improvements included in **Table 5** and **Figure 10** are implemented as described, the future roadway network in Tremonton will appear as shown **Figure 11** and **Figure 12** in 20 years and 50 years respectively. **Figure 11** is the culmination of all previous analyses and vehicular planning efforts as well as the analysis included as part of this TMP. The final recommended roadway network seeks to balance accommodating demand for the next 50 years with fiscal responsibility, while also considering the planning efforts of neighboring cities. If all the improvements included in **Table 5** and **Figure 10** are implemented, **Figure 13** and **Figure 14** show the LOS for the 20-Year and 50-Year build which is projected to be LOS D (acceptable) or better.

### *Changes to Proposed Roadway Network from Previous Transportation Master Plan*

There are a few differences between what is recommended in this TMP and previous analyses. The following highlights the changes included in **Table 5** and **Figure 10** which are not included in previous analyses.

**Project 4 and Project 5:** New Minor Arterial: 1000 N to 2300 W

This project is a new Minor Arterial (named BR Mountain Road) connecting 1000 North to Main Street. The roadway parallels the Interstate until it turn east/west at 2550 West. The road utilizes the open space surrounding 2000 West to turn and connect to Main Street. The existing portion of 2000 West north of the new roadway is re-routed to connect perpendicularly on the new roadway (See Project 10).

The previous TMP map called out for the arterial street to connect to Main Street via 2300 West. In this TMP, 2300 West will not be affected and will be a collector roadway from 1000 North to Main Street.

**Project 11:** Signal at 2000 W/Main St

This project corresponds to the change of the location where Project 4 connects to Main Street. The previous TMP map had both the new Minor Arterial and Signal connecting at 2300 West. It is ideal to have traffic signals where Arterial streets cross. This change also improves the signal spacing from the I-84 interchange.

**Project 12:** Local Roads South of 1000 North

In the previous TMP map, the development south of 1000 North between Iowa String Road and Tremont Street were all local roadways with a collector roadway connecting 760 North to 800 North. This TMP removes the collector road designation and all roadways in this area are local roadways.

**Project 14:** HAWK Signal at 400 W and Main St

Included as part of this TMP is a concept drawing of a high-intensity activated crosswalk beacon (HAWK) pedestrian signal for the trail crossing at 400 West and Main Street. This is a difficult crossing since the north side of Main Street has a separated bike and pedestrian path whereas it is joint on the south side of Main Street. This concept provides a high level look at an alternative to updating the crossing. When the trail is completed, a pedestrian activated signalized crossing will be needed at this intersection.

**Project 30:** New Collector Road (3300 West): 1000 N to Project #4 and **Project 31:** New Collector Road (3450 West): 1000 N to Project #4

Both Project 30 and Project 31 were included in the previous TMP map. The analysis of roadway spacing recommends only one of these two roadways be built as a collector road in the future. Reasons for keeping both in the TMP as alternatives are to allow the City flexibility for future planning efforts. If both roadways are built, only one will be a collector roadway with the other as a local roadway.

**Project 33:** New Collector: Main St to Project #32 and **Project 34:** New Collector: Rocky Point Rd to Project #33

These projects are alternatives to improve connectivity between Main Street and Rocky Point Road. Project 32 re-routes Rocky Point Road as a Minor Arterial to connect to Main Street at a new signal on Main Street (Project 59). Between the old and new alignments, 8400 West connects to Main Street from the South. Both the collector roads in Project 33 and Project 34 utilize this connection. Project 33 connects to the Rocky Point Road extension (Project 32) and Project 34 connects into the old collector alignment of Rocky Point Road.

The other option included in that area are to curve the existing Rocky Point Road alignment into Main Street as indicated in Project 35 as a collector road. When development occurs in this area, one or more of these alternatives will be selected.

**Project 71:** New Minor Arterial (Commerce Highway): Iowa String Road to Main Street

Commerce Highway, the new road connecting Iowa String Road and Main Street South of I-15/I-84 is the major change from the previous TMP. Commerce Highway realigns Iowa String road to parallel the Interstate beginning at approximately 10000 North and connects to Main Street at the new traffic signal (Project 59). Aligning the minor arterial to parallel the Interstate facilitates future commercial development in the area. With development along the minor arterial corridor, Commerce Highway will become an economic center for Tremonton City as well as the surrounding communities.

The road will be built with 90 feet of Right-of-Way with raised medians. All major intersections will be signalized with all other accesses as right-in/right-out (RIRO) only. Since this area will act as an economic center for the entire area, the pavement section will

be built wide enough to be striped as either a 3-lane or 5-lane road. A trail section will be developed as part of the roadway for ease of pedestrian traffic.

Another purpose for this minor arterial is to assist with semi-truck traffic flow. Currently, there is significant semi-truck traffic which travels from distribution centers south of the City via Main Street. Commerce Highway allows semi-trucks to access the I-84 and I-15 without using Main Street.

As this minor arterial will be primarily to assist semi-truck traffic to quickly access the interstate, access management as included in the TMP along the corridor is very important to the success of Commerce Highway. Too many accesses will cause congestion and deter semi-trucks from using the minor arterial.

The existing roadways throughout the area will be re-aligned to connect to the minor arterial perpendicularly and are changes from the previous TMP map (See Projects 41, 42, 43, 44, 45, and 50). Project #71 (Commerce Highway) is a high priority project because corridor preservation is required throughout the roadway alignment. Although the roadway will not be built for over 20 years, if the ROW along the alignment can be purchased before it develops it will minimize impacts and facilitate the process of building the road.

**Project 63, Project 72 and Project 73:** I-15 Interchange at Tremont Street

These projects add a new interchange at I-15 at Tremont Street and minor arterials connecting the interchange to the existing Tremont Street alignment on the north and to Iowa String on the south. The project also adds a traffic signal at Rocket Road. This interchange and corresponding roadways are solely dependent on if significant growth has occurred throughout the next 50 years. If the interchange is not needed, all the roadway improvements will not be built.

### *Future Interchange Location in Tremonton*

There was a discussion regarding adding an interchange at Main Street and I-15. This would be a difficult task due to spacing issues: the interchange would be 0.25 miles from the I-15 and I-84 interchange, and 0.75 miles from Main Street and I-84 interchange. However, the location for a new interchange with no spacing issues on I-15 is at Tremont Street. If an interchange is built, it will be closer to 50 years and by the time it is built, it is anticipated that development and re-development surrounding the interchange will allow for proper traffic flow to the area.

# Transportation Master Plan

Figure 11: 20-Year Model Roadway Network

**Notes:**

1 A new railroad crossing is desired at 800 N.
If built, the crossing at 200 N will be removed.

**Legend**

**Roadway Network**

- Interstate
- Major Arterial
- Minor Arterial
- New Minor Arterial
- Collector
- New Collector
- New Local
- Existing City Boundary
- Annexation Boundary

**Signals & Crossings**

- Existing RR Crossing
- New RR Crossing
- Existing Signal
- Future Signal
- Pedestrian Crossing

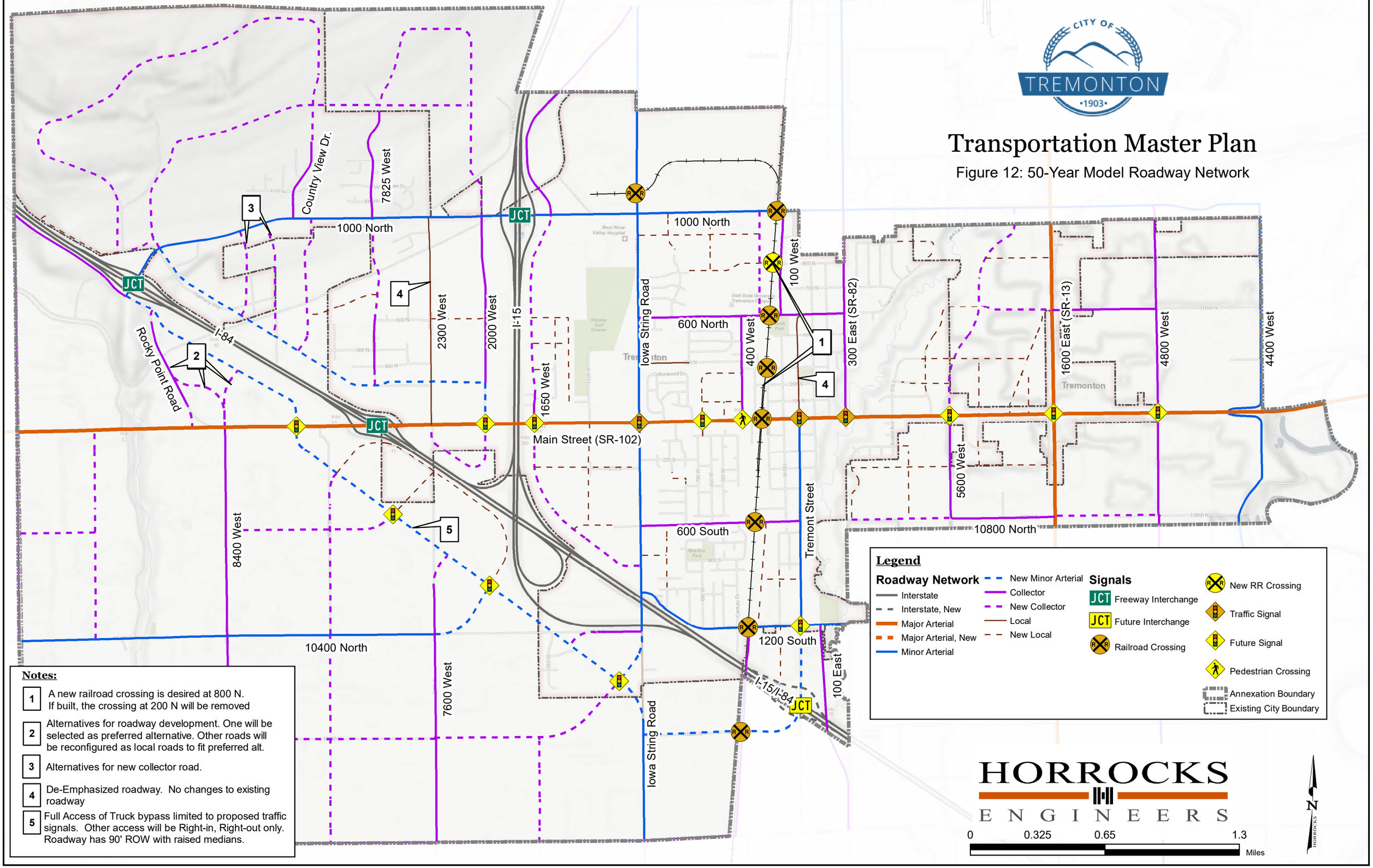
0 0.325 0.65 1.3 Miles

N

HORROCKS

# Transportation Master Plan

Figure 12: 50-Year Model Roadway Network



# Transportation Master Plan

## Figure 13: 20-Year Model Level of Service

5,941(B)
1,600(A)
1,899(A)
2,308(A)
1,599(A)
1,505(A)
4,199(A)
7,451(B)
9,087(C)
3,715(A)
7,232(B)
1,890(A)
6,017(B)
< 1,000
3,681(A)
< 1,000
4,650(A)
3,093(A)
< 1,000
2,434(A)
6,492(B)
2,842(A)
7,716(C)
1,234(A)
3,382(A)
< 1,000
1,092(A)
2,509(A)
5,023(A)
1,002(A)
4,564(A)
13,235(D)
16,125(D)
13,331(A)
13,915(D)
11,920(C)
9,876(C)
8,055(C)
1,214(A)
1,417(A)
< 1,000
4,772(A)
1,579(A)
3,645(A)
8,374(C)
< 1,000
1,677(A)
2,080(A)
6,723(B)
6,598(B)

**Legend**

**Level of Service**

- Acceptable (LOS C or Better)
- Acceptable (LOS D)
- Unacceptable (LOS E or Worse)
- Interstate
- Annexation Boundary
- Existing City Boundary

1,700 (A) AADT (LOS)

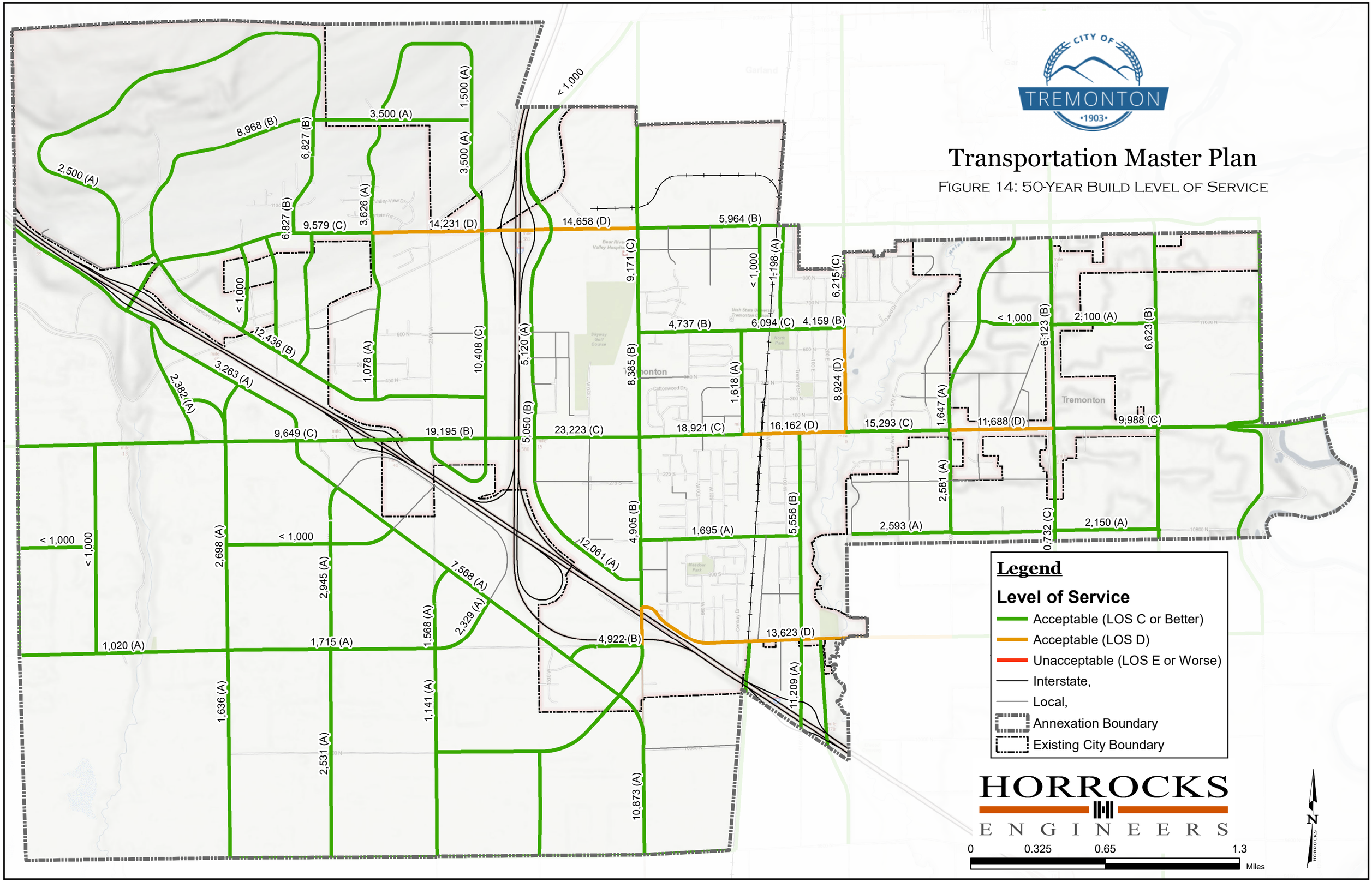
HORROCKS ENGINEERS

0 0.325 0.65 1.3 Miles

N

# Transportation Master Plan

## Figure 14: 50-Year Build Level of Service



## Potential Funding to Meet Demands of New Development

All possible funding sources should be considered as a means of financing transportation capital improvements needed as a result of new growth. This section discusses the potential funding sources that could be used to fund transportation needs as a result of new development.

Transportation routes often span multiple jurisdictions and provide regional significance to the transportation network. As a result, other government jurisdictions or agencies often help pay for such regional benefits. Those jurisdictions and agencies could include the Federal Government, the State (UDOT), and Box Elder County. The City will need to continue to partner and work with these other jurisdictions to ensure adequate funds are available for the specific improvements necessary to maintain an acceptable LOS. The City will also need to partner with adjacent communities to ensure corridor continuity across jurisdictional boundaries (i.e., arterials connect with arterials; collectors connect with collectors, etc.).

Funding sources for transportation are essential if the Tremonton City recommended improvements are to be built. The following paragraphs further describe the various transportation funding sources available to the City.

### *Federal Funding*

Federal monies are available to cities and counties through the federal-aid program. UDOT administers the funds and in order to be eligible for federal funds, a transportation project must be listed on the five-year Statewide Transportation Improvement Program (STIP). What follows are various federal transportation funding programs.

*Surface Transportation Program (STP) Funds.* The Surface Transportation Program (STP) funds projects for any roadway with a functional classification of a collector street or higher as established on the Statewide Functional Classification Map. STP funds can be used for both rehabilitation and new construction. The Joint Highway Committee programs a portion of the STP funds for projects around the state in urban areas. Another portion of the STP funds can be used for projects in any area of the state at the discretion of the State Transportation Commission. STP funds are allocated based on a competitive application process and is reviewed by the Joint Highway Committee. Transportation enhancements include twelve categories ranging from historic preservation, bicycle and pedestrian facilities, and water runoff mitigation.

*Congestion Mitigation and Air Quality (CMAQ).* Tremonton City is located within a non-obtainment area wherein the air quality does not meet the National Ambient Air Quality Standards ("NAAQS") for ozone, carbon monoxide, or particulate matter. As a part of being within a non-obtainment area, Tremonton City is eligible for receiving Congestion Mitigation Air Quality ("CMAQ") Funds that 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. To

benefit from the CMAQ program, Tremonton City has applied for CMAQ Funding for intersection improvements within the City limits.

### *State/County Funding*

The distribution of State Class B and C Program monies is established by State Legislation and is administered by the State Department of Transportation. Revenues for the program are derived from State fuel taxes, registration fees, driver license fees, inspection fees, and transportation permits. 75% of these funds are kept by UDOT for their construction and maintenance programs. The rest is made available to counties and cities. As several of the roads in Tremonton fall under UDOT jurisdiction, coordination with UDOT is needed to ensure funds are allocated for future roadway projects. Including these projects in the TMP is a good way for the City to be active in requesting the funds be made available for UDOT owned roadways in the City.

Class B and C funds are allocated to each city and county by a formula based on population, centerline miles, and land area. Class B funds are given to counties, and Class C funds are given to cities and towns. Class B and C funds can be used for maintenance and construction projects; however, thirty percent of those funds must be used for construction or maintenance projects that exceed $40,000. The remainder of these funds can be used for matching federal funds or to pay the principal, interest, premiums, and reserves for issued bonds.

The Utah State Legislature has authorized counties to impose a Local Option Transportation Corridor Preservation Fee of up to ten dollars ($10.00) on each motor vehicle registration within a county for the advance acquisition of right-of-way for future transportation corridors while it is vacant and available rather than years later, when the property is developed. Box Elder County adopted the Local Option Transportation Corridor Preservation Fee and has established an application and approval process for the use of these funds. Tremonton City has in the past and should continue in the future to apply to the County for the use of these funds.

In 2005, the State Senate passed a bill providing for the advance acquisition of right-of-way for highways of regional significance. These corridor preservation funds would enable cities and counties to better plan for future transportation needs by acquiring property to be used as future right-of-way before it is fully developed and becomes extremely difficult to acquire. In order to qualify for preservation funds, the City must comply with the Corridor Preservation Process, which is found on UDOT's website using the following link *www.udot.utah.gov/public/ucon*.

### *City Funding*

Some cities utilize general fund revenues for their transportation programs. Another option for transportation funding is the creation of special improvement districts. These districts are organized for the purpose of funding a single specific project that benefits an identifiable group of properties. Another source of funding used by cities is revenue bonding for projects intended to benefit the entire community. A revenue bond pledges the repayment solely from revenues source, such as Class C Road Funds.

General fund revenues are typically reserved for operation and maintenance purposes as they relate to transportation. However, general funds could be used if available to fund the expansion or introduction of specific services. Providing a line item in the City general fund budget to address roadway improvements, which are not impact fee eligible, is a recommended practice to fund transportation projects, should other funding options fall short of the needed amount.

General obligation bonds are debt paid for or backed by the City's property taxing power. General obligation bonds require a special election and the majority vote in support of issuance of the bond. Typically, general obligation bonds are not used to fund facilities that are needed as a result of new growth because existing residents would be paying for the impacts of new growth. As a result, general obligation bonds are not considered a fair means of financing future facilities needed as a result of new growth. They may be considered a reasonable means to address existing deficiencies.

Certain areas might have different needs or require different methods of funding than traditional funding sources. A Special Assessment Area (SAA) can be created for infrastructure needs that benefit or encompass specific areas of the City. Creation of the SAA may be initiated by the municipality by a resolution declaring public health, convenience, and necessity require the creation of a SAA. The boundaries and specific improvements must be specified and a public hearing held prior to creation of the SAA. Once the SAA is created, funding can be obtained from tax levies, bonds, and fees when approved by the majority of the qualified electors of the SAA. These funding mechanisms allow the costs to be financed out over time. Through the SAA, tax levies and bonding can apply to specific areas in the City needing to benefit from the improvements.

### *Interfund Loans*

Since infrastructure must generally be built ahead of growth, it must sometimes be funded before expected impact fees are collected. Bonds are the solution to this problem in some cases. In other cases, funds from existing user rate revenue will be loaned to the impact fee fund to complete initial construction of the project. As impact fees are received, they will be reimbursed. Consideration of these loans will be included in the impact fee analysis and should be considered in subsequent accounting of impact fee expenditures.

### *Developer Exactions and Dedications*

Utah Code Annotated 10-9a-508 allows municipalities to require Developers to make infrastructure improvements as a condition of issuance of a development permit which is typically referred to as an exaction. Imposing an exaction on development for improvements to the road network is legal if: there is an essential link exists between a legitimate governmental interest and each exaction; and each exaction is roughly proportionate, both in nature and extent, to the impact of the proposed development. As such it is common for municipalities to exact or require developers to dedicate right-of-way to cities and construct the local streets and collector roads within subdivisions and to participate in their proportionate share of constructing arterial streets adjacent to their developments.

### *Impact Fees*

Impact fees provides the City funds to assist in the construction of infrastructure improvements resulting from and needed to serve new development. The premise behind impact fees is that if no new development occurred, the existing infrastructure would be adequate. Therefore, new development should pay for the portion of required improvements that result from their impact on the existing road network like traffic signals and road widening. Impact fees are assessed for many types of infrastructure and facilities that are provided by a community, such as roadways and trails. According to state law, impact fees can only be used to fund growth related system improvements. Impact fees are typically assessed and collected by the city with the issuance of a building permit.

# Alternative Modes of Transportation

## Transit

Transit in Brigham City, Perry, and Willard is provided by the Utah Transit Authority (UTA). There is currently no transit service in Tremonton City. As development continues to occur in Tremonton City as well as the surrounding areas, it is recommended that the voters of Tremonton City consider joining either the UTA or Cache Valley Transit District (CVTD). To receive transit service from UTA or CVTD it is anticipated that the majority of Tremonton City voters would need to vote in favor of an optional sales tax to fund transit. The UDOT Box Elder County Emerging Plan includes future transit connecting Tremonton to Brigham City as well as the surrounding communities as shown in **Figure 15**.

### *Future Commuter Rail in Tremonton*

Frontrunner will eventually extend as far north as Brigham City and the current Box Elder Emerging Area Plan envisions Frontrunner transit connecting Tremonton. It is desired for the FrontRunner rail line to extend into Tremonton City. Although the commuter rail line will not reach Tremonton for many years to come (See Appendix C regarding a memo from UTA on Frontrunner), preparing for a future FrontRunner station will assist the City as development occurs. Although the exact location of the future station is not known at this time, the following indicate three potential locations near existing railroad lines within Tremonton that seem like reasonable sites:

1. 6400 West and 1600 South (South of I-15)
2. 6400 West and 1200 South
3. 400 West and 450 North

Commuter rail service as another form of transportation will allow Tremonton to become an attractive destination for development. This is due to the easy access for commuter traffic to Brigham City, Ogden, Salt Lake City and Provo. It is important for Tremonton City to begin planning for a future FrontRunner station today in order to be prepared for the future station. Each of the three potential locations on **Figure 15** were examined to determine a preferred station alternative. The following characteristics were used to determine a preferred alternative:

**Distance from Main Street**

Main Street is important for the economic growth in Tremonton City. If the station can be located close to Main Street, it will increase clientele for all businesses throughout the downtown corridor. This will help maintain the importance and relevance of the downtown area.

**Interstate Access**

Access to the station is important for ridership of commuter rail. With the station close to the Interstate, it will be easy to access throughout the region. A station close to an Interstate access will minimize the impact of outside traffic volumes on City streets.

**Transit Oriented Development**

A FrontRunner station provides a great opportunity for new development. Transit Oriented Development (TOD) is development surrounding the station which is focused on utilizing transit. Included is high density residential, commercial and business land uses where residents can live, work and still have easy access utilizing the commuter rail.

### Proposed Station Size

The proposed site will require enough land to include the platform along the tracks, parking, and access for buses. If there is inadequate space to fit these items, it will have a negative impact on ridership.

### Access to Station and Platform

Ease of access to the station and the platform are important to determine the location of the station. If access to the either the station or platform is difficult, it will have a negative impact on ridership. Access can be impacted by the size and location of the property near the tracks.

### Bus Transfers

On **Figure 15** are proposed bus routes throughout the area. It is important for the station to allow for bus transfers. This allows riders from the area who cannot drive to the station to have easy access to the FrontRunner.

Each characteristic above was analyzed for each station alternative, and a summary is included in **Table 6**. For each station alternative, a "+", "o", for a "–" were included to determine if the characteristics described above have a positive, neutral, or negative impact for the alternative respectively. Included for each alternative are notes which describe the reasoning for the positive, mediocre or negative rating. Also included is an "alternative ranking" which ranks each alternative from 1-3 based on the number of positive, neutral, and negative rankings with the most positive being 1 and least positive being 3. Based on the analysis, the station location at 6400 West & 1600 South ranked the highest with the station located at 400 West & 450 North ranked the lowest. This analysis does not determine the final station location alternative, but can be used as development occurs to assist the City in making a final decision on a proposed location for the future FrontRunner station.

**Table 6: FrontRunner Station Alternative Analysis Summary**

| Station Alternative Location | Distance from Main Street | Distance from Interstate Access | Transit Oriented Development | Access to Station and Platform | Ability to Include Bus Transfers | Size of Proposed Site | **Alternative Ranking** | Notes |
|---|---|---|---|---|---|---|---|---|
| 1. 6400 West & 1600 South | – | + | + | ○ | + | + | **1** | Located far from Main Street<br>Easy Interstate access at new interchange<br>Great potential for TOD<br>Need to cross RR tracks when entering station<br>Size of site should allow both parking and bus transfers<br>Proximity to Canal Rail Trail |
| 2. 6400 West & 1200 South | – | + | + | – | + | + | **2** | Located far from Main Street<br>Easy Interstate access at new interchange<br>Great potential for TOD<br>Need to cross both street and tracks to access platform<br>Size of site should allow both parking and bus transfers<br>Proximity to Canal Rail Trail |
| 3. 400 West & 450 North | + | ○ | – | + | ○ | – | **3** | Located closest to Main Street<br>Location is furthest from Interstate<br>Already built out, no TOD potential<br>Easy access to station and platform<br>Small station which limits parking and/or bus transfers<br>Proximity to Canal Rail Trail |

### *Coordination with UTA*

As mentioned, FrontRunner is something the City is beginning to plan, but not expecting to implement for many years to come. Implementation of a future FrontRunner line will be very expensive and significant planning and analysis is required before breaking ground. Coordination with UTA has begun, and it is recommended to focus on bus service within the City for the time being (See **Appendix C: UTA FrontRunner Memo**). As shown in **Figure 15**, there are many commuter bus routes which are planned from Tremonton to Brigham City and Logan. As this TMP is updated, this section will be updated to incorporate transit planning in Tremonton.

# Transportation Master Plan

Figure 15: Tremonton Transit

**Tremonton to Logan**
*Cache Valley Short-Range Transit Plan*

**Tremonton to Logan**
(Alternative)
*Cache Valley Short-Range Transit Plan*

**Brigham City to Tremonton**
(All Day Service)
*Box Elder Transit Study*

**Brigham City to Tremonton**
(Commuter Service)
*Box Elder Transit Study*

**Thiokol to Logan**
(Commuter Service)
*Box Elder Transit Study*

Site 1

Site 2

Site 3

**Legend**

**Bus Routes**
- Brigham City to Tremonton (Comm.)
- Brigham City to Tremonton (Daily)
- Thiokol to Logan
- Tremonton to Logan
- Tremonton to Logan Alt.
- FrontRunner Locations

**Future Roadway Network**
- Interstate
- New Interstate
- Existing Roadways
- New Roadways
- Existing City Boundary
- Annexation Boundary
- Canal Rail Trail

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0 0.325 0.65 1.3 Miles

## Pedestrians and Bicycles

Pedestrian and bicycle facilities and safety are an important feature of any transportation master plan. Tremonton City is currently working on the *Tremonton City Bike Route & Non-Motorized Trail Plan (see appendix D)*. People are more inclined to walk or ride their bicycle on facilities when the experience is pleasant, they feel safe, and distances are reasonable. High-density housing near high-traffic generators or main street type areas encourages people to use alternative travel options. The following descriptions of bicycle-related terms are provided to assist readers who are unfamiliar with bicycle terminology. The terms bicycle and bike are used interchangeably.

- **Bikeway** - A thoroughfare suitable for bicycles that may either exist within the right-of-way of other modes of transportation, such as highways, or along a separate and independent corridor.
- **Bicycle Facilities** - A general term denoting improvements and provisions to accommodate or encourage bicycling, including parking facilities, maps, all bikeways, and shared roadways.
- **Bicycle or Multi-Use Path (Bike Path or Class 1)** - A bikeway physically separated from motorized vehicular traffic and either within the highway right-of-way or within an independent right-of-way. Bike path facilities are often excellent recreational routes and can be developed where right-of-way is available. Typically, bike paths are a minimum of 10 feet to 12 feet wide, with an additional graded area maintained on each side of the path.
- **Bicycle Lane (Bike Lane or Class 2)** - A portion of a roadway that has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists. Bike lanes are ideal for minor thoroughfares or collectors. Under certain conditions, bike lanes may be beneficial on streets with significant traffic volumes and/or speeds. Under ideal conditions, minimum bike lane width is four feet.
- **Signed Bike Route (Class 3)** - A segment of a system of bikeways designated by appropriate directional and/or informational signs. In the TMP, a Class 3 signed bike route may be a local or residential street, Bicycle Boulevard, an arterial with wide outside lanes, or a roadway with a paved shoulder.
- **Paved Shoulder** - The part of the highway that is adjacent to the regularly traveled portion of the highway, is on the same level as the highway, and when paved can serve as a bikeway. Paved shoulders should be at least four feet wide, and additional width is desirable in areas where speeds are high and/or a large percentage of semi-trucks use the roadway.
- **Wide Outside Lane** - An outside (curb) lane on a roadway that does not have a striped bike lane, but is of sufficient width for a bicyclist and motorist to share the lane with a degree of separation. A width of 14 feet is recommended to safely accommodate both motor vehicles and bicycles.
- **Bicycle Boulevard** - A residential street that has been modified for bicyclist safety and access.

Figure 16 shows future pedestrian and bike paths in Tremonton City. The most current draft version of the *Tremonton City Bike Route & Non-Motorized Trail Plan* is included in Appendix D: Tremonton City Bike Route & Non-Motorized Trail Plan. Included in the plan are proposed locations for non-motorized routes, bike routes, separate bike & pedestrian paths and signage locations.

### *Canal Rail Trail Crossing at Main Street*

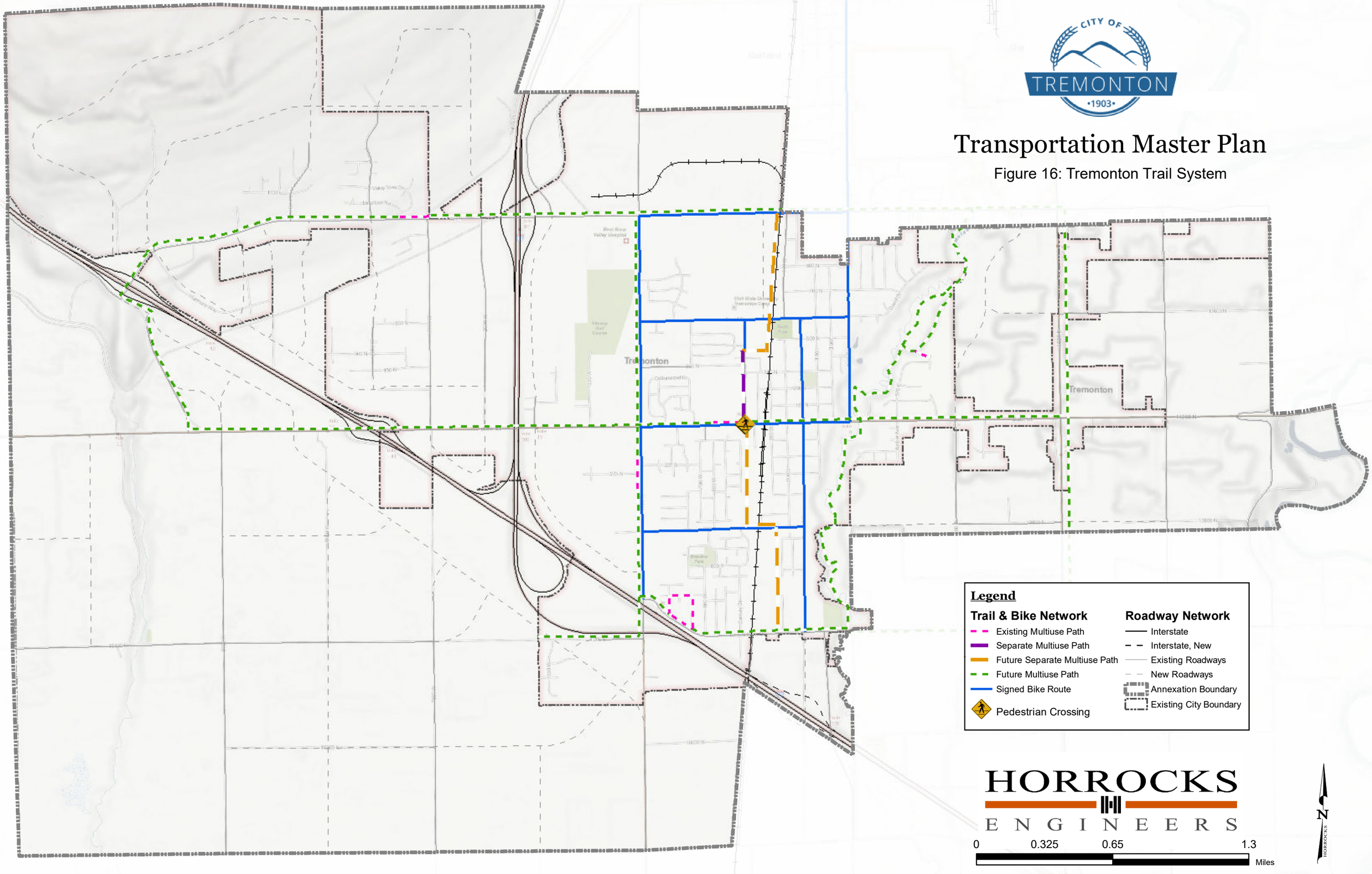
Included in the *Tremonton City Bike Route & Non-Motorized Trail Plan* is a Non-Motorized Route (see **Figure 16**) identified as the Canal Rail Trail which when constructed will be a 10' - 12' wide paved multi-use path that is primarily separated from motorized vehicular traffic within an independent right-of-way (class 1 facility). As the Canal Rail Trail crosses Main Street at 400 West the trail will diverge into a separated bike and pedestrian facility from Main Street to approximate 450 North, with the cyclist using an on-street bike lane and the pedestrians using an 8' sidewalk (see Appendix D, *Canal Rail Trail Enlarged Area*). The Canal Rail Trail crossing at Main Street is a unique because as stated above the north side of Main Street has a separated bike and pedestrian path, whereas on the south side of Main Street the Canal Rail Trail converges into a shared multi-use path. To address this unique crossing and transition from a separated path to a multi-use path, it is proposed that a HAWK (High-intensity Activated crosswalk) signal crossing with separate crossing for pedestrians and bicyclists be installed to minimize potential conflicts between pedestrians, bicyclists and vehicles. The flashing lights on the HAWK signal crossing is activated by cyclist or pedestrians pushing a button. It is also proposed that the Main Street be reduced from 5 lanes to 3 lanes before the HAWK crossing to reduce the crossing distance and improve safety for cyclist and pedestrians. Since Main Street is a UDOT facility it is important for the City to coordinate the construction costs and permits associated with installing the HAWK crossing.

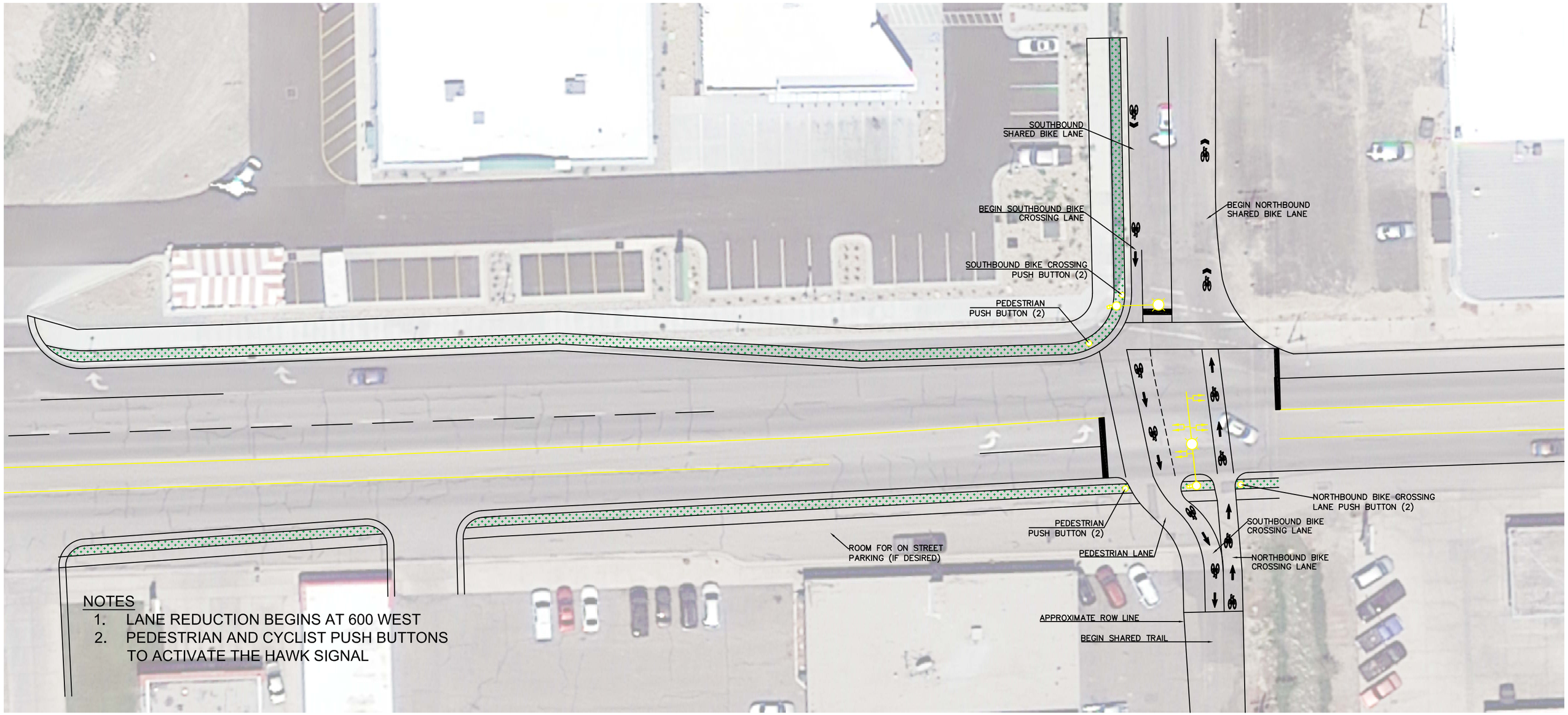
Two concept drawings of the crossing are included in **Figure 17**. The first concept has the crossing on the west side of the canal. The curb and gutter would be built on the west side of the intersection to allow for a shorter crossing for pedestrians and bicyclists.

The second concept shifts the trail alignment over the canal at the crossing. Approximately 75 feet of the canal would be covered as part of the project before shifting back to the original alignment.

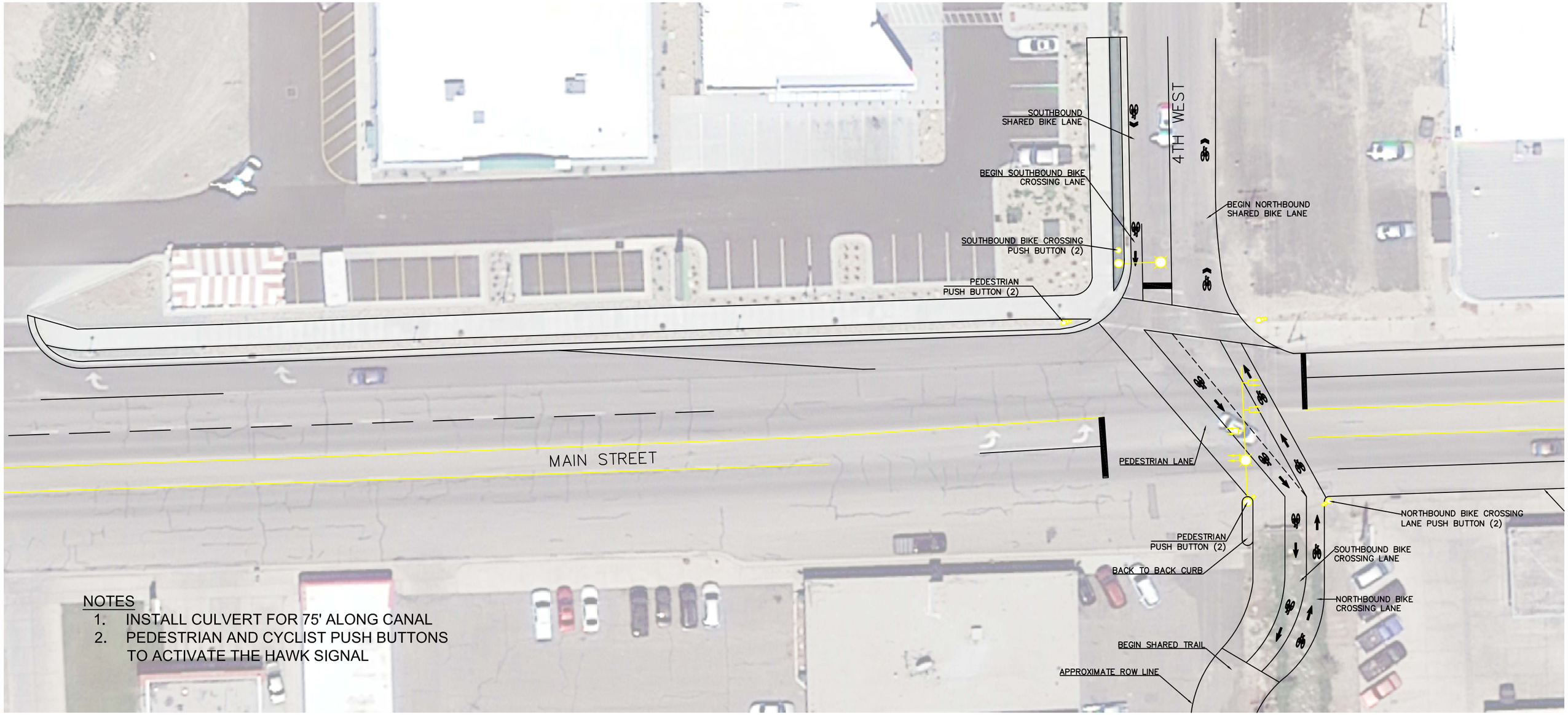
# Transportation Master Plan

Figure 16: Tremonton Trail System






Alternative 1: Alignment West of Canal




Alternative 2: Alignment Over Canal

TRANSPORTATION MASTER PLAN
May 2018

# Other Elements of the Transportation Master Plan

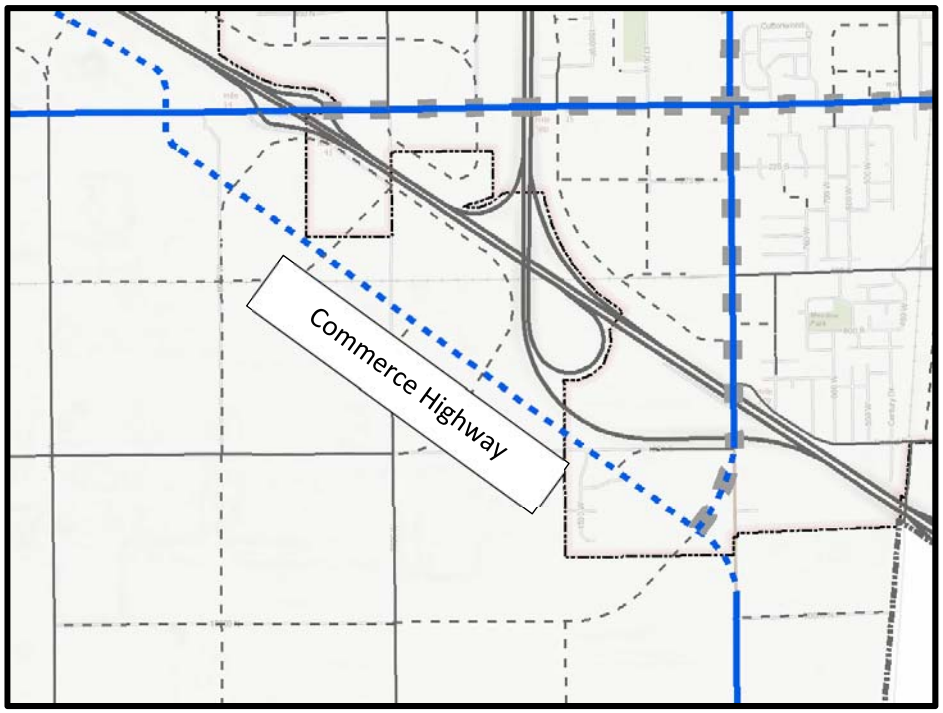
There are many other elements and guidelines to help improve and maintain the roadway network performance in Tremonton City. Future planning, especially where there is the potential for significant development, is vital to ensure the transportation network functions well as the City grows. The following is a comprehensive list of other elements included in the TMP:

1. **Semi-Truck Routes**
   - Minimize Truck Traffic on Main Street
2. **School Zones**
   - School Zone Analysis
3. **Access Management**
   - Signal
   - Access Spacing
   - Sight Distance
4. **Traffic Calming**
   - Traffic Calming Measures
5. **Corridor Preservation**
   - Corridor Preservation Techniques
6. **Traffic Impact Studies**
7. **Railroad Crossings**
   - Railroad Crossing Inventory

# Semi-Truck Routes

With the existing semi-trucking companies located within the city, the interchange of I-15 and I-84 as well as many industrial destinations, Tremonton City is a major destination for semi-truck traffic. There is concern regarding the significant number of semi-trucks accessing the P&G manufacturing plant south of Tremonton City utilizing Main Street to access I-15/I-84. There is also frequent semi-truck traffic on Iowa String Road which is deteriorating the roadway. The *UDOT Box Elder County Emerging Area Plan* indicates that a "truck bypass road or a truly limited or no access highway to serve the high truck traffic" is required. The existing and proposed semi-truck routes for Tremonton City are shown in **Figure 20**.

**Figure 18: Semi-Truck Route on Commerce Highway**




## Recommendations to Minimize Semi-Truck Traffic on Main Street

To minimize semi-truck traffic on Iowa String Rd and Main Street, the new Commerce Higway paralleling I-84 is to become the main semi-truck route for vehicles utilizing the P&G manufacturing plant south of the City. This allows semi-truck traffic to have quick access to the Interstate without traveling on Main Street. **Figure 18** shows a detailed view of Commerce Highway. Main Street and Iowa String Road will remain a semi-truck route, but will be for delivery only in order to maintain connectivity for semi-truck traffic and is indicated in **Figure 20**.

**Figure 19: R5-2 Sign**

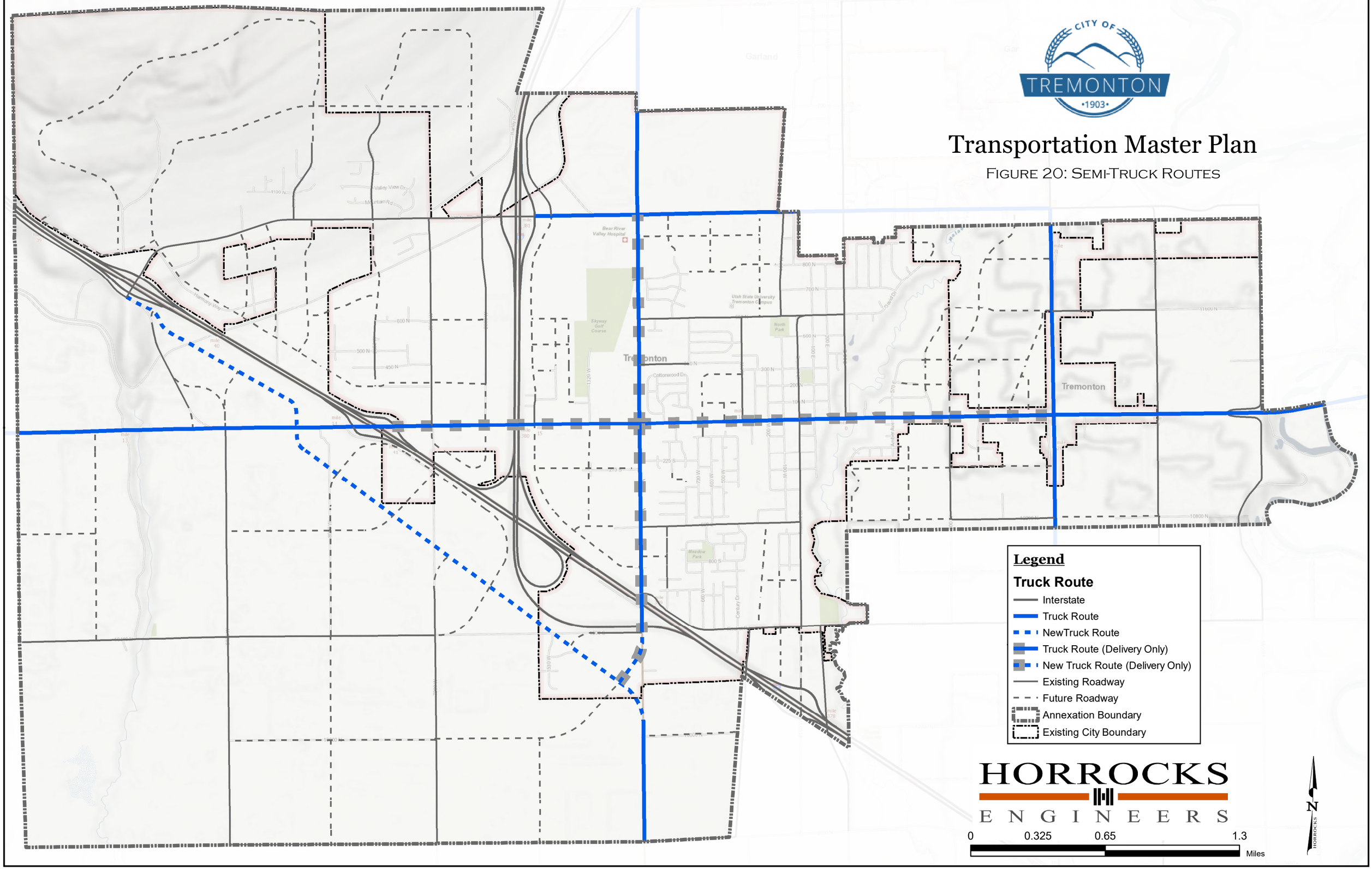
## Removal of Truck Route on 1000 North

The city desires to completely remove truck access on 1000 North between I-84 and I-15. To restrict semi-truck access, sign R5-2 or R5-2a as shown in **Figure 19** are required to be installed on 1000 North at the interchanges of I-84 and I-

15. Coordination with UDOT is required to create custom guide exit sign for the semi-truck drivers on NB and SB I-84 and SB I-15.

# Transportation Master Plan

## Figure 20: Semi-Truck Routes

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# School Zones

There are many children using all modes of transportation to travel to and from school. Without proper planning and safety improvements, students have a higher risk of injury during their commute. All guidelines for traffic control in school zones are found in Chapter 7 of the Utah MUTCD, which can be found online at *http://mutcd.fhwa.dot.gov*. Included in this chapter are guidelines to creating SNAP plans as well as the process for school crossing control criteria, such as signage, pavement markings, and crossing supervision. It is recommended the City coordinate with all schools to ensure all Student Neighborhood Access Program (SNAP) plans are created and updated yearly if needed.

## School Zone Analysis

Included in this TMP is an analysis of all schools in Tremonton using Chapter 7 of the Utah MUTCD to determine any necessary updates. The analysis includes the signing and roadway paint required to meet the Utah MUTCD standards. The analysis is very detailed, and is difficult to include within the body of the TMP text. General recommendations are included in **Table 7** with the full analysis included in **Appendix E: Utah MUTCD School Zone Analysis**. Included in the analysis is an examination of the existing signage at the intersections surrounding each of the schools within Tremonton City. Each intersection and crossing was analyzed by comparing the existing conditions with the guidelines set forth by the Utah MUTCD. In instances where the MUTCD requires signage that is currently installed at the existing intersections are noted. **Table 7** includes stop, house shaped pedestrian crossing, ahead, diagonal, left-turn arrow, right-turn arrow signs (examples of these are included in **Appendix E: Utah MUTCD School Zone Analysis**). In addition to the included signs, roadway paint control such as school zone crosswalks, the word "SCHOOL", and solid double yellow lines are included with their respective MUTCD identification numbers. Each one of the traffic control devices are required by the Utah MUTCD and it is recommended to update all school zones as indicated in **Table 7**. A blue dot represents the traffic control device that needs to be added to the intersection in question. Blank spaces represent that the required traffic control device has already been installed.

### *Future Box Elder District Property*

Box Elder School District owns a property for a new school which will be located in 2900 West and 500 North in Tremonton. The school district has coordinated with the City as required by section 10-9a-305 (4) of the Utah Cade. When the school is built, the roadway width will be increased in front of the school to allow parking which will alleviate traffic congestion during peak times. It is recommended that the guidelines outlined in Chapter 7 of the Utah MUTCD for traffic control surrounding the school.

**Table 7: Summary of School Zone Analysis**

| School | Intersection | Stop Sign (R1-1) | House Shaped Crossing Sign (S1-1) | Ahead Sign (W16-9P) | Diagonal Arrow (W16-7P) | Left-Turn Arrow (W16-6P) | Right-Turn Arrow (W16-6P) | School Zone Crosswalk Paint | Painted **SCHOOL** on Pavement | Solid Double Yellow Line |
|---|---|---|---|---|---|---|---|---|---|---|
| North Park Elementary | 700 North and 100 East | | | | | | | | ● | ● |
| | 800 North and 100 East | | | | | | | | ● | ● |
| | 800 North and Tremont St. | | | | | | | | ● | ● |
| | 700 North and 100 West | | | | | | ● | | ● | ● |
| McKinley School | 600 South and 460 West | | | ● | | | | | ● | ● |
| | 600 South and 300 West | | | ● | | | | | ● | ● |
| | 600 South and 100 West | | ● | ● | | | | | ● | ● |
| | 500 South and 100 West | | | | ● | | | | ● | ● |
| | 600 South and Tremont St. | | ● | | ● | ● | ● | | ● | ● |
| | 400 South and Tremont St. | | | ● | ● | | | | ● | ● |
| | 400 South and 100 West | | ● | ● | ● | | | | ● | ● |
| Harris Intermediate School | 350 North and 800 West | | ● | | ● | ● | ● | | ● | ● |
| | 500 North and 800 West* | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | 600 North and 800 West | | ● | ● | | | | | ● | ● |
| | 600 North and 800 West | | ● | ● | ● | | | | ● | ● |
| Bear River Campus (High School, Middle School, and Natatorium) | 1500 South | | | ● | | | | ● | ● | ● |
| | 1400 South and Main Street | | | | | | | | ● | |
| | 1500 South and 300 East/Main street | | ● | | | | | | ● | ● |
| | 800 North and 300 East | | ● | ● | | ● | | | | |
| | 700 North and 300 East | | ● | | | ● | ● | | | |
| | 800 North and 100 East | | | | | | | | ● | ● |
| | 800 North and Tremont Street | | | | | ● | | | ● | ● |
| Athenian E-Academy | | | ● | ● | | | | | ● | ● |

● = Traffic control device needs to be added to the intersection
A blank box indicates that the required traffic control device has already been installed

*Field verification of intersection required due to inability to accurately analyze using satellite pictures

# Access Management

Access management is the process of establishing and enforcing road and driveway accesses within the City. This includes establishing the location, number, spacing, type, and design of city streets and accesses to minimize vehicle conflicts and maximize the traffic capacity and safety of a roadway. Access management is typically enforced based on the functional classification based on mobility vs. access as shown in **Figure 3**. Unmanaged or unorganized access along travel corridors can result in congested and unsafe roadways. In some cases, each individual landowner along a corridor has their own access driveway; partly due to the order development occurs. Numerous access points along travel corridors create unnecessary conflicts between turning and through traffic, which causes delays and reduces safety. Numerous benefits are derived from controlling the location and number of access points to a roadway. Those benefits include:

- Improving overall roadway safety
- Reducing the total number of vehicle trips on the roadway
- Decreasing interruptions in traffic flow
- Minimizing traffic delays and congestion
- Maintaining roadway capacity
- Extending the useful life of roads
- Avoiding costly highway projects
- Improving air quality
- Encouraging compact development patterns
- Improving access to adjacent land uses
- Enhancing pedestrian and bicycle facilities

## Signal, Access Spacing, and Sight Distance

Establishing a minimum distance between access points reduces the number of points a driver has to observe and reduces the opportunity for conflicts. Spacing requirements between accesses are based on the classification and design speed of the road, the existing and projected volume of traffic as a result of the proposed development, and the physical conditions of the site. Minimum spacing standards between accesses as summarized in **Table 2** should be applied to both residential and commercial/industrial developments.

To ensure efficient traffic flow, new signals should be limited to locations where the progressive movement of traffic will not be impeded significantly. Uniform, or near uniform, spacing of signals will benefit the progression of traffic and allow for better signal coordination. Typically, signals are spaced no less than one-quarter mile (1,320 feet) apart on any street. On principal arterial streets, signals should be placed no closer than one-half mile (2,640 feet). Tremonton has six planned signalized intersections on Main Street which comply with spacing recommendations.

Un-signalized accesses are far more common than signalized accesses. Longer distances between roadway accesses improve roadway traffic operations, especially at medium/high-volume driveways. Properly spaced accesses help with merging, stopping sight distance, acceleration rates, and storage distance for back-to-back left turns.

Restricted access movement (i.e. right-in/right-out access) can provide for additional access to promote economic development with minimum impact to the roadway facility. This type of access should be spaced to allow for a minimum of traffic conflicts and provide distance for deceleration and acceleration of traffic in and out of the access as may be determined by a traffic impact study.

### *Access Management Standard*

It is important to follow the correct access management standards. Tremonton City has commercial access management planned along Main Street in accordance with UDOT standards and is shown in **Figure 21**. Outside of the Main Street commercial access management, the City does not currently have a specific access management guide used for City owned roads. Access Management on UDOT roadways follow the *R930-6. Access Management* document which is found online at *www.udot.utah.gov*. It is recommended the City utilize this resource for access management throughout the City. **Table 8** includes access management spacing standards (Table 1 R930-6) for the roadways included in Tremonton City.

**Table 8: Access Management Spacing Standards (UDOT R930-6)**

| Access Category/ Name | Equivalent Functional Classification | Minimum Signal Spacing (ft) | Minimum Street Spacing (ft) | Minimum Driveway Spacing (ft) | Minimum Interchange to Crossroad Access Spacing | | |
|---|---|---|---|---|---|---|---|
| | | | | | To 1st Right-in Right-out Driveway (ft) | To 1st Intersection (ft) | From Last Right-in Right-out Driveway (ft) |
| 4. R-R Regional-Rural Importance | Major Arterial/ Minor Arterial | 2,640 | 660 | 500 | 660 | 1,320 | 500 |
| 7. C-R Community-Rural Importance | Minor Arterial/ Collector | 1,320 | 350 | 200 | 500 | 1,320 | 500 |

### *Main Street Access Management*

Tremonton City has plans for limited commercial access on Main Street to improve traffic flow throughout the corridor. Limiting commercial access is beneficial for vehicles using Main Street as well as those using the commercial development. With limited access, vehicles on Main Street have a reduced number of conflict areas which will improve vehicle safety as well as reduce vehicle delay on the corridor. The red lines on **Figure 21** indicate the locations where access will be located along Main Street. All accesses included comply with UDOT standards.

### *Commerce Highway (Minor Arterial) Access Management*

Commerce Highway will include access management to ensure proper semi-truck flow. The cross-section will be 90 feet and striped as three lanes. The roadway width will be wide enough to be restriped to five lanes if future demands require. It will include raised medians and signals spaced at least 2,640 feet apart (see **Figure 12** for signal spacing). Other access will be granted between the signals, but will most likely be right-in-right-out access.

JA

1"=600'

4900 W

4725 W (APPROXIMATE LOCATION)

4575 W (APPROXIMATE LOCATION)

4400 W (APPROXIMATE LOCATION)

3950 (APPROXIMATE LOCATION)

3800 W (APPROXIMATE LOCATION)

ABANDON EXISTING ROAD

3475 W (APPROXIMATE LOCATION)

3300 W (APPROXIMATE LOCATION)

3175 W (APPROXIMATE LOCATION)

I-84

FUTURE COLLECTOR ROAD

660' TYP. WEST OF FREEWAY

FUTURE STOP LIGHT

MATCH LINE A

1353' MIN.

3600 W

RIGHT-OF-WAY TO BE DEDICATED AS DEVELOPMENT OCCURS

PURCHASE RIGHT-OF-WAY (COLLECTOR)

FUTURE COLLECTOR ROAD

I-84

2300 WEST

2100 W (APPROXIMATE LOCATION)

2000 WEST

I-15

150 N

125 NORTH

100 N

1650 W

1500 W

1320 W

BOX ELDER FAIR GROUNDS

IOWA STRING ROAD

COUNTRY CIRCLE DR

ASPEN COURT

RODEO DR

EXISTING STOP LIGHT

MATCH LINE B

FUTURE ST

800 W

1000 WEST

ELIMINATE ACCESS TO MAIN STREET

865'

730'

630'

CROSS ACCESS WORK TO COMBINE D.W.

CROSS ACCESS

100' ROW

MAIN STREET

PURCHASE RIGHT-OF-WAY (LOCAL)

POSSIBLE PURCHASE OF RIGHT-OF-WAY

CROSS ACCESS

731'

630'

805'

600'

565'

720'

FUTURE STOP LIGHT

APPROXIMATE LOCATION FOR NEW PERMANENT DRIVEWAY ACCESS

PURCHASE RIGHT-OF-WAY (COLLECTOR)

2300 W (ALIGNED WITH EXISTING STREET)

2100 W (APPROXIMATE LOCATION)

2000 W (ALIGNED WITH EXISTING STREET)

1550 W (ALIGNED WITH EXISTING STREET)

1450 W (APPROXIMATE LOCATION)

1320 W (ALIGNED WITH EXISTING STREET)

1200 W (APPROXIMATE LOCATION)

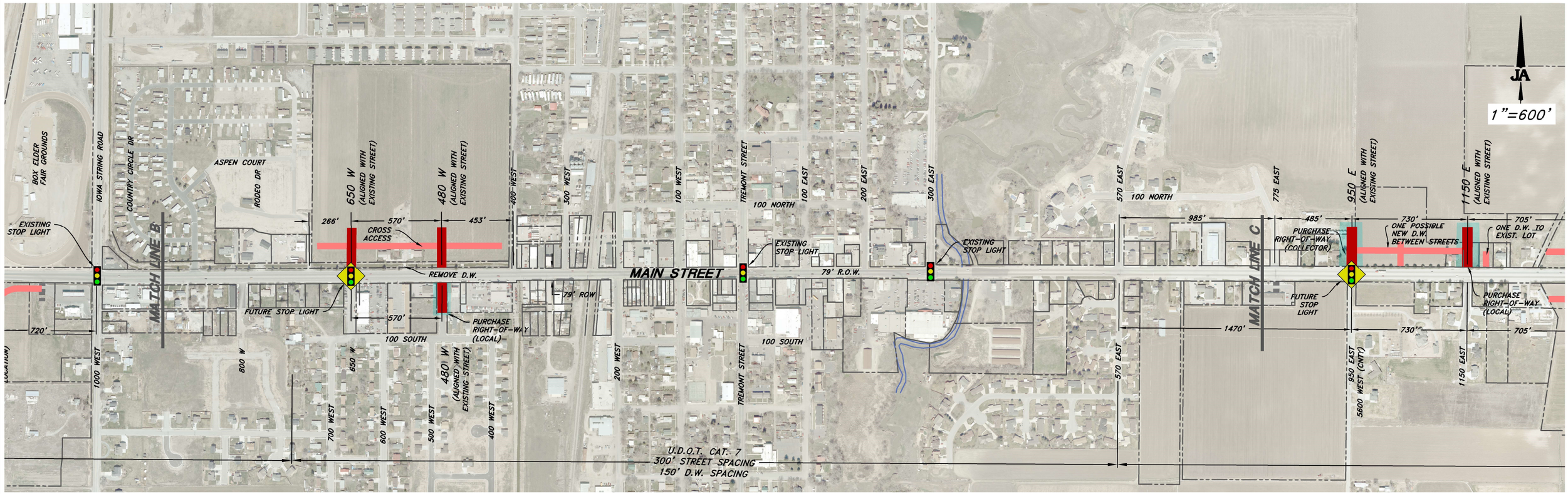
U.D.O.T. CAT. 4 (PROPOSE CAT. 5)
660' STREET SPACING
350' D.W. SPACING

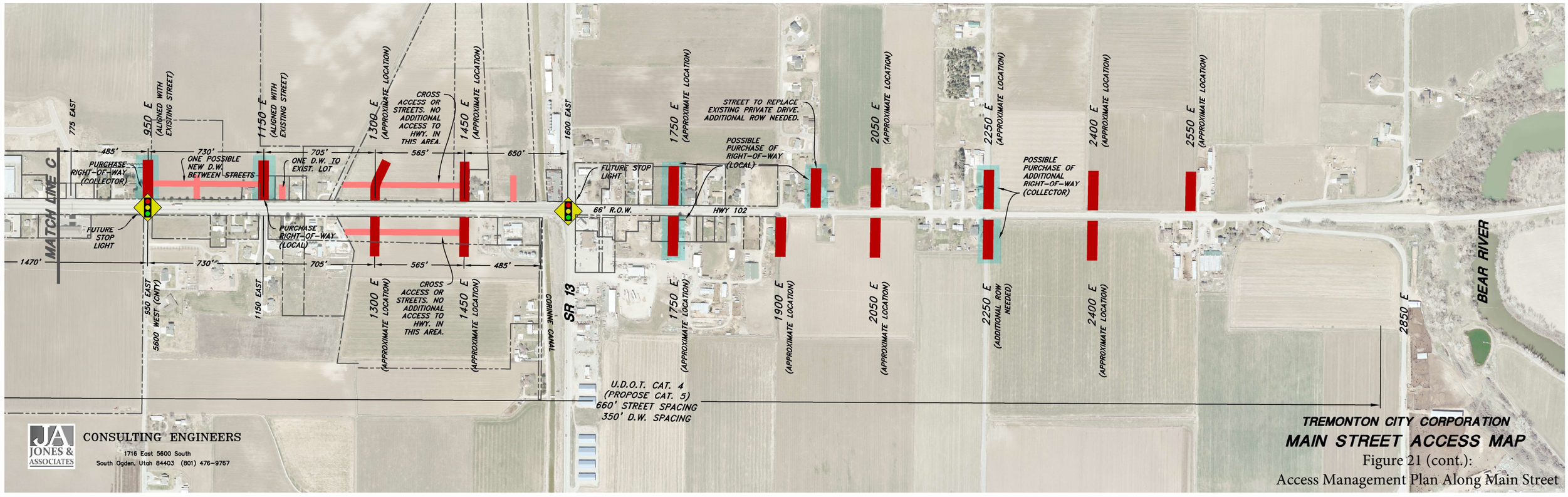
JA JONES & ASSOCIATES
CONSULTING ENGINEERS
1716 East 5600 South
South Ogden, Utah 84403 (801) 476-9767

TREMONTON CITY CORPORATION

MAIN STREET ACCESS MAP

Figure 21:
Access Management Plan Along Main Street

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CONSULTING ENGINEERS
1716 East 5600 South
South Ogden, Utah 84403 (801) 476-9767

**TREMONTON CITY CORPORATION**

**MAIN STREET ACCESS MAP**

Figure 21 (cont.):
Access Management Plan Along Main Street

## Intersection Design

As traffic volumes increase throughout the community, intersection design will become more critical. Proper intersection design will typically facilitate larger traffic flows without widening existing roadway cross-sections and minimize impacts to adjacent properties. Therefore, emphasis was placed on identifying critical intersections during the traffic modeling process.

Intersections are a critical element to future roadway functionality and should provide sufficient turn lanes and adequate turn pocket lengths to accommodate vehicle queues. In the future, many intersections throughout the City may require improvements in order to maintain a desirable LOS. Stop signs and traffic signals should not be used when not warranted per the MUTCD. Studies have shown that in areas where intersection control has been installed and not warranted, a higher percentage of the motoring public will disregard the control measure and create a more unsafe condition.

### *Traffic Signal Warrants*

Traffic signals should not be installed unless at least one or more of the nine traffic signal warrants in the Manual on Uniform Traffic Control Devices (MUTCD) have been met. The MUTCD can be found online at *https://mutcd.fhwa.dot.gov/*. Even if warrants are met for a particular intersection, justification for installation should still be based on information obtained through engineering studies and comparisons with the requirements set forth in the MUTCD. As stated in the MUTCD, "*the satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal*." The nine warrants outlined in the MUTCD include the following:

**Warrant 1:** Eight-Hour Vehicular Volume
**Warrant 2:** Four-Hour Vehicular Volume
**Warrant 3:** Peak Hour
**Warrant 4:** Pedestrian Volume
**Warrant 5:** School Crossing
**Warrant 6:** Coordinated Signal System
**Warrant 7:** Crash Experience
**Warrant 8:** Roadway Network
**Warrant 9:** Intersection Near a Grade Crossing (Railroad)

Traffic signals may be warranted at the intersection of any two roadways depending upon the warrants outlined above. The design of the signal and intersection will depend primarily on the amount of traffic passing through the intersection during the peak times of day. Design parameters that are essential to a well-designed signalized intersection include lane configuration, turn radii, and turn pocket lengths and taper lengths. Each of these parameters is a function of the road classification, peak hour volumes, and design speeds.

### *Typical Intersection Configurations*

Typical intersection configurations are a helpful planning tool when preserving right-of-way and for project cost estimating. This TMP includes some typical intersection treatments, including expanded right-of-way requirements, turn pocket configurations, and taper lengths. **Appendix F: Typical Intersection Configurations** includes all typical intersection configurations based on the typical cross-

sections. These areas may include two-way or all-way stop-controlled intersections, or yield-controlled intersections.

# Traffic Calming

In Utah, the history of using a grid system for planning and development purposes started with the first settlers and has proven efficient for moving people and goods throughout a network of surface streets. However, the nature of a grid system with wide and often long, straight roads can result in excessive speeds. For that reason, traffic calming measures (TCM) can be implemented to reduce speeds on residential roadways. Tremonton also follows the Utah grid system with some interruptions due to I-15, I-84, and railroad tracks. Traffic calming is however still applicable to many neighborhood or local streets and should be at least given consideration on the City's local and residential streets on a case-by-case basis where applicable.

Institute of Transportation Engineers (ITE) has established a definition for traffic calming that reads, "*Traffic calming is the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users*." Altering driver behavior includes lowering of speeds, reducing aggressive driving, and increasing respect for non-motorized street users.

## Types of Traffic Calming Measures

There are several types of TCM that can be grouped into three categories, depending on the level of control or the effect on traffic flow and speeds. Category 1 measures are the least restrictive, while Category 3 is the most restrictive. These categories are outlined in further detail below. Several factors can influence the choice of TCM used, including the location, street classification, street geometry, adjacent land uses, public transit needs, budget, climate, aesthetics, and community preferences.

### *Category 1: Non-Physical Measures*

Traffic control devices consist regulatory signs (i.e., speed limit signs), warning signs (i.e., pedestrian warning signs), traffic signals, etc. Often traffic control devices are overused as TCMs. Though the function of traffic control devices is often similar to that of TCMs, specific traffic control devices should not be overused to communicate different purposes. One of the primary purposes of traffic control devices is to inform drivers of traffic laws and specific right-of-ways in order to maintain order and safety. Overuse of such traffic control devices diminishes their intended purpose. For example, the MUTCD states "*stop signs should not be used for speed control*." Traffic control devices, when used following the guidelines outlined in the MUTCD, can assist to calm traffic where necessary.

### *Category 2: Speed Control Measures*

Street modification TCMs include actions that physically alter the vertical or horizontal alignment of the roadway. Alterations of the vertical alignment of a roadway include speed humps, speed tables, raised intersections, etc. Alterations of the horizontal alignment of a roadway include chicanes and lateral shifts. Other street modification TCMs include constrictions (i.e., narrowing, pinch points, islands, chokers, etc.), narrow pavement widths (i.e., medians, edge treatments, bulb-outs, etc.), entrance features, roundabouts, small corner radii, street closures, and streetscaping (i.e., surface textures and colors, landscaping, street trees, street furniture, etc.).

### *Category 3: Volume Control Measures*

Route modifications consist of altering available routes of traffic flow. Examples include one-way streets, diverters, closures, and turn prohibitions. Instead of attempting to alter drivers' behavior (Categories 1 and 2), route modification TCMs alter drivers' routes and traffic flows.

### *Streetscaping*

Streetscaping includes the planning and placement of items, such as street furniture, lighting, art, trees, landscaping, and side treatments along streets and intersections. Although streetscaping can be implemented without traffic calming, TCMs need elements of streetscaping to be functional. Streetscaping softens the appearance of speed humps or tables and enhances the aesthetics of roundabouts and constrictions, etc. Landscaping and other roadside treatments make street closures more effective and safer by highlighting the presence of the measure.

### *Other Considerations*

Spacing is an important consideration for TCMs. If TCMs are too far apart (greater than 600 to 1000 feet), speeding can occur between the measures. TCMs should be spaced 200 to 300 feet apart so vehicles will not have sufficient distance to accelerate between measures.

Other considerations when deciding which TCMs to install include snow removal maintenance and emergency vehicle access. Some TCMs may decrease the efficiency of both snow removal and/or emergency vehicle access; for example speed humps or tables, etc.

### *Installation of Traffic Calming Measures*

When deciding to implement TCMs, the decision should be based on engineering merits of a TCM application, as opposed to public clamor. An engineering study that documents the need for such measures and the nature of the traffic problem via speed and volume measurements should be the determining factor.

The next step should be to propose TCMs that are capable of solving the problem and matching the terrain, climate and nature of the street in question. One or several measures could then be implemented on a temporary basis subject to performance evaluations and neighborhood review. Before implementing these improvements on a more permanent basis, the final step would be to compare the before and after studies for speed and volume changes to see if the TCMs have performed as expected.

In order to make any of the TCMs effective, traffic calming must be community based and as wide spread as possible. For example, the repercussions of traffic calming on one street can result in higher speeds on adjacent streets due to a shift in travel patterns. The need for a community based traffic calming plan is fundamental to the quality of life for the citizens of the community.

## Corridor Preservation

Corridor preservation is an important transportation planning tool that agencies should use and apply to all future transportation corridors. There are several new transportation facilities that have been identified in the TMP. In planning for these future facilities, corridor preservation techniques should be employed. The main purposes of corridor preservation are to:

- **Preserve the viability of future options**
- **Reduce the cost of these options**
- **Minimize environmental and socio-economic impacts of future implementation**

Corridor preservation seeks to preserve the right-of-way needed for future transportation facilities and prevent development that might be incompatible with these facilities. This is primarily accomplished by the community's ability to apply land use controls, such as zoning and approval of developments.

Perhaps the most important elements of corridor preservation are ensuring that the corridors are preserved in the correct location and that they meet the applicable design and right-of-way standards for the type of facility being preserved. The 50 year build roadway network in **Figure 12** acts as a corridor plan for Tremonton City. In particular, it is recommended to begin Corridor Preservation for Commerce Highway, a minor arterial road that provides a new commercial and industrial district and a bypass for

semi-truck traffic on Iowa String traveling to the interstate. As the master plan does not define the exact alignment of each future corridor, it becomes the responsibility of the City to make sure the corridors are correctly preserved. This will have to be accomplished through the engineering and planning reviews done within the City as development and annexation requests are approved that involve properties within or adjacent to the future corridors. In **Appendix G: Corridor Preservation**, intersection details outline the desire for the city to preserve future roadway intersections.

## Corridor Preservation Techniques

Some examples of specific corridor preservation techniques that may be most beneficial and easily implemented include the following:

**Developer Incentives and Agreements** – Public agencies can offer incentives through agreement in the form of tax abatements, density credits, or timely site plan approvals to developers who maintain property within proposed transportation corridors in an undeveloped state.

**Exactions** – As development proposals are submitted to the city for review, efforts should be made to exact land identified within the future corridors.

**Fee Simple Acquisitions** – A voluntary transaction full ownership of a land parcel, including the underlying title, transferred from the owner to the City via either purchase, donation, or impact fee credit.

**Transfer of Development Rights and Density Transfers** – Government entities can provide incentives for developers and landowners to participate in corridor preservation programs using the transfer of development rights and density transfers. This is a powerful tool in that there seldom is any capital cost to local governments.

**Land Use Controls** – This method allows government entities to use its policing power to regulate intensity and types of land use. Zoning ordinances are the primary controls over land use and the most important land use tools available for use in corridor preservation programs.

**Purchase of Options and Easements** – Options and easements allow government agencies to purchase interests in property that lies within highway corridors without obtaining full title of the land.

**Transportation Corridor Preservation** – The Utah Legislature recognizes the importance of transportation corridor preservation and in Utah Code 72-5-402 has made the finding and declaration that planning, preservation, and acquisition of transportation corridor is a public purpose. As such the State Legislature has created a transportation corridor preservation process, which enables counties and municipalities to plan and/or acquire transportation corridors to enhance the capacity of existing corridors and protect the availability of future proposed corridors. More specifically, the transportation corridor preservation process allows counties and municipalities to limit the development within transportation corridors by adopting land use regulations and official map that identifies proposed future transportation corridor (including the corridor's center line and setback) and restricting development within the designated future transportation corridor. The official map and land use regulations are adopted by ordinance and is recorded at the county recorder office on

the title of property where the future transportation corridor is aligned. These land use regulations adopted by ordinance may include: restriction on the subdividing of land; the construction of improvements, expansions, or additions; or any other action that will appreciably increase the value of and the future acquisition cost of land.

In adopting and recording an official map of a transportation corridor and land use regulation on the title of property where the future transportation corridor is aligned, counties and municipalities shall observe all protections conferred on private property rights and compensation for takings. Private property owners who property restricted by a county or municipality for transportation corridor preservation have the right to petition the county or municipality to acquire the affected property. If the county or municipality petitioned by a property owner does not acquire the interest in the property requested by the property owner, then the county or municipality may not exercise any of the powers granted under Utah Code 72-5-401 through 72-5-406 to limit or restrict the affected property's development.

## Traffic Impact Studies

As growth occurs throughout the City, the City will evaluate the impacts of proposed developments on the surrounding transportation networks prior to giving approval to build. This will be accomplished by requiring that a Traffic Impact Study (TIS) be performed for any development in the City based on city staff recommendations. A TIS will allow the City to determine the site specific impacts of a development including internal site circulation, access issues, and adjacent roadway and intersection impacts. In addition, a TIS will assist in defining possible impacts to the overall transportation system in the vicinity of the development. The area and items to be evaluated in a TIS include key intersections and roads as determined by the City Traffic Engineer on a case by case basis.

Each TIS will be conducted by a qualified Traffic Engineer chosen by the developer at their cost and approved by the City. A scope meeting will be required by the developer/Traffic Engineer with the City Engineer to determine the scope of each TIS. Tremonton Traffic Impact Study Requirements are in **Appendix H: Traffic Impact Studies** of this plan.

## Railroad Crossings

A Railroad line runs north/south through the City and crosses Main Street at approximately 250 West and other roadways throughout the city.

Each of these rail crossings must be treated with extreme caution when planning the roadway network for safety reasons. Vehicle/train or pedestrian/train accidents are catastrophic at at-grade rail crossings. Where there are areas of high pedestrian activity, such as in mixed-use zoning and transit oriented development, or around transit stops, provision must be made to include a physical barrier between the

pedestrian facilities and the rail tracks. Strict adherence to design and safety standards must be maintained and all plans should be prepared by a qualified engineer.

## Railroad Crossing Inventory

Railroad crossings, specifically pedestrian crossings are governed by the *UDOT Pedestrian Grade Crossing Manual*. The manual can be accessed online at https://www.udot.utah.gov/. Within the manual, guidelines are set forth concerning pedestrian crossings at railroads. Pedestrian control devices are also set forth, which include the following:

- Detectable warning surfaces
- Look Signs (MUTCD R15-8) and Grade Crossing (Crossbuck) Signs (MUTCD R15-1)
- Audible Devices
- Pavement Markings, such as "STOP" before the crossing
- Pathway delineation, which includes markings, colors and/or textures which guide pedestrians through the crossing
- Flashing-Light Signals (if train speed exceeds 35 mph)

The use of pedestrian control devices is guided by the following table for different categories of railroad crossings as shown in **Table 9** (Table 4 of *UDOT Pedestrian Grade Crossing Manual)*. Semi-Exclusive alignments are railroad alignments which has a separate right-of-way or along a roadway where motor vehicles, pedestrians, and bicycles have limited access and cross at designated locations only. Street-running alignments are alignments where trains operate in mixed traffic with all types of road users. In Tremonton, all crossings follow the "Rural Crossings" guidelines and are semi-exclusive alignments.

**Table 9: Standard Railroad Crossing Safety Treatments**

| SAFETY TREATMENT | URBAN CROSSINGS | | RURAL CROSSINGS |
|---|---|---|---|
| | Semi-Exclusive Alignments | Street-Running Alignments | |
| Crossbuck Assembly | ● | | ● |
| Detectable Warning Surface | ● | ● | ● |
| Look Sign (R15-8) | ● | ● | |
| "Stop" Pavement Marking | ● | | |
| Pathway Delineation | ● | ● | ● |

A blue dot represents control devices that should exist at various types of railroad and pedestrian crossings. Blank Spaces indicate that the control devices are not required at railroad and pedestrian crossings. Additionally, some railroad crossings may require additional safety treatments based on site specific evaluations.

All Railroad crossings for this TMP shown in **Figure 22** were evaluated based on the *UDOT Pedestrian Grade Crossing Manual* to determine recommended upgrades to improve safety. The majority of the improvements are to improve ADA compliance at the crossings. **Table 10** shows the recommended improvements for each railroad crossing in Tremonton City. All crossings within the City as well as the proposed annexation boundary are included in the analysis. The crossing which is currently outside of

city limits, but included in the annexation boundary is located at 10000 North (#9 in Table 10). All new crossings should follow the same guidelines included in this section.

When determining which pedestrian control devices to implement at crossings, pedestrian sight distance must also be taken into account. Minimum sight distances are based on train speed, with higher train speeds requiring larger sight distances (see also Table 5 of *UDOT Pedestrian Grade Crossing Manual*). If the minimum sight distance is not met, additional control devices, such as blackout signs, may be necessary based on results of an engineering study. Additionally, bicycle sight distances should be considered. These may be calculated based on train speed and bicycle speed (See Table 6 of *UDOT Pedestrian Grade Crossing Manual*). Included in **Appendix I: Railroad Crossing Inventory** is an inventory of railroad crossings found within the current city limits of as well as the future annexation boundary of Tremonton City.

**Table 10: Railroad Crossing Recommendations**

| Crossing Improvement | 1. Iowa String Rd | 2. 1000 North | 3. 600 North | 4. 300 North | 5. 200 North | 6. Main Street | 7. 600 South | 8. 1200 South | 9. 10000 North |
|---|---|---|---|---|---|---|---|---|---|
| Detectable Warning Surface | ● | ● | ● | ● | ● | | ● | ● | ● |
| LOOK Sign (R15-8) | ● | ● | ● | ● | ● | ● | ● | ● | |
| "Stop" Pavement Marking | ● | ● | | ● | ● | | | ● | |
| Pathway Delineation | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Roadway Striping | ● | | | | ● | | | ● | |
| Curb & Gutter | | ● | | ● | | | | ● | ● |
| Crossing Gates | | | ● | ● | ● | | ● | | ● |

● = Traffic control device exists at the intersection. A blank box indicates the required traffic control device is required to be installed at the intersection.

# Transportation Master Plan

## Figure 22: Tremonton Railroad Crossing Locations

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**Legend**

**Railroad Crossing**

- Railroad Crossing
- Railroads

**Roadway Network**

- Interstate
- Roadway Network
- Annexation Boundary
- Existing City Boundary

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0 0.325 0.65 1.3 Miles

N

TRANSPORTATION MASTER PLAN
May 2018

# TMP Policy and Recommendations Summary

This chapter contains a very brief summary of all of the recommendations that were made in this TMP. For more specific details about each one of these recommendations please see the previous chapters of this TMP.

## Roadway Network Analysis

### Typical Cross-Section Review

There are no current updates required for the typical cross-sections. It is recommended to review the typical cross-sections as development occurs to determine if any updates are required.

### Collector Spacing

Based on the roadway characteristics in **Table 2**, the following are recommendations regarding Collector Spacing in Tremonton City which is explained in more detail on pages 15-16 of this TMP:

1. De-emphasize the following collector roadways
   - **Tremont Street** (Main Street to 600 North)
   - **2300 West** (Main Street to 1000 North)
2. Build North/South collector at approximately 3300 West (project 30 in **Table 5**, and explained in greater detail on page 31 of this TMP)

Minimum spacing standards as summarized in **Table 2** should be applied to both residential and commercial/industrial developments.

### Capital Project List

The capital project list for Tremonton City can be found in **Table 5**. There are 71 total projects which will be funded by UDOT, developers, and the City. The costs in **Table 5** are planning level costs represented in 2017 dollars and is not the full responsibility of the City. More analysis will be required to determine specific costs during design. The total cost for all 71 projects is **$221,058,000**.

## Alternative Modes of Transportation

### *Transit*

It is recommended to incorporate all transit planning efforts from other agencies to implement transit service in Tremonton.

Based on the FrontRunner station location analysis, the station location at 6400 West & 1600 South scored the highest. This analysis does not determine the final station location alternative, but can be used as development occurs to assist the City in making a final decision on the location for the future FrontRunner station. The table to the right shows the summary from the analysis (see pages 41-45 for more detail).

| Station Alternative Location | Distance from Main Street | Distance from Interstate Access | Transit Oriented Development | Access to Station and Platform | Ability to Include Bus Transfers | Size of Proposed Site | **Alternative Ranking** |
|---|---|---|---|---|---|---|---|
| 1. 6400 West & 1600 South | – | + | + | O | + | + | **1** |
| 2. 6400 West & 1200 South | – | + | + | – | + | + | **2** |
| 3. 400 West & 450 North | + | O | – | + | O | – | **3** |

### *Pedestrian and Bicycles*

It is recommended to implement the trails per the *Tremonton City Trails, Parks, and Open Spaces Master Plan* (See pages 41-45 and Appendix D for additional detail).

It is recommended to include a signalized HAWK signal at the trail crossing at 400 West and Main Street. This is the best way to incorporate the separated bike and pedestrian trail on the north side and the joint trail on the south side.

# Other Elements of the Transportation Master Plan

## Semi-Truck Routes

Commerce Highway paralleling I-84 is to become the main semi-truck route for vehicles utilizing the P&G manufacturing plant south of the City. This highway will be built as a 3 lane facilities with the potential to be striped as 5 lanes to allow semi-truck traffic to have quick access to the Interstate without traveling on Main Street. Main Street and Iowa String Road will remain a semi-truck route, but will be for delivery only in order to maintain connectivity for semi-truck traffic.

To remove semi-truck access, sign R5-2 or R5-2a in MUTCD is required to be installed on 1000 North at the interchanges of I-84 and I-15. Coordination with UDOT is required to create custom guide exit sign for the semi-truck drivers on NB and SB I-84 and SB I-15 (See pages 51-52 for additional details).

## School Zones

Recommendations includes stop, house shaped pedestrian crossing, ahead, diagonal, left-turn arrow, right-turn arrow signs, school zone crosswalks, the word "SCHOOL", and solid yellow double lines were each included. The summary of recommendations are below:

| School | Intersection | Stop Sign (R1-1) | House Shaped Crossing Sign (S1-1) | Ahead Sign (W16-9P) | Diagonal Arrow (W16-7P) | Left-Turn Arrow (W16-6P) | Right-Turn Arrow (W16-6P) | School Zone Crosswalk Paint | Painted **SCHOOL** on Pavement | Solid Double Yellow Line |
|---|---|---|---|---|---|---|---|---|---|---|
| North Park Elementary | 700 North and 100 East | | | | | | | | ● | ● |
| | 800 North and 100 East | | | | | | | | ● | ● |
| | 800 North and Tremont St. | | | | | | | | ● | ● |
| | 700 North and 100 West | | | | | | ● | | ● | ● |
| McKinley School | 600 South and 460 West | | | ● | | | | | ● | ● |
| | 600 South and 300 West | | | ● | | | | | ● | ● |
| | 600 South and 100 West | | ● | ● | | | | | ● | ● |
| | 500 South and 100 West | | | | ● | | | | ● | ● |
| | 600 South and Tremont St. | | ● | | ● | ● | ● | | ● | ● |
| | 400 South and Tremont St. | | | ● | ● | | | | ● | ● |
| | 400 South and 100 West | | ● | ● | ● | | | | ● | ● |
| Harris Intermediate School | 350 North and 800 West | | ● | | ● | ● | ● | | ● | ● |
| | 500 North and 800 West* | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | 600 North and 800 West | | ● | ● | | | | | ● | ● |
| | 600 North and 800 West | | ● | ● | ● | | | | ● | ● |
| Bear River Campus (High School, Middle School, and Natatorium) | 1500 South | | | ● | | | | ● | ● | ● |
| | 1400 South and Main Street | | | | | | | | ● | |
| | 1500 South and 300 East/Main street | | ● | | | | | | ● | ● |
| | 800 North and 300 East | | ● | ● | | ● | | | | |
| | 700 North and 300 East | | ● | | | ● | ● | | | |
| | 800 North and 100 East | | | | | | | | ● | ● |
| | 800 North and Tremont Street | | | | | ● | | | ● | ● |
| Athenian E-Academy | | | ● | ● | | | | | ● | ● |

● = Traffic control device is required to be added to the intersection. A blank box indicates the required traffic control device has already been installed.
*Field verification of intersection required due to inability to accurately analyze using satellite pictures

Box Elder School District owns a property for a new school which will be located in 2900 West and 500 North in Tremonton. When the school is built, the roadway width will be increased in front of the school to allow parking which will alleviate traffic congestion during peak times. It is recommended that the guidelines outlined in Chapter 7 of the Utah MUTCD for traffic control surrounding the school.

## Access Management

It is recommended the City continue to follow recommendations outlined in UDOT's *R930-6. Access Management* and are included in **Table 8** of this TMP document.

## Traffic Calming

It is recommended the City follow the guidelines included in this TMP document to implement traffic calming on roadways where speeding is a problem, or for roadways which need to be de-emphasized.

## Corridor Preservation

It is recommended the City use Corridor Preservation to begin securing the ROW for Commerce Highway.

## Railroad Crossings

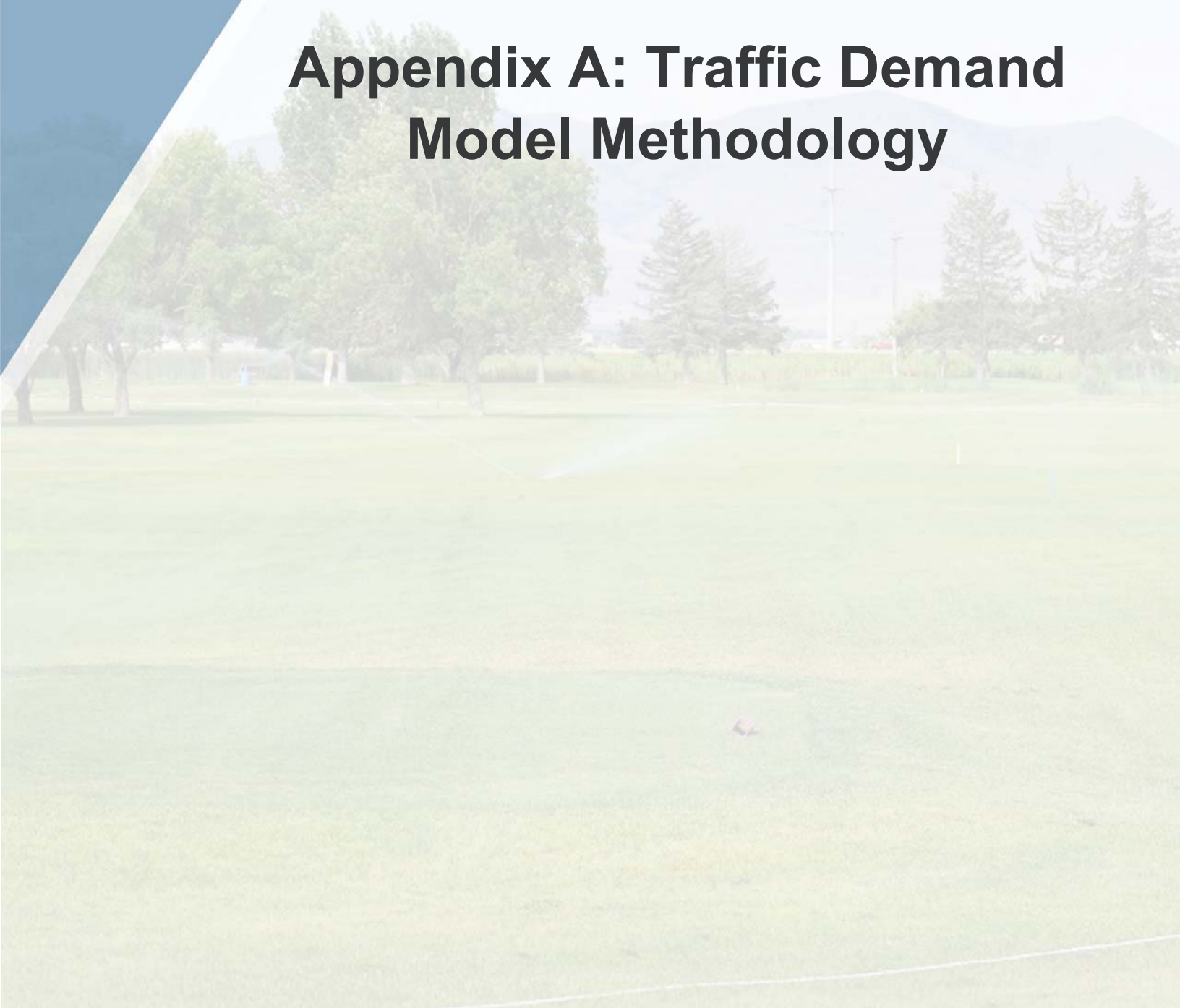
The following table shows the recommended updates for all existing and future City owned crossings:

| Crossing Improvement | 1. Iowa String Rd | 2. 1000 North | 3. 600 North | 4. 300 North | 5. 200 North | 6. Main Street | 7. 600 South | 8. 1200 South | 9. 10000 North |
|---|---|---|---|---|---|---|---|---|---|
| Detectable Warning Surface | ● | ● | ● | ● | ● | | ● | ● | ● |
| LOOK Sign (R15-8) | ● | ● | ● | ● | ● | ● | ● | ● | |
| "Stop" Pavement Marking | ● | ● | | ● | ● | | | ● | |
| Pathway Delineation | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Roadway Striping | ● | | | | ● | | | ● | |
| Curb & Gutter | | ● | | ● | | | | ● | ● |
| Crossing Gates | | | ● | ● | ● | | ● | | ● |

● = Traffic control device exists at the intersection. A blank box indicates the required traffic control device is required to be installed at the intersection.

TRANSPORTATION MASTER PLAN
May 2018

# Appendix A: Traffic Demand Model Methodology



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# Traffic Demand Model Methodology

## Trip Generation

### ITE Trip Generation Manual

In order to best estimate existing and future daily traffic flows in Tremonton, the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 9th Edition* was used. The ITE Trip Generation Manual has data for over 170 land uses which vary from residential to industrial. Typical measurement of trip generation utilizes a "per acre", "per 1,000 sf" or a "per unit" type of measurement. For the Tremonton TMP, it was necessary to convert all measurements to show the estimated trip generation using the same unit of measure. The unit of measure used for all trip generation was "per acre".

### Determining Estimated Trips based on Zoning Map

Using the Tremonton City Zoning Map, the appropriate trip generation land use was chosen for each land use. For areas of the City already built out, the trip generation was directly applied to the existing land uses. For areas where development has not occurred, approximations based on land use were applied to generate an approximate trip generation value. The following are assumptions for undeveloped land:

- Commercial – Big Box type store: 25% of land used for building
- Commercial – Retail: 50% of land used for building
- Industrial: 33% of land used for building
- Business park: 25% of land used for building
- Supermarket: 11,800 SF floor space per acre of land
- Residential – Converted to units "per acre" based on zoned densities on Map

### Existing, 20-Year and 50-Year Analysis

The trip generation included the total daily trips as if all zones are built out. In order to determine the number of trips for each analysis scenario, reductions were required. The total number of trips were reduced by coordinating with City staff to determine the developed percentage for each land use on the Zoning Map. With reductions, the total number of trip generated in Tremonton City are 47,634, 103,885, and 171,147 for the Existing, 20-Year, and 50-Year Analyses respectively. The appendix of this report includes a table which has the trip generation for each zone.

## Trip Distribution

### Development Zones

Once trips are generated, they can be distributed throughout the city. A significant effort would be required to connect each land use zone on the Zoning Map together. To maintain accuracy as well as reduce the amount of effort required to distribute trips, eight Development Zones (DZ) were created within the City. Each development zone includes a number of land uses from the Zoning Map. The Development Zones are shown in **Figure 1**. The Appendix of this report includes the trip generation for each DZ.

# Transportation Master Plan

## Figure 01: Tremonton City Development Zones

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Tremonton
Tremonton

**Legend**

**Roadway Network**

- Existing Interstate
- Future Interstate
- Existing Roadways
- Future Roadways
- Annexation Boundary
- Existing City Boundary

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0 0.325 0.65 1.3 Miles

N

### Vistro Software

In order to effectively distribute trips on the roadway network between the eight DZ's, a software program called *PTV Vistro 5* was used. In Vistro, each DZ is connected by a series of "paths". Each path connects to another DZ using the roadway network and carries a percentage of the total trip generation of the DZ. For example, all trips between DZ #1 and DZ #2 have a series of paths connecting to each other which utilize all logical roadways between them.

### Reduction in Trips

Trips within DZ's need to be reduced for internal trips. Trips between land uses within the same DZ do not contribute to trips on the roadway network outside the DZ. Internal trips are attributed to roadways located within the DZ. Included in the appendix of this report is a table which includes the reductions for each DZ.

### Trip Assignment

Utilizing the trip generation and trip distribution, trips were assigned to each path. A percentage of the total trip generation within the DZ is assigned to each path. 8,000+ paths were created as part of the TDM. Also, included in the model were trips where either the origin or destination occur outside the City. To incorporate these trips, paths were created connecting each DZ to I-15, I-84, and areas outside the City.

## Model Calibration

This methodology of generating and distributing trips represents theoretical traffic volumes on the roadway network. In order to apply this methodology specifically to the needs of Tremonton, it was calibrated to meet the existing roadway conditions in the City. The existing count volumes in Tremonton was compared to the existing model volumes. Where there were significant differences between the count and model volumes, small adjustments were made to the model to match count volumes. Once the differences between the count and model volumes were close (within +/- 3,000 daily trips), an adjustment factor was created as the difference between the two volumes to finalize the calibration process. The adjustment factor was applied to create 20-year and 50-year calibrated models.

# Appendix

| Zone | ITE Code | Name | Unit of Measure | Measurement | Measurement per Acre | Zone Size (Acre) | Number of Units | Trip Rate per Unit | Trips Generated (Entire Zone) | Percent Developed | | | Trips Generated | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Existing | 20-Year | 50-Year | Existing | 20-Year | 50-Year |
| 1 | 210 | Single-Family Detached Housing | Per Unit | 1 per .5 acre | 2.00 | 114.96 | 230 | 9.52 | 2190 | 0% | 0% | 5% | 0 | 0 | 110 |
| 2 | 210 | Single-Family Detached Housing | Per Unit | 1 per .33 acre | 3.03 | 418.71 | 1269 | 9.52 | 12081 | 0% | 0% | 10% | 0 | 0 | 1209 |
| 3 | 411 | City Park | Acres | | 1.00 | 57.66 | 58 | 1.89 | 110 | 0% | 100% | 100% | 0 | 110 | 110 |
| 4 | 210 | Single-Family Detached Housing | Per Unit | 1 per .25 acre | 4.00 | 147.26 | 590 | 9.52 | 5617 | 0% | 40% | 80% | 0 | 2247 | 4494 |
| 5 | 210 | Single-Family Detached Housing | Per Unit | 1 per 8000 SF | 5.45 | 67.79 | 370 | 9.52 | 3523 | 0% | 40% | 80% | 0 | 1410 | 2819 |
| 6 | 210 | Single-Family Detached Housing | Per Unit | 1 per 5000 SF | 8.71 | 35.07 | 306 | 9.52 | 2914 | 0% | 40% | 80% | 0 | 1166 | 2332 |
| 7 | 826 | Specialty Retail Center | 1000 SFGFA | .5 per Acre | 0.50 | 28.02 | 15 | 44.32 | 665 | 0% | 50% | 100% | 0 | 333 | 665 |
| 8 | 826 | Specialty Retail Center | 1000 SFGFA | .5 per acre | 0.50 | 70.00 | 35 | 42.7 | 1495 | 0% | 50% | 100% | 0 | 748 | 1495 |
| 9 | 210 | Single-Family Detached Housing | Per Unit | 1 per 12000 SF | 3.63 | 70.00 | 255 | 9.52 | 2428 | 0% | 50% | 80% | 0 | 1214 | 1943 |
| 10 | 210 | Single-Family Detached Housing | Per Unit | 1 per 20000 SF | 2.18 | 50.00 | 109 | 9.52 | 1038 | 20% | 50% | 100% | 208 | 519 | 1038 |
| 11 | 850 | Supermarket | Per 1000 SF GFA | 59 per 5 acres | 11.80 | 5.00 | 59 | 102.24 | 6033 | 50% | 75% | 100% | 3017 | 4525 | 6033 |
| 12 | 210 | Single-Family Detached Housing | Per Unit | 1 per 12000 SF | 3.63 | 100.00 | 363 | 9.52 | 3456 | 40% | 80% | 100% | 1383 | 2765 | 3456 |
| 13 | 210 | Single-Family Detached Housing | Per Unit | 1 per 10000 SF | 4.36 | 80.00 | 349 | 9.52 | 3323 | 15% | 90% | 100% | 499 | 2991 | 3323 |
| 14 | 270 | Residential Planned Unit Development | Per Unit | 1 Per 16000 SF | 2.72 | 17.00 | 47 | 7.5 | 353 | 50% | 100% | 100% | 177 | 353 | 353 |
| 15 | | MIXED USE | | | | 25.00 | 0 | | 0 | 0% | 50% | 100% | 0 | 0 | 0 |
| 16 | 820 | Shopping Center | 1000 SFGFA | .20 per Acre | 0.20 | 250.00 | 50 | 42.7 | 2135 | 20% | 60% | 100% | 427 | 1281 | 2135 |
| 17 | 770 | Business Park | Per 1000 SF GFA | .25 an acre | 0.25 | 150.00 | 38 | 12.44 | 473 | 20% | 65% | 90% | 95 | 308 | 426 |
| 18 | 270 | Residential Planned Unit Development | Per Unit | 1 Per 16000 SF | 2.72 | 10.00 | 28 | 7.5 | 210 | 30% | 80% | 100% | 63 | 168 | 210 |
| 19 | 210 | Single-Family Detached Housing | Per Unit | 1 per 10000 SF | 4.36 | 20.00 | 88 | 9.52 | 838 | 20% | 75% | 100% | 168 | 629 | 838 |
| 20 | 130 | Industrial Park | 1000 SF GFA | 33% land used | 0.33 | 30.00 | 10 | 6.83 | 69 | 20% | 50% | 75% | 14 | 35 | 52 |
| 21 | 430 | Golf Course | Acres | | 1.00 | 65.80 | 66 | 5.04 | 333 | 100% | 100% | 100% | 333 | 333 | 333 |
| 22 | 210 | Single-Family Detached Housing | Per Unit | 1 per 10000 SF | 4.36 | 10.00 | 44 | 9.52 | 419 | 5% | 70% | 100% | 21 | 294 | 419 |
| 23 | 210 | Single-Family Detached Housing | Per Unit | 1 per 20000 SF | 2.18 | 50.00 | 109 | 9.52 | 1038 | 20% | 50% | 100% | 208 | 519 | 1038 |
| 24 | | MIXED USE | | | | 80.00 | 0 | | 0 | 0% | 10% | 50% | 0 | 0 | 0 |
| 25 | 130 | Industrial Park | 1000 SF GFA | 33% land used | 14.37 | 45.00 | 647 | 6.83 | 4420 | 50% | 75% | 75% | 2210 | 3315 | 3315 |
| 26 | 210 | Single-Family Detached Housing | Per unit | 1 per 20000 SF | 2.18 | 5.00 | 11 | 9.52 | 105 | 0% | 50% | 100% | 0 | 53 | 105 |
| 27 | 210 | Single-Family Detached Housing | Per Unit | 1 per 8000 SF | 5.45 | 16.00 | 88 | 9.52 | 838 | 90% | 100% | 100% | 755 | 838 | 838 |
| 28 | 210 | Single-Family Detached Housing | Per Unit | 1 per .5 acre | 2.00 | 1.00 | 2 | 9.52 | 20 | 100% | 100% | 100% | 20 | 20 | 20 |
| 29 | 210 | Single-Family Detached Housing | Per Unit | 1 per 10000 SF | 4.36 | 4.00 | 18 | 9.52 | 172 | 100% | 100% | 100% | 172 | 172 | 172 |
| 30 | 270 | Residential Planned Unit Development | Per Unit | 1 per 8000 SF | 5.45 | 20.00 | 109 | 7.5 | 818 | 80% | 100% | 100% | 655 | 818 | 818 |
| 31 | 210 | Single-Family Detached Housing | Per Unit | 1 per .5 acre | 2.00 | 3.00 | 6 | 9.52 | 58 | 80% | 100% | 100% | 47 | 58 | 58 |
| 32 | 210 | Single-Family Detached Housing | Per Unit | 1 per 10000 SF | 4.36 | 40.98 | 179 | 9.52 | 1705 | 80% | 100% | 100% | 1364 | 1705 | 1705 |
| 33 | 210 | Single-Family Detached Housing | Per Unit | 1 per 0.5 acre | 2.00 | 20.00 | 40 | 9.52 | 381 | 10% | 30% | 50% | 39 | 115 | 191 |
| 34 | 210 | Single-Family Detached Housing | Per Unit | 1 per 0.5 acre | 2.00 | 50.00 | 100 | 9.52 | 952 | 10% | 30% | 50% | 96 | 286 | 476 |
| 35 | 520 | Elementary School | Per 1000 SF GFA | 1 per 5000 SF | 8.71 | 14.21 | 124 | 15.43 | 1914 | 100% | 100% | 100% | 1914 | 1914 | 1914 |
| 36 | 270 | Residential Planned Unit Development | per unit | 1 per 8000 SF | 5.45 | 3.00 | 17 | 7.5 | 128 | 100% | 100% | 100% | 128 | 128 | 128 |
| 37 | 270 | Residential Planned Unit Development | per unit | 1 per 8000 SF | 5.45 | 1.50 | 9 | 7.5 | 68 | 80% | 100% | 100% | 55 | 68 | 68 |
| 38 | 252 | Senior Adult Housing- Attached | per Unit | 5 per 8000 SF | 3.00 | 1.54 | 5 | 3.44 | 18 | 100% | 100% | 100% | 18 | 18 | 18 |
| 39 | 210 | Single-Family Detached Housing | Per Unit | 1 per 0.5 acre | 2.00 | 46.00 | 92 | 9.52 | 876 | 3% | 70% | 100% | 27 | 614 | 876 |
| 40 | 210 | Single-Family Detached Housing | Per Unit | 1 per 10000 SF | 4.36 | 75.00 | 327 | 9.52 | 3114 | 5% | 80% | 100% | 156 | 2492 | 3114 |
| 41 | 560 | Church | Per 1000 SF GFA | 7 per 2 acres | 3.50 | 2.04 | 8 | 9.11 | 73 | 100% | 100% | 100% | 73 | 73 | 73 |
| 42 | 270 | Residential Planned Unit Development | Per Unit | 1 Per 16000 SF | 2.72 | 27.46 | 75 | 7.5 | 563 | 90% | 100% | 100% | 507 | 563 | 563 |
| 43 | | TREMONT CENTER MIXED USE | | | | 36.92 | 0 | | 0 | 20% | 100% | 100% | 0 | 0 | 0 |
| 44 | 210 | Single-Family Detached Housing | Per Unit | 1 per 8000 SF | 5.45 | 67.16 | 366 | 9.11 | 3335 | 90% | 100% | 100% | 3002 | 3335 | 3335 |
| 45 | 210 | Single-Family Detached Housing | Per Unit | 1 per 6000 SF | 7.26 | 38.94 | 283 | 9.11 | 2579 | 95% | 100% | 100% | 2451 | 2579 | 2579 |
| 46 | 411 | City Park | Acres | | 1.00 | 5.93 | 6 | 1.89 | 12 | 100% | 100% | 100% | 12 | 12 | 12 |
| 47 | 210 | Single-Family Detached Housing | Per Unit | 1 per 8000 SF | 5.45 | 39.27 | 214 | 9.11 | 1950 | 95% | 100% | 100% | 1853 | 1950 | 1950 |
| 48 | 151 | Mini-Warehouse | Acres | | 1.00 | 2.54 | 3 | 35.43 | 107 | 100% | 100% | 100% | 107 | 107 | 107 |
| 49 | 270 | Residential Planned Unit Development | Per Unit | 1 per 8000 SF | 5.45 | 1.80 | 10 | 7.5 | 75 | 90% | 100% | 100% | 68 | 75 | 75 |
| 50 | 210 | Single-Family Detached Housing | Per unit | 1 per 0.5 acre | 2.00 | 14.91 | 30 | 9.11 | 274 | 100% | 100% | 100% | 274 | 274 | 274 |
| 51 | 720 | Medical-Dental Office Building | Per 1000 SF GFA | 5 per acre | 5.00 | 35.00 | 175 | 36.13 | 6323 | 30% | 70% | 100% | 1897 | 4427 | 6323 |
| 52 | 715 | Single Tenant Office Building | Per 1000 SF GFA | .43 per acre | 0.43 | 140.14 | 61 | 11.65 | 711 | 90% | 100% | 100% | 640 | 711 | 711 |
| 53 | 270 | Residential Planned Unit Development | Per Unit | 1 Per 16000 SF | 2.72 | 12.51 | 35 | 7.5 | 263 | 25% | 100% | 100% | 66 | 263 | 263 |
| 54 | 210 | Single-Family Detached Housing | Per Unit | 1 per 8000 SF | 5.45 | 152.80 | 832 | 9.11 | 7580 | 95% | 100% | 100% | 7201 | 7580 | 7580 |
| 55 | 520 | Elementary School | Per 1000 SF GFA | 55 per 7.2 Acres | 7.64 | 7.20 | 55 | 15.43 | 849 | 100% | 100% | 100% | 849 | 849 | 849 |
| 56 | 411 | City Park | Acres | | 1.00 | 5.34 | 6 | 1.89 | 12 | 100% | 100% | 100% | 12 | 12 | 12 |
| 57 | 411 | City Park | Acres | | 1.00 | 2.81 | 3 | 1.89 | 6 | 60% | 100% | 100% | 4 | 6 | 6 |
| 58 | 560 | Church | Per 1000 SF GFA | 2 per .33 acres | 6.06 | 0.33 | 2 | 9.11 | 19 | 100% | 100% | 100% | 19 | 19 | 19 |
| 59 | 560 | Church | Per 1000 SF GFA | 10 per 1.1 acres | 9.09 | 1.10 | 10 | 9.11 | 92 | 100% | 100% | 100% | 92 | 92 | 92 |
| 60 | 730 | Government Office Building | Per 1000 SF GFA | 40 per 3.73 Acres | 10.72 | 3.73 | 40 | 68.93 | 2758 | 100% | 100% | 100% | 2758 | 2758 | 2758 |
| 61 | 210 | Single-Family Detached Housing | per Unit | 1 per 8000 SF | 5.45 | 80.00 | 436 | 9.11 | 3972 | 85% | 100% | 100% | 3377 | 3972 | 3972 |
| 62 | 520 | Elementary School | Per 1000 SF GFA | 56 per 6.97 Acres | 8.03 | 6.97 | 56 | 15.43 | 865 | 100% | 100% | 100% | 865 | 865 | 865 |
| 63 | 210 | Single-Family Detached Housing | Per Unit | 1 per 20000 SF | 2.18 | 1.25 | 3 | 9.11 | 28 | 100% | 100% | 100% | 28 | 28 | 28 |
| 64 | 560 | Church | Per 1000 SF GFA | 28.5 per 6.72 acres | 4.24 | 6.72 | 29 | 9.11 | 265 | 100% | 100% | 100% | 265 | 265 | 265 |
| 65 | 560 | Church | Per 1000 SF GFA | 15.77 per 1.70acres | 9.28 | 1.70 | 16 | 9.11 | 146 | 100% | 100% | 100% | 146 | 146 | 146 |
| 66 | 715 | Single Tenant Office Building | Per 1000 SF GFA | 9.5 per acre | 9.50 | 1.00 | 10 | 11.65 | 117 | 100% | 100% | 100% | 117 | 117 | 117 |
| 67 | 270 | Residential Planned Unit Development | Per Unit | 1 per 8000 SF | 5.45 | 8.40 | 46 | 7.5 | 345 | 50% | 100% | 100% | 173 | 345 | 345 |
| 68 | 566 | Cemetery | Per Acre | | 1.00 | 13.32 | 14 | 4.73 | 67 | 100% | 100% | 100% | 67 | 67 | 67 |
| 69 | 210 | Single-Family Detached Housing | Per Unit | 1 per 8000 SF | 5.45 | 3.00 | 17 | 9.11 | 155 | 50% | 100% | 100% | 78 | 155 | 155 |
| 70 | 210 | Single-Family Detached Housing | Per Unit | 1 per 20000 SF | 2.18 | 1.20 | 3 | 9.11 | 28 | 0% | 100% | 100% | 0 | 28 | 28 |
| 71 | 715 | Single Tenant Office Building | Per 1000 SF GFA | 9.5 per acre | 9.50 | 1.00 | 10 | 11.65 | 117 | 0% | 100% | 100% | 0 | 117 | 117 |
| 72 | 530 | High School | Per 1000 SF GFA | 8.5 per acre | 8.57 | 2.90 | 25 | 12.89 | 323 | 100% | 100% | 100% | 323 | 323 | 323 |
| 73 | 210 | Single-Family Detached Housing | Per Unit | 1 per 10000 SF | 4.36 | 79.79 | 348 | 9.11 | 3171 | 80% | 100% | 100% | 2537 | 3171 | 3171 |
| 74 | 560 | Church | Per 1000 SF GFA | 29.6 per 6.7 acres | 4.42 | 6.70 | 30 | 9.11 | 274 | 100% | 100% | 100% | 274 | 274 | 274 |
| 75 | | SENSITIVE AREA DISTRICT | | | | | 0 | | 0 | 0% | 0% | 0% | 0 | 0 | 0 |
| 76 | 210 | Single-Family Detached Housing | Per Unit | 1 per 10000 SF | 4.36 | 32.10 | 140 | 9.11 | 1276 | 90% | 100% | 100% | 1149 | 1276 | 1276 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | WASTEWATER TREATMENT PLANT | | | | | 0 | | 0 | 100% | 100% | 100% | 0 | 0 | 0 |
| | 210 | Single-Family Detached Housing | Per Unit | 1 per 0.5 acre | 2.00 | 5.88 | 12 | 9.11 | 110 | 100% | 100% | 100% | 110 | 110 | 110 |
| | 210 | Single-Family Detached Housing | Per Unit | 1 per 10000 SF | 4.36 | 74.64 | 326 | 9.11 | 2970 | 40% | 90% | 100% | 1188 | 2673 | 2970 |
| | | MIXED USE | | | | | 0 | | 0 | 40% | 60% | 80% | 0 | 0 | 0 |
| | 210 | Single-Family Detached Housing | Per Unit | 1 per 10000 SF | 4.36 | 24.01 | 105 | 9.11 | 957 | 10% | 80% | 100% | 96 | 766 | 957 |
| | 210 | Single-Family Detached Housing | Per Unit | 1 per 20000 SF | 2.18 | 70.00 | 153 | 9.11 | 1394 | 0% | 25% | 60% | 0 | 349 | 837 |
| | 210 | Single-Family Detached Housing | Per Unit | 1 per 0.5 acre | 2.00 | 50.00 | 100 | 9.11 | 911 | 10% | 60% | 100% | 92 | 547 | 911 |
| | 150 | Warehousing | Per 1000 SF GFA | 10 per acre | 10.00 | 40.00 | 400 | 3.56 | 1424 | 30% | 50% | 75% | 428 | 712 | 1068 |
| | 210 | Single-Family Detached Housing | Per Unit | 1 per 20000 SF | 2.18 | 2.00 | 5 | 9.11 | 46 | 100% | 100% | 100% | 46 | 46 | 46 |
| | 210 | Single-Family Detached Housing | Per Unit | 1 per 20000 SF | 2.18 | 20.00 | 44 | 9.11 | 401 | 30% | 75% | 100% | 121 | 301 | 401 |
| | **ANNEXATION ZONE** | | | | | | | | | | | | | | |
| | 210 | single-family Detached Housing | Per Unit | 1 per 20000 SF | 2.18 | 2632.00 | 5733 | 9.11 | 52228 | 0% | 15% | 30% | 0 | 7835 | 15669 |
| | 210 | Single-Family Detached Housing | Per Unit | 1 per 12000 SF | 3.63 | 434.00 | 1576 | 9.11 | 14358 | 0% | 5% | 50% | 0 | 718 | 7179 |
| | 210 | Single-Family Detached Housing | Per Unit | 1 per 20000 SF | 2.18 | 99.10 | 216 | 9.11 | 1968 | 0% | 20% | 70% | 0 | 394 | 1378 |
| | 210 | Single-Family Detached Housing | Per Unit | 1 per 10000 SF | 4.36 | 115.18 | 502 | 9.11 | 4574 | 0% | 20% | 70% | 0 | 915 | 3202 |
| | 826 | Specialty Retail Center | Per 1000 SF GFA | .25 per acre | 0.25 | 139.00 | 35 | 44.32 | 1552 | 0% | 40% | 80% | 0 | 621 | 1242 |
| | 826 | Specialty Retail Center | Per 1000 SF GFA | .25 per acre | 0.25 | 563.00 | 141 | 44.32 | 6250 | 0% | 40% | 80% | 0 | 2500 | 5000 |
| | 210 | Single-Family Detached Housing | Per Unit | 1 per 12000 SF | 3.63 | 556.00 | 2019 | 9.11 | 18394 | 0% | 15% | 60% | 0 | 2760 | 11037 |
| | 210 | Single-Family Detached Housing | Per Unit | 1 per 12000 SF | 3.63 | 270.00 | 981 | 9.11 | 8937 | 0% | 15% | 60% | 0 | 1341 | 5363 |
| | 210 | Single-Family Detached Housing | Per Unit | 1 per 20000 SF | 2.18 | 108.00 | 236 | 9.11 | 2150 | 0% | 30% | 80% | 0 | 645 | 1720 |
| | 210 | Single-Family Detached Housing | Per Unit | 1 per 10000 SF | 4.36 | 274.00 | 1194 | 9.11 | 10878 | 0% | 30% | 80% | 0 | 3264 | 8703 |
| | 210 | Single-Family Detached Housing | Per Unit | 1 per 10000 SF | 4.36 | 203.00 | 885 | 9.11 | 8063 | 0% | 30% | 80% | 0 | 2419 | 6451 |
| | 210 | Single-Family Detached Housing | Per Unit | 1 per 20000 SF | 2.18 | 600.0 | 1307 | 9.11 | 11907 | 0% | 30% | 80% | 0 | 3573 | 9526 |
| | | | | | | | | | | | | | 47,634 | 103,885 | 171,147 |

# Development Zone 1

| Zone | ITE Code | Name | Trips Generated (Entire Zone) | Percent Developed | | | Trips Generated | | | % Attributed to Dev. Zone 1 | | | % Internal Capture | Adjusted Trips Generated | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Existing | 20-Year | 50-Year | Existing | 20-Year | 50-Year | Existing | 20-Year | 50-Year | | Existing | 20-Year | 50-Year |
| 1 | 210 | Single-Family Detached Housing | 2190 | 0% | 0% | 5% | 0 | 0 | 110 | 100% | 100% | 100% | 15% | 0 | 0 | 94 |
| 2 | 210 | Single-Family Detached Housing | 12081 | 0% | 0% | 10% | 0 | 0 | 1209 | 100% | 100% | 100% | 15% | 0 | 0 | 1028 |
| 3 | 411 | City Park | 110 | 0% | 100% | 100% | 0 | 110 | 110 | 100% | 100% | 100% | 15% | 0 | 94 | 94 |
| 4 | 210 | Single-Family Detached Housing | 5617 | 0% | 40% | 80% | 0 | 2247 | 4494 | 100% | 100% | 100% | 15% | 0 | 1910 | 3820 |
| 5 | 210 | Single-Family Detached Housing | 3523 | 0% | 40% | 80% | 0 | 1410 | 2819 | 100% | 100% | 100% | 15% | 0 | 1199 | 2397 |
| 6 | 210 | Single-Family Detached Housing | 2914 | 0% | 40% | 80% | 0 | 1166 | 2332 | 100% | 100% | 100% | 15% | 0 | 992 | 1983 |
| 7 | 826 | Specialty Retail Center | 665 | 0% | 50% | 100% | 0 | 333 | 665 | 100% | 100% | 100% | 5% | 0 | 317 | 632 |
| 9 | 210 | Single-Family Detached Housing | 2428 | 0% | 50% | 80% | 0 | 1214 | 1943 | 100% | 100% | 100% | 5% | 0 | 1154 | 1846 |
| 10 | 210 | Single-Family Detached Housing | 1038 | 20% | 50% | 100% | 208 | 519 | 1038 | 50% | 50% | 50% | 5% | 99 | 247 | 494 |
| 11 | 850 | Supermarket | 6033 | 50% | 75% | 100% | 3017 | 4525 | 6033 | 100% | 100% | 100% | 5% | 2867 | 4299 | 5732 |
| 12 | 210 | Single-Family Detached Housing | 3456 | 40% | 80% | 100% | 1383 | 2765 | 3456 | 100% | 100% | 100% | 0% | 1383 | 2765 | 3456 |
| 88 | 210 | Single-Family Detached Housing | 14358 | 0% | 5% | 50% | 0 | 718 | 7179 | 100% | 100% | 100% | 0% | 0 | 718 | 7179 |
| | | | | | | **Total** | **4,608** | **15,007** | **31,388** | | | | | **4,349** | **13,695** | **28,755** |

# Development Zone 2

| Zone | ITE Code | Name | Trips Generated (Entire Zone) | Percent Developed | | | Trips Generated | | | % Attributed to Dev. Zone 2 | | | % Internal Capture | Adjusted Trips Generated | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Existing | 20-Year | 50-Year | Existing | 20-Year | 50-Year | Existing | 20-Year | 50-Year | | Existing | 20-Year | 50-Year |
| 8 | 826 | Specialty Retail Center | 1495 | 0% | 50% | 100% | 0 | 748 | 1495 | 100% | 100% | 100% | 3% | 0 | 726 | 1451 |
| 10 | 210 | Single-Family Detached Housing | 1038 | 20% | 50% | 100% | 208 | 519 | 1038 | 50% | 50% | 50% | 10% | 94 | 234 | 468 |
| 13 | 210 | Single-Family Detached Housing | 3323 | 15% | 90% | 100% | 499 | 2991 | 3323 | 100% | 100% | 100% | 10% | 450 | 2692 | 2991 |
| 14 | 270 | Residential Planned Unit Developme | 353 | 50% | 100% | 100% | 177 | 353 | 353 | 100% | 100% | 100% | 10% | 160 | 318 | 318 |
| 15 | 0 | MIXED USE | 0 | 0% | 50% | 100% | 0 | 0 | 0 | 100% | 100% | 100% | 5% | 0 | 0 | 0 |
| 16 | 820 | Shopping Center | 2135 | 20% | 60% | 100% | 427 | 1281 | 2135 | 70% | 70% | 70% | 5% | 284 | 852 | 1420 |
| 17 | 770 | Business Park | 473 | 20% | 65% | 90% | 95 | 308 | 426 | 50% | 50% | 50% | 5% | 46 | 147 | 203 |
| 89 | 210 | Single-Family Detached Housing | 1968 | 0% | 20% | 70% | 0 | 394 | 1378 | 100% | 100% | 100% | 10% | 0 | 355 | 1241 |
| 90 | 210 | Single-Family Detached Housing | 4574 | 0% | 20% | 70% | 0 | 915 | 3202 | 100% | 100% | 100% | 10% | 0 | 824 | 2882 |
| | | | | | | **Total** | **1,406** | **7,509** | **13,350** | | | | | **1,034** | **6,148** | **10,974** |

# Development Zone 3

| Zone | ITE Code | Name | Trips Generated (Entire Zone) | Percent Developed | | | Trips Generated | | | % Attributed to Dev. Zone 3 | | | % Internal Capture | Adjusted Trips Generated | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Existing | 20-Year | 50-Year | Existing | 20-Year | 50-Year | Existing | 20-Year | 50-Year | | Existing | 20-Year | 50-Year |
| 16 | 820 | Shopping Center | 2135 | 20% | 60% | 100% | 427 | 1281 | 2135 | 10% | 10% | 10% | 3% | 42 | 125 | 208 |
| 17 | 770 | Business Park | 473 | 20% | 65% | 90% | 95 | 308 | 426 | 50% | 50% | 50% | 5% | 46 | 147 | 203 |
| 18 | 270 | Residential Planned Unit Developme | 210 | 30% | 80% | 100% | 63 | 168 | 210 | 100% | 100% | 100% | 15% | 54 | 143 | 179 |
| 19 | 210 | Single-Family Detached Housing | 838 | 20% | 75% | 100% | 168 | 629 | 838 | 100% | 100% | 100% | 15% | 143 | 535 | 713 |
| 20 | 130 | Industrial Park | 69 | 20% | 50% | 75% | 14 | 35 | 52 | 100% | 100% | 100% | 2% | 14 | 35 | 51 |
| 21 | 430 | Golf Course | 333 | 100% | 100% | 100% | 333 | 333 | 333 | 100% | 100% | 100% | 3% | 324 | 324 | 324 |
| 25 | 130 | Industrial Park | 4420 | 50% | 75% | 75% | 2210 | 3315 | 3315 | 100% | 100% | 100% | 2% | 2166 | 3249 | 3249 |
| 26 | 210 | Single-Family Detached Housing | 105 | 0% | 50% | 100% | 0 | 53 | 105 | 100% | 100% | 100% | 15% | 0 | 46 | 90 |
| 27 | 210 | Single-Family Detached Housing | 838 | 90% | 100% | 100% | 755 | 838 | 838 | 50% | 50% | 50% | 15% | 321 | 357 | 357 |
| 28 | 210 | Single-Family Detached Housing | 20 | 100% | 100% | 100% | 20 | 20 | 20 | 100% | 100% | 100% | 15% | 17 | 17 | 17 |
| 29 | 210 | Single-Family Detached Housing | 172 | 100% | 100% | 100% | 172 | 172 | 172 | 100% | 100% | 100% | 15% | 147 | 147 | 147 |
| 30 | 270 | Residential Planned Unit Developme | 818 | 80% | 100% | 100% | 655 | 818 | 818 | 100% | 100% | 100% | 15% | 557 | 696 | 696 |
| 35 | 520 | Elementary School | 1914 | 100% | 100% | 100% | 1914 | 1914 | 1914 | 100% | 100% | 100% | 20% | 1532 | 1532 | 1532 |
| 38 | 252 | Senior Adult Housing- Attached | 18 | 100% | 100% | 100% | 18 | 18 | 18 | 100% | 100% | 100% | 10% | 17 | 17 | 17 |
| 39 | 210 | Single-Family Detached Housing | 876 | 3% | 70% | 100% | 27 | 614 | 876 | 100% | 100% | 100% | 15% | 23 | 522 | 745 |
| 40 | 210 | Single-Family Detached Housing | 3114 | 5% | 80% | 100% | 156 | 2492 | 3114 | 100% | 100% | 100% | 15% | 133 | 2119 | 2647 |
| 41 | 560 | Church | 73 | 100% | 100% | 100% | 73 | 73 | 73 | 100% | 100% | 100% | 5% | 70 | 70 | 70 |
| 42 | 270 | Residential Planned Unit Developme | 563 | 90% | 100% | 100% | 507 | 563 | 563 | 100% | 100% | 100% | 15% | 431 | 479 | 479 |
| 43 | 0 | TREMONT CENTER MIXED USE | 0 | 20% | 100% | 100% | 0 | 0 | 0 | 100% | 100% | 100% | 5% | 0 | 0 | 0 |
| 51 | 720 | Medical-Dental Office Building | 6323 | 30% | 70% | 100% | 1897 | 4427 | 6323 | 100% | 100% | 100% | 5% | 1803 | 4206 | 6007 |
| 52 | 715 | Single Tenant Office Building | 711 | 90% | 100% | 100% | 640 | 711 | 711 | 40% | 40% | 40% | 5% | 244 | 271 | 271 |
| 54 | 210 | Single-Family Detached Housing | 7580 | 95% | 100% | 100% | 7201 | 7580 | 7580 | 100% | 100% | 100% | 15% | 6121 | 6443 | 6443 |
| 55 | 520 | Elementary School | 849 | 100% | 100% | 100% | 849 | 849 | 849 | 100% | 100% | 100% | 20% | 680 | 680 | 680 |
| 56 | 411 | City Park | 12 | 100% | 100% | 100% | 12 | 12 | 12 | 100% | 100% | 100% | 5% | 12 | 12 | 12 |
| 57 | 411 | City Park | 6 | 60% | 100% | 100% | 4 | 6 | 6 | 100% | 100% | 100% | 5% | 4 | 6 | 6 |
| 58 | 560 | Church | 19 | 100% | 100% | 100% | 19 | 19 | 19 | 100% | 100% | 100% | 5% | 19 | 19 | 19 |
| 59 | 560 | Church | 92 | 100% | 100% | 100% | 92 | 92 | 92 | 100% | 100% | 100% | 5% | 88 | 88 | 88 |
| | | | | | | **Total** | **18,321** | **27,340** | **31,412** | | | | | **15,008** | **22,285** | **25,250** |

# Development Zone 4

| Zone | ITE Code | Name | Trips Generated (Entire Zone) | Percent Developed | | | Trips Generated | | | % Attributed to Dev. Zone 4 | | | % Internal Capture | Adjusted Trips Generated | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Existing | 20-Year | 50-Year | Existing | 20-Year | 50-Year | Existing | 20-Year | 50-Year | | Existing | 20-Year | 50-Year |
| 16 | 820 | Shopping Center | 2135 | 20% | 60% | 100% | 427 | 1281 | 2135 | 20% | 15% | 15% | 3% | 83 | 187 | 311 |
| 22 | 210 | Single-Family Detached Housing | 419 | 5% | 70% | 100% | 21 | 294 | 419 | 100% | 100% | 100% | 10% | 19 | 265 | 378 |
| 23 | 210 | Single-Family Detached Housing | 1038 | 20% | 50% | 100% | 208 | 519 | 1038 | 100% | 100% | 100% | 10% | 188 | 468 | 935 |
| 31 | 210 | Single-Family Detached Housing | 58 | 80% | 100% | 100% | 47 | 58 | 58 | 100% | 100% | 100% | 10% | 43 | 53 | 53 |
| 32 | 210 | Single-Family Detached Housing | 1705 | 80% | 100% | 100% | 1364 | 1705 | 1705 | 100% | 100% | 100% | 10% | 1228 | 1535 | 1535 |
| 33 | 210 | Single-Family Detached Housing | 381 | 10% | 30% | 50% | 39 | 115 | 191 | 100% | 100% | 100% | 10% | 36 | 104 | 172 |
| 34 | 210 | Single-Family Detached Housing | 952 | 10% | 30% | 50% | 96 | 286 | 476 | 30% | 30% | 30% | 10% | 26 | 78 | 129 |
| 36 | 270 | Residential Planned Unit Developme | 128 | 100% | 100% | 100% | 128 | 128 | 128 | 100% | 100% | 100% | 10% | 116 | 116 | 116 |
| 37 | 270 | Residential Planned Unit Developme | 68 | 80% | 100% | 100% | 55 | 68 | 68 | 100% | 100% | 100% | 10% | 50 | 62 | 62 |
| 44 | 210 | Single-Family Detached Housing | 3335 | 90% | 100% | 100% | 3002 | 3335 | 3335 | 100% | 100% | 100% | 10% | 2702 | 3002 | 3002 |
| 45 | 210 | Single-Family Detached Housing | 2579 | 95% | 100% | 100% | 2451 | 2579 | 2579 | 100% | 100% | 100% | 10% | 2206 | 2322 | 2322 |
| 46 | 411 | City Park | 12 | 100% | 100% | 100% | 12 | 12 | 12 | 100% | 100% | 100% | 3% | 12 | 12 | 12 |
| 47 | 210 | Single-Family Detached Housing | 1950 | 95% | 100% | 100% | 1853 | 1950 | 1950 | 100% | 100% | 100% | 10% | 1668 | 1755 | 1755 |
| 48 | 151 | Mini-Warehouse | 107 | 100% | 100% | 100% | 107 | 107 | 107 | 100% | 100% | 100% | 3% | 104 | 104 | 104 |
| 49 | 270 | Residential Planned Unit Developme | 75 | 90% | 100% | 100% | 68 | 75 | 75 | 100% | 100% | 100% | 10% | 62 | 68 | 68 |
| 50 | 210 | Single-Family Detached Housing | 274 | 100% | 100% | 100% | 274 | 274 | 274 | 100% | 100% | 100% | 10% | 247 | 247 | 247 |
| 52 | 715 | Single Tenant Office Building | 711 | 90% | 100% | 100% | 640 | 711 | 711 | 60% | 60% | 60% | 3% | 373 | 414 | 414 |
| 53 | 270 | Residential Planned Unit Developme | 263 | 25% | 100% | 100% | 66 | 263 | 263 | 100% | 100% | 100% | 10% | 60 | 237 | 237 |
| 60 | 730 | Government Office Building | 2758 | 100% | 100% | 100% | 2758 | 2758 | 2758 | 100% | 100% | 100% | 2% | 2703 | 2703 | 2703 |
| 61 | 210 | Single-Family Detached Housing | 3972 | 85% | 100% | 100% | 3377 | 3972 | 3972 | 100% | 100% | 100% | 10% | 3040 | 3575 | 3575 |
| 62 | 520 | Elementary School | 865 | 100% | 100% | 100% | 865 | 865 | 865 | 100% | 100% | 100% | 20% | 692 | 692 | 692 |
| 63 | 210 | Single-Family Detached Housing | 28 | 100% | 100% | 100% | 28 | 28 | 28 | 100% | 100% | 100% | 10% | 26 | 26 | 26 |
| 64 | 560 | Church | 265 | 100% | 100% | 100% | 265 | 265 | 265 | 100% | 100% | 100% | 5% | 252 | 252 | 252 |
| 65 | 560 | Church | 146 | 100% | 100% | 100% | 146 | 146 | 146 | 100% | 100% | 100% | 5% | 139 | 139 | 139 |
| 66 | 715 | Single Tenant Office Building | 117 | 100% | 100% | 100% | 117 | 117 | 117 | 100% | 100% | 100% | 3% | 114 | 114 | 114 |
| 67 | 270 | Residential Planned Unit Developme | 345 | 50% | 100% | 100% | 173 | 345 | 345 | 100% | 100% | 100% | 10% | 156 | 311 | 311 |
| 68 | 566 | Cemetery | 67 | 100% | 100% | 100% | 67 | 67 | 67 | 100% | 100% | 100% | 3% | 65 | 65 | 65 |
| 69 | 210 | Single-Family Detached Housing | 155 | 50% | 100% | 100% | 78 | 155 | 155 | 100% | 100% | 100% | 10% | 71 | 140 | 140 |
| 70 | 210 | Single-Family Detached Housing | 28 | 0% | 100% | 100% | 0 | 28 | 28 | 100% | 100% | 100% | 10% | 0 | 26 | 26 |
| 71 | 715 | Single Tenant Office Building | 117 | 0% | 100% | 100% | 0 | 117 | 117 | 100% | 100% | 100% | 3% | 0 | 114 | 114 |
| 77 | 0 | WASTEWATER TREATMENT PLANT | 0 | 100% | 100% | 100% | 0 | 0 | 0 | 100% | 100% | 100% | 3% | 0 | 0 | 0 |
| 95 | 210 | Single-Family Detached Housing | 2150 | 0% | 30% | 80% | 0 | 645 | 1720 | 100% | 100% | 100% | 10% | 0 | 581 | 1548 |
| | | | | | | **Total** | **18,732** | **23,268** | **26,107** | | | | | **16,481** | **19,767** | **21,557** |

# Development Zone 5

| Zone | ITE Code | Name | Trips Generated (Entire Zone) | Percent Developed | | | Trips Generated | | | % Attributed to Dev. Zone 5 | | | % Internal Capture | Adjusted Trips Generated | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Existing | 20-Year | 50-Year | Existing | 20-Year | 50-Year | Existing | 20-Year | 50-Year | | Existing | 20-Year | 50-Year |
| 72 | 530 | High School | 323 | 100% | 100% | 100% | 323 | 323 | 323 | 100% | 100% | 100% | 3% | 314 | 314 | 314 |
| 73 | 210 | Single-Family Detached Housing | 3171 | 80% | 100% | 100% | 2537 | 3171 | 3171 | 100% | 100% | 100% | 5% | 2411 | 3013 | 3013 |
| 74 | 560 | Church | 274 | 100% | 100% | 100% | 274 | 274 | 274 | 100% | 100% | 100% | 2% | 269 | 269 | 269 |
| 75 | 0 | SENSITIVE AREA DISTRICT | 0 | 0% | 0% | 0% | 0 | 0 | 0 | 100% | 100% | 100% | 0% | 0 | 0 | 0 |
| 79 | 210 | Single-Family Detached Housing | 2970 | 40% | 90% | 100% | 1188 | 2673 | 2970 | 100% | 100% | 100% | 2% | 1165 | 2620 | 2911 |
| 80 | 0 | MIXED USE | 0 | 40% | 60% | 80% | 0 | 0 | 0 | 50% | 50% | 50% | 1% | 0 | 0 | 0 |
| 82 | 210 | Single-Family Detached Housing | 1394 | 0% | 25% | 60% | 0 | 349 | 837 | 100% | 100% | 100% | 2% | 0 | 343 | 821 |
| 83 | 210 | Single-Family Detached Housing | 911 | 10% | 60% | 100% | 92 | 547 | 911 | 100% | 100% | 100% | 2% | 91 | 537 | 893 |
| 84 | 150 | Warehousing | 1424 | 30% | 50% | 75% | 428 | 712 | 1068 | 15% | 15% | 15% | 1% | 64 | 106 | 159 |
| 86 | 210 | Single-Family Detached Housing | 401 | 30% | 75% | 100% | 121 | 301 | 401 | 100% | 100% | 100% | 2% | 119 | 295 | 393 |
| 96 | 210 | Single-Family Detached Housing | 10878 | 0% | 30% | 80% | 0 | 3264 | 8703 | 100% | 100% | 100% | 5% | 0 | 3101 | 8268 |
| 98 | 210 | Single-Family Detached Housing | 11907 | 0% | 30% | 80% | 0 | 3573 | 9526 | 50% | 50% | 50% | 5% | 0 | 1698 | 4525 |
| | | | | | | **Total** | **4,963** | **15,187** | **28,184** | | | | | **4,433** | **12,296** | **21,566** |

# Development Zone 6

| Zone | ITE Code | Name | Trips Generated (Entire Zone) | Percent Developed | | | Trips Generated | | | % Attributed to Dev. Zone 6 | | | % Internal Capture | Adjusted Trips Generated | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Existing | 20-Year | 50-Year | Existing | 20-Year | 50-Year | Existing | 20-Year | 50-Year | | Existing | 20-Year | 50-Year |
| 75 | 0 | SENSITIVE AREA DISTRICT | 0 | 0% | 0% | 0% | 0 | 0 | 0 | 0% | 0% | 0% | 0% | 0 | 0 | 0 |
| 76 | 210 | Single-Family Detached Housing | 1276 | 90% | 100% | 100% | 1149 | 1276 | 1276 | 100% | 100% | 100% | 3% | 1115 | 1238 | 1238 |
| 80 | 0 | MIXED USE | 0 | 40% | 60% | 80% | 0 | 0 | 0 | 50% | 50% | 50% | 1% | 0 | 0 | 0 |
| 81 | 210 | Single-Family Detached Housing | 957 | 10% | 80% | 100% | 96 | 766 | 957 | 100% | 100% | 100% | 3% | 94 | 744 | 929 |
| 84 | 150 | Warehousing | 1424 | 30% | 50% | 75% | 428 | 712 | 1068 | 85% | 85% | 85% | 1% | 361 | 600 | 899 |
| 85 | 210 | Single-Family Detached Housing | 46 | 100% | 100% | 100% | 46 | 46 | 46 | 100% | 100% | 100% | 5% | 44 | 44 | 44 |
| 86 | 210 | Single-Family Detached Housing | 401 | 30% | 75% | 100% | 121 | 301 | 401 | 100% | 100% | 100% | 5% | 115 | 286 | 381 |
| 97 | 210 | Single-Family Detached Housing | 8063 | 0% | 30% | 80% | 0 | 2419 | 6451 | 100% | 100% | 100% | 5% | 0 | 2299 | 6129 |
| 98 | 210 | Single-Family Detached Housing | 11907 | 0% | 30% | 80% | 0 | 3573 | 9526 | 50% | 50% | 50% | 5% | 0 | 1698 | 4525 |
| | | | | | | **Total** | **1,840** | **9,093** | **19,725** | | | | | **1,729** | **6,909** | **14,145** |

# Development Zone 7

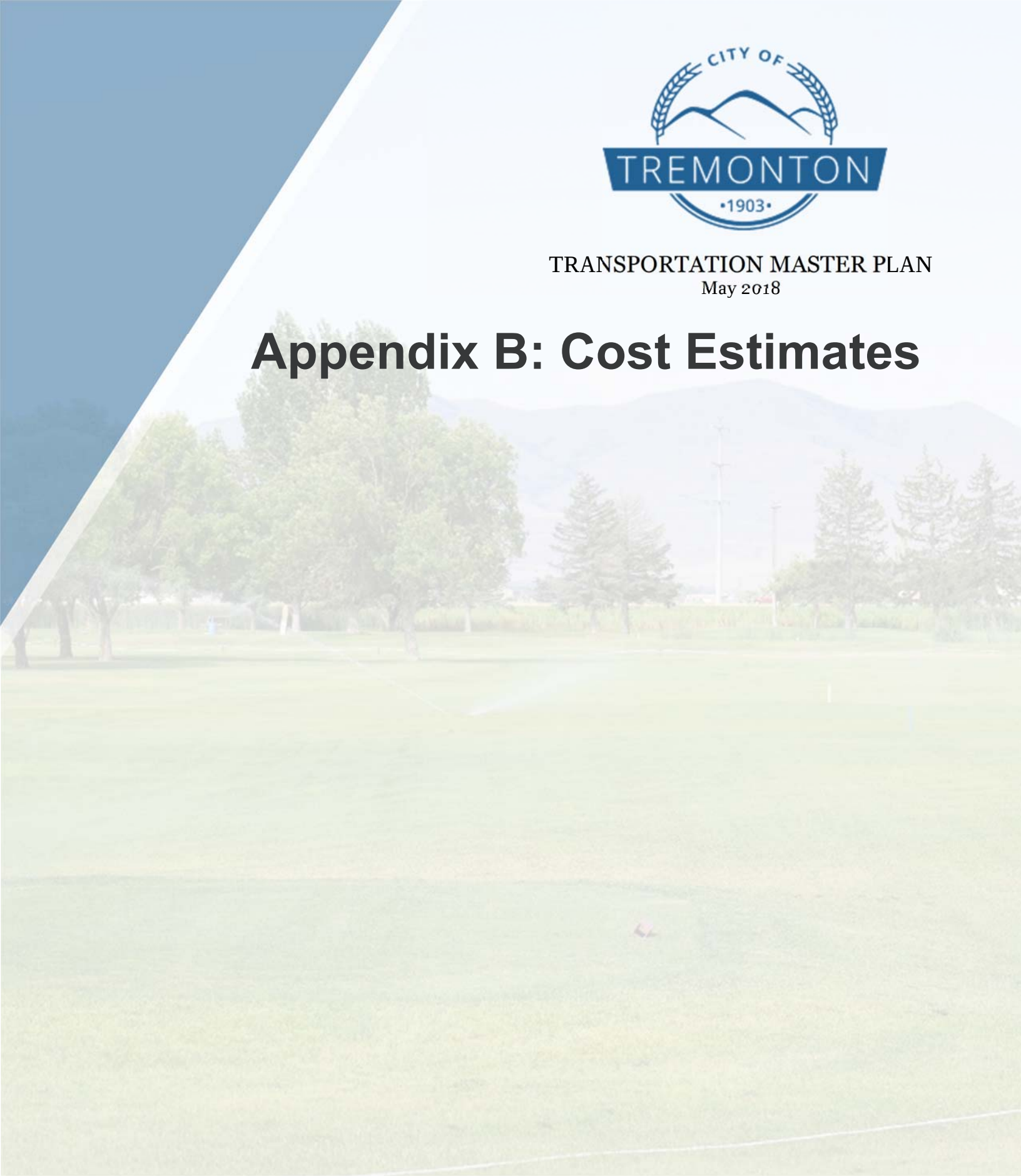
| Zone | ITE Code | Name | Trips Generated (Entire Zone) | Percent Developed | | | Trips Generated | | | % Attributed to Dev. Zone 7 | | | % Internal Capture | Adjusted Trips Generated | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Existing | 20-Year | 50-Year | Existing | 20-Year | 50-Year | Existing | 20-Year | 50-Year | | Existing | 20-Year | 50-Year |
| 16 | 820 | Shopping Center | 2135 | 20% | 60% | 100% | 427 | 1281 | 2135 | 0% | 5% | 5% | 5% | 0 | 61 | 102 |
| 24 | 0 | MIXED USE | 0 | 0% | 10% | 50% | 0 | 0 | 0 | 50% | 50% | 50% | 5% | 0 | 0 | 0 |
| 87 | 210 | single-family Detached Housing | 52228 | 0% | 15% | 30% | 0 | 7835 | 15669 | 33% | 33% | 33% | 15% | 0 | 2198 | 4396 |
| 91 | 826 | Specialty Retail Center | 1552 | 0% | 40% | 80% | 0 | 621 | 1242 | 100% | 100% | 100% | 5% | 0 | 590 | 1180 |
| 92 | 826 | Specialty Retail Center | 6250 | 0% | 40% | 80% | 0 | 2500 | 5000 | 95% | 95% | 95% | 5% | 0 | 2257 | 4513 |
| 93 | 210 | Single-Family Detached Housing | 18394 | 0% | 15% | 60% | 0 | 2760 | 11037 | 50% | 50% | 50% | 15% | 0 | 1173 | 4691 |
| | | | | | | **Total** | **427** | **14,997** | **35,083** | | | | | **0** | **6,279** | **14,882** |

# Development Zone 8

| Zone | ITE Code | Name | Trips Generated (Entire Zone) | Percent Developed | | | Trips Generated | | | % Attributed to Dev. Zone 8 | | | % Internal Capture | Adjusted Trips Generated | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Existing | 20-Year | 50-Year | Existing | 20-Year | 50-Year | Existing | 20-Year | 50-Year | | Existing | 20-Year | 50-Year |
| 24 | 0 | MIXED USE | 0 | 0% | 10% | 50% | 0 | 0 | 0 | 50% | 50% | 50% | 5% | 0 | 0 | 0 |
| 34 | 210 | Single-Family Detached Housing | 952 | 10% | 30% | 50% | 96 | 286 | 476 | 70% | 70% | 70% | 5% | 64 | 191 | 317 |
| 87 | 210 | single-family Detached Housing | 52228 | 0% | 15% | 30% | 0 | 7835 | 15669 | 66% | 66% | 66% | 5% | 0 | 4913 | 9825 |
| 92 | 826 | Specialty Retail Center | 6250 | 0% | 40% | 80% | 0 | 2500 | 5000 | 5% | 5% | 5% | 2% | 0 | 123 | 245 |
| 94 | 210 | Single-Family Detached Housing | 8937 | 0% | 15% | 60% | 0 | 1341 | 5363 | 100% | 100% | 100% | 5% | 0 | 1274 | 5095 |
| | | | | | | **Total** | **96** | **11,962** | **26,508** | | | | | **64** | **6,501** | **15,482** |

TRANSPORTATION MASTER PLAN
May 2018

# Appendix B: Cost Estimates



HORROCKS ENGINEERS

# Tremonton City
# Transportation Improvement Program (TIP)

**Unit Costs**

| Item | Unit | Unit Cost |
|---|---|---|
| Parkstrip | S.F. | $10.00 |
| Removal of Existing Asphalt | S.Y. | $4.00 |
| Clearing and Grubbing | Acre | $2,000 |
| Roadway Excavation | C.Y. | $10.50 |
| HMA Concrete | Ton | $85.00 |
| Untreated Base Course | C.Y. | $15.00 |
| Granular Borrow | C.Y. | $40.00 |
| Curb and Gutter (2.5' width) | L.F. | $22.50 |
| Sidewalk (5' width) | L.F. | $25.00 |
| Drainage | L.F. | $45.00 |
| Right of Way | S.F. | $1.27 |
| | | |
| Bridge/Culvert | S.F. | $225.00 |
| Traffic Signal | Each | $193,000 |

| | |
|---|---|
| **Contingency** | 25% |

| | |
|---|---|
| **Mobilization** | 10% |

| | |
|---|---|
| **Preconstruction Engineering** | 10% |
| **Construction Engineering** | 10% |

# Tremonton City
# Transportation Master Plan

**New Road: 1000 North to Project #3**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 17 | $33,333 |
| Roadway Excavation | C.Y. | $11 | 42,778 | $449,167 |
| HMA Concrete | Ton | $85 | 11,935 | $1,014,475 |
| Untreated Base Course | C.Y. | $15 | 11,407 | $171,111 |
| Granular Borrow | C.Y. | $40 | 8,556 | $342,222 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 22,000 | $495,000 |
| Sidewalk (5' width) | L.F. | $25 | 22,000 | $550,000 |
| Drainage | L.F. | $45 | 22,000 | $990,000 |
| Right of Way | S.F. | $1.27 | 11,000 | $14,014 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$4,059,323** |
| Mobilization (10% of Construction) | Lump | 10% | 405,932 | $405,932 |
| Contingency (25% of Construction) | Lump | 25% | 1,014,831 | $1,014,831 |
| | | | **Subtotal** | **$5,480,086** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $405,932 |
| **Construction Engineering** | 10% | $405,932 |

| | |
|---|---|
| **Total Project Costs** | **$6,292,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **1**
Improvement Type: **New Road**
Completion Year: **2037**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**Country View Drive Extenstion to Project #1**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 2 | $3,030 |
| Roadway Excavation | C.Y. | $11 | 3,889 | $40,833 |
| HMA Concrete | Ton | $85 | 1,085 | $92,225 |
| Untreated Base Course | C.Y. | $15 | 1,037 | $15,556 |
| Granular Borrow | C.Y. | $40 | 778 | $31,111 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 2,000 | $45,000 |
| Sidewalk (5' width) | L.F. | $25 | 2,000 | $50,000 |
| Drainage | L.F. | $45 | 2,000 | $90,000 |
| Right of Way | S.F. | $1.27 | 1,000 | $1,274 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$369,029** |
| Mobilization (10% of Construction) | Lump | 10% | 36,903 | $36,903 |
| Contingency (25% of Construction) | Lump | 25% | 92,257 | $92,257 |
| | | | **Subtotal** | **$498,190** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $36,903 |
| **Construction Engineering** | 10% | $36,903 |

| | |
|---|---|
| **Total Project Costs** | **$572,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **2**
Improvement Type: **New Road**
Completion Year: **2037**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**New Road: Project #1 to 1000 North**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 5 | $9,091 |
| Roadway Excavation | C.Y. | $11 | 11,667 | $122,500 |
| HMA Concrete | Ton | $85 | 3,255 | $276,675 |
| Untreated Base Course | C.Y. | $15 | 3,111 | $46,667 |
| Granular Borrow | C.Y. | $40 | 2,333 | $93,333 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 6,000 | $135,000 |
| Sidewalk (5' width) | L.F. | $25 | 6,000 | $150,000 |
| Drainage | L.F. | $45 | 6,000 | $270,000 |
| Right of Way | S.F. | $1.27 | 3,000 | $3,822 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,107,088** |
| Mobilization (10% of Construction) | Lump | 10% | 110,709 | $110,709 |
| Contingency (25% of Construction) | Lump | 25% | 276,772 | $276,772 |
| | | | **Subtotal** | **$1,494,569** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $110,709 |
| **Construction Engineering** | 10% | $110,709 |

| | |
|---|---|
| **Total Project Costs** | **$1,716,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **3**
Improvement Type: **New Road**
Completion Year: **2037**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**New Road: 1000 North to 2300 West**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 15 | $29,752 |
| Roadway Excavation | C.Y. | $11 | 42,000 | $441,000 |
| HMA Concrete | Ton | $85 | 14,648 | $1,245,038 |
| Untreated Base Course | C.Y. | $15 | 11,200 | $168,000 |
| Granular Borrow | C.Y. | $40 | 8,400 | $336,000 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 16,200 | $364,500 |
| Sidewalk (5' width) | L.F. | $30 | 16,200 | $486,000 |
| Drainage | L.F. | $45 | 16,200 | $729,000 |
| Right of Way | S.F. | $1.27 | 8,100 | $10,320 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$3,809,609** |
| Mobilization (10% of Construction) | Lump | 10% | 380,961 | $380,961 |
| Contingency (25% of Construction) | Lump | 25% | 952,402 | $952,402 |
| | | | **Subtotal** | **$5,142,972** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $380,961 |
| **Construction Engineering** | 10% | $380,961 |

| | |
|---|---|
| **Total Project Costs** | **$5,905,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **5** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

| | |
|---|---|
| Project Number: | **4** |
| Improvement Type: | **New Road** |
| Completion Year: | **2037** |
| Roadway Functional Class: | **Minor Arterial - 80'** |

# Tremonton City
# Transportation Master Plan

**New Road: 2300 West to Main Street**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 3 | $5,000 |
| Roadway Excavation | C.Y. | $11 | 6,264 | $65,771 |
| HMA Concrete | Ton | $85 | 1,748 | $148,548 |
| Untreated Base Course | C.Y. | $15 | 1,670 | $25,056 |
| Granular Borrow | C.Y. | $40 | 1,253 | $50,111 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 3,300 | $74,250 |
| Sidewalk (5' width) | L.F. | $25 | 3,300 | $82,500 |
| Drainage | L.F. | $45 | 3,300 | $148,500 |
| Right of Way | S.F. | $1.27 | 1,650 | $2,102 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$601,838** |
| Mobilization (10% of Construction) | Lump | 10% | 60,184 | $60,184 |
| Contingency (25% of Construction) | Lump | 25% | 150,459 | $150,459 |
| | | | **Subtotal** | **$812,481** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $60,184 |
| **Construction Engineering** | 10% | $60,184 |

| | |
|---|---|
| **Total Project Costs** | **$933,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **5**
Improvement Type: **New Road**
Completion Year: **2037**
Roadway Functional Class: **Minor Arterial - 66'**

# Tremonton City
# Transportation Master Plan

**New Road (3040 West): 1000 N to Project #4**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 5 | $10,909 |
| Roadway Excavation | C.Y. | $11 | 14,000 | $147,000 |
| HMA Concrete | Ton | $85 | 3,906 | $332,010 |
| Untreated Base Course | C.Y. | $15 | 3,733 | $56,000 |
| Granular Borrow | C.Y. | $40 | 2,800 | $112,000 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 7,200 | $162,000 |
| Sidewalk (5' width) | L.F. | $25 | 7,200 | $180,000 |
| Drainage | L.F. | $45 | 7,200 | $324,000 |
| Right of Way | S.F. | $1.27 | 3,600 | $4,586 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,328,506** |
| Mobilization (10% of Construction) | Lump | 10% | 132,851 | $132,851 |
| Contingency (25% of Construction) | Lump | 25% | 332,126 | $332,126 |
| | | | **Subtotal** | **$1,793,483** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $132,851 |
| **Construction Engineering** | 10% | $132,851 |

| | |
|---|---|
| **Total Project Costs** | **$2,060,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **6**
Improvement Type: **New Road**
Completion Year: **2037**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**2650 West Extension to 1000 North**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 4 | $7,879 |
| Roadway Excavation | C.Y. | $11 | 10,111 | $106,167 |
| HMA Concrete | Ton | $85 | 2,821 | $239,785 |
| Untreated Base Course | C.Y. | $15 | 2,696 | $40,444 |
| Granular Borrow | C.Y. | $40 | 2,022 | $80,889 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 5,200 | $117,000 |
| Sidewalk (5' width) | L.F. | $25 | 5,200 | $130,000 |
| Drainage | L.F. | $45 | 5,200 | $234,000 |
| Right of Way | S.F. | $1.27 | 2,600 | $3,312 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$959,476** |
| Mobilization (10% of Construction) | Lump | 10% | 95,948 | $95,948 |
| Contingency (25% of Construction) | Lump | 25% | 239,869 | $239,869 |
| | | | **Subtotal** | **$1,295,293** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $95,948 |
| **Construction Engineering** | 10% | $95,948 |

| | |
|---|---|
| **Total Project Costs** | **$1,488,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **7**
Improvement Type: **New Road**
Completion Year: **2037**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**2650 West Extension to Project #4**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 1 | $1,061 |
| Roadway Excavation | C.Y. | $11 | 1,361 | $14,292 |
| HMA Concrete | Ton | $85 | 380 | $32,279 |
| Untreated Base Course | C.Y. | $15 | 363 | $5,444 |
| Granular Borrow | C.Y. | $40 | 272 | $10,889 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 700 | $15,750 |
| Sidewalk (5' width) | L.F. | $25 | 700 | $17,500 |
| Drainage | L.F. | $45 | 700 | $31,500 |
| Right of Way | S.F. | $1.27 | 350 | $446 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$129,160** |
| Mobilization (10% of Construction) | Lump | 10% | 12,916 | $12,916 |
| Contingency (25% of Construction) | Lump | 25% | 32,290 | $32,290 |
| | | | **Subtotal** | **$174,366** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $12,916 |
| **Construction Engineering** | 10% | $12,916 |

| | |
|---|---|
| **Total Project Costs** | **$201,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **8**
Improvement Type: **New Road**
Completion Year: **2037**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**New Road: Project #6 to Project #7**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 3 | $5,455 |
| Roadway Excavation | C.Y. | $11 | 7,000 | $73,500 |
| HMA Concrete | Ton | $85 | 1,953 | $166,005 |
| Untreated Base Course | C.Y. | $15 | 1,867 | $28,000 |
| Granular Borrow | C.Y. | $40 | 1,400 | $56,000 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 3,600 | $81,000 |
| Sidewalk (5' width) | L.F. | $25 | 3,600 | $90,000 |
| Drainage | L.F. | $45 | 3,600 | $162,000 |
| Right of Way | S.F. | $1.27 | 1,800 | $2,293 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$664,253** |
| Mobilization (10% of Construction) | Lump | 10% | 66,425 | $66,425 |
| Contingency (25% of Construction) | Lump | 25% | 166,063 | $166,063 |
| | | | **Subtotal** | **$896,741** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $66,425 |
| **Construction Engineering** | 10% | $66,425 |

| | |
|---|---|
| **Total Project Costs** | **$1,030,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **9**
Improvement Type: **New Road**
Completion Year: **2037**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**2000 West Realignment to Project #4**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 1 | $1,818 |
| Roadway Excavation | C.Y. | $11 | 2,333 | $24,500 |
| HMA Concrete | Ton | $85 | 651 | $55,335 |
| Untreated Base Course | C.Y. | $15 | 622 | $9,333 |
| Granular Borrow | C.Y. | $40 | 467 | $18,667 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 1,200 | $27,000 |
| Sidewalk (5' width) | L.F. | $25 | 1,200 | $30,000 |
| Drainage | L.F. | $45 | 1,200 | $54,000 |
| Right of Way | S.F. | $1.27 | 600 | $764 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$221,418** |
| Mobilization (10% of Construction) | Lump | 10% | 22,142 | $22,142 |
| Contingency (25% of Construction) | Lump | 25% | 55,354 | $55,354 |
| | | | **Subtotal** | **$298,914** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $22,142 |
| **Construction Engineering** | 10% | $22,142 |

| | |
|---|---|
| **Total Project Costs** | **$344,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **10**
Improvement Type: **New Road**
Completion Year: **2037**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**New Traffic Signal : 2000 West & Main Street**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 0 | $0 |
| Roadway Excavation | C.Y. | $11 | 0 | $0 |
| HMA Concrete | Ton | $85 | 0 | $0 |
| Untreated Base Course | C.Y. | $15 | 0 | $0 |
| Granular Borrow | C.Y. | $40 | 0 | $0 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 0 | $0 |
| Sidewalk (5' width) | L.F. | $25 | 0 | $0 |
| Drainage | L.F. | $45 | 0 | $0 |
| Right of Way | S.F. | $1.27 | 0 | $0 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 1 | $193,000 |
| | | | | |
| | | | **Construction Cost** | **$193,000** |
| Mobilization (10% of Construction) | Lump | 10% | 19,300 | $19,300 |
| Contingency (25% of Construction) | Lump | 25% | 48,250 | $48,250 |
| | | | **Subtotal** | **$260,550** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $19,300 |
| **Construction Engineering** | 10% | $19,300 |

| | |
|---|---|
| **Total Project Costs** | **$300,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **0** |
| HMA Thickness (in) = | **0** |
| Untreated Base Course Thickness (in) = | **0** |
| Granual Borrow Thickness (in) = | **0** |
| Roadway Excavation Depth (ft) = | **0** |
| Number of Sidewalks (No.) = | **0** |

Project Parameters:

Project Number: **11**
Improvement Type: **Traffic Signal**
Completion Year: **2037**
Roadway Functional Class: **Traffic Signal**

# Tremonton City
# Transportation Master Plan

**Local Roads: South of 1000 North from Iowa String Road to 100 West**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 11 | $22,039 |
| Roadway Excavation | C.Y. | $11 | 26,667 | $280,000 |
| HMA Concrete | Ton | $85 | 5,580 | $474,300 |
| Untreated Base Course | C.Y. | $15 | 7,111 | $106,667 |
| Granular Borrow | C.Y. | $40 | 5,333 | $213,333 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 16,000 | $360,000 |
| Sidewalk (5' width) | L.F. | $25 | 16,000 | $400,000 |
| Drainage | L.F. | $45 | 16,000 | $720,000 |
| Right of Way | S.F. | $1.27 | 8,000 | $10,192 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$2,586,531** |
| Mobilization (10% of Construction) | Lump | 10% | 258,653 | $258,653 |
| Contingency (25% of Construction) | Lump | 25% | 646,633 | $646,633 |
| | | | **Subtotal** | **$3,491,817** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $258,653 |
| **Construction Engineering** | 10% | $258,653 |

| | |
|---|---|
| **Total Project Costs** | **$4,010,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **3** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **12**
Improvement Type: **New Road**
Completion Year: **2037**
Roadway Functional Class: **Local Street**

# Tremonton City
# Transportation Master Plan

**New Road: 1000 North to 600 North**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 4 | $8,182 |
| Roadway Excavation | C.Y. | $11 | 10,500 | $110,250 |
| HMA Concrete | Ton | $85 | 2,930 | $249,008 |
| Untreated Base Course | C.Y. | $15 | 2,800 | $42,000 |
| Granular Borrow | C.Y. | $40 | 2,100 | $84,000 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 5,400 | $121,500 |
| Sidewalk (5' width) | L.F. | $25 | 5,400 | $135,000 |
| Drainage | L.F. | $45 | 5,400 | $243,000 |
| Right of Way | S.F. | $1.27 | 2,700 | $3,440 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$996,379** |
| Mobilization (10% of Construction) | Lump | 10% | 99,638 | $99,638 |
| Contingency (25% of Construction) | Lump | 25% | 249,095 | $249,095 |
| | | | **Subtotal** | **$1,345,112** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $99,638 |
| **Construction Engineering** | 10% | $99,638 |

| | |
|---|---|
| **Total Project Costs** | **$1,545,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **13**
Improvement Type: **New Road**
Completion Year: **2037**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**HAWK Pedestrian Signal: Main Street & 400 West**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 0 | $0 |
| Roadway Excavation | C.Y. | $11 | 0 | $0 |
| HMA Concrete | Ton | $85 | 0 | $0 |
| Untreated Base Course | C.Y. | $15 | 0 | $0 |
| Granular Borrow | C.Y. | $40 | 0 | $0 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 0 | $0 |
| Sidewalk (5' width) | L.F. | $25 | 0 | $0 |
| Drainage | L.F. | $45 | 0 | $0 |
| Right of Way | S.F. | $1.27 | 0 | $0 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Pedestrian HAWK Signal | Each | $200,000 | 1 | $200,000 |
| | | | | |
| | | | **Construction Cost** | **$200,000** |
| Mobilization (10% of Construction) | Lump | 10% | 20,000 | $20,000 |
| Contingency (25% of Construction) | Lump | 25% | 50,000 | $50,000 |
| | | | **Subtotal** | **$270,000** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $20,000 |
| **Construction Engineering** | 10% | $20,000 |

| | |
|---|---|
| **Total Project Costs** | **$310,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **0** |
| HMA Thickness (in) = | **0** |
| Untreated Base Course Thickness (in) = | **0** |
| Granual Borrow Thickness (in) = | **0** |
| Roadway Excavation Depth (ft) = | **0** |
| Number of Sidewalks (No.) = | **0** |

Project Parameters:

Project Number: **14**
Improvement Type: **Traffic Signal**
Completion Year: **2037**
Roadway Functional Class: **Traffic Signal**

# Tremonton City
# Transportation Master Plan

**Railroad Crossing: 800 North & 150 West**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 0 | $0 |
| Roadway Excavation | C.Y. | $11 | 0 | $0 |
| HMA Concrete | Ton | $85 | 0 | $0 |
| Untreated Base Course | C.Y. | $15 | 0 | $0 |
| Granular Borrow | C.Y. | $40 | 0 | $0 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 0 | $0 |
| Sidewalk (5' width) | L.F. | $25 | 0 | $0 |
| Drainage | L.F. | $45 | 0 | $0 |
| Right of Way | S.F. | $1.27 | 0 | $0 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Railroad Crossing | Each | $300,000 | 1 | $300,000 |
| | | | | |
| | | | **Construction Cost** | **$300,000** |
| Mobilization (10% of Construction) | Lump | 10% | 30,000 | $30,000 |
| Contingency (25% of Construction) | Lump | 25% | 75,000 | $75,000 |
| | | | **Subtotal** | **$405,000** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $30,000 |
| **Construction Engineering** | 10% | $30,000 |

| | |
|---|---|
| **Total Project Costs** | **$465,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **0** |
| HMA Thickness (in) = | **0** |
| Untreated Base Course Thickness (in) = | **0** |
| Granual Borrow Thickness (in) = | **0** |
| Roadway Excavation Depth (ft) = | **0** |
| Number of Sidewalks (No.) = | **0** |

Project Parameters:

Project Number: **15**
Improvement Type: **Traffic Signal**
Completion Year: **2037**
Roadway Functional Class: **Traffic Signal**

# Tremonton City
# Transportation Master Plan

**New Road: 1000 North to Main Street**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 9 | $17,576 |
| Roadway Excavation | C.Y. | $11 | 22,556 | $236,833 |
| HMA Concrete | Ton | $85 | 6,293 | $534,905 |
| Untreated Base Course | C.Y. | $15 | 6,015 | $90,222 |
| Granular Borrow | C.Y. | $40 | 4,511 | $180,444 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 11,600 | $261,000 |
| Sidewalk (5' width) | L.F. | $25 | 11,600 | $290,000 |
| Drainage | L.F. | $45 | 11,600 | $522,000 |
| Right of Way | S.F. | $1.27 | 5,800 | $7,389 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$2,140,370** |
| Mobilization (10% of Construction) | Lump | 10% | 214,037 | $214,037 |
| Contingency (25% of Construction) | Lump | 25% | 535,093 | $535,093 |
| | | | **Subtotal** | **$2,889,500** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $214,037 |
| **Construction Engineering** | 10% | $214,037 |

| | |
|---|---|
| **Total Project Costs** | **$3,318,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **16**
Improvement Type: **New Road**
Completion Year: **2037**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**New Road (11600 North): 1600 East to Project #16**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 3 | $5,758 |
| Roadway Excavation | C.Y. | $11 | 7,389 | $77,583 |
| HMA Concrete | Ton | $85 | 2,062 | $175,228 |
| Untreated Base Course | C.Y. | $15 | 1,970 | $29,556 |
| Granular Borrow | C.Y. | $40 | 1,478 | $59,111 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 3,800 | $85,500 |
| Sidewalk (5' width) | L.F. | $25 | 3,800 | $95,000 |
| Drainage | L.F. | $45 | 3,800 | $171,000 |
| Right of Way | S.F. | $1.27 | 1,900 | $2,421 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$701,156** |
| Mobilization (10% of Construction) | Lump | 10% | 70,116 | $70,116 |
| Contingency (25% of Construction) | Lump | 25% | 175,289 | $175,289 |
| | | | **Subtotal** | **$946,560** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $70,116 |
| **Construction Engineering** | 10% | $70,116 |

| | |
|---|---|
| **Total Project Costs** | **$1,087,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **17**
Improvement Type: **New Road**
Completion Year: **2037**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**Local Roads: West of Project #16**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 7 | $14,050 |
| Roadway Excavation | C.Y. | $11 | 17,000 | $178,500 |
| HMA Concrete | Ton | $85 | 3,557 | $302,366 |
| Untreated Base Course | C.Y. | $15 | 4,533 | $68,000 |
| Granular Borrow | C.Y. | $40 | 3,400 | $136,000 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 10,200 | $229,500 |
| Sidewalk (5' width) | L.F. | $25 | 10,200 | $255,000 |
| Drainage | L.F. | $45 | 10,200 | $459,000 |
| Right of Way | S.F. | $1.27 | 5,100 | $6,498 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,648,913** |
| Mobilization (10% of Construction) | Lump | 10% | 164,891 | $164,891 |
| Contingency (25% of Construction) | Lump | 25% | 412,228 | $412,228 |
| | | | **Subtotal** | **$2,226,033** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $164,891 |
| **Construction Engineering** | 10% | $164,891 |

| | |
|---|---|
| **Total Project Costs** | **$2,556,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **3** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **18**
Improvement Type: **New Road**
Completion Year: **2037**
Roadway Functional Class: **Local Street**

# Tremonton City
# Transportation Master Plan

**Local Roads: East of Project #16**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 13 | $25,620 |
| Roadway Excavation | C.Y. | $11 | 31,000 | $325,500 |
| HMA Concrete | Ton | $85 | 6,487 | $551,374 |
| Untreated Base Course | C.Y. | $15 | 8,267 | $124,000 |
| Granular Borrow | C.Y. | $40 | 6,200 | $248,000 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 18,600 | $418,500 |
| Sidewalk (5' width) | L.F. | $25 | 18,600 | $465,000 |
| Drainage | L.F. | $45 | 18,600 | $837,000 |
| Right of Way | S.F. | $1.27 | 9,300 | $11,848 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$3,006,842** |
| Mobilization (10% of Construction) | Lump | 10% | 300,684 | $300,684 |
| Contingency (25% of Construction) | Lump | 25% | 751,711 | $751,711 |
| | | | **Subtotal** | **$4,059,237** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $300,684 |
| **Construction Engineering** | 10% | $300,684 |

| | |
|---|---|
| **Total Project Costs** | **$4,661,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **3** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **19**
Improvement Type: **New Road**
Completion Year: **2037**
Roadway Functional Class: **Local Street**

# Tremonton City
# Transportation Master Plan

**Local Roads: West of 5600 W**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 8 | $16,942 |
| Roadway Excavation | C.Y. | $11 | 20,500 | $215,250 |
| HMA Concrete | Ton | $85 | 4,290 | $364,618 |
| Untreated Base Course | C.Y. | $15 | 5,467 | $82,000 |
| Granular Borrow | C.Y. | $40 | 4,100 | $164,000 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 12,300 | $276,750 |
| Sidewalk (5' width) | L.F. | $25 | 12,300 | $307,500 |
| Drainage | L.F. | $45 | 12,300 | $553,500 |
| Right of Way | S.F. | $1.27 | 6,150 | $7,835 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,988,396** |
| Mobilization (10% of Construction) | Lump | 10% | 198,840 | $198,840 |
| Contingency (25% of Construction) | Lump | 25% | 497,099 | $497,099 |
| | | | **Subtotal** | **$2,684,334** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $198,840 |
| **Construction Engineering** | 10% | $198,840 |

| | |
|---|---|
| **Total Project Costs** | **$3,083,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **3** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **20**
Improvement Type: **New Road**
Completion Year: **2037**
Roadway Functional Class: **Local Street**

# Tremonton City
# Transportation Master Plan

**Local Roads: East of 5600 W**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 5 | $9,366 |
| Roadway Excavation | C.Y. | $11 | 11,333 | $119,000 |
| HMA Concrete | Ton | $85 | 2,372 | $201,578 |
| Untreated Base Course | C.Y. | $15 | 3,022 | $45,333 |
| Granular Borrow | C.Y. | $40 | 2,267 | $90,667 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 6,800 | $153,000 |
| Sidewalk (5' width) | L.F. | $25 | 6,800 | $170,000 |
| Drainage | L.F. | $45 | 6,800 | $306,000 |
| Right of Way | S.F. | $1.27 | 3,400 | $4,332 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 1,200 | $270,000 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,369,276** |
| Mobilization (10% of Construction) | Lump | 10% | 136,928 | $136,928 |
| Contingency (25% of Construction) | Lump | 25% | 342,319 | $342,319 |
| | | | **Subtotal** | **$1,848,522** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $136,928 |
| **Construction Engineering** | 10% | $136,928 |

| | |
|---|---|
| **Total Project Costs** | **$2,123,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **3** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **21**
Improvement Type: **New Road**
Completion Year: **2037**
Roadway Functional Class: **Local Street**

# Tremonton City
# Transportation Master Plan

**10800 North Extension: 5600 West to 550 East & 1600 East to 4800 West**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 7,200 | $28,800 |
| Clearing and Grubbing | Acre | $2,000 | 4 | $8,182 |
| Roadway Excavation | C.Y. | $11 | 4,500 | $47,250 |
| HMA Concrete | Ton | $85 | 1,256 | $106,718 |
| Untreated Base Course | C.Y. | $15 | 1,200 | $18,000 |
| Granular Borrow | C.Y. | $40 | 900 | $36,000 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 5,400 | $121,500 |
| Sidewalk (5' width) | L.F. | $25 | 5,400 | $135,000 |
| Drainage | L.F. | $45 | 5,400 | $243,000 |
| Right of Way | S.F. | $1.27 | 2,700 | $3,440 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 1,200 | $270,000 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,017,889** |
| Mobilization (10% of Construction) | Lump | 10% | 101,789 | $101,789 |
| Contingency (25% of Construction) | Lump | 25% | 254,472 | $254,472 |
| | | | **Subtotal** | **$1,374,150** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $101,789 |
| **Construction Engineering** | 10% | $101,789 |

| | |
|---|---|
| **Total Project Costs** | **$1,578,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **22**
Improvement Type: **New Road**
Completion Year: **2037**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**1000 North: I-84 to 2300 West**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 21,067 | $84,267 |
| Clearing and Grubbing | Acre | $2,000 | 0 | $0 |
| Roadway Excavation | C.Y. | $11 | 12,435 | $130,569 |
| HMA Concrete | Ton | $85 | 3,469 | $294,900 |
| Untreated Base Course | C.Y. | $15 | 3,316 | $49,741 |
| Granular Borrow | C.Y. | $40 | 2,487 | $99,481 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 15,800 | $355,500 |
| Sidewalk (5' width) | L.F. | $25 | 15,800 | $395,000 |
| Drainage | L.F. | $45 | 15,800 | $711,000 |
| Right of Way | S.F. | $1.27 | 7,900 | $10,065 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$2,130,524** |
| Mobilization (10% of Construction) | Lump | 10% | 213,052 | $213,052 |
| Contingency (25% of Construction) | Lump | 25% | 532,631 | $532,631 |
| | | | **Subtotal** | **$2,876,207** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $213,052 |
| **Construction Engineering** | 10% | $213,052 |

| | |
|---|---|
| **Total Project Costs** | **$3,303,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **23**
Improvement Type: **Capacity Improvement**
Completion Year: **2037**
Roadway Functional Class: **Minor Arterial - 66'**

# Tremonton City
# Transportation Master Plan

**1000 North: 2300 West to 2000 West**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 23,778 | $95,111 |
| Clearing and Grubbing | Acre | $2,000 | 0 | $737 |
| Roadway Excavation | C.Y. | $11 | 495 | $5,201 |
| HMA Concrete | Ton | $85 | 138 | $11,748 |
| Untreated Base Course | C.Y. | $15 | 132 | $1,981 |
| Granular Borrow | C.Y. | $40 | 99 | $3,963 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 10,700 | $240,750 |
| Sidewalk (5' width) | L.F. | $25 | 10,700 | $267,500 |
| Drainage | L.F. | $45 | 10,700 | $481,500 |
| Right of Way | S.F. | $1.27 | 5,350 | $6,816 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,115,308** |
| Mobilization (10% of Construction) | Lump | 10% | 111,531 | $111,531 |
| Contingency (25% of Construction) | Lump | 25% | 278,827 | $278,827 |
| | | | **Subtotal** | **$1,505,665** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $111,531 |
| **Construction Engineering** | 10% | $111,531 |

| | |
|---|---|
| **Total Project Costs** | **$1,729,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **24**
Improvement Type: **Capacity Improvement**
Completion Year: **2037**
Roadway Functional Class: **Minor Arterial - 66'**

# Tremonton City
# Transportation Master Plan

**1000 North: 2000 West to 1500 West**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 9,111 | $36,444 |
| Clearing and Grubbing | Acre | $2,000 | 3 | $6,061 |
| Roadway Excavation | C.Y. | $11 | 0 | $0 |
| HMA Concrete | Ton | $85 | 0 | $0 |
| Untreated Base Course | C.Y. | $15 | 0 | $0 |
| Granular Borrow | C.Y. | $40 | 0 | $0 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 4,000 | $90,000 |
| Sidewalk (5' width) | L.F. | $25 | 4,000 | $100,000 |
| Drainage | L.F. | $45 | 4,000 | $180,000 |
| Right of Way | S.F. | $1.27 | 2,000 | $2,548 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$415,053** |
| Mobilization (10% of Construction) | Lump | 10% | 41,505 | $41,505 |
| Contingency (25% of Construction) | Lump | 25% | 103,763 | $103,763 |
| | | | **Subtotal** | **$560,322** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $41,505 |
| **Construction Engineering** | 10% | $41,505 |

| | |
|---|---|
| **Total Project Costs** | **$644,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **25**
Improvement Type: **Capacity Improvement**
Completion Year: **2037**
Roadway Functional Class: **Minor Arterial - 66'**

# Tremonton City
# Transportation Master Plan

**1000 North: 1500 West to Iowa String Road**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 9,111 | $36,444 |
| Clearing and Grubbing | Acre | $2,000 | 0 | $565 |
| Roadway Excavation | C.Y. | $11 | 190 | $1,993 |
| HMA Concrete | Ton | $85 | 53 | $4,501 |
| Untreated Base Course | C.Y. | $15 | 51 | $759 |
| Granular Borrow | C.Y. | $40 | 38 | $1,519 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 4,100 | $92,250 |
| Sidewalk (5' width) | L.F. | $25 | 4,100 | $102,500 |
| Drainage | L.F. | $45 | 4,100 | $184,500 |
| Right of Way | S.F. | $1.27 | 2,050 | $2,612 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$427,643** |
| Mobilization (10% of Construction) | Lump | 10% | 42,764 | $42,764 |
| Contingency (25% of Construction) | Lump | 25% | 106,911 | $106,911 |
| | | | **Subtotal** | **$577,318** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $42,764 |
| **Construction Engineering** | 10% | $42,764 |

| | |
|---|---|
| **Total Project Costs** | **$663,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **26**

Improvement Type: **Capacity Improvement**

Completion Year: **2037**

Roadway Functional Class: **Minor Arterial - 66'**

# Tremonton City
# Transportation Master Plan

**Iowa String Road: 1000 North to Main St**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 24,000 | $96,000 |
| Clearing and Grubbing | Acre | $2,000 | 1 | $1,488 |
| Roadway Excavation | C.Y. | $11 | 500 | $5,250 |
| HMA Concrete | Ton | $85 | 140 | $11,858 |
| Untreated Base Course | C.Y. | $15 | 133 | $2,000 |
| Granular Borrow | C.Y. | $40 | 100 | $4,000 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 10,800 | $243,000 |
| Sidewalk (5' width) | L.F. | $25 | 10,800 | $270,000 |
| Drainage | L.F. | $45 | 10,800 | $486,000 |
| Right of Way | S.F. | $1.27 | 5,400 | $6,880 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,126,475** |
| Mobilization (10% of Construction) | Lump | 10% | 112,647 | $112,647 |
| Contingency (25% of Construction) | Lump | 25% | 281,619 | $281,619 |
| | | | **Subtotal** | **$1,520,741** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $112,647 |
| **Construction Engineering** | 10% | $112,647 |

| | |
|---|---|
| **Total Project Costs** | **$1,747,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **27**
Improvement Type: **Capacity Improvement**
Completion Year: **2037**
Roadway Functional Class: **Minor Arterial - 66'**

# Tremonton City
# Transportation Master Plan

**New Road: 1000 N to Country View Dr (Project #1)**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 21 | $42,424 |
| Roadway Excavation | C.Y. | $11 | 54,444 | $571,667 |
| HMA Concrete | Ton | $85 | 15,190 | $1,291,150 |
| Untreated Base Course | C.Y. | $15 | 14,519 | $217,778 |
| Granular Borrow | C.Y. | $40 | 10,889 | $435,556 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 28,000 | $630,000 |
| Sidewalk (5' width) | L.F. | $25 | 28,000 | $700,000 |
| Drainage | L.F. | $45 | 28,000 | $1,260,000 |
| Right of Way | S.F. | $1.27 | 14,000 | $17,836 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$5,166,411** |
| Mobilization (10% of Construction) | Lump | 10% | 516,641 | $516,641 |
| Contingency (25% of Construction) | Lump | 25% | 1,291,603 | $1,291,603 |
| | | | **Subtotal** | **$6,974,654** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $516,641 |
| **Construction Engineering** | 10% | $516,641 |

| | |
|---|---|
| **Total Project Costs** | **$8,008,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **28**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**New Road: Project #1 to Project #3**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 9 | $17,576 |
| Roadway Excavation | C.Y. | $11 | 22,556 | $236,833 |
| HMA Concrete | Ton | $85 | 6,293 | $534,905 |
| Untreated Base Course | C.Y. | $15 | 6,015 | $90,222 |
| Granular Borrow | C.Y. | $40 | 4,511 | $180,444 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 11,600 | $261,000 |
| Sidewalk (5' width) | L.F. | $25 | 11,600 | $290,000 |
| Drainage | L.F. | $45 | 11,600 | $522,000 |
| Right of Way | S.F. | $1.27 | 5,800 | $7,389 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$2,140,370** |
| Mobilization (10% of Construction) | Lump | 10% | 214,037 | $214,037 |
| Contingency (25% of Construction) | Lump | 25% | 535,093 | $535,093 |
| | | | **Subtotal** | **$2,889,500** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $214,037 |
| **Construction Engineering** | 10% | $214,037 |

| | |
|---|---|
| **Total Project Costs** | **$3,318,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **29**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**New Road (3300 West): 1000 North to Project #4**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 5 | $9,697 |
| Roadway Excavation | C.Y. | $11 | 12,444 | $130,667 |
| HMA Concrete | Ton | $85 | 3,472 | $295,120 |
| Untreated Base Course | C.Y. | $15 | 3,319 | $49,778 |
| Granular Borrow | C.Y. | $40 | 2,489 | $99,556 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 6,400 | $144,000 |
| Sidewalk (5' width) | L.F. | $25 | 6,400 | $160,000 |
| Drainage | L.F. | $45 | 6,400 | $288,000 |
| Right of Way | S.F. | $1.27 | 3,200 | $4,077 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,180,894** |
| Mobilization (10% of Construction) | Lump | 10% | 118,089 | $118,089 |
| Contingency (25% of Construction) | Lump | 25% | 295,223 | $295,223 |
| | | | **Subtotal** | **$1,594,207** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $118,089 |
| **Construction Engineering** | 10% | $118,089 |

| | |
|---|---|
| **Total Project Costs** | **$1,831,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **30**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**New Road (3450 West): 1000 North to Project #4**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 4 | $7,273 |
| Roadway Excavation | C.Y. | $11 | 9,333 | $98,000 |
| HMA Concrete | Ton | $85 | 2,604 | $221,340 |
| Untreated Base Course | C.Y. | $15 | 2,489 | $37,333 |
| Granular Borrow | C.Y. | $40 | 1,867 | $74,667 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 4,800 | $108,000 |
| Sidewalk (5' width) | L.F. | $25 | 4,800 | $120,000 |
| Drainage | L.F. | $45 | 4,800 | $216,000 |
| Right of Way | S.F. | $1.27 | 2,400 | $3,058 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$885,670** |
| Mobilization (10% of Construction) | Lump | 10% | 88,567 | $88,567 |
| Contingency (25% of Construction) | Lump | 25% | 221,418 | $221,418 |
| | | | **Subtotal** | **$1,195,655** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $88,567 |
| **Construction Engineering** | 10% | $88,567 |

| | |
|---|---|
| **Total Project Costs** | **$1,373,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **31**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**Rocky Point Road Re-Alignment: I-84 to Main Street**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 10 | $20,937 |
| Roadway Excavation | C.Y. | $11 | 29,556 | $310,333 |
| HMA Concrete | Ton | $85 | 10,308 | $876,138 |
| Untreated Base Course | C.Y. | $15 | 7,881 | $118,222 |
| Granular Borrow | C.Y. | $40 | 5,911 | $236,444 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 11,400 | $256,500 |
| Sidewalk (5' width) | L.F. | $30 | 11,400 | $342,000 |
| Drainage | L.F. | $45 | 11,400 | $513,000 |
| Right of Way | S.F. | $1.27 | 5,700 | $7,262 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$2,680,836** |
| Mobilization (10% of Construction) | Lump | 10% | 268,084 | $268,084 |
| Contingency (25% of Construction) | Lump | 25% | 670,209 | $670,209 |
| | | | **Subtotal** | **$3,619,129** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $268,084 |
| **Construction Engineering** | 10% | $268,084 |

| | |
|---|---|
| **Total Project Costs** | **$4,156,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **5** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **32**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Minor Arterial - 80'**

# Tremonton City
# Transportation Master Plan

**New Road: Main Street to Project #32**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 2 | $4,848 |
| Roadway Excavation | C.Y. | $11 | 6,222 | $65,333 |
| HMA Concrete | Ton | $85 | 1,736 | $147,560 |
| Untreated Base Course | C.Y. | $15 | 1,659 | $24,889 |
| Granular Borrow | C.Y. | $40 | 1,244 | $49,778 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 3,200 | $72,000 |
| Sidewalk (5' width) | L.F. | $25 | 3,200 | $80,000 |
| Drainage | L.F. | $45 | 3,200 | $144,000 |
| Right of Way | S.F. | $1.27 | 1,600 | $2,038 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$590,447** |
| Mobilization (10% of Construction) | Lump | 10% | 59,045 | $59,045 |
| Contingency (25% of Construction) | Lump | 25% | 147,612 | $147,612 |
| | | | **Subtotal** | **$797,103** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $59,045 |
| **Construction Engineering** | 10% | $59,045 |

| | |
|---|---|
| **Total Project Costs** | **$916,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **33**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**New Road: Main Street to Old Rocky Point Rd**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 3 | $5,303 |
| Roadway Excavation | C.Y. | $11 | 6,806 | $71,458 |
| HMA Concrete | Ton | $85 | 1,899 | $161,394 |
| Untreated Base Course | C.Y. | $15 | 1,815 | $27,222 |
| Granular Borrow | C.Y. | $40 | 1,361 | $54,444 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 3,500 | $78,750 |
| Sidewalk (5' width) | L.F. | $25 | 3,500 | $87,500 |
| Drainage | L.F. | $45 | 3,500 | $157,500 |
| Right of Way | S.F. | $1.27 | 1,750 | $2,230 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$645,801** |
| Mobilization (10% of Construction) | Lump | 10% | 64,580 | $64,580 |
| Contingency (25% of Construction) | Lump | 25% | 161,450 | $161,450 |
| | | | **Subtotal** | **$871,832** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $64,580 |
| **Construction Engineering** | 10% | $64,580 |

| | |
|---|---|
| **Total Project Costs** | **$1,001,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **34**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**Old Rocky Point Road: Re-Align to Connect to New Rocky Point Road and Main Street**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 2 | $3,939 |
| Roadway Excavation | C.Y. | $11 | 5,056 | $53,083 |
| HMA Concrete | Ton | $85 | 1,411 | $119,893 |
| Untreated Base Course | C.Y. | $15 | 1,348 | $20,222 |
| Granular Borrow | C.Y. | $40 | 1,011 | $40,444 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 2,600 | $58,500 |
| Sidewalk (5' width) | L.F. | $25 | 2,600 | $65,000 |
| Drainage | L.F. | $45 | 2,600 | $117,000 |
| Right of Way | S.F. | $1.27 | 1,300 | $1,656 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$479,738** |
| Mobilization (10% of Construction) | Lump | 10% | 47,974 | $47,974 |
| Contingency (25% of Construction) | Lump | 25% | 119,935 | $119,935 |
| | | | **Subtotal** | **$647,646** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $47,974 |
| **Construction Engineering** | 10% | $47,974 |

| | |
|---|---|
| **Total Project Costs** | **$744,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **35**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**New Road: Main Sreett to 10400 North**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 8 | $16,364 |
| Roadway Excavation | C.Y. | $11 | 21,000 | $220,500 |
| HMA Concrete | Ton | $85 | 5,859 | $498,015 |
| Untreated Base Course | C.Y. | $15 | 5,600 | $84,000 |
| Granular Borrow | C.Y. | $40 | 4,200 | $168,000 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 10,800 | $243,000 |
| Sidewalk (5' width) | L.F. | $25 | 10,800 | $270,000 |
| Drainage | L.F. | $45 | 10,800 | $486,000 |
| Right of Way | S.F. | $1.27 | 5,400 | $6,880 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,992,758** |
| Mobilization (10% of Construction) | Lump | 10% | 199,276 | $199,276 |
| Contingency (25% of Construction) | Lump | 25% | 498,190 | $498,190 |
| | | | **Subtotal** | **$2,690,224** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $199,276 |
| **Construction Engineering** | 10% | $199,276 |

| | |
|---|---|
| **Total Project Costs** | **$3,089,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **36**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**New Road (10400 North): 9200 West to Project #36**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 3 | $6,364 |
| Roadway Excavation | C.Y. | $11 | 8,167 | $85,750 |
| HMA Concrete | Ton | $85 | 2,279 | $193,673 |
| Untreated Base Course | C.Y. | $15 | 2,178 | $32,667 |
| Granular Borrow | C.Y. | $40 | 1,633 | $65,333 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 4,200 | $94,500 |
| Sidewalk (5' width) | L.F. | $25 | 4,200 | $105,000 |
| Drainage | L.F. | $45 | 4,200 | $189,000 |
| Right of Way | S.F. | $1.27 | 2,100 | $2,675 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$774,962** |
| Mobilization (10% of Construction) | Lump | 10% | 77,496 | $77,496 |
| Contingency (25% of Construction) | Lump | 25% | 193,740 | $193,740 |
| | | | **Subtotal** | **$1,046,198** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $77,496 |
| **Construction Engineering** | 10% | $77,496 |

| | |
|---|---|
| **Total Project Costs** | **$1,202,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **37**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**New Road (10400 North): 8400 W to Project #32**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 7 | $13,182 |
| Roadway Excavation | C.Y. | $11 | 16,917 | $177,625 |
| HMA Concrete | Ton | $85 | 4,720 | $401,179 |
| Untreated Base Course | C.Y. | $15 | 4,511 | $67,667 |
| Granular Borrow | C.Y. | $40 | 3,383 | $135,333 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 8,700 | $195,750 |
| Sidewalk (5' width) | L.F. | $25 | 8,700 | $217,500 |
| Drainage | L.F. | $45 | 8,700 | $391,500 |
| Right of Way | S.F. | $1.27 | 4,350 | $5,542 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,605,278** |
| Mobilization (10% of Construction) | Lump | 10% | 160,528 | $160,528 |
| Contingency (25% of Construction) | Lump | 25% | 401,319 | $401,319 |
| | | | **Subtotal** | **$2,167,125** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $160,528 |
| **Construction Engineering** | 10% | $160,528 |

| | |
|---|---|
| **Total Project Costs** | **$2,489,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **38**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**New Road: 10400 North to Project #71**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 8 | $15,427 |
| Roadway Excavation | C.Y. | $11 | 21,778 | $228,667 |
| HMA Concrete | Ton | $85 | 7,595 | $645,575 |
| Untreated Base Course | C.Y. | $15 | 5,807 | $87,111 |
| Granular Borrow | C.Y. | $40 | 4,356 | $174,222 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 8,400 | $189,000 |
| Sidewalk (5' width) | L.F. | $30 | 8,400 | $252,000 |
| Drainage | L.F. | $45 | 8,400 | $378,000 |
| Right of Way | S.F. | $1.27 | 4,200 | $5,351 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,975,353** |
| Mobilization (10% of Construction) | Lump | 10% | 197,535 | $197,535 |
| Contingency (25% of Construction) | Lump | 25% | 493,838 | $493,838 |
| | | | **Subtotal** | **$2,666,726** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $197,535 |
| **Construction Engineering** | 10% | $197,535 |

| | |
|---|---|
| **Total Project Costs** | **$3,062,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **5** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

| | |
|---|---|
| Project Number: | **39** |
| Improvement Type: | **New Road** |
| Completion Year: | **2067** |
| Roadway Functional Class: | **Minor Arterial - 80'** |

# Tremonton City
# Transportation Master Plan

**New Road: 10400 North to 10000 North**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 4 | $8,182 |
| Roadway Excavation | C.Y. | $11 | 10,500 | $110,250 |
| HMA Concrete | Ton | $85 | 2,930 | $249,008 |
| Untreated Base Course | C.Y. | $15 | 2,800 | $42,000 |
| Granular Borrow | C.Y. | $40 | 2,100 | $84,000 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 5,400 | $121,500 |
| Sidewalk (5' width) | L.F. | $25 | 5,400 | $135,000 |
| Drainage | L.F. | $45 | 5,400 | $243,000 |
| Right of Way | S.F. | $1.27 | 2,700 | $3,440 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$996,379** |
| Mobilization (10% of Construction) | Lump | 10% | 99,638 | $99,638 |
| Contingency (25% of Construction) | Lump | 25% | 249,095 | $249,095 |
| | | | **Subtotal** | **$1,345,112** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $99,638 |
| **Construction Engineering** | 10% | $99,638 |

| | |
|---|---|
| **Total Project Costs** | **$1,545,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **40**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**2300 West Alignment to Project #71**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 1 | $1,515 |
| Roadway Excavation | C.Y. | $11 | 1,944 | $20,417 |
| HMA Concrete | Ton | $85 | 543 | $46,113 |
| Untreated Base Course | C.Y. | $15 | 519 | $7,778 |
| Granular Borrow | C.Y. | $40 | 389 | $15,556 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 1,000 | $22,500 |
| Sidewalk (5' width) | L.F. | $25 | 1,000 | $25,000 |
| Drainage | L.F. | $45 | 1,000 | $45,000 |
| Right of Way | S.F. | $1.27 | 500 | $637 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$184,515** |
| Mobilization (10% of Construction) | Lump | 10% | 18,451 | $18,451 |
| Contingency (25% of Construction) | Lump | 25% | 46,129 | $46,129 |
| | | | **Subtotal** | **$249,095** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $18,451 |
| **Construction Engineering** | 10% | $18,451 |

| | |
|---|---|
| **Total Project Costs** | **$286,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **41**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**10400 North Alignment to Project #71 (West)**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 3 | $6,061 |
| Roadway Excavation | C.Y. | $11 | 7,593 | $79,722 |
| HMA Concrete | Ton | $85 | 2,118 | $180,058 |
| Untreated Base Course | C.Y. | $15 | 2,025 | $30,370 |
| Granular Borrow | C.Y. | $40 | 1,519 | $60,741 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 4,000 | $90,000 |
| Sidewalk (5' width) | L.F. | $25 | 4,000 | $100,000 |
| Drainage | L.F. | $45 | 4,000 | $180,000 |
| Right of Way | S.F. | $1.27 | 2,000 | $2,548 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$729,500** |
| Mobilization (10% of Construction) | Lump | 10% | 72,950 | $72,950 |
| Contingency (25% of Construction) | Lump | 25% | 182,375 | $182,375 |
| | | | **Subtotal** | **$984,825** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $72,950 |
| **Construction Engineering** | 10% | $72,950 |

| | |
|---|---|
| **Total Project Costs** | **$1,131,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **42**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Minor Arterial - 66'**

# Tremonton City
# Transportation Master Plan

**10000 North Extension to Project #71**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 8 | $15,909 |
| Roadway Excavation | C.Y. | $11 | 20,417 | $214,375 |
| HMA Concrete | Ton | $85 | 5,696 | $484,181 |
| Untreated Base Course | C.Y. | $15 | 5,444 | $81,667 |
| Granular Borrow | C.Y. | $40 | 4,083 | $163,333 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 10,500 | $236,250 |
| Sidewalk (5' width) | L.F. | $25 | 10,500 | $262,500 |
| Drainage | L.F. | $45 | 10,500 | $472,500 |
| Right of Way | S.F. | $1.27 | 5,250 | $6,689 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,937,404** |
| Mobilization (10% of Construction) | Lump | 10% | 193,740 | $193,740 |
| Contingency (25% of Construction) | Lump | 25% | 484,351 | $484,351 |
| | | | **Subtotal** | **$2,615,495** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $193,740 |
| **Construction Engineering** | 10% | $193,740 |

| | |
|---|---|
| **Total Project Costs** | **$3,003,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **43**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**Iowa String Road Alignment to Project #71**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 2 | $4,545 |
| Roadway Excavation | C.Y. | $11 | 5,694 | $59,792 |
| HMA Concrete | Ton | $85 | 1,589 | $135,044 |
| Untreated Base Course | C.Y. | $15 | 1,519 | $22,778 |
| Granular Borrow | C.Y. | $40 | 1,139 | $45,556 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 3,000 | $67,500 |
| Sidewalk (5' width) | L.F. | $25 | 3,000 | $75,000 |
| Drainage | L.F. | $45 | 3,000 | $135,000 |
| Right of Way | S.F. | $1.27 | 1,500 | $1,911 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$547,125** |
| Mobilization (10% of Construction) | Lump | 10% | 54,713 | $54,713 |
| Contingency (25% of Construction) | Lump | 25% | 136,781 | $136,781 |
| | | | **Subtotal** | **$738,619** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $54,713 |
| **Construction Engineering** | 10% | $54,713 |

| | |
|---|---|
| **Total Project Costs** | **$849,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **44**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Minor Arterial - 66'**

# Tremonton City
# Transportation Master Plan

**10400 North Alignment to Project #71 (East)**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 1 | $1,818 |
| Roadway Excavation | C.Y. | $11 | 2,278 | $23,917 |
| HMA Concrete | Ton | $85 | 636 | $54,018 |
| Untreated Base Course | C.Y. | $15 | 607 | $9,111 |
| Granular Borrow | C.Y. | $40 | 456 | $18,222 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 1,200 | $27,000 |
| Sidewalk (5' width) | L.F. | $25 | 1,200 | $30,000 |
| Drainage | L.F. | $45 | 1,200 | $54,000 |
| Right of Way | S.F. | $1.27 | 600 | $764 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$218,850** |
| Mobilization (10% of Construction) | Lump | 10% | 21,885 | $21,885 |
| Contingency (25% of Construction) | Lump | 25% | 54,713 | $54,713 |
| | | | **Subtotal** | **$295,448** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $21,885 |
| **Construction Engineering** | 10% | $21,885 |

| | |
|---|---|
| **Total Project Costs** | **$340,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **45**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Minor Arterial - 66'**

# Tremonton City
# Transportation Master Plan

**New Road: 9600 North to Project #43**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 4 | $8,182 |
| Roadway Excavation | C.Y. | $11 | 10,500 | $110,250 |
| HMA Concrete | Ton | $85 | 2,930 | $249,008 |
| Untreated Base Course | C.Y. | $15 | 2,800 | $42,000 |
| Granular Borrow | C.Y. | $40 | 2,100 | $84,000 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 5,400 | $121,500 |
| Sidewalk (5' width) | L.F. | $25 | 5,400 | $135,000 |
| Drainage | L.F. | $45 | 5,400 | $243,000 |
| Right of Way | S.F. | $1.27 | 2,700 | $3,440 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$996,379** |
| Mobilization (10% of Construction) | Lump | 10% | 99,638 | $99,638 |
| Contingency (25% of Construction) | Lump | 25% | 249,095 | $249,095 |
| | | | **Subtotal** | **$1,345,112** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $99,638 |
| **Construction Engineering** | 10% | $99,638 |

| | |
|---|---|
| **Total Project Costs** | **$1,545,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **46**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**1650 West Extension to 1000 N**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 7 | $14,394 |
| Roadway Excavation | C.Y. | $11 | 18,472 | $193,958 |
| HMA Concrete | Ton | $85 | 5,154 | $438,069 |
| Untreated Base Course | C.Y. | $15 | 4,926 | $73,889 |
| Granular Borrow | C.Y. | $40 | 3,694 | $147,778 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 9,500 | $213,750 |
| Sidewalk (5' width) | L.F. | $25 | 9,500 | $237,500 |
| Drainage | L.F. | $45 | 9,500 | $427,500 |
| Right of Way | S.F. | $1.27 | 4,750 | $6,052 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,752,889** |
| Mobilization (10% of Construction) | Lump | 10% | 175,289 | $175,289 |
| Contingency (25% of Construction) | Lump | 25% | 438,222 | $438,222 |
| | | | **Subtotal** | **$2,366,401** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $175,289 |
| **Construction Engineering** | 10% | $175,289 |

| | |
|---|---|
| **Total Project Costs** | **$2,717,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **47**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**New Road: Main Street to 6800 West**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 8 | $15,758 |
| Roadway Excavation | C.Y. | $11 | 20,222 | $212,333 |
| HMA Concrete | Ton | $85 | 5,642 | $479,570 |
| Untreated Base Course | C.Y. | $15 | 5,393 | $80,889 |
| Granular Borrow | C.Y. | $40 | 4,044 | $161,778 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 10,400 | $234,000 |
| Sidewalk (5' width) | L.F. | $25 | 10,400 | $260,000 |
| Drainage | L.F. | $45 | 10,400 | $468,000 |
| Right of Way | S.F. | $1.27 | 5,200 | $6,625 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,918,953** |
| Mobilization (10% of Construction) | Lump | 10% | 191,895 | $191,895 |
| Contingency (25% of Construction) | Lump | 25% | 479,738 | $479,738 |
| | | | **Subtotal** | **$2,590,586** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $191,895 |
| **Construction Engineering** | 10% | $191,895 |

| | |
|---|---|
| **Total Project Costs** | **$2,975,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **48**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**New Traffic Signal: 5600 West & Main Street**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 0 | $0 |
| Roadway Excavation | C.Y. | $11 | 0 | $0 |
| HMA Concrete | Ton | $85 | 0 | $0 |
| Untreated Base Course | C.Y. | $15 | 0 | $0 |
| Granular Borrow | C.Y. | $40 | 0 | $0 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 0 | $0 |
| Sidewalk (5' width) | L.F. | $25 | 0 | $0 |
| Drainage | L.F. | $45 | 0 | $0 |
| Right of Way | S.F. | $1.27 | 0 | $0 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 1 | $193,000 |
| | | | | |
| | | | **Construction Cost** | **$193,000** |
| Mobilization (10% of Construction) | Lump | 10% | 19,300 | $19,300 |
| Contingency (25% of Construction) | Lump | 25% | 48,250 | $48,250 |
| | | | **Subtotal** | **$260,550** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $19,300 |
| **Construction Engineering** | 10% | $19,300 |

| | |
|---|---|
| **Total Project Costs** | **$300,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **0** |
| HMA Thickness (in) = | **0** |
| Untreated Base Course Thickness (in) = | **0** |
| Granual Borrow Thickness (in) = | **0** |
| Roadway Excavation Depth (ft) = | **0** |
| Number of Sidewalks (No.) = | **0** |

Project Parameters:

Project Number: **49**
Improvement Type: **Traffic Signal**
Completion Year: **2037**
Roadway Functional Class: **Traffic Signal**

# Tremonton City
# Transportation Master Plan

**Local Roads Northeast of Project #71**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 12 | $23,967 |
| Roadway Excavation | C.Y. | $11 | 29,000 | $304,500 |
| HMA Concrete | Ton | $85 | 6,068 | $515,801 |
| Untreated Base Course | C.Y. | $15 | 7,733 | $116,000 |
| Granular Borrow | C.Y. | $40 | 5,800 | $232,000 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 17,400 | $391,500 |
| Sidewalk (5' width) | L.F. | $25 | 17,400 | $435,000 |
| Drainage | L.F. | $45 | 17,400 | $783,000 |
| Right of Way | S.F. | $1.27 | 8,700 | $11,084 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$2,812,852** |
| Mobilization (10% of Construction) | Lump | 10% | 281,285 | $281,285 |
| Contingency (25% of Construction) | Lump | 25% | 703,213 | $703,213 |
| | | | **Subtotal** | **$3,797,351** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $281,285 |
| **Construction Engineering** | 10% | $281,285 |

| | |
|---|---|
| **Total Project Costs** | **$4,360,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **3** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **50**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Local Street**

# Tremonton City
# Transportation Master Plan

**Local Roads Southwest of Tremont St and 600 S**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 6 | $11,708 |
| Roadway Excavation | C.Y. | $11 | 14,167 | $148,750 |
| HMA Concrete | Ton | $85 | 2,964 | $251,972 |
| Untreated Base Course | C.Y. | $15 | 3,778 | $56,667 |
| Granular Borrow | C.Y. | $40 | 2,833 | $113,333 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 8,500 | $191,250 |
| Sidewalk (5' width) | L.F. | $25 | 8,500 | $212,500 |
| Drainage | L.F. | $45 | 8,500 | $382,500 |
| Right of Way | S.F. | $1.27 | 4,250 | $5,415 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 1,560 | $351,000 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,725,094** |
| Mobilization (10% of Construction) | Lump | 10% | 172,509 | $172,509 |
| Contingency (25% of Construction) | Lump | 25% | 431,274 | $431,274 |
| | | | **Subtotal** | **$2,328,878** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $172,509 |
| **Construction Engineering** | 10% | $172,509 |

| | |
|---|---|
| **Total Project Costs** | **$2,674,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **3** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **51**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Local Street**

# Tremonton City
# Transportation Master Plan

**New Road Connection: 830 West to 760 West**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 1 | $1,928 |
| Roadway Excavation | C.Y. | $11 | 2,333 | $24,500 |
| HMA Concrete | Ton | $85 | 488 | $41,501 |
| Untreated Base Course | C.Y. | $15 | 622 | $9,333 |
| Granular Borrow | C.Y. | $40 | 467 | $18,667 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 1,400 | $31,500 |
| Sidewalk (5' width) | L.F. | $25 | 1,400 | $35,000 |
| Drainage | L.F. | $45 | 1,400 | $63,000 |
| Right of Way | S.F. | $1.27 | 700 | $892 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$226,321** |
| Mobilization (10% of Construction) | Lump | 10% | 22,632 | $22,632 |
| Contingency (25% of Construction) | Lump | 25% | 56,580 | $56,580 |
| | | | **Subtotal** | **$305,534** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $22,632 |
| **Construction Engineering** | 10% | $22,632 |

| | |
|---|---|
| **Total Project Costs** | **$351,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **3** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **52**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Local Street**

# Tremonton City
# Transportation Master Plan

**Local Roads Southwest of Main St/Iowa String Rd**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 9 | $18,182 |
| Roadway Excavation | C.Y. | $11 | 22,000 | $231,000 |
| HMA Concrete | Ton | $85 | 4,604 | $391,298 |
| Untreated Base Course | C.Y. | $15 | 5,867 | $88,000 |
| Granular Borrow | C.Y. | $40 | 4,400 | $176,000 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 13,200 | $297,000 |
| Sidewalk (5' width) | L.F. | $25 | 13,200 | $330,000 |
| Drainage | L.F. | $45 | 13,200 | $594,000 |
| Right of Way | S.F. | $1.27 | 6,600 | $8,409 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$2,133,888** |
| Mobilization (10% of Construction) | Lump | 10% | 213,389 | $213,389 |
| Contingency (25% of Construction) | Lump | 25% | 533,472 | $533,472 |
| | | | **Subtotal** | **$2,880,749** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $213,389 |
| **Construction Engineering** | 10% | $213,389 |

| | |
|---|---|
| **Total Project Costs** | **$3,308,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **3** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

| | |
|---|---|
| Project Number: | **53** |
| Improvement Type: | **New Road** |
| Completion Year: | **2067** |
| Roadway Functional Class: | **Local Street** |

# Tremonton City
# Transportation Master Plan

**Local Road connecting 600 N to 2000 W**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 2 | $3,857 |
| Roadway Excavation | C.Y. | $11 | 4,667 | $49,000 |
| HMA Concrete | Ton | $85 | 977 | $83,003 |
| Untreated Base Course | C.Y. | $15 | 1,244 | $18,667 |
| Granular Borrow | C.Y. | $40 | 933 | $37,333 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 2,800 | $63,000 |
| Sidewalk (5' width) | L.F. | $25 | 2,800 | $70,000 |
| Drainage | L.F. | $45 | 2,800 | $126,000 |
| Right of Way | S.F. | $1.27 | 1,400 | $1,784 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$452,643** |
| Mobilization (10% of Construction) | Lump | 10% | 45,264 | $45,264 |
| Contingency (25% of Construction) | Lump | 25% | 113,161 | $113,161 |
| | | | **Subtotal** | **$611,068** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $45,264 |
| **Construction Engineering** | 10% | $45,264 |

| | |
|---|---|
| **Total Project Costs** | **$702,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **3** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **54**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Local Street**

# Tremonton City
# Transportation Master Plan

**Local Roads East of Project #47**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 8 | $15,702 |
| Roadway Excavation | C.Y. | $11 | 19,000 | $199,500 |
| HMA Concrete | Ton | $85 | 3,976 | $337,939 |
| Untreated Base Course | C.Y. | $15 | 5,067 | $76,000 |
| Granular Borrow | C.Y. | $40 | 3,800 | $152,000 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 11,400 | $256,500 |
| Sidewalk (5' width) | L.F. | $25 | 11,400 | $285,000 |
| Drainage | L.F. | $45 | 11,400 | $513,000 |
| Right of Way | S.F. | $1.27 | 5,700 | $7,262 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,842,903** |
| Mobilization (10% of Construction) | Lump | 10% | 184,290 | $184,290 |
| Contingency (25% of Construction) | Lump | 25% | 460,726 | $460,726 |
| | | | **Subtotal** | **$2,487,919** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $184,290 |
| **Construction Engineering** | 10% | $184,290 |

| | |
|---|---|
| **Total Project Costs** | **$2,857,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **3** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **55**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Local Street**

# Tremonton City
# Transportation Master Plan

**Local Roads Northwest of Main St/4th W**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 5 | $9,642 |
| Roadway Excavation | C.Y. | $11 | 11,667 | $122,500 |
| HMA Concrete | Ton | $85 | 2,441 | $207,506 |
| Untreated Base Course | C.Y. | $15 | 3,111 | $46,667 |
| Granular Borrow | C.Y. | $40 | 2,333 | $93,333 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 7,000 | $157,500 |
| Sidewalk (5' width) | L.F. | $25 | 7,000 | $175,000 |
| Drainage | L.F. | $45 | 7,000 | $315,000 |
| Right of Way | S.F. | $1.27 | 3,500 | $4,459 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,131,607** |
| Mobilization (10% of Construction) | Lump | 10% | 113,161 | $113,161 |
| Contingency (25% of Construction) | Lump | 25% | 282,902 | $282,902 |
| | | | **Subtotal** | **$1,527,670** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $113,161 |
| **Construction Engineering** | 10% | $113,161 |

| | |
|---|---|
| **Total Project Costs** | **$1,754,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **3** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **56**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Local Street**

# Tremonton City
# Transportation Master Plan

**Local RoadsSoutheast of 600 S/6800 W**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 3 | $5,510 |
| Roadway Excavation | C.Y. | $11 | 6,667 | $70,000 |
| HMA Concrete | Ton | $85 | 1,395 | $118,575 |
| Untreated Base Course | C.Y. | $15 | 1,778 | $26,667 |
| Granular Borrow | C.Y. | $40 | 1,333 | $53,333 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 4,000 | $90,000 |
| Sidewalk (5' width) | L.F. | $25 | 4,000 | $100,000 |
| Drainage | L.F. | $45 | 4,000 | $180,000 |
| Right of Way | S.F. | $1.27 | 2,000 | $2,548 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$646,633** |
| Mobilization (10% of Construction) | Lump | 10% | 64,663 | $64,663 |
| Contingency (25% of Construction) | Lump | 25% | 161,658 | $161,658 |
| | | | **Subtotal** | **$872,954** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $64,663 |
| **Construction Engineering** | 10% | $64,663 |

| | |
|---|---|
| **Total Project Costs** | **$1,003,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **3** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **57**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Local Street**

# Tremonton City
# Transportation Master Plan

**Local Rd connecting 875 N to David Dr**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 2 | $3,581 |
| Roadway Excavation | C.Y. | $11 | 4,333 | $45,500 |
| HMA Concrete | Ton | $85 | 907 | $77,074 |
| Untreated Base Course | C.Y. | $15 | 1,156 | $17,333 |
| Granular Borrow | C.Y. | $40 | 867 | $34,667 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 2,600 | $58,500 |
| Sidewalk (5' width) | L.F. | $25 | 2,600 | $65,000 |
| Drainage | L.F. | $45 | 2,600 | $117,000 |
| Right of Way | S.F. | $1.27 | 1,300 | $1,656 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$420,311** |
| Mobilization (10% of Construction) | Lump | 10% | 42,031 | $42,031 |
| Contingency (25% of Construction) | Lump | 25% | 105,078 | $105,078 |
| | | | **Subtotal** | **$567,420** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $42,031 |
| **Construction Engineering** | 10% | $42,031 |

| | |
|---|---|
| **Total Project Costs** | **$652,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **3** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **58**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Local Street**

# Tremonton City
# Transportation Master Plan

**New Traffic Signal: Main Street & Project #32**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 0 | $0 |
| Roadway Excavation | C.Y. | $11 | 0 | $0 |
| HMA Concrete | Ton | $85 | 0 | $0 |
| Untreated Base Course | C.Y. | $15 | 0 | $0 |
| Granular Borrow | C.Y. | $40 | 0 | $0 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 0 | $0 |
| Sidewalk (5' width) | L.F. | $25 | 0 | $0 |
| Drainage | L.F. | $45 | 0 | $0 |
| Right of Way | S.F. | $1.27 | 0 | $0 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 1 | $193,000 |
| | | | | |
| | | | **Construction Cost** | **$193,000** |
| Mobilization (10% of Construction) | Lump | 10% | 19,300 | $19,300 |
| Contingency (25% of Construction) | Lump | 25% | 48,250 | $48,250 |
| | | | **Subtotal** | **$260,550** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $19,300 |
| **Construction Engineering** | 10% | $19,300 |

| | |
|---|---|
| **Total Project Costs** | **$300,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **0** |
| HMA Thickness (in) = | **0** |
| Untreated Base Course Thickness (in) = | **0** |
| Granual Borrow Thickness (in) = | **0** |
| Roadway Excavation Depth (ft) = | **0** |
| Number of Sidewalks (No.) = | **0** |

Project Parameters:

Project Number: **59**
Improvement Type: **Traffic Signal**
Completion Year: **2067**
Roadway Functional Class: **Traffic Signal**

# Tremonton City
# Transportation Master Plan

**New Traffic Signal: Main Street & 1650 West**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 0 | $0 |
| Roadway Excavation | C.Y. | $11 | 0 | $0 |
| HMA Concrete | Ton | $85 | 0 | $0 |
| Untreated Base Course | C.Y. | $15 | 0 | $0 |
| Granular Borrow | C.Y. | $40 | 0 | $0 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 0 | $0 |
| Sidewalk (5' width) | L.F. | $25 | 0 | $0 |
| Drainage | L.F. | $45 | 0 | $0 |
| Right of Way | S.F. | $1.27 | 0 | $0 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 1 | $193,000 |
| | | | | |
| | | | **Construction Cost** | **$193,000** |
| Mobilization (10% of Construction) | Lump | 10% | 19,300 | $19,300 |
| Contingency (25% of Construction) | Lump | 25% | 48,250 | $48,250 |
| | | | **Subtotal** | **$260,550** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $19,300 |
| **Construction Engineering** | 10% | $19,300 |

| | |
|---|---|
| **Total Project Costs** | **$300,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **0** |
| HMA Thickness (in) = | **0** |
| Untreated Base Course Thickness (in) = | **0** |
| Granual Borrow Thickness (in) = | **0** |
| Roadway Excavation Depth (ft) = | **0** |
| Number of Sidewalks (No.) = | **0** |

Project Parameters:

Project Number: **60**
Improvement Type: **Traffic Signal**
Completion Year: **2067**
Roadway Functional Class: **Traffic Signal**

# Tremonton City
# Transportation Master Plan

**New Traffic Signal: Main St & 600 West**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 0 | $0 |
| Roadway Excavation | C.Y. | $11 | 0 | $0 |
| HMA Concrete | Ton | $85 | 0 | $0 |
| Untreated Base Course | C.Y. | $15 | 0 | $0 |
| Granular Borrow | C.Y. | $40 | 0 | $0 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 0 | $0 |
| Sidewalk (5' width) | L.F. | $25 | 0 | $0 |
| Drainage | L.F. | $45 | 0 | $0 |
| Right of Way | S.F. | $1.27 | 0 | $0 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 1 | $193,000 |
| | | | | |
| | | | **Construction Cost** | **$193,000** |
| Mobilization (10% of Construction) | Lump | 10% | 19,300 | $19,300 |
| Contingency (25% of Construction) | Lump | 25% | 48,250 | $48,250 |
| | | | **Subtotal** | **$260,550** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $19,300 |
| **Construction Engineering** | 10% | $19,300 |

| | |
|---|---|
| **Total Project Costs** | **$300,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **0** |
| HMA Thickness (in) = | **0** |
| Untreated Base Course Thickness (in) = | **0** |
| Granual Borrow Thickness (in) = | **0** |
| Roadway Excavation Depth (ft) = | **0** |
| Number of Sidewalks (No.) = | **0** |

Project Parameters:

Project Number: **61**
Improvement Type: **Traffic Signal**
Completion Year: **2067**
Roadway Functional Class: **Traffic Signal**

# Tremonton City
# Transportation Master Plan

**New Traffic Signal: Main Street & 1600 East**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 0 | $0 |
| Roadway Excavation | C.Y. | $11 | 0 | $0 |
| HMA Concrete | Ton | $85 | 0 | $0 |
| Untreated Base Course | C.Y. | $15 | 0 | $0 |
| Granular Borrow | C.Y. | $40 | 0 | $0 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 0 | $0 |
| Sidewalk (5' width) | L.F. | $25 | 0 | $0 |
| Drainage | L.F. | $45 | 0 | $0 |
| Right of Way | S.F. | $1.27 | 0 | $0 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 1 | $193,000 |
| | | | | |
| | | | **Construction Cost** | **$193,000** |
| Mobilization (10% of Construction) | Lump | 10% | 19,300 | $19,300 |
| Contingency (25% of Construction) | Lump | 25% | 48,250 | $48,250 |
| | | | **Subtotal** | **$260,550** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $19,300 |
| **Construction Engineering** | 10% | $19,300 |

| | |
|---|---|
| **Total Project Costs** | **$300,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **0** |
| HMA Thickness (in) = | **0** |
| Untreated Base Course Thickness (in) = | **0** |
| Granual Borrow Thickness (in) = | **0** |
| Roadway Excavation Depth (ft) = | **0** |
| Number of Sidewalks (No.) = | **0** |

Project Parameters:

Project Number: **62**
Improvement Type: **Traffic Signal**
Completion Year: **2067**
Roadway Functional Class: **Traffic Signal**

# Tremonton City
# Transportation Master Plan

**I-15 JCT at Project 64**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 0 | $0 |
| Roadway Excavation | C.Y. | $11 | 0 | $0 |
| HMA Concrete | Ton | $85 | 0 | $0 |
| Untreated Base Course | C.Y. | $15 | 0 | $0 |
| Granular Borrow | C.Y. | $40 | 0 | $0 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 0 | $0 |
| Sidewalk (5' width) | L.F. | $25 | 0 | $0 |
| Drainage | L.F. | $45 | 0 | $0 |
| Right of Way | S.F. | $1.27 | 0 | $0 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Interchange | Each | $50,000,000 | 1 | $50,000,000 |
| | | | | |
| | | | **Construction Cost** | **$50,000,000** |
| Mobilization (10% of Construction) | Lump | 10% | 5,000,000 | $5,000,000 |
| Contingency (25% of Construction) | Lump | 25% | 12,500,000 | $12,500,000 |
| | | | **Subtotal** | **$67,500,000** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $5,000,000 |
| **Construction Engineering** | 10% | $5,000,000 |

| | |
|---|---|
| **Total Project Costs** | **$77,500,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

| | |
|---|---|
| Project Number: | **63** |
| Improvement Type: | **Capacity Improvement** |
| Completion Year: | **2067** |
| Roadway Functional Class: | **Collector** |

# Tremonton City
# Transportation Master Plan

**New Road (Tremont Street): Extension to I-15 Interchange (Project #64)**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 5 | $10,376 |
| Roadway Excavation | C.Y. | $11 | 15,556 | $163,333 |
| HMA Concrete | Ton | $85 | 5,425 | $461,125 |
| Untreated Base Course | C.Y. | $15 | 3,111 | $46,667 |
| Granular Borrow | C.Y. | $40 | 7,778 | $311,111 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 4,000 | $90,000 |
| Sidewalk (5' width) | L.F. | $25 | 4,000 | $100,000 |
| Drainage | L.F. | $45 | 4,000 | $180,000 |
| Right of Way | S.F. | $1.27 | 2,000 | $2,548 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,365,161** |
| Mobilization (10% of Construction) | Lump | 10% | 136,516 | $136,516 |
| Contingency (25% of Construction) | Lump | 25% | 341,290 | $341,290 |
| | | | **Subtotal** | **$1,842,967** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $136,516 |
| **Construction Engineering** | 10% | $136,516 |

| | |
|---|---|
| **Total Project Costs** | **$2,116,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **5** |
| Untreated Base Course Thickness (in) = | **6** |
| Granual Borrow Thickness (in) = | **15** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **64**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Major Arterial**

# Tremonton City
# Transportation Master Plan

**10400 N Widening: 9200 West to 2300 West**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 33,133 | $132,533 |
| Clearing and Grubbing | Acre | $2,000 | 7 | $13,691 |
| Roadway Excavation | C.Y. | $11 | 27,611 | $289,917 |
| HMA Concrete | Ton | $85 | 9,629 | $818,497 |
| Untreated Base Course | C.Y. | $15 | 7,363 | $110,444 |
| Granular Borrow | C.Y. | $40 | 5,522 | $220,889 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 21,300 | $479,250 |
| Sidewalk (5' width) | L.F. | $30 | 21,300 | $639,000 |
| Drainage | L.F. | $45 | 21,300 | $958,500 |
| Right of Way | S.F. | $1.27 | 10,650 | $13,568 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$3,676,290** |
| Mobilization (10% of Construction) | Lump | 10% | 367,629 | $367,629 |
| Contingency (25% of Construction) | Lump | 25% | 919,073 | $919,073 |
| | | | **Subtotal** | **$4,962,992** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $367,629 |
| **Construction Engineering** | 10% | $367,629 |

| | |
|---|---|
| **Total Project Costs** | **$5,699,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **5** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **65**
Improvement Type: **Capacity Improvement**
Completion Year: **2067**
Roadway Functional Class: **Minor Arterial - 80'**

# Tremonton City
# Transportation Master Plan

**1200 South Widening: Malad River to 4700 West**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 16,956 | $67,822 |
| Clearing and Grubbing | Acre | $2,000 | 2 | $3,753 |
| Roadway Excavation | C.Y. | $11 | 12,111 | $127,167 |
| HMA Concrete | Ton | $85 | 4,224 | $359,019 |
| Untreated Base Course | C.Y. | $15 | 2,422 | $36,333 |
| Granular Borrow | C.Y. | $40 | 6,056 | $242,222 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 10,900 | $245,250 |
| Sidewalk (5' width) | L.F. | $25 | 10,900 | $272,500 |
| Drainage | L.F. | $45 | 10,900 | $490,500 |
| Right of Way | S.F. | $1.27 | 5,450 | $6,943 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,851,510** |
| Mobilization (10% of Construction) | Lump | 10% | 185,151 | $185,151 |
| Contingency (25% of Construction) | Lump | 25% | 462,878 | $462,878 |
| | | | **Subtotal** | **$2,499,539** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $185,151 |
| **Construction Engineering** | 10% | $185,151 |

| | |
|---|---|
| **Total Project Costs** | **$2,870,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **5** |
| Untreated Base Course Thickness (in) = | **6** |
| Granual Borrow Thickness (in) = | **15** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **66**

Improvement Type: **Capacity Improvement**

Completion Year: **2067**

Roadway Functional Class: **Minor Arterial - 80' Trail**

# Tremonton City
# Transportation Master Plan

**Main Street Widening: Iowa String Road to 1650 West**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 13,902 | $55,609 |
| Clearing and Grubbing | Acre | $2,000 | 1 | $2,498 |
| Roadway Excavation | C.Y. | $11 | 9,570 | $100,489 |
| HMA Concrete | Ton | $85 | 3,338 | $283,702 |
| Untreated Base Course | C.Y. | $15 | 1,914 | $28,711 |
| Granular Borrow | C.Y. | $40 | 4,785 | $191,407 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 5,440 | $122,400 |
| Sidewalk (5' width) | L.F. | $25 | 5,440 | $136,000 |
| Drainage | L.F. | $45 | 5,440 | $244,800 |
| Right of Way | S.F. | $1.27 | 2,720 | $3,465 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,169,081** |
| Mobilization (10% of Construction) | Lump | 10% | 116,908 | $116,908 |
| Contingency (25% of Construction) | Lump | 25% | 292,270 | $292,270 |
| | | | **Subtotal** | **$1,578,259** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $116,908 |
| **Construction Engineering** | 10% | $116,908 |

| | |
|---|---|
| **Total Project Costs** | **$1,813,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **5** |
| Untreated Base Course Thickness (in) = | **6** |
| Granual Borrow Thickness (in) = | **15** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **67**

Improvement Type: **Capacity Improvement**

Completion Year: **2037**

Roadway Functional Class: **Major Arterial**

# Tremonton City
# Transportation Master Plan

**Main Street Widening: 1650 West to I-84**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 21,494 | $85,978 |
| Clearing and Grubbing | Acre | $2,000 | 2 | $4,357 |
| Roadway Excavation | C.Y. | $11 | 10,477 | $110,007 |
| HMA Concrete | Ton | $85 | 3,654 | $310,573 |
| Untreated Base Course | C.Y. | $15 | 2,095 | $31,431 |
| Granular Borrow | C.Y. | $40 | 5,238 | $209,537 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 7,300 | $164,250 |
| Sidewalk (5' width) | L.F. | $25 | 7,300 | $182,500 |
| Drainage | L.F. | $45 | 7,300 | $328,500 |
| Right of Way | S.F. | $1.27 | 3,650 | $4,650 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,431,783** |
| Mobilization (10% of Construction) | Lump | 10% | 143,178 | $143,178 |
| Contingency (25% of Construction) | Lump | 25% | 357,946 | $357,946 |
| | | | **Subtotal** | **$1,932,907** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $143,178 |
| **Construction Engineering** | 10% | $143,178 |

| | |
|---|---|
| **Total Project Costs** | **$2,220,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **5** |
| Untreated Base Course Thickness (in) = | **6** |
| Granual Borrow Thickness (in) = | **15** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **68**
Improvement Type: **Capacity Improvement**
Completion Year: **2067**
Roadway Functional Class: **Major Arterial**

# Tremonton City
# Transportation Master Plan

**New Traffic Signal: Main Street & 4800 West**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 0 | $0 |
| Roadway Excavation | C.Y. | $11 | 0 | $0 |
| HMA Concrete | Ton | $85 | 0 | $0 |
| Untreated Base Course | C.Y. | $15 | 0 | $0 |
| Granular Borrow | C.Y. | $40 | 0 | $0 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 0 | $0 |
| Sidewalk (5' width) | L.F. | $25 | 0 | $0 |
| Drainage | L.F. | $45 | 0 | $0 |
| Right of Way | S.F. | $1.27 | 0 | $0 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 1 | $193,000 |
| | | | | |
| | | | **Construction Cost** | **$193,000** |
| Mobilization (10% of Construction) | Lump | 10% | 19,300 | $19,300 |
| Contingency (25% of Construction) | Lump | 25% | 48,250 | $48,250 |
| | | | **Subtotal** | **$260,550** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $19,300 |
| **Construction Engineering** | 10% | $19,300 |

| | |
|---|---|
| **Total Project Costs** | **$300,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **0** |
| HMA Thickness (in) = | **0** |
| Untreated Base Course Thickness (in) = | **0** |
| Granual Borrow Thickness (in) = | **0** |
| Roadway Excavation Depth (ft) = | **0** |
| Number of Sidewalks (No.) = | **0** |

Project Parameters:

Project Number: **69**
Improvement Type: **Traffic Signal**
Completion Year: **2067**
Roadway Functional Class: **Traffic Signal**

# Tremonton City
# Transportation Master Plan

**New Loop Road: 2300 West to 2000 West**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 5 | $9,091 |
| Roadway Excavation | C.Y. | $11 | 11,667 | $122,500 |
| HMA Concrete | Ton | $85 | 3,255 | $276,675 |
| Untreated Base Course | C.Y. | $15 | 3,111 | $46,667 |
| Granular Borrow | C.Y. | $40 | 2,333 | $93,333 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 6,000 | $135,000 |
| Sidewalk (5' width) | L.F. | $25 | 6,000 | $150,000 |
| Drainage | L.F. | $45 | 6,000 | $270,000 |
| Right of Way | S.F. | $1.27 | 3,000 | $3,822 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$1,107,088** |
| Mobilization (10% of Construction) | Lump | 10% | 110,709 | $110,709 |
| Contingency (25% of Construction) | Lump | 25% | 276,772 | $276,772 |
| | | | **Subtotal** | **$1,494,569** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $110,709 |
| **Construction Engineering** | 10% | $110,709 |

| | |
|---|---|
| **Total Project Costs** | **$1,716,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **4** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **70**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Collector**

# Tremonton City
# Transportation Master Plan

**New Road: Iowa String Road to Main Street**

## Costs

| Item | Unit | Unit Cost | Quantity | Cost |
|---|---|---|---|---|
| Parkstrip | S.F. | $10 | 0 | $0 |
| Removal of Existing Asphalt | S.Y. | $4 | 0 | $0 |
| Clearing and Grubbing | Acre | $2,000 | 21 | $42,424 |
| Roadway Excavation | C.Y. | $11 | 59,889 | $628,833 |
| HMA Concrete | Ton | $85 | 20,886 | $1,775,331 |
| Untreated Base Course | C.Y. | $15 | 15,970 | $239,556 |
| Granular Borrow | C.Y. | $40 | 11,978 | $479,111 |
| Curb and Gutter (2.5' width) | L.F. | $23 | 23,100 | $519,750 |
| Sidewalk (5' width) | L.F. | $30 | 23,100 | $693,000 |
| Drainage | L.F. | $45 | 23,100 | $1,039,500 |
| Right of Way | S.F. | $1.27 | 11,550 | $14,715 |
| | | | | |
| Bridge/Culvert | S.F. | $225 | 0 | $0 |
| Traffic Signal | Each | $193,000 | 0 | $0 |
| | | | | |
| | | | **Construction Cost** | **$5,432,221** |
| Mobilization (10% of Construction) | Lump | 10% | 543,222 | $543,222 |
| Contingency (25% of Construction) | Lump | 25% | 1,358,055 | $1,358,055 |
| | | | **Subtotal** | **$7,333,498** |

| | | |
|---|---|---|
| **Preconstruction Engineering** | 10% | $543,222 |
| **Construction Engineering** | 10% | $543,222 |

| | |
|---|---|
| **Total Project Costs** | **$8,420,000** |

Overall Assumptions:

| | |
|---|---|
| HMA Pavement Density (pcf) = | **155** |
| HMA Thickness (in) = | **5** |
| Untreated Base Course Thickness (in) = | **8** |
| Granual Borrow Thickness (in) = | **6** |
| Roadway Excavation Depth (ft) = | **2.5** |
| Number of Sidewalks (No.) = | **2** |

Project Parameters:

Project Number: **71**
Improvement Type: **New Road**
Completion Year: **2067**
Roadway Functional Class: **Minor Arterial - 80'**

TRANSPORTATION MASTER PLAN
May 2018

# Appendix C: UTA FrontRunner Memo

HORROCKS
ENGINEERS

**Memo**
**To:** Shawn Warnke
**From:** Hal Johnson
**Subject:** Tremonton TMP –Transit Section
January 8, 2018

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Shawn,

Thank you for the opportunity to review the transit section in Tremonton's Transportation Master Plan. As your community grows transit will become a great tool to improve mobility and promote economic development. Let me give you an update on the current efforts to extend commuter rail to Brigham City. UTA is currently working to acquire right of way adjacent to Union Pacific's right of way. There are a couple of reasons for UTA constructing a separated track, rather than operating on UP's mainline. First, a shared track limits when UTA can provide service and affects reliability. Second, the Rail Safety Improvement Act of 2008 requires upgrades to be made on the UP track before passenger rail could operate on the corridor. Specifically, positive train control (PTC) systems are required. UP and UTA have developed different PTC solutions, using the UP track would require a significant investment in PTC equipment. As such it is more cost effective to construct a new track. Acquiring the right of way will be a timely endeavor. Following that UTA will have to complete an environmental study on the project and obtain funding. UTA's previous commuter rail projects (FrontRunner North and South) cost an average of $17.7 million per mile. It will also take a while to obtain funding. Unfortunately extending commuter rail to Brigham City is many years away, and that much further to getting it to Tremonton.

As such I would recommend focusing on bus service in your master plan for the time being. Moving forward it would be beneficial to work with the County to identify a plan to pass a tax to support future transit service. The Box Elder County Transit Feasibility Study and proposed service should be reviewed with the County and updated as needed. In addition to the routes currently shown in your plan, you may want to evaluate the option of having a local circulator. This would most likely be a route similar to the FLEX service UTA currently operates in Brigham City. I pulled some data from the 2012 Utah Household Survey, which indicates that approximately 54% of the trips originating in Tremonton stay in the city, and another 30% of stay in the closely surrounding areas of north Box Elder County. The remaining 15% of trips include destinations in Cache Valley, Brigham City, Weber County, and further south. It is a wise plan to preserve property for a rail station, even if commuter rail service is in the very far future. Short term I recommend you consider park and ride/bus transfer center at one of the sites the plan identifies on the rail line. A location near downtown would be preferred.

| Tremonton Trip Destinations | |
|---|---|
| Trips Leaving Tremonton Area | 15.7% |
| Trips Remaining in the Tremonton | 54.0% |
| Trips Remaining in North Box Elder County | 30.3% |

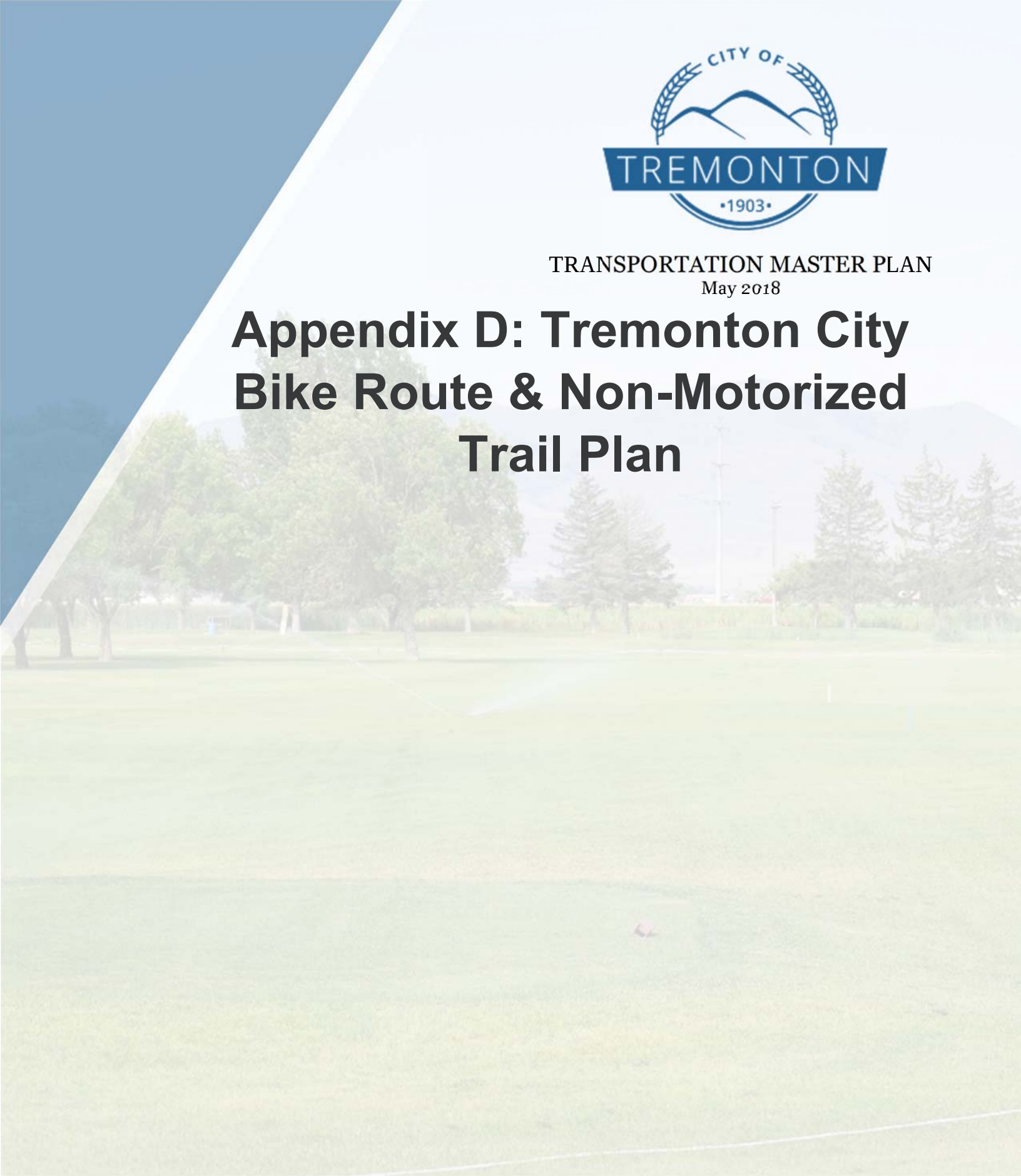
| Trips Leaving Tremonton Area Destination | |
|---|---|
| Cache County | 5.7% |
| Brigham City | 3.7% |
| South Box Elder | 1.8% |
| Weber County | 3.1% |
| Davis County | 0.8% |
| Salt Lake County | 0.4% |
| Utah County | 0.2% |
| Total | 15.7% |

Once Tremonton is closer to securing sale tax funding for transit, discussions should be held with UTA, Cache Valley Transit District, Box Elder County, and local officials to determine the most efficient way to provide service to your community. It may be more cost effective to subsidize a private company, such as Salt Lake Express to serve Tremonton and other communities in North Box Elder County. I would enjoy the opportunity to talk more over the phone if you have any questions.

Thanks,
Hal

TRANSPORTATION MASTER PLAN
May 2018

# Appendix D: Tremonton City Bike Route & Non-Motorized Trail Plan



HORROCKS ENGINEERS


## Tremonton City Bike Route & Non-Motorized Trail Plan:

This plan includes a bike route system with destinations, distance, and approximate bike travel time. It also includes a non-motorized trail, Canal Rail Trail, with distances and approximate pedestrian and bike travel times. On 400 West, this trail will separate bicyclist and pedestrians, keeping the pedestrians on the sidewalk and having bicyclist share the road with vehicles.

Aside from streets destinations, the only other destination listed on bike signs is the Tremonton Library. Below are some quick facts regarding both the bike route signage system and the Canal Rail Trail signage system.

*Along Bike Routes (including along 400 West from Main St. to 600 North while excluding pedestrian focused signs along the Canal Rail Trail)*

- 1 Listed Destinations (other than road names)
- 42 Total Destination/Distance Signs *(see sign example #2)*
- 19 Bike Route Direction Signs *(see sign example #3)*
- 0 Bike Route Confirmation Signs *(see sign example #1)*

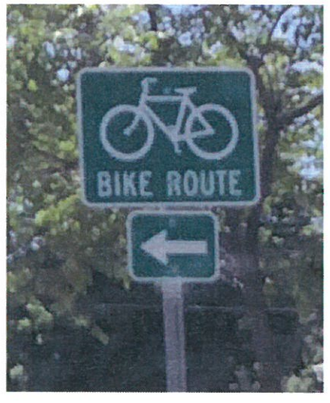
*Canal Rail Trail Only Signage*

- 0 Listed Destinations (other than road names)
- 10 Total Destination/Distance Signs *(see sign example #2)*
- 4 Route Direction Signs *(see sign example #3)*
- 3 Kiosks

Below are some images explaining what is meant by each sign designation.

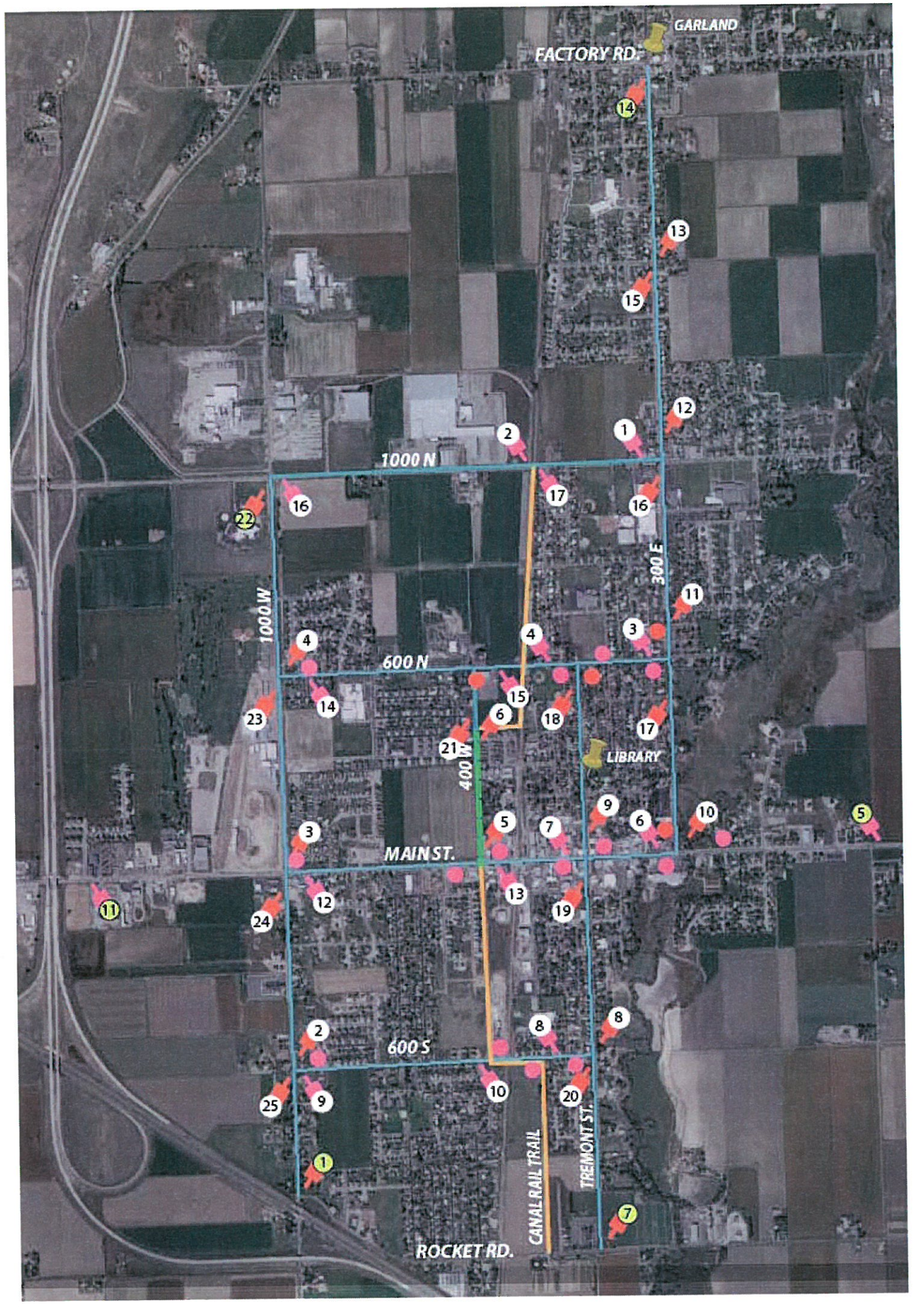

*Sign Example #1:*
"Bike Route Confirmation Signs"
24"x18"


*Sign Example #2:*
"Destination/Distance Signs"
24"x18"




*Sign Example #3:*
"Bike Route Direction Signs"
12"x9" Arrow Sign


*Sign Example #4:*
Combination Sign



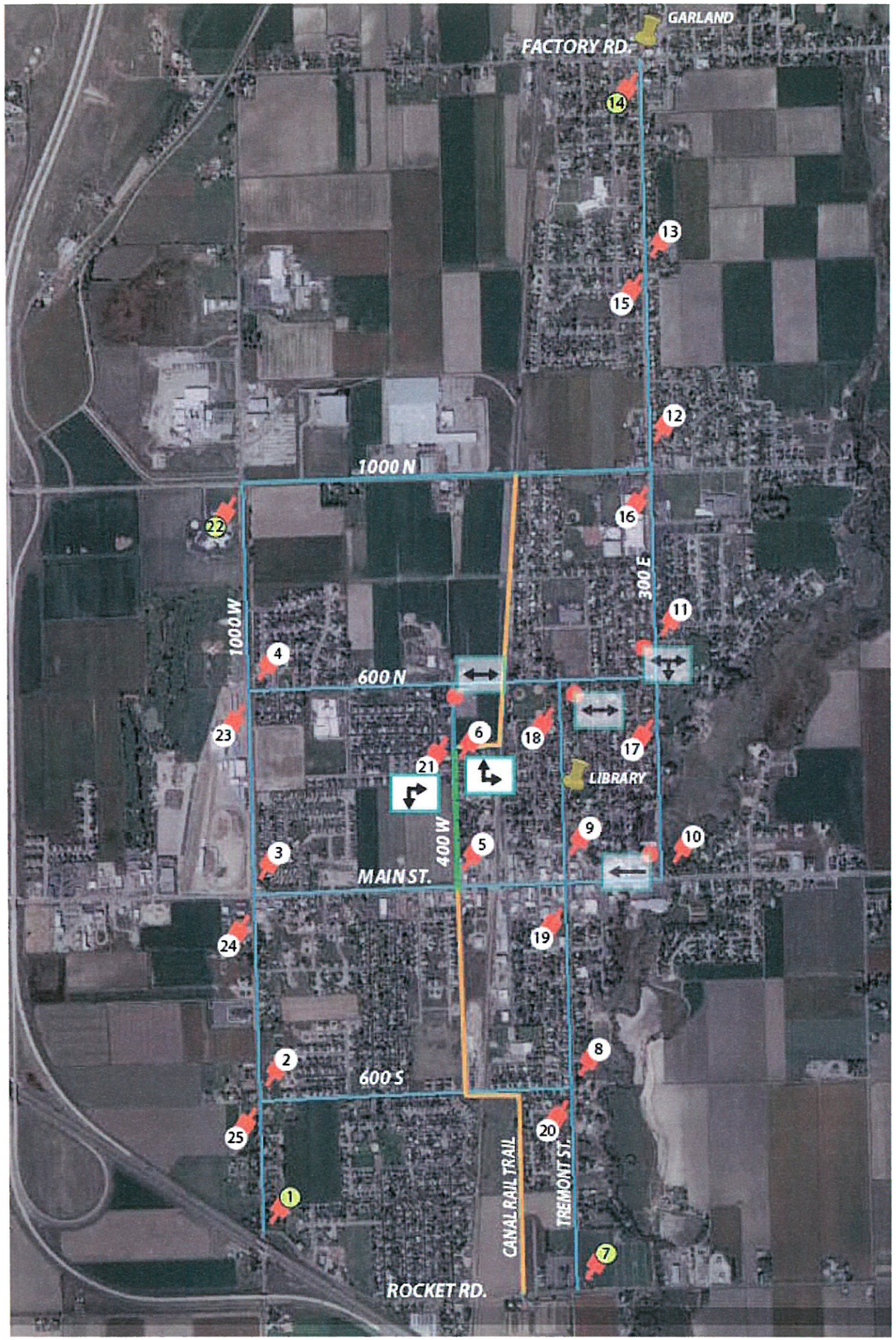

## BIKE ROUTE NETWORK SYSTEM

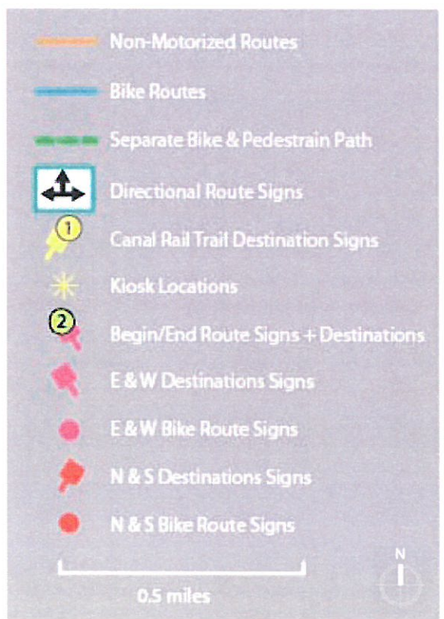
This shows all the destination and directional signs going all four cardinal directions for bike routes only. The Canal Rail Trail signs are shown later. A deeper look at the content of the signs is given on the following pages.

To keep from visually cluttering the roadways with bike route signage, it was decided that instead of having a directional sign on all four corners at each trail and route intersection, the destination signs would be used to replace 21 (14 N&S, 7 E&W) directional signs. Each intersection was evaluated to see if adequate but minimal signage was provided in a timely manner without compromising route clarity.

Users of this system would rely on destination signs to have an estimate of how far an intersecting bike route is along with the estimate travel time. Using street signs provided, they would be informed of the exact location of where that bike route intersection is located.

Throughout the document, there are various directional signs. Some are opaque while others are transparent. The *opaque* ones are directional signs attached to the same post as a destination sign (see sign example #4). The *transparent* ones are directional signs only (see sign example #3). All bike route signs include the "bike route" sign (see sign example #1) on top except for the Canal Rail Trail signs (see sign example #5).




## NORTH

*Going North on 1000 West*

1. 600 South, Main St., 600 North
2. Main St., 600 North, 1000 North
3. 600 North, 1000 North
4. 1000 North

*Going North on 400 West/Canal Rail Trail*

5. Canal Rail Trail, 600 North, 1000 North
6. Canal Rail Trail*, 600 North, 1000 North*

*Going North on Tremonton St.*

7. 600 South, Main St., Library
8. Main St., Library, 600 North
9. Library, 600 North

*Going North on 300 East*

10. 600 North, 1000 North, Factory Rd.
11. 1000 North, Factory Rd.
12. Factory Rd.
13. Factory Rd.

## SOUTH

*Going South on 300 East*

14. 1000 North, 600 North, Main St.
15. 1000 North, 600 North, Main St.
16. 600 North, Main St.
17. Main St.

*Going South on Tremonton St.*

18. Library, Main St., 600 South
19. 600 South, Rocket Rd.
20. Rocket Rd.

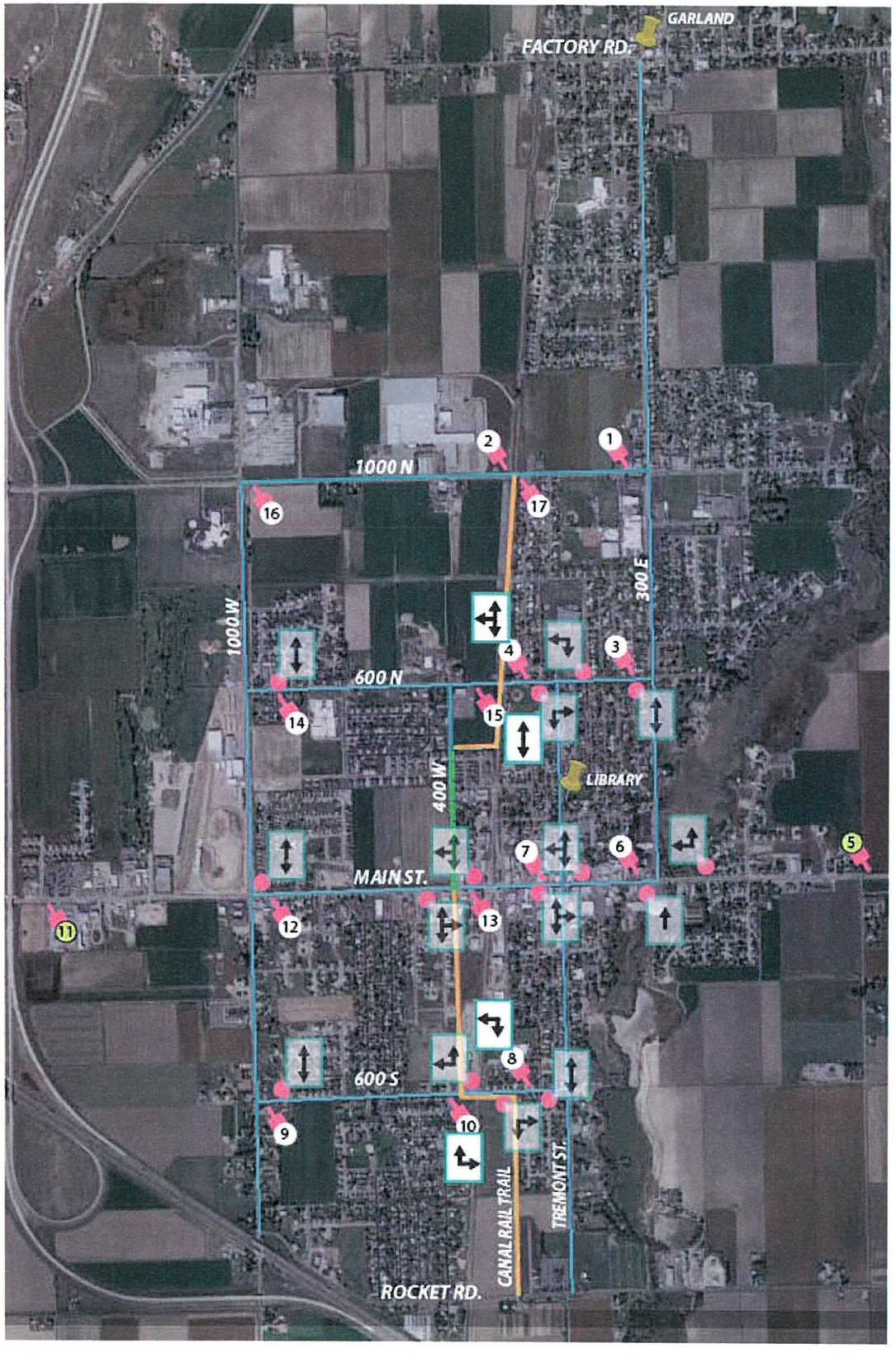
*Going South on 400 West/Canal Rail Trail*

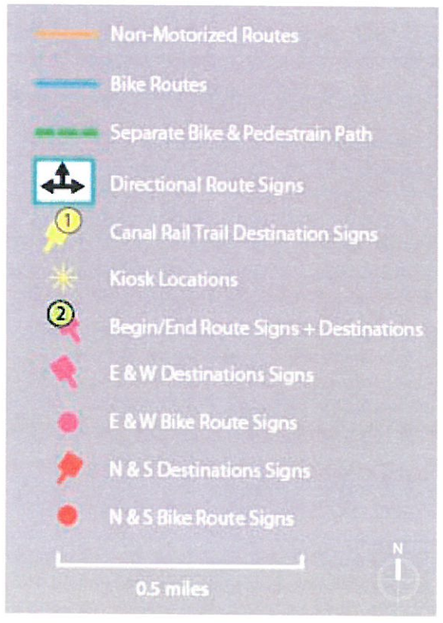
21. Canal Rail Trail*, Main St., 600 South

*Going South on 1000 West*

22. 600 North, Main St., 600 South
23. Main St., 600 South, Rocket Rd.
24. 600 South, Rocket Rd.
25. Rocket Rd.

* The arrow on the destination sign will be sideways i.e. ←




## WEST

*Going West on 1000 North*

1. Canal Rail Trail, 1000 West
2. 1000 West

*Going West on 600 North*

3. Tremont St., Canal Rail Trail, 400 West
4. Canal Rail Trail*, 400 West, 1000 West

*Going West on Main St.*

5. 300 East, Tremont St., Canal Rail Trail
6. Tremont St., Canal Rail Trail, 1000 West
7. Canal Rail Trail, 1000 West

*Going West on 600 South*

8. Canal Rail Trail*, 1000 West

## EAST

*Going East on 600 South*

9. Canal Rail Trail, Tremont St.
10. Canal Rail Trail*, Tremont St.

*Going East on Main St.*

11. 1000 West, Canal Rail Trail, Tremont St.
12. Canal Rail Trail, Tremont St., 300 East
13. Tremont St., 300 East

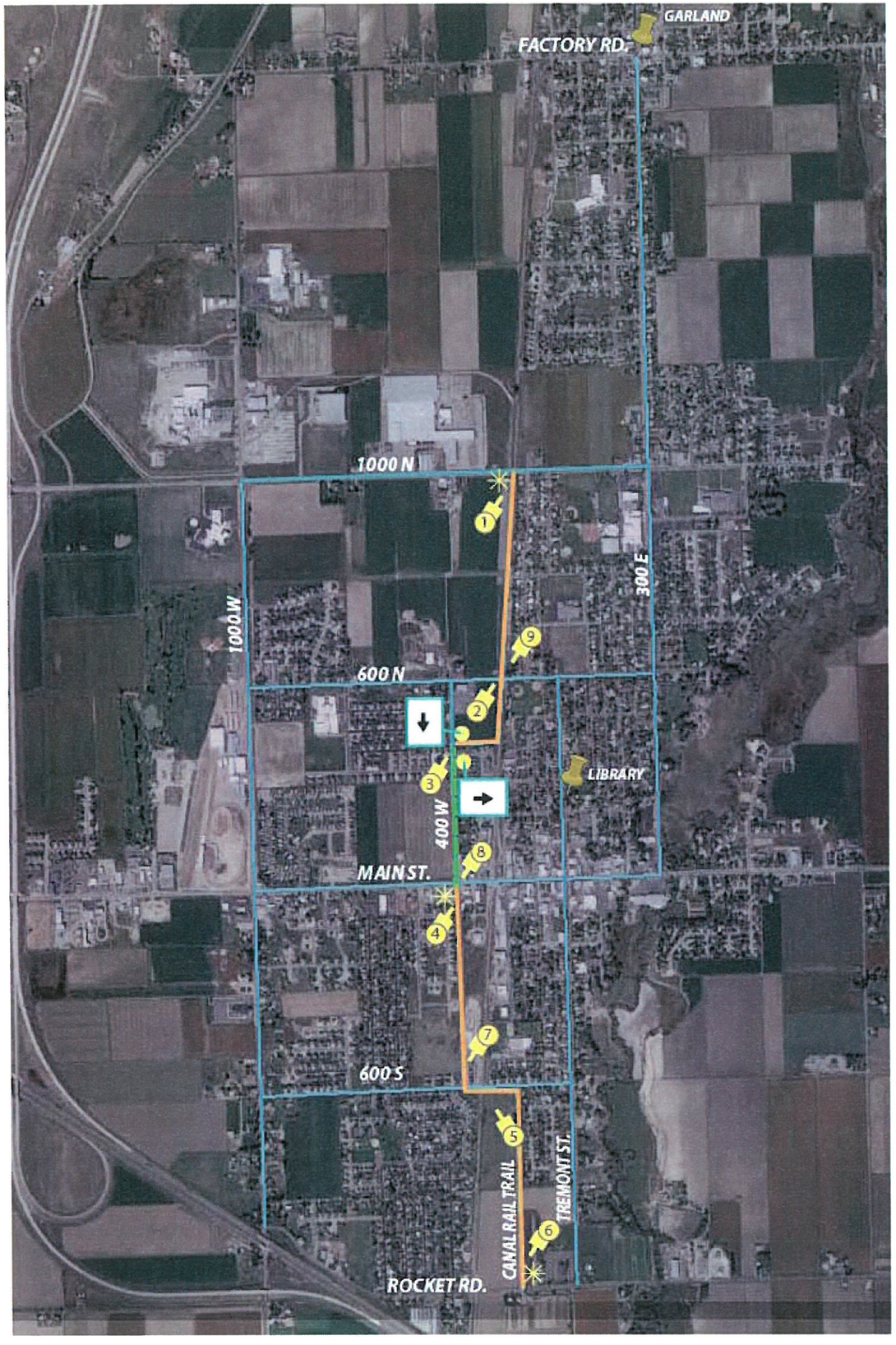
*Going East on 600 North*

14. 400 West, Canal Rail Trail, Tremont St.
15. Canal Rail Trail*, Tremont St., 300 East

*Going East on 1000 North*

16. Canal Rail Trail, 300 East
17. 300 East

* The arrow on the destination sign will be sideways i.e. ←




## CANAL RAIL TRAIL

*Going South on Canal Rail Trail*

1. 600 North, 400 West
2. 400 West, Main St.
3. Main St., 600 South
4. 600 South, Rocket Rd.
5. Rocket Rd.

*Going North on Canal Rail Trail*

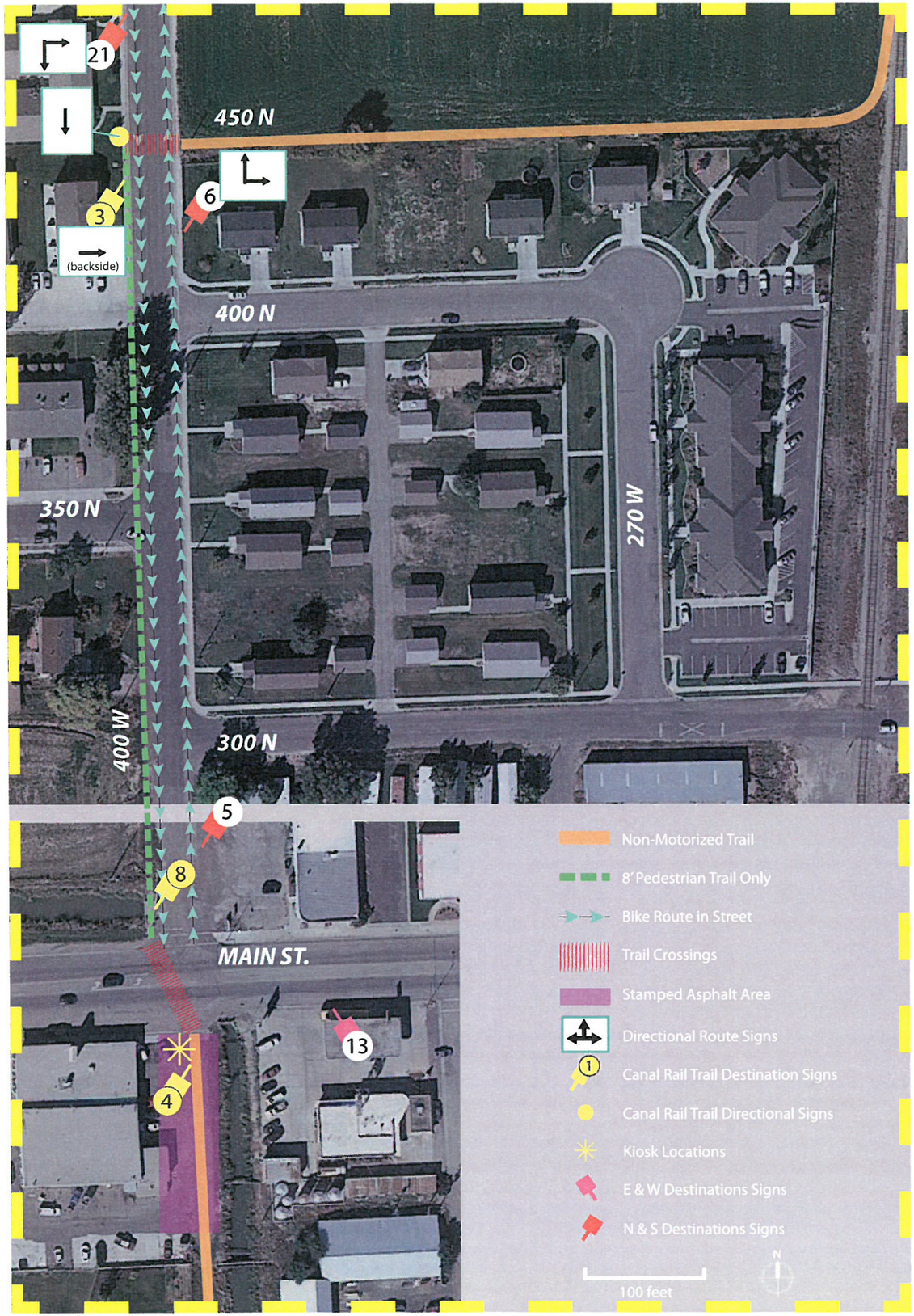
6. 600 South, Main St.
7. Main St., 600 North
8. 600 North, 1000 North
9. 1000 North


The Canal Rail Trail signage system will include 3 kiosks at key locations providing an overview of the trail system. To the right is a precedent image of what these kiosks will look like.



*Sign Example #5:*
"Canal Rail Trail Destination Signs"
12"x18"


*Sign Example #6:*
"Canal Rail Trail Directional Signs"
9"x12"




## CANAL RAIL TRAIL ENLARGED AREA

The Canal Rail Trail along 400 West divides the travel path of each user group. This enlargement shows the travel path of the routes for each user, namely bicyclist and pedestrians.

On 400 West, bicyclist will enter and remain in the road similar to all the other bike routes. Pedestrians going south on the Canal Rail Trail will start out sharing the trail with bicyclist. At the intersection of the trail with 400 West, pedestrians will cross in a clearly marked crossing at 450 North to the west side of 400 West where a 8' sidewalk has been/will be constructed. Pedestrians will use this sidewalk from 450 North to Main Street. At Main Street, pedestrians will use an approximately 21.5° diagonal crossing. This crossing will connect the sidewalk on the northwest corner to the Canal Rail Trail on the south side of Main Street. At this point, bicyclist and pedestrians will resume sharing the trail.

Key signs to understand: #3 will primarily serve pedestrians going south. On the south side of the sign, serving those going north, there will be a directional sign directing trail users across the crossing to the other side of 400 West where the trail resumes. Additionally, the sign terminating the pedestrian crossing on the west side of 400 West, is solely a directional sign directing trail users to use the sidewalk to Main Street.

*Bicyclist Destination Signs (see sign example #2)*

21. Canal Rail Trail*, Main St., 600 South
5. Canal Rail Trail, 600 North, 1000 North
6. Canal Rail Trail*, 600 North, 1000 North*
13. Tremont St., 300 East

*Canal Trail Specific Destination Signs (see sign example #5)*

3. Main St., 600 South
4. 600 South, Rocket Rd.
8. 600 North, 1000 North

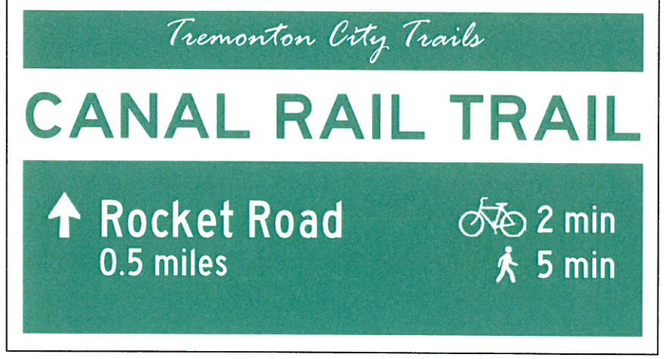
* The arrow on the destination sign will be sideways i.e. ←

## CANAL RAIL TRAIL SAMPLE SIGN SYSTEM

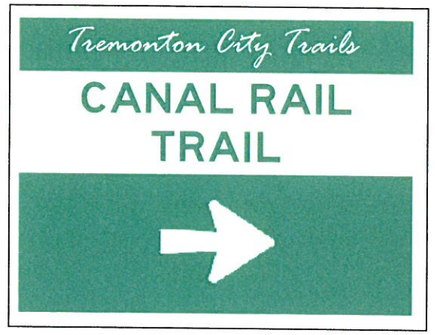
This system includes 2 destinations maximum per sign with pedestrian and bicyclist time and distance information.


*Sign Example #7*: 2 destinations per sign
- 12"x18"
- 2 5/8" White Bar
- 1 ½" "Canal Rail Trail"
- 1" Destinations
- 3/4" Time & Distance


*Sign Example #8*
- 12"x18"
- 2 5/8" White Bar
- 1 ½" "Canal Rail Trail"
- 1" Destinations
- 3/4" Time & Distance



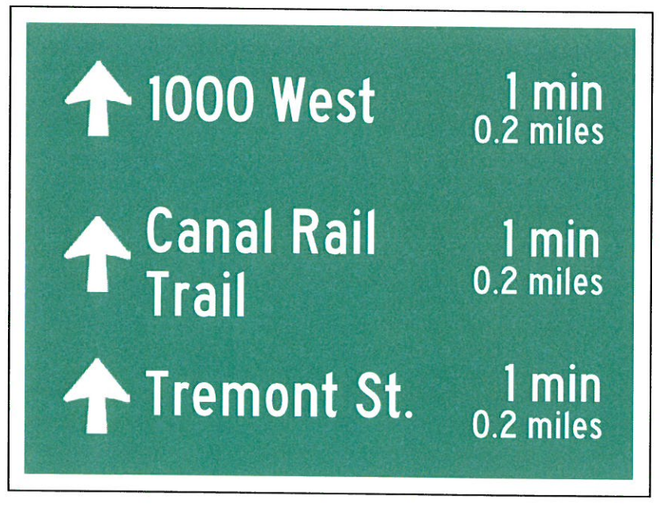

*Sign Example #9*
- 9"x18"
- 2 5/8" White Bar
- 1 ½" "Canal Rail Trail"
- 1" Destinations
- 3/4" Time & Distance




*Sign Example #10*
- 8: Direction signs
- 9"x12"
- 3" White Bar
- 15/16" "Canal Rail Trail"

## BIKE ROUTE WAYFINDING SIGNAGE

This system includes 3 destinations maximum per sign with time and distance information being intended solely for bicyclist.




*Sign Example #11*: Bike Destination/ Distance Signs
- 1 ¾" Destinations
- 1 1/2" Time
- 1" Distance

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# Appendix E: Utah MUTCD School Zone Analysis

HORROCKS ENGINEERS

# School Zone Utah MUTCD Requirements

1. North Park Elementary School
    a. Intersection at 700 North and 100 East
        i. MUTCD Still Required/Recommended
            1. Crossing ahead (S1-1) & (W16-9P) on SB approach
            2. Ahead portion of sign missing on WB approach (W16-9P)
            3. The word “SCHOOL” painted on all approaches at same distance from intersection as Crossing Ahead signs
            4. Solid yellow double line typical in school zone on north-south street and east-west street
    b. Intersection at 800 North and 100 East
        i. MUTCD Still Required/Recommended
            1. Crossing ahead (S1-1) & (W16-9P) on WB approach
            2. Crossing with left-turn arrow (S1-1) & (W16-6P) on NB approach
            3. Solid yellow double line typical in school zone on east-west street
            4. The word “SCHOOL” painted on EB and WB approaches at same distance from intersection as Crossing Ahead signs
    c. Intersection at 800 North and Tremont St
        i. MUTCD Still Required/Recommended
            1. Crossing with left-turn arrow (S1-1) & (W16-6P) on SB approach
            2. Solid yellow double line typical in school zone on east-west street
            3. The word “SCHOOL” painted on EB and WB approaches at same distance from intersection as Crossing Ahead signs
    d. Intersection at 700 North and 100 W
        i. MUTCD Still Required/Recommended
            1. Crossing with right-turn arrow (S1-1) & (W16-6P) on WB approach
            2. Solid yellow double line typical in school zone on east-west and north-west street
            3. The word “SCHOOL” painted on NB, SB, and WB approaches at same distance from intersection as Crossing Ahead signs
2. McKinley School
    a. 600 South and 460 West
        i. MUTCD Still Required/Recommended
            1. Ahead (W16-9P) should be added to the sign on the NB, EB, and WB approaches
            2. Solid yellow double line typical in school zone on east-west and north-south street
            3. The word “SCHOOL” painted on NB, EB, and WB approaches at same distance from intersection as Crossing Ahead signs
    b. 600 South and 300 W
        i. MUTCD Still Required/Recommended
            1. Ahead (W16-9P) should be added to the sign on the SB approach
            2. Solid yellow double line typical in school zone on east-west street

3. The word “SCHOOL” painted on SB approaches at same distance from intersection as Crossing Ahead signs

ii. It should be noted that this intersection is in very close proximity to the railroad tracks and that their MUTCD probably governs.

c. 600 South and 100 W
   i. MUTCD Still Required/Recommended
      1. Crossing (S1-1) and ahead (W16-9P) should on the SB approach
      2. Solid yellow double line typical in school zone on east-west and north-south street
      3. The word “SCHOOL” painted on SB approaches at same distance from intersection as Crossing Ahead signs

d. 500 South and 100 W
   i. MUTCD Still Required/Recommended
      1. Crossing (S1-1) and ahead (W16-9P) should on the SB approach
      2. Ahead (W16-9P) should be added to the crossing sign on the EB approach
      3. Crossing and arrow on NE corner (S1-1) & (W16-7P)
      4. Solid yellow double line typical in school zone on east-west street
      5. The word “SCHOOL” painted on EB approaches at same distance from intersection as Crossing Ahead signs

e. 600 South and Tremont St.
   i. MUTCD Still Required/Recommended
      1. Crossing with right-turn arrow (S1-1) & (W16-6P) on SB and NB approach. (Left arrow on NB approach)
      2. Crossing and arrow on East approach (S1-1) & (W16-7P)
      3. Solid yellow double line typical in school zone on east-west street
      4. The word “SCHOOL” painted on EB approaches at same distance from intersection as Crossing Ahead signs

f. 400 South and Tremont St.
   i. MUTCD Still Required/Recommended
      1. Ahead (W16-9P) should be added to the crossing sign on the NB and SB approaches
      2. Crossing and arrow on either side of painted crosswalk (S1-1) & (W16-7P)
      3. Crossing (S1-1) and ahead (W16-9P) should on the EB approach
      4. Solid yellow double line typical in school zone on north-south street
      5. The word “SCHOOL” painted on NB and SB approaches at same distance from intersection as Crossing Ahead signs

g. 400 South and 100 West
   i. MUTCD Still Required/Recommended
      1. Crossing and arrow (S1-1) & (W16-7P) on either side of painted crosswalk on the north, south, and west approaches
      2. Crossing (S1-1) and ahead (W16-9P) on the EB and WB approach

3. Solid yellow double line typical in school zone on east-west and north-south street
4. The word “SCHOOL” painted on all approaches at same distance from intersection as Crossing Ahead signs

3. Harris Intermediate School
    a. 350 North and 800 West
        i. MUTCD Still Required/Recommended
            1. Crossing and arrow (S1-1) & (W16-7P) on either side of painted crosswalk on the north side of the intersection
            2. Crossing with left-turn arrow (S1-1) & (W16-6P) on EB and WB approach (right arrow on WB approach)
            3. Solid yellow double line typical in school zone on east-west and north-south street
            4. The word “SCHOOL” painted on SB approach at same distance from intersection as Crossing Ahead signs
    b. 500 North and 800 West
        i. The 2017 aerial view shows school zone crosswalk paint present on the south and east side of intersection.
        ii. The ground view is from 2015. The intersection MUTCD is not the same in these two different views
    c. 600 North and 800 West
        i. MUTCD Still Required/Recommended
            1. Crossing and arrow (S1-1) & (W16-7P) on SW, SE, and NE side of painted crosswalks
            2. Ahead (W16-9P) should be added to the crossing sign on the EB and NB approach
            3. Solid yellow double line typical in school zone on east-west and north-south street
            4. The word “SCHOOL” painted on SB approach at same distance from intersection as Crossing Ahead signs
    d. 600 North and 800 West
        i. MUTCD Still Required/Recommended
            1. Crossing and arrow (S1-1) & (W16-7P) on SW, SE, NW, and NE side of painted crosswalks
            2. Ahead (W16-9P) should be added to the crossing sign on the EB and WB approach
            3. Crossing (S1-1) and ahead (W16-9P) on the SB approach
            4. Solid yellow double line typical in school zone on east-west street
            5. The word “SCHOOL” painted on EB and WB approach at same distance from intersection as Crossing Ahead signs
4. Bear River Middle, Schools natatorium, and High Schools (They’re right next to each other)
    a. 1500 South (between school and institute building)
        i. MUTCD Still Required/Recommended

1. The word “SCHOOL” painted on EB and WB approach at same distance from intersection as Crossing Ahead signs
2. Crossing (S1-1) and ahead (W16-9P) on the EB and WB approach
3. Yield to pedestrians sign (R1-5) on either side of the crosswalk
4. Solid yellow double line typical in school zone on east-west street

b. 1400 South and Main Street
    i. MUTCD Still Required/Recommended
        1. The word “SCHOOL” painted on all approaches at same distance from intersection as Crossing Ahead signs

c. 1500 South and 300 East/Main Street
    i. MUTCD Still Required/Recommended
        1. Crossing (S1-1) and ahead (W16-9P) on the SB approach
        2. The word “SCHOOL” painted on all approaches at same distance from intersection as Crossing Ahead signs
        3. Solid yellow double line typical in school zone on east-west street

d. 800 North and 300 East
    i. MUTCD Still Required/Recommended
        1. Crossing (S1-1) and ahead (W16-9P) on SB and NB approaches
        2. Crossing with left-turn arrow (S1-1) & (W16-6P) on EB approach

e. 700 North and 300 East
    i. MUTCD Still Required/Recommended
        1. Crossing with left-turn arrow (S1-1) & (W16-6P) on EB approach
        2. Crossing with right-turn arrow (S1-1) & (W16-6P) on WB approach

f. Intersection at 800 North and 100 East
    i. MUTCD Still Required/Recommended
        1. Crossing ahead (S1-1) & (W16-9P) on WB approach
        2. Crossing with left-turn arrow (S1-1) & (W16-6P) on NB approach
        3. Solid yellow double line typical in school zone on east-west street
        4. The word “SCHOOL” painted on EB and WB approaches at same distance from intersection as Crossing Ahead signs

g. Intersection at 800 North and Tremont St
    i. MUTCD Still Required/Recommended
        1. Crossing with left-turn arrow (S1-1) & (W16-6P) on SB approach
        2. Solid yellow double line typical in school zone on east-west street
        3. The word “SCHOOL” painted on EB and WB approaches at same distance from intersection as Crossing Ahead signs

5. Athenian E-Academy
    a. 600 North and 800 West
        i. MUTCD Still Required/Recommended
            1. Crossing and arrow (S1-1) & (W16-7P) on SW, SE, and NE side of painted crosswalks
            2. Ahead (W16-9P) should be added to the crossing sign on the EB and NB approach

3. Solid yellow double line typical in school zone on east-west and north-south street
4. The word “SCHOOL” painted on SB approach at same distance from intersection as Crossing Ahead signs

| MUTCD Name | MUTCD Code | Picture of Sign |
|---|---|---|
| Stop Sign | R1-1 |   |
| School Crossing Assembly | S1-1 |  |
| AHEAD | W16-9P |   |
| Diagonal Arrow | W16-7P |  |
| Advanced Turn Arrow | W16-6P |  |
| Advanced Turn Arrow | W16-6P |  |
| School Zone Crosswalk | N/A |  |
| Painted “SCHOOL” | N/A |   |
| Solid Double Yellow Line | N/A |  |

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# Appendix F: Typical Intersection Configurations

HORROCKS
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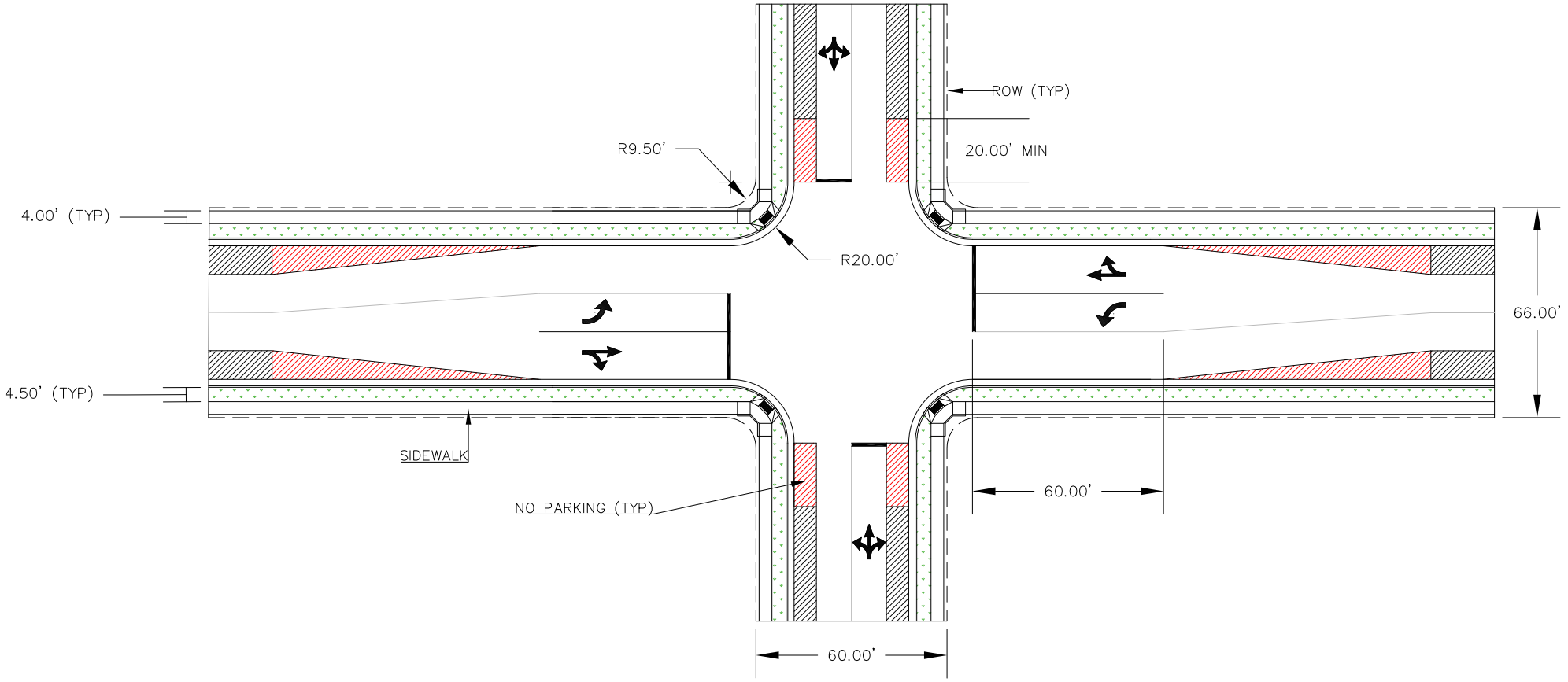
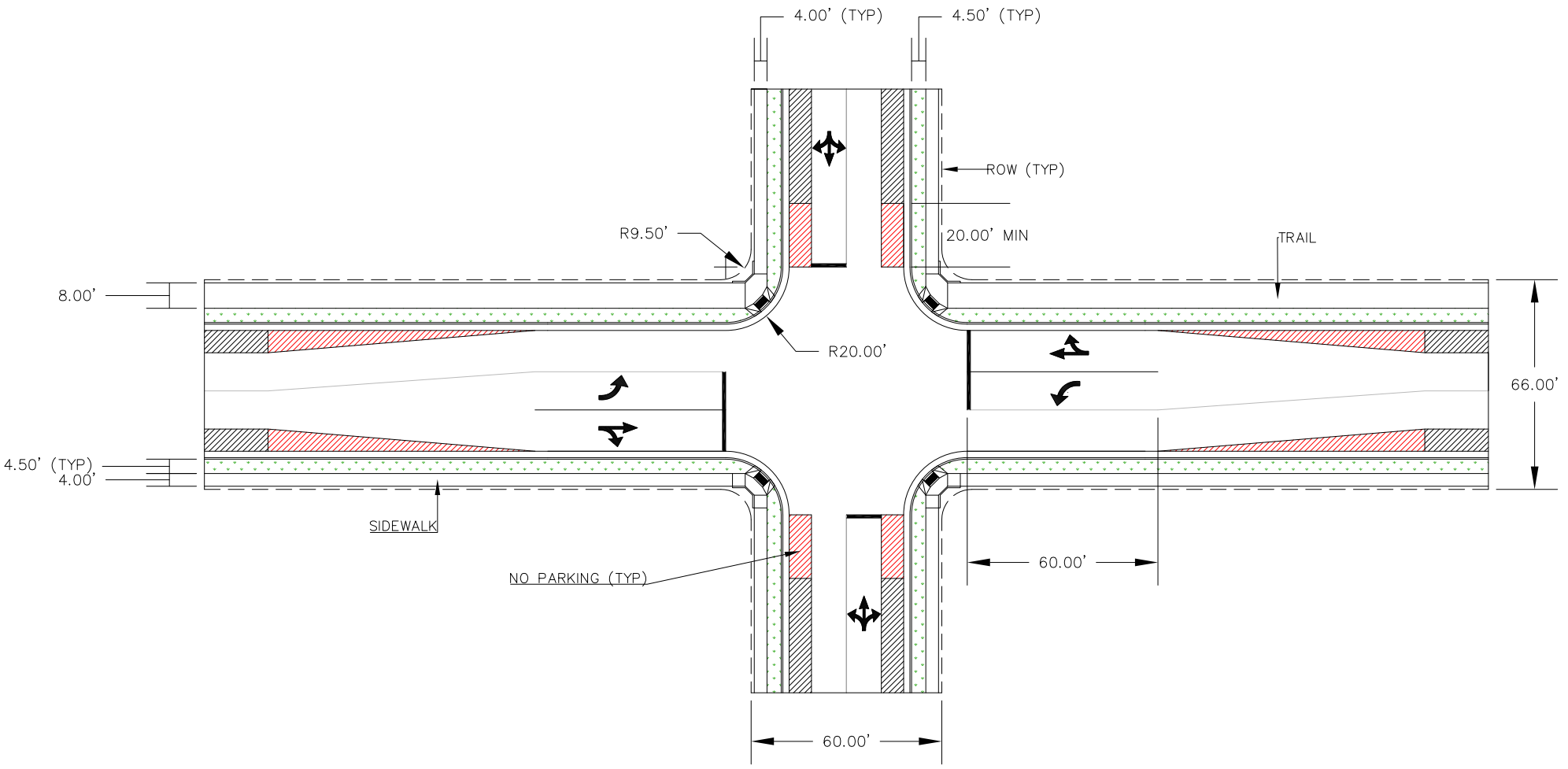
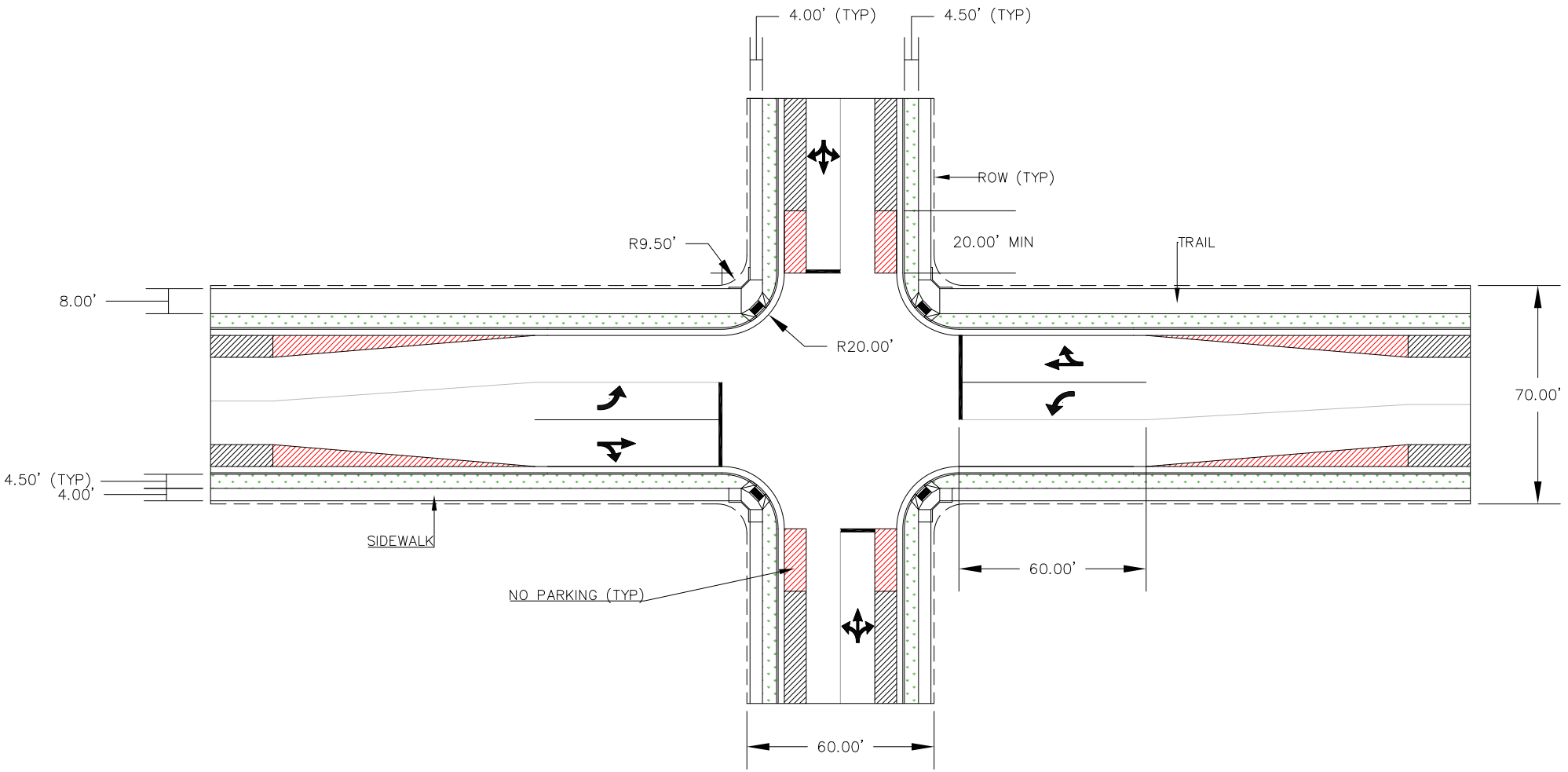
# LOCAL (60') TO COLLECTOR (66')



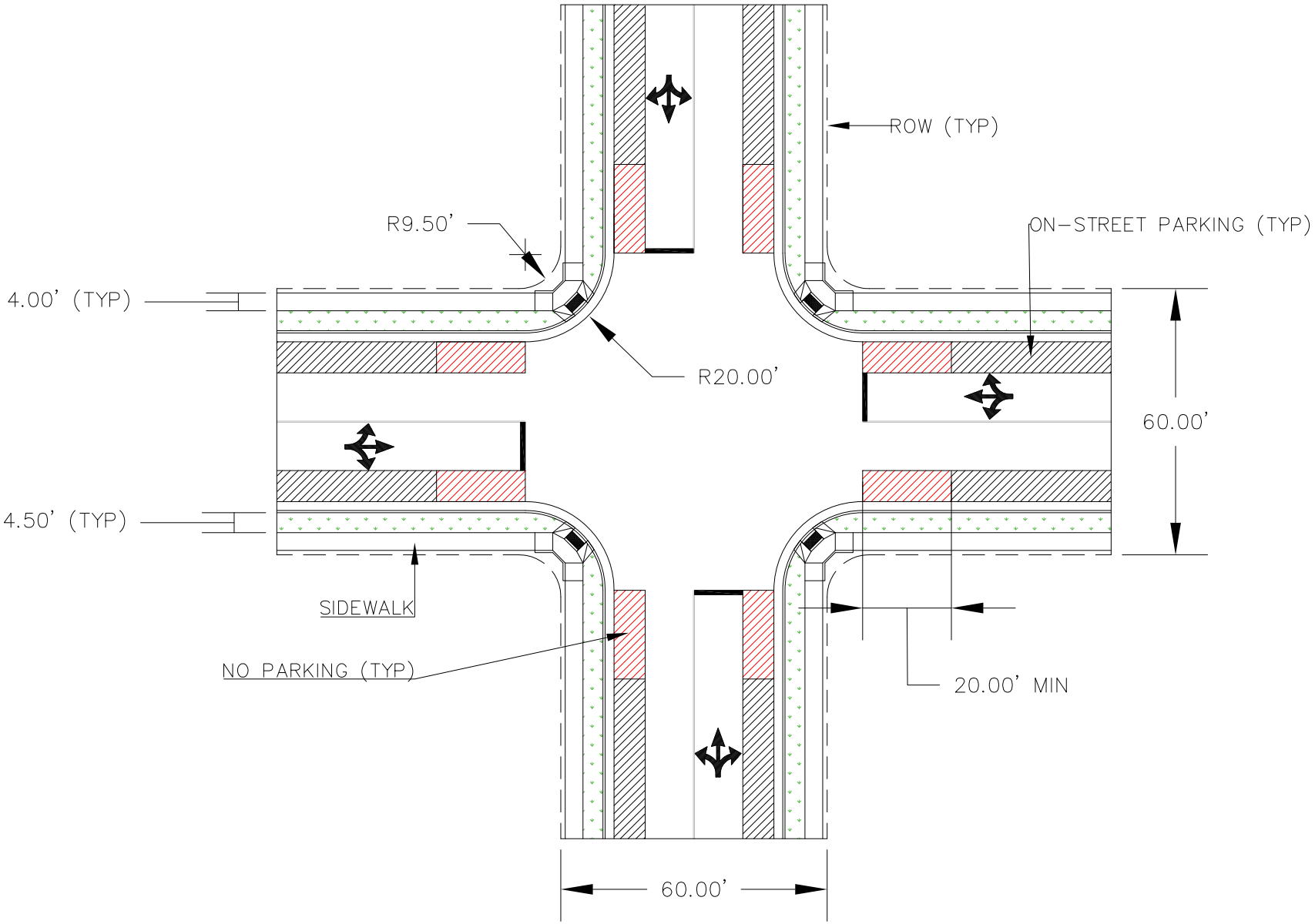
# LOCAL (60') TO COLLECTOR W/TRAIL (66')



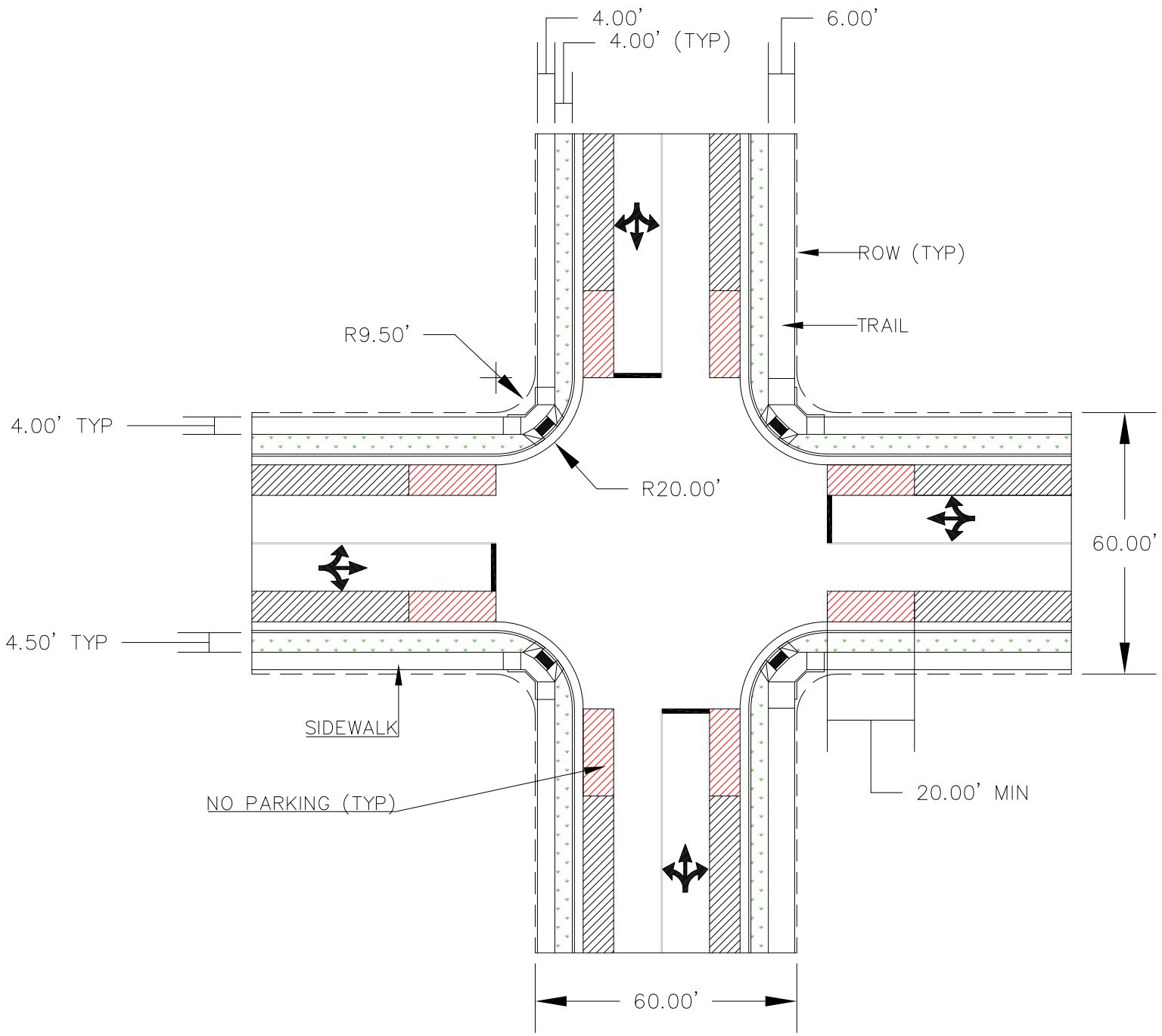
# LOCAL (60') TO EXTENDED COLLECTOR (70')



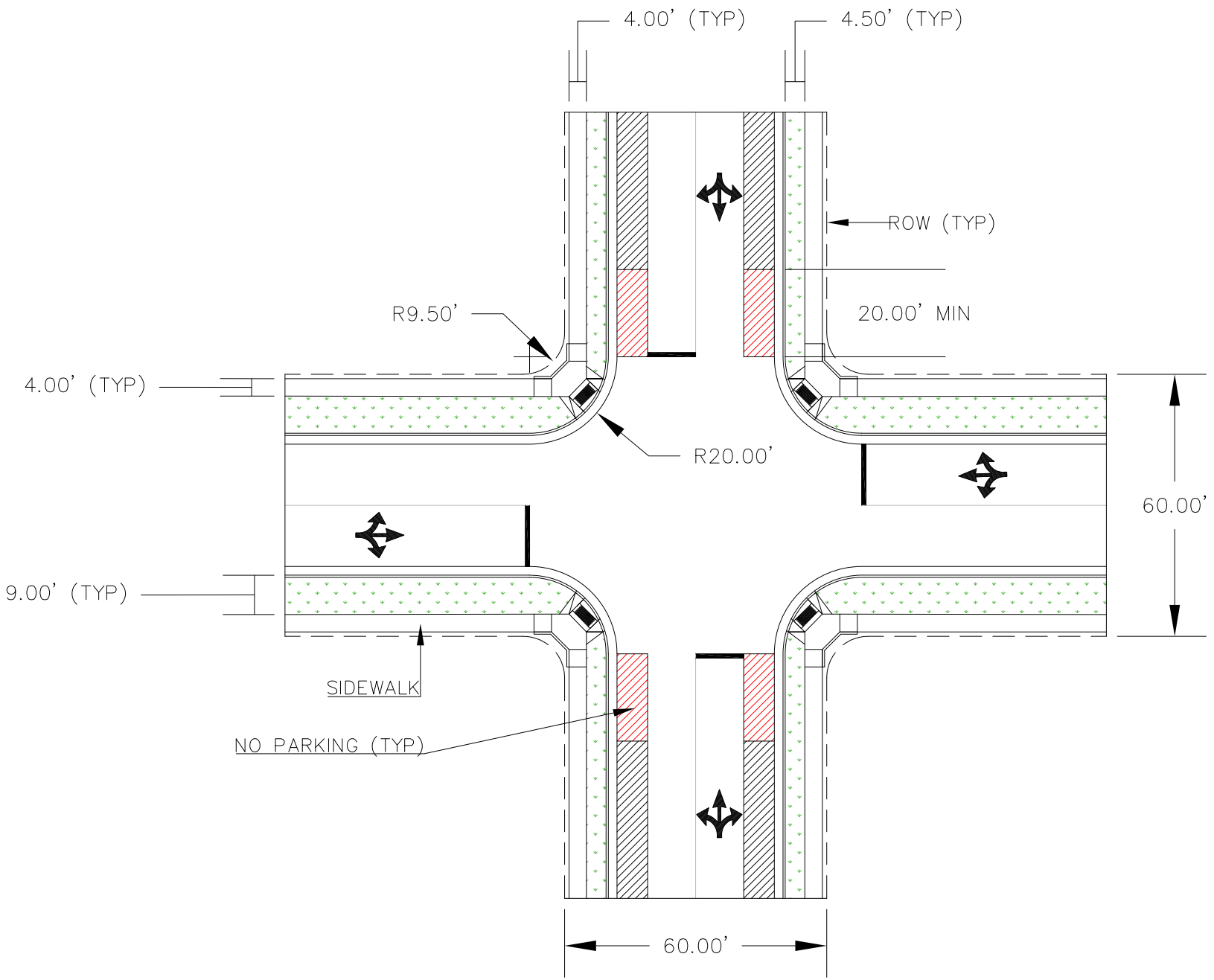
# LOCAL (60') TO LOCAL (60')



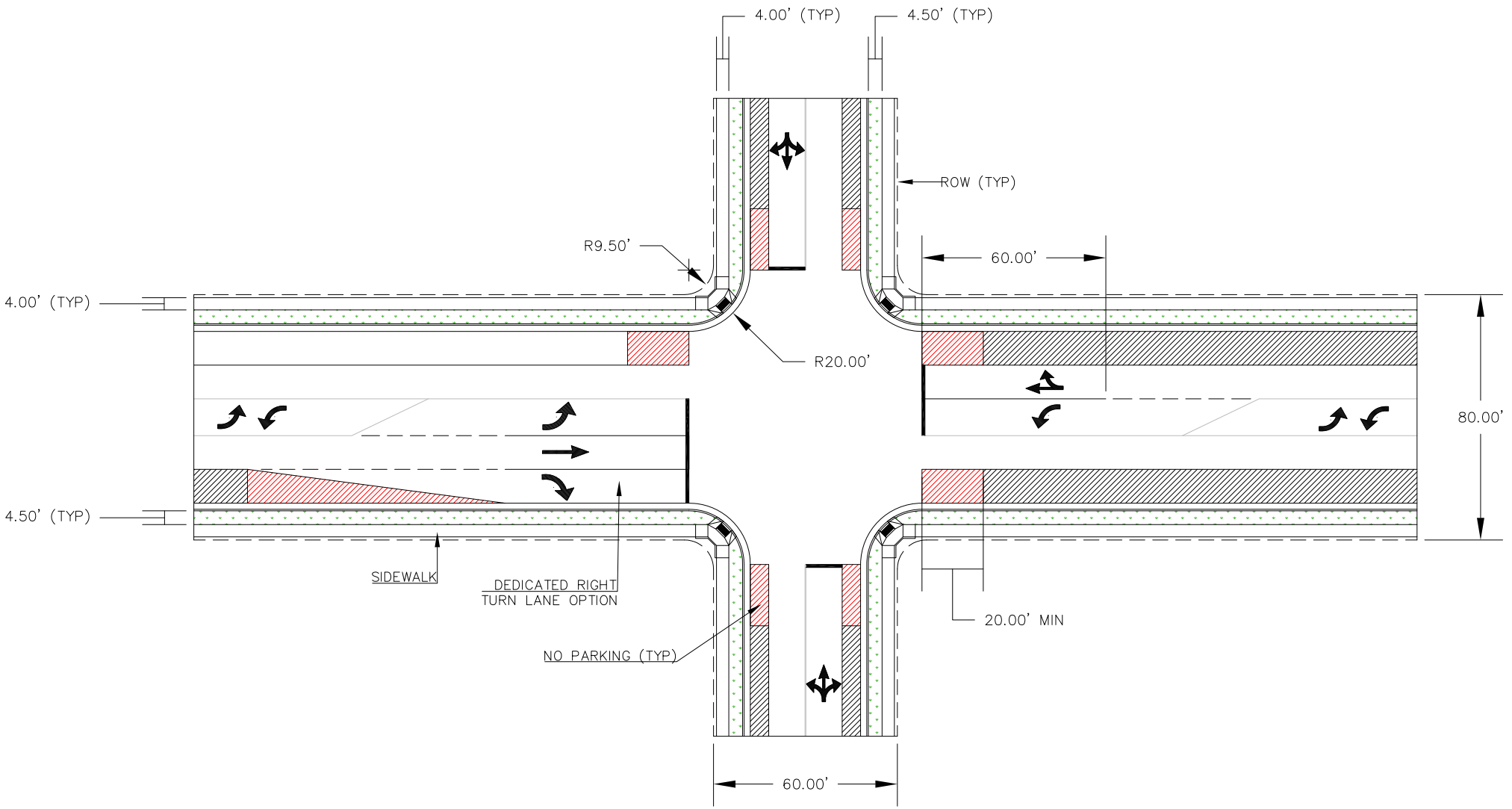
# LOCAL (60') TO LOCAL W/TRAIL (60')



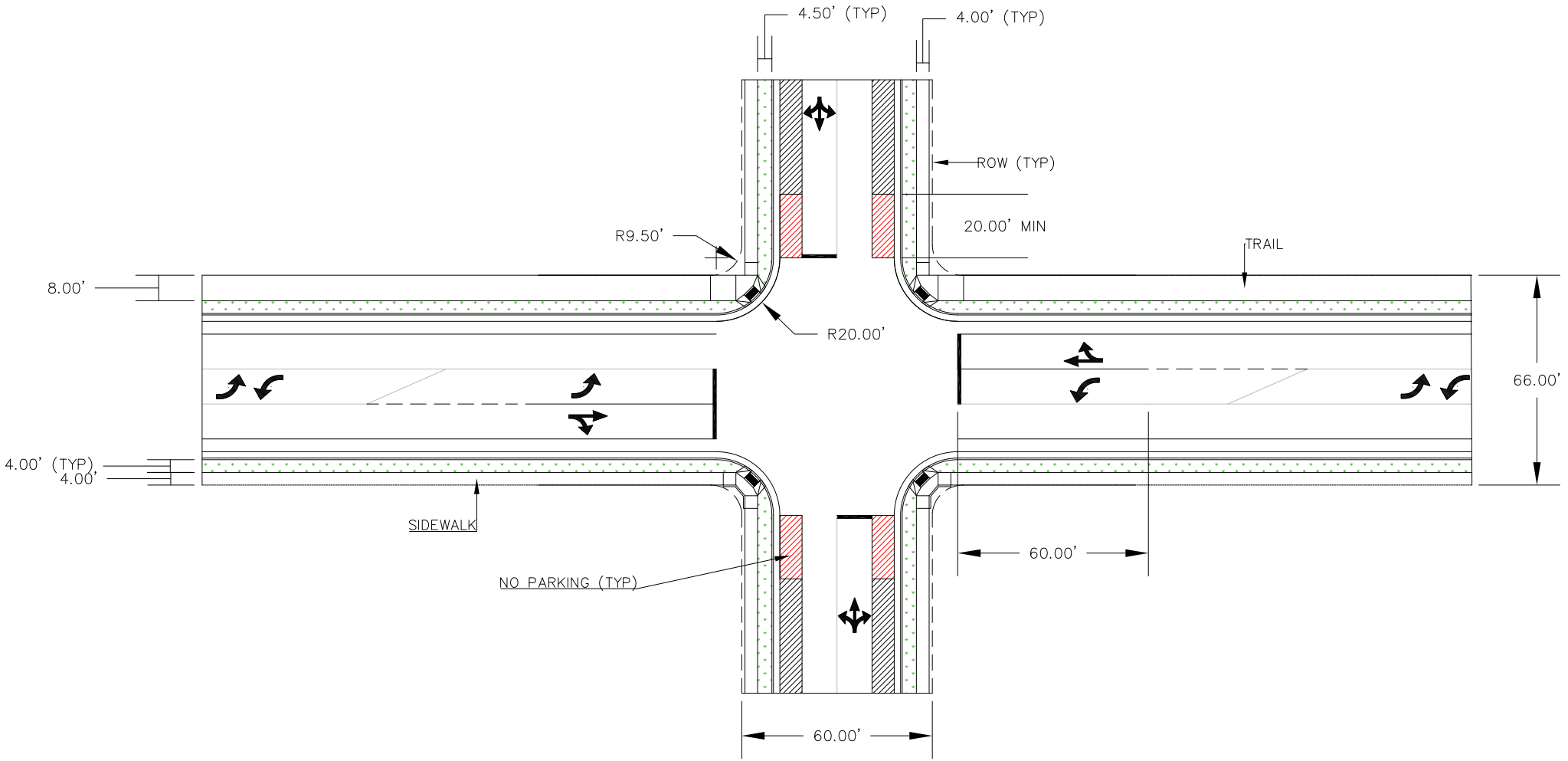
# LOCAL (60') TO LOW IMPACT LOCAL (60')



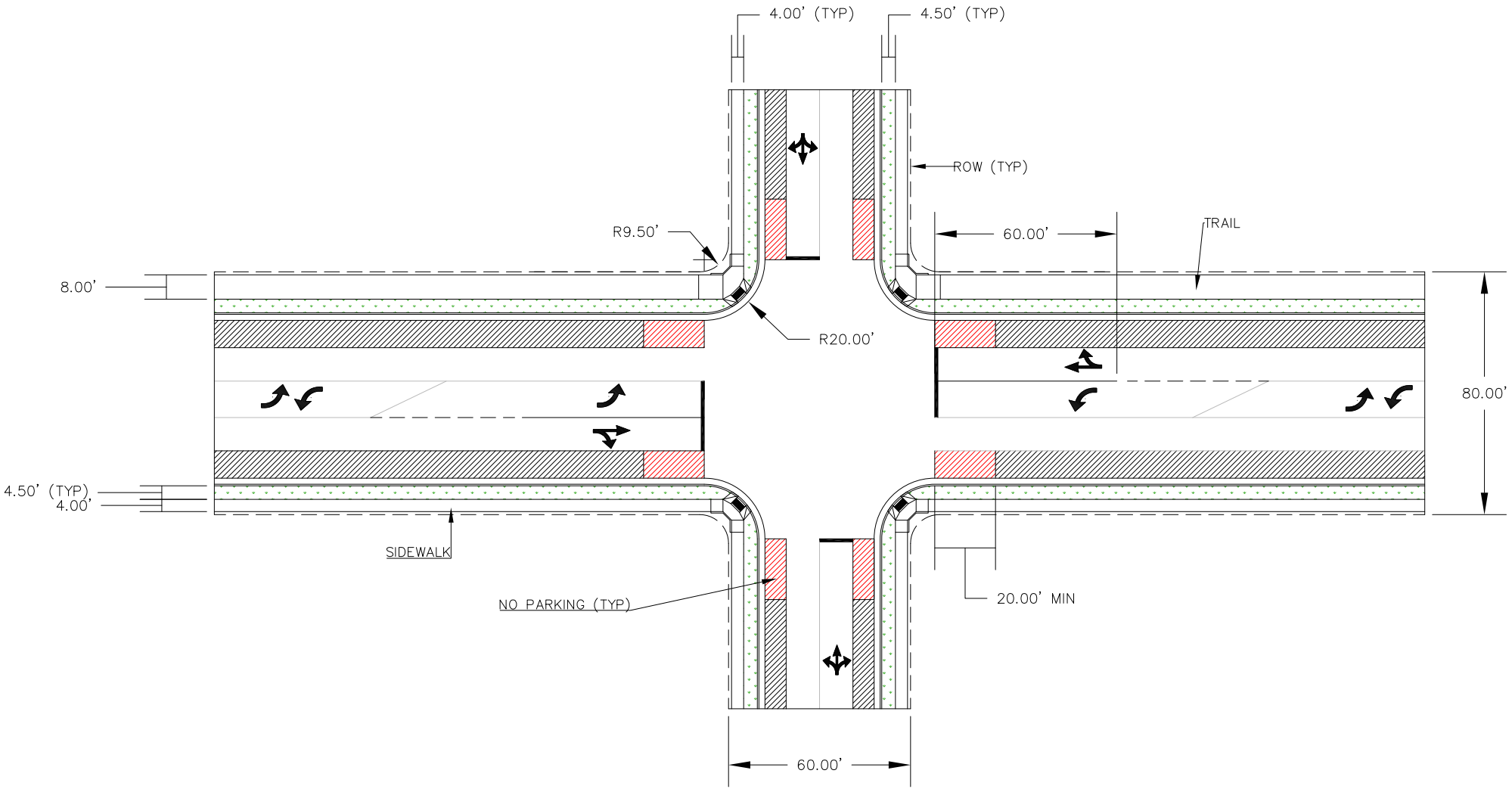
# LOCAL (60') TO MINOR ARTERIAL (80')



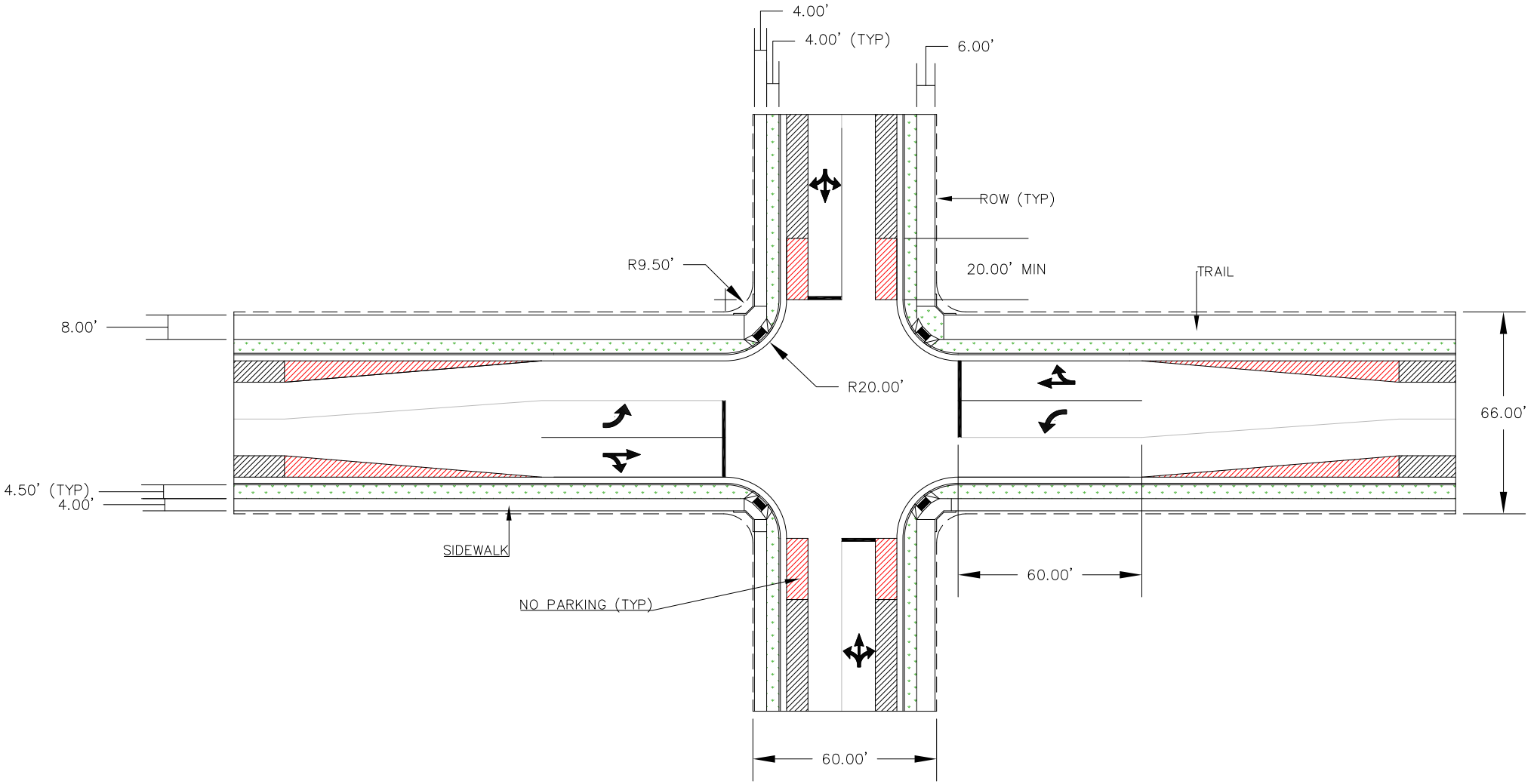
# LOCAL (60') TO MINOR ARTERIAL W/TRAIL (66')



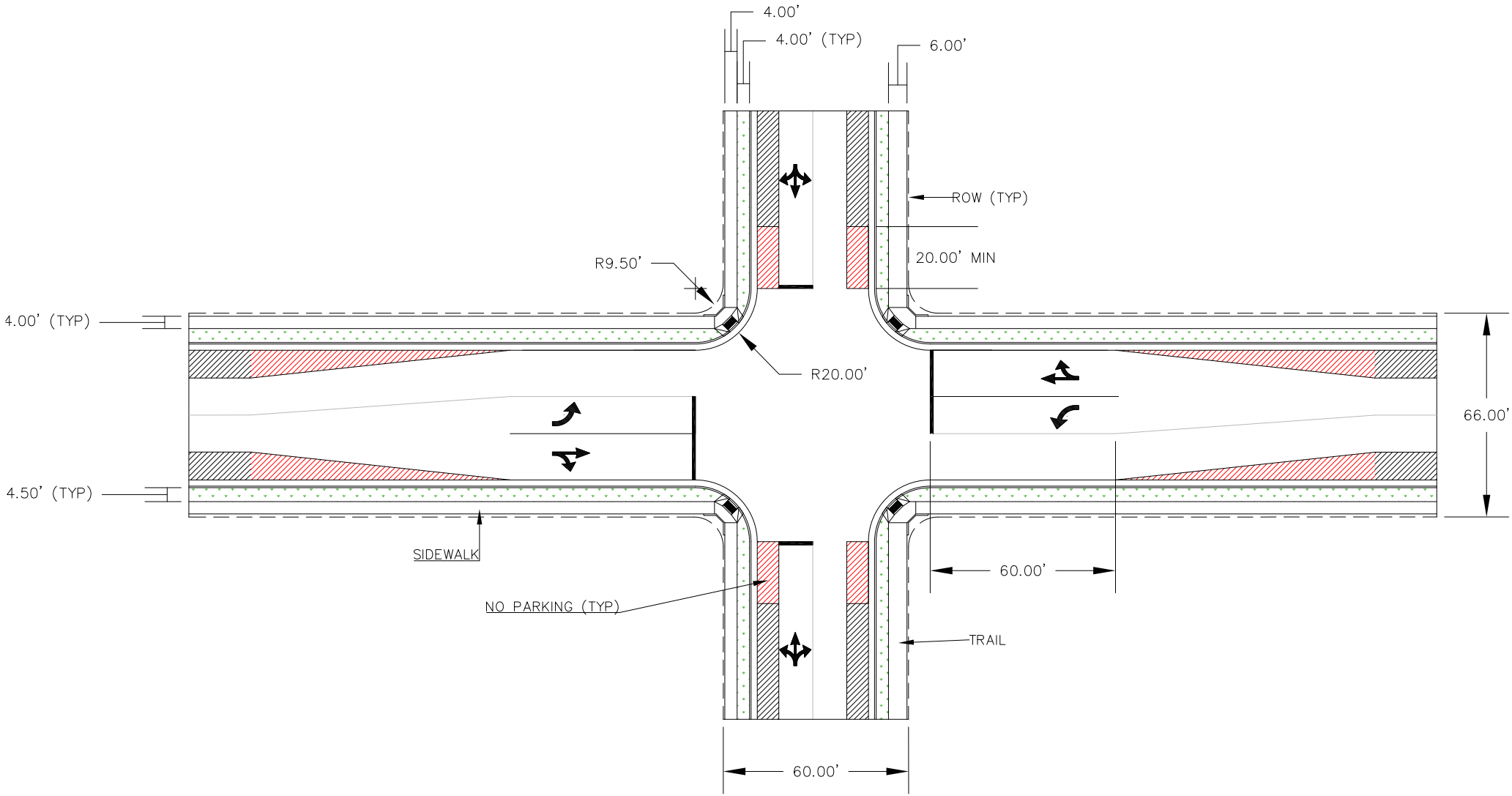
# LOCAL (60') TO MINOR ARTERIAL W/TRAIL (80')



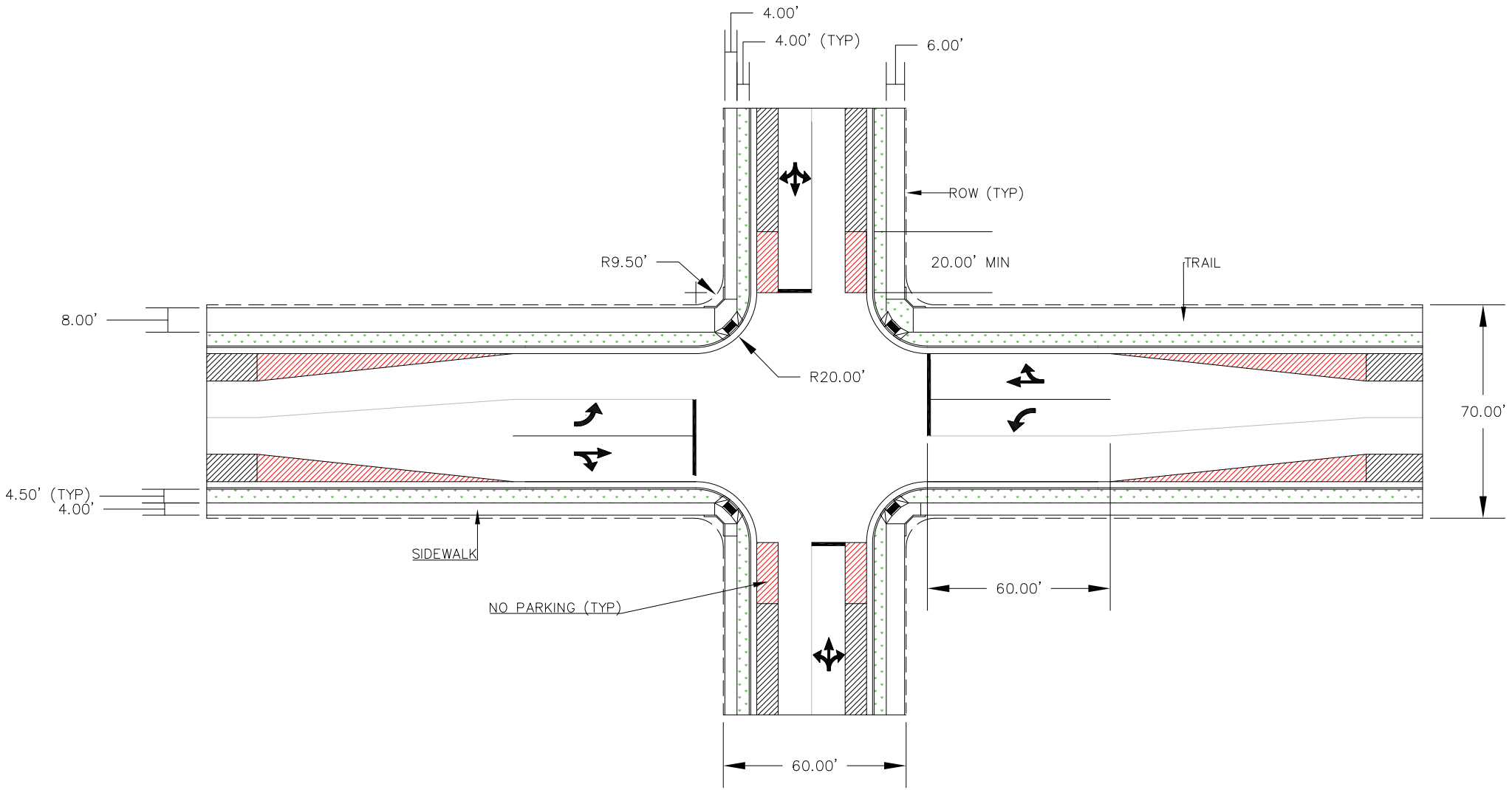
# LOCAL W/TRAIL (60') TO COLLECTOR W/TRAIL (66')



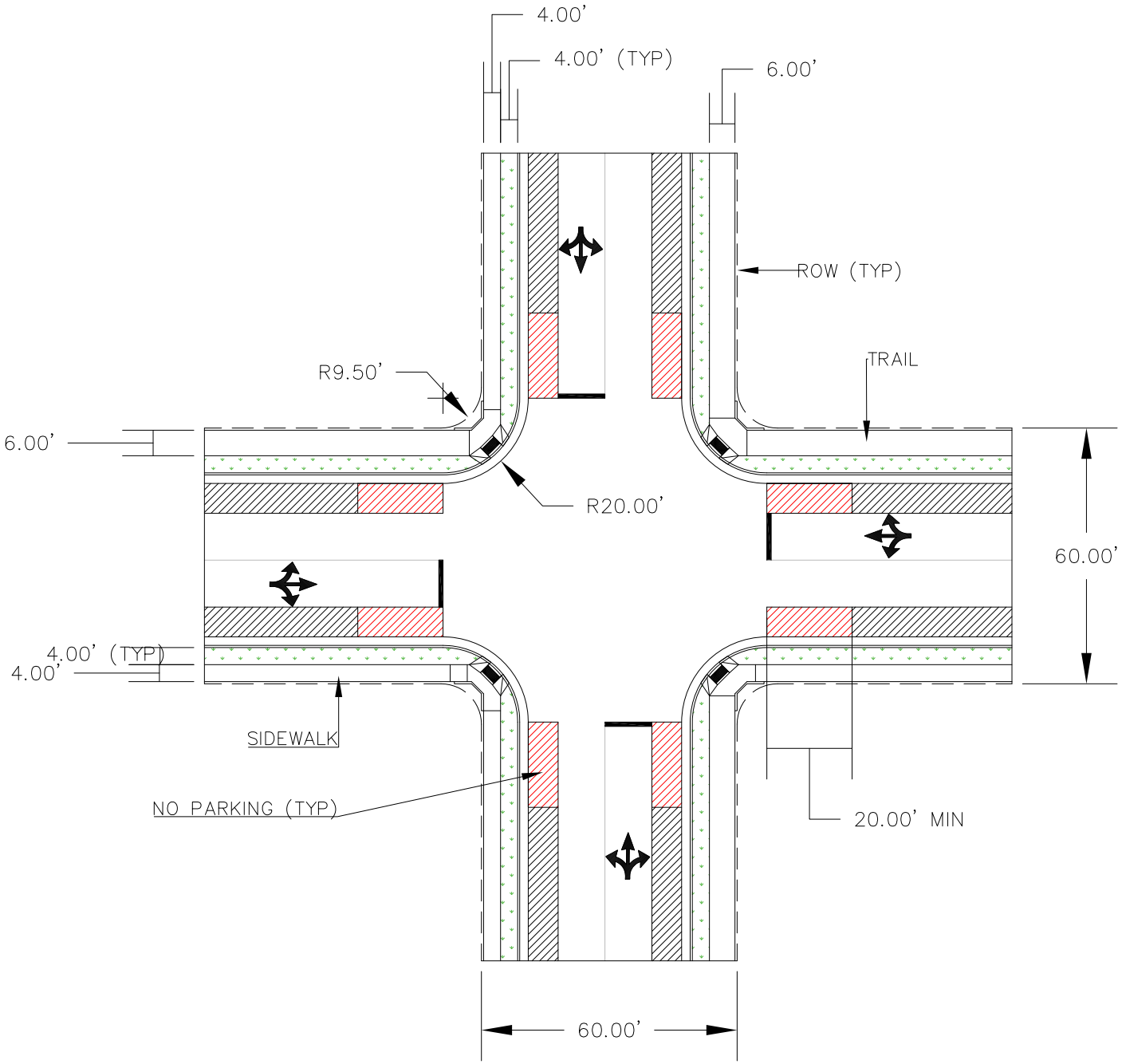
# LOCAL W/TRAIL (60') TO COLLECTOR (66')



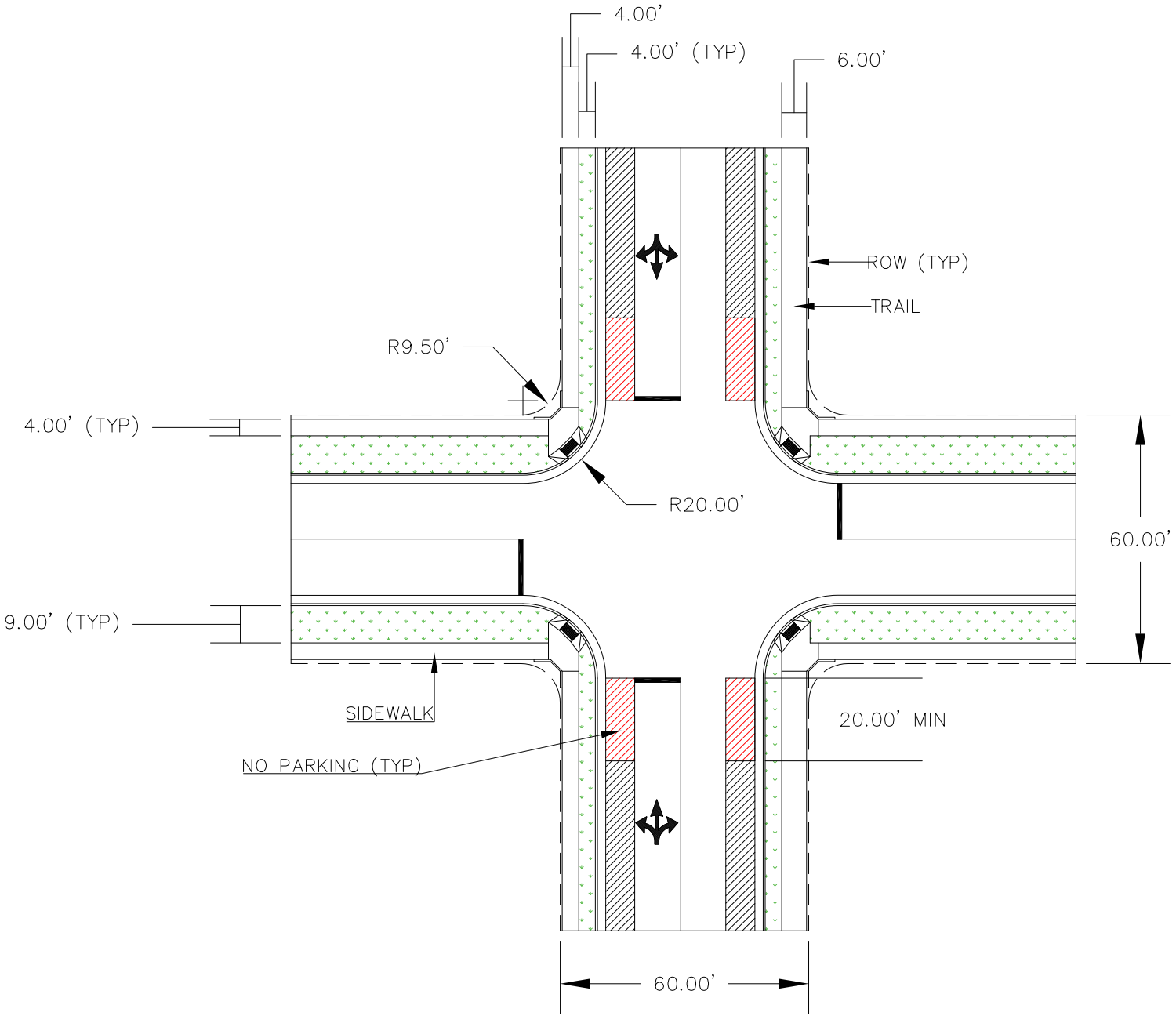
# LOCAL W/TRAIL (60') TO EXTENDED COLLECTOR (70')



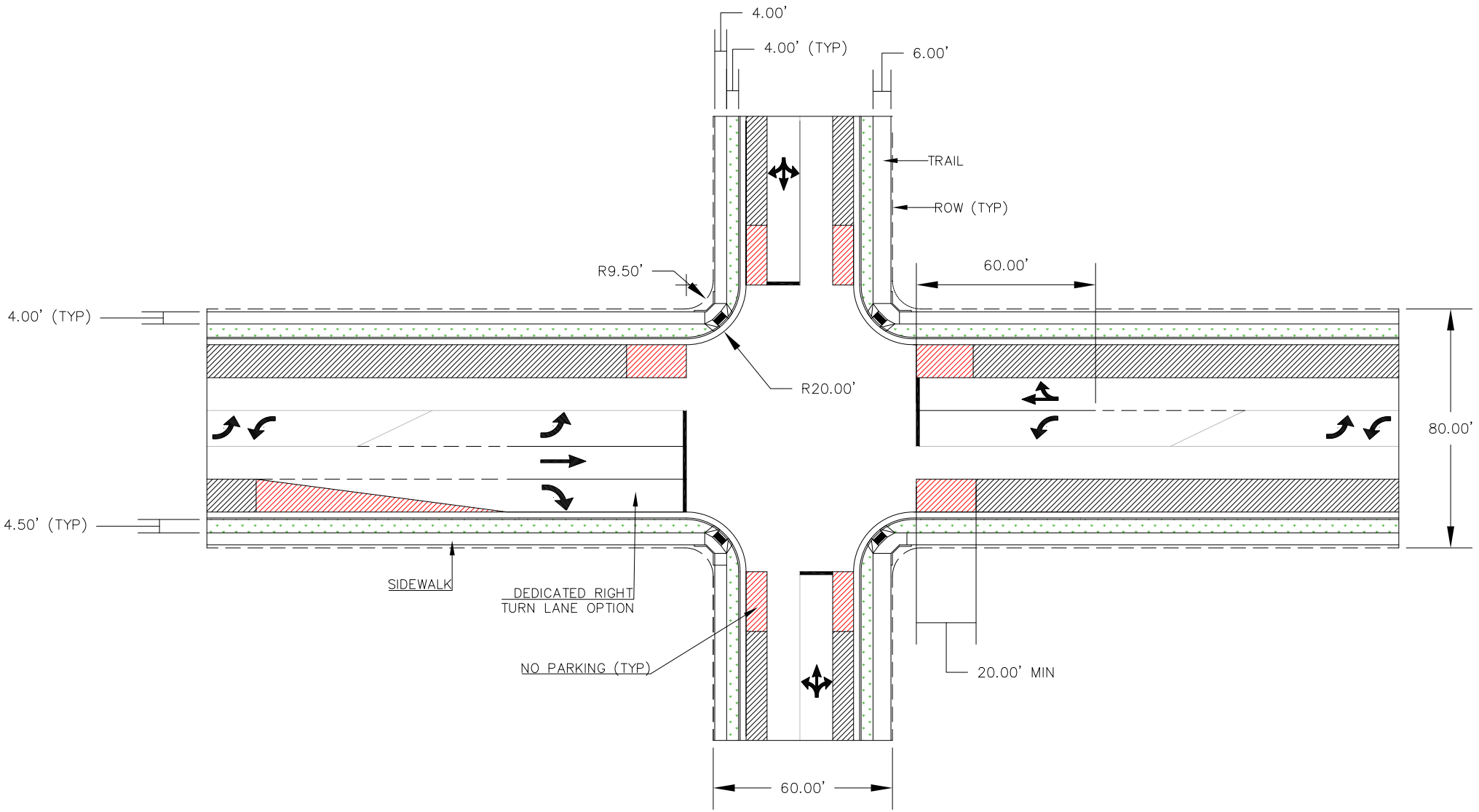
# LOCAL W/TRAIL (60') TO LOCAL W/TRAIL (60')



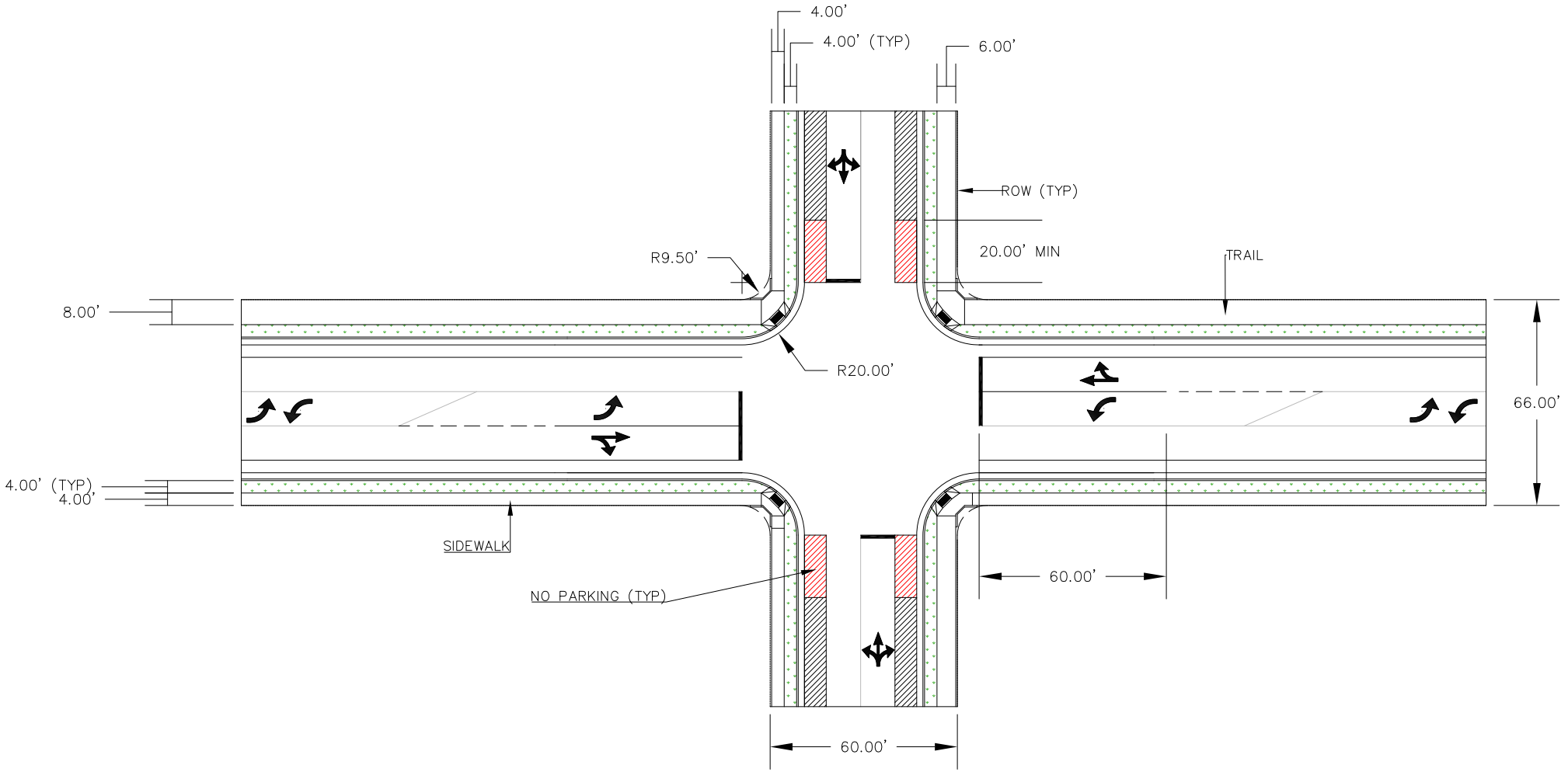
# LOCAL W/TRAIL (60') TO LOW IMPACT LOCAL (60')



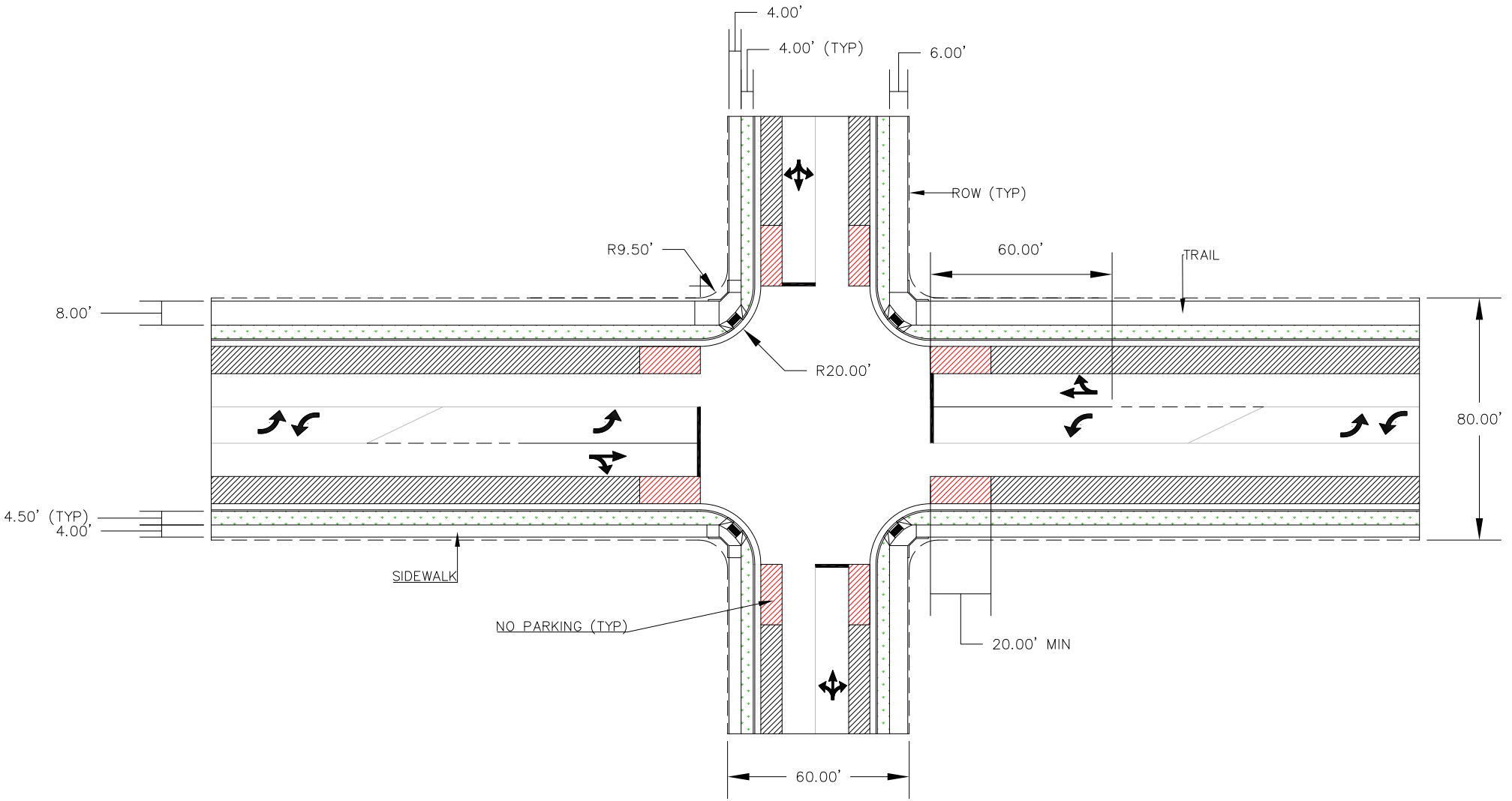
# LOCAL W/TRAIL (60') TO MINOR ARTERIAL (80')



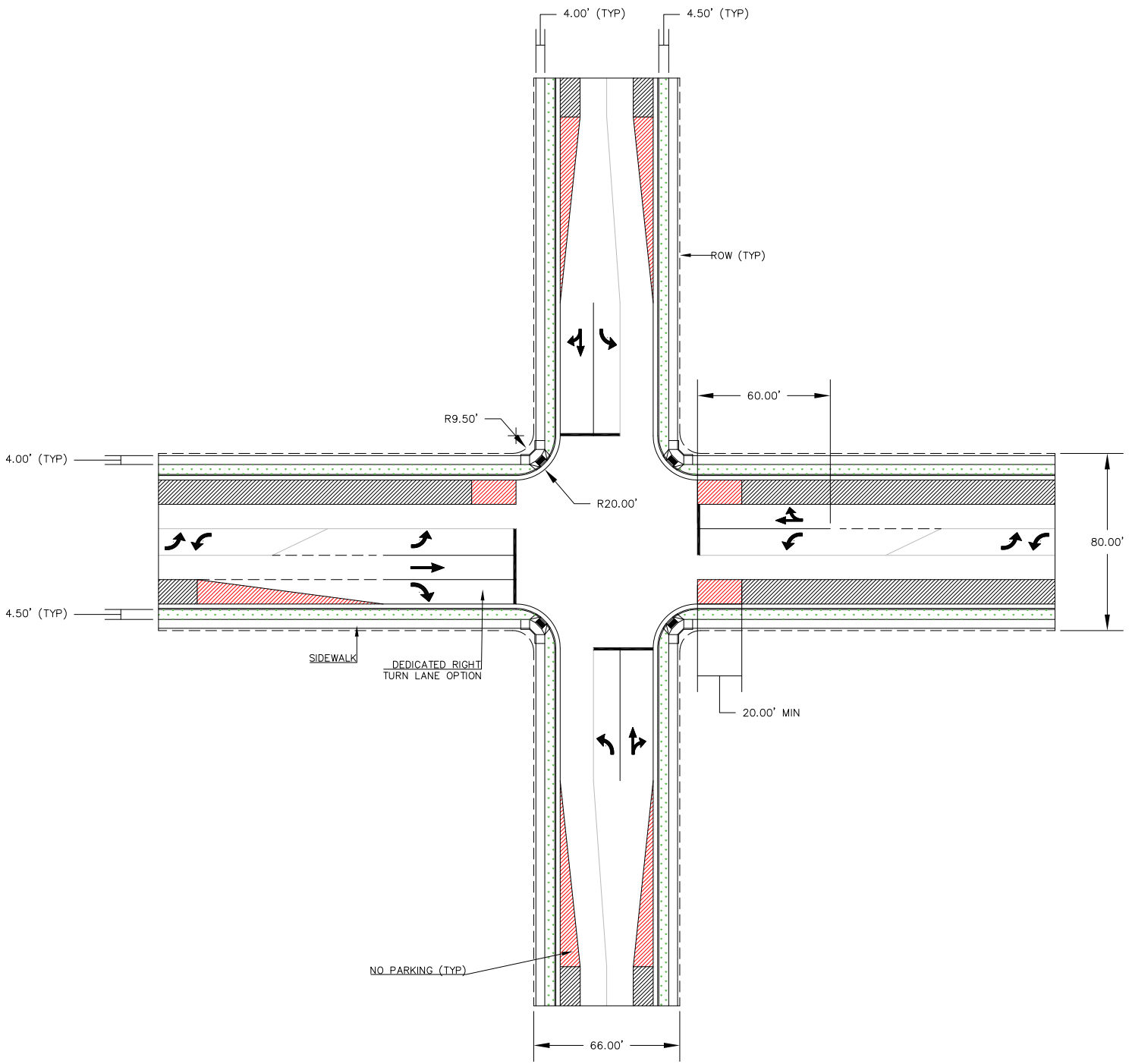
# LOCAL W/TRAIL (60') TO MINOR ARTERIAL W/TRAIL (66')



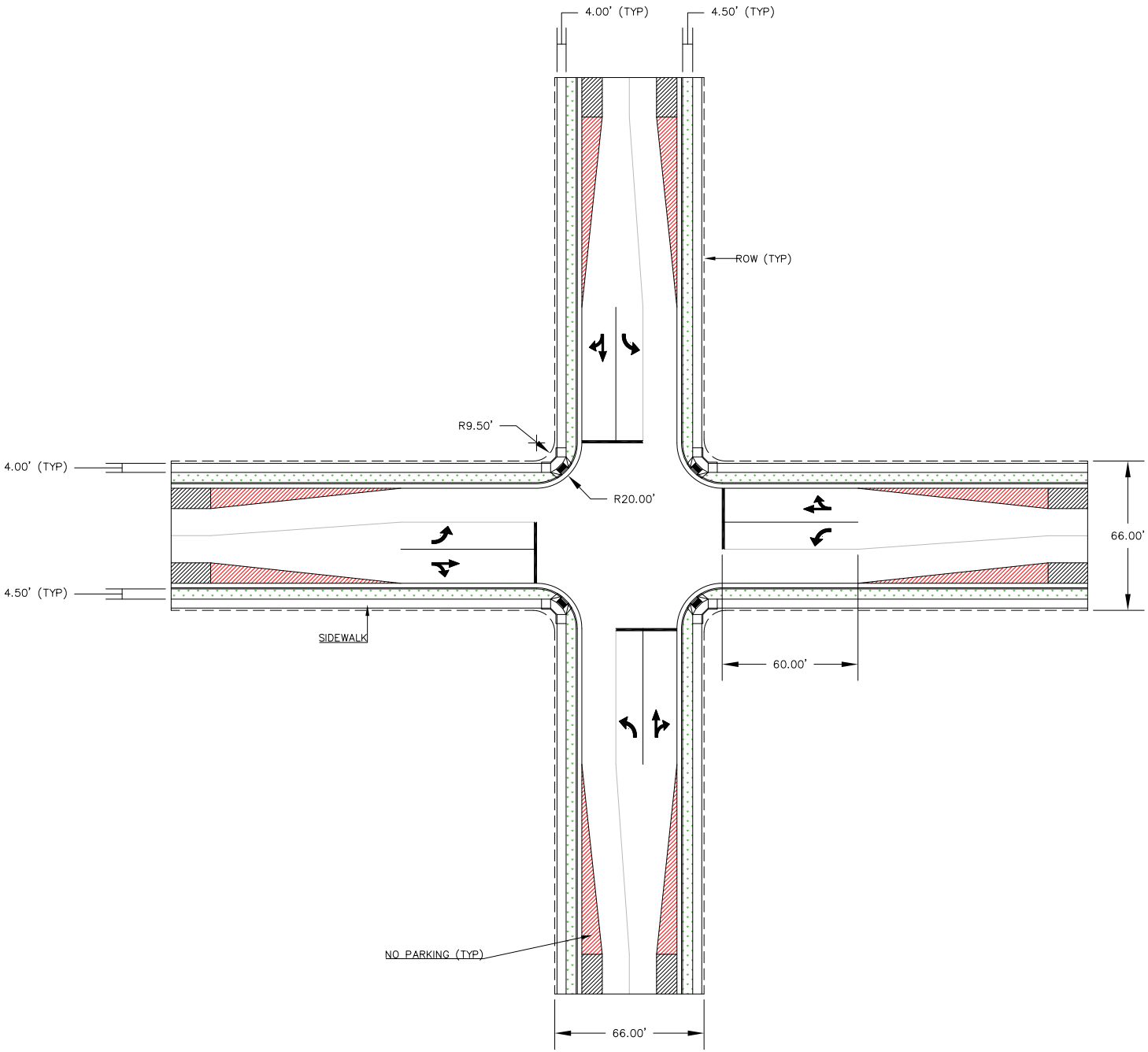
# LOCAL W/TRAIL (60') TO MINOR ARTERIAL W/TRAIL (80')



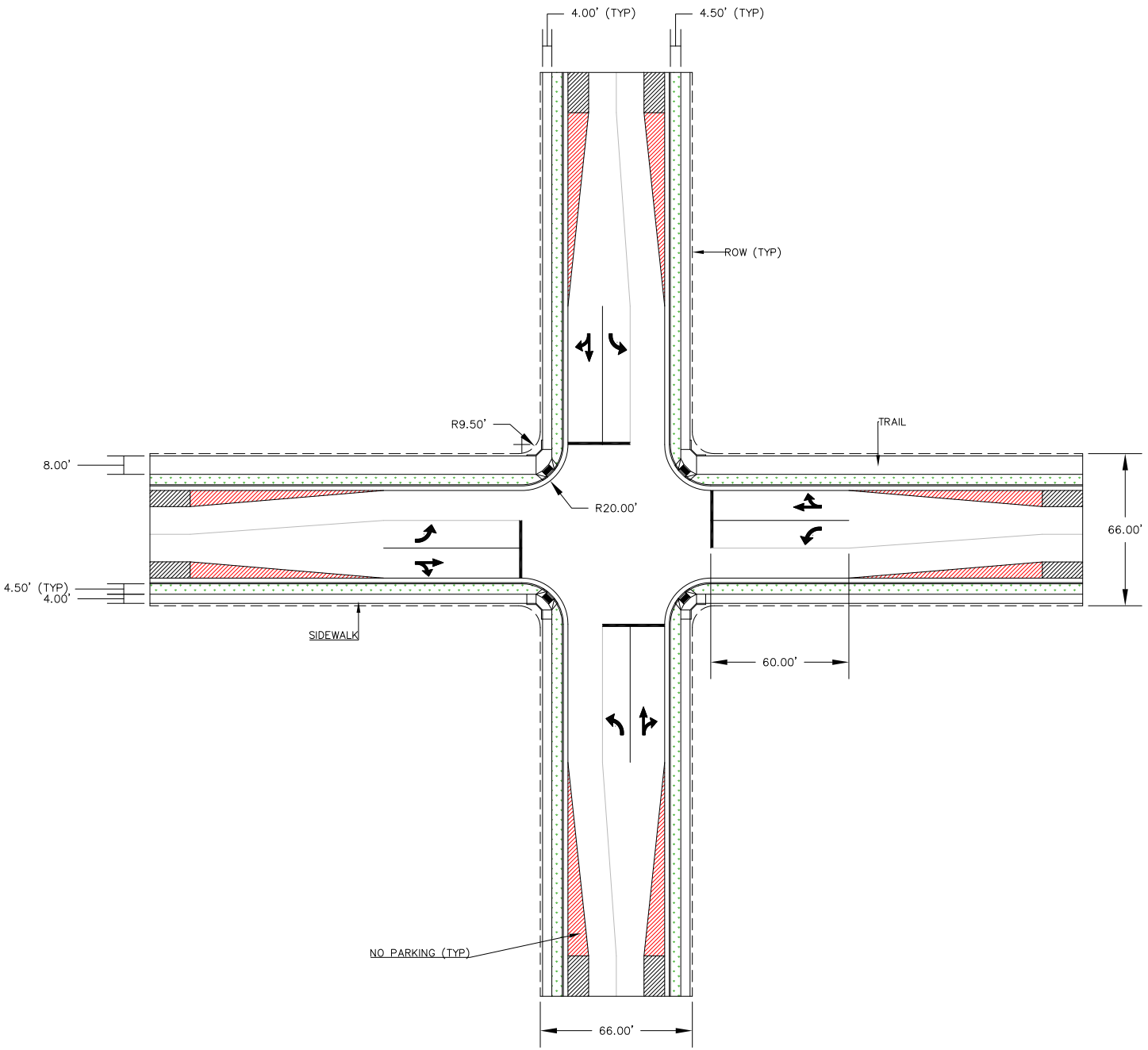
# COLLECTOR (66') TO MINOR ARTERIAL (80')



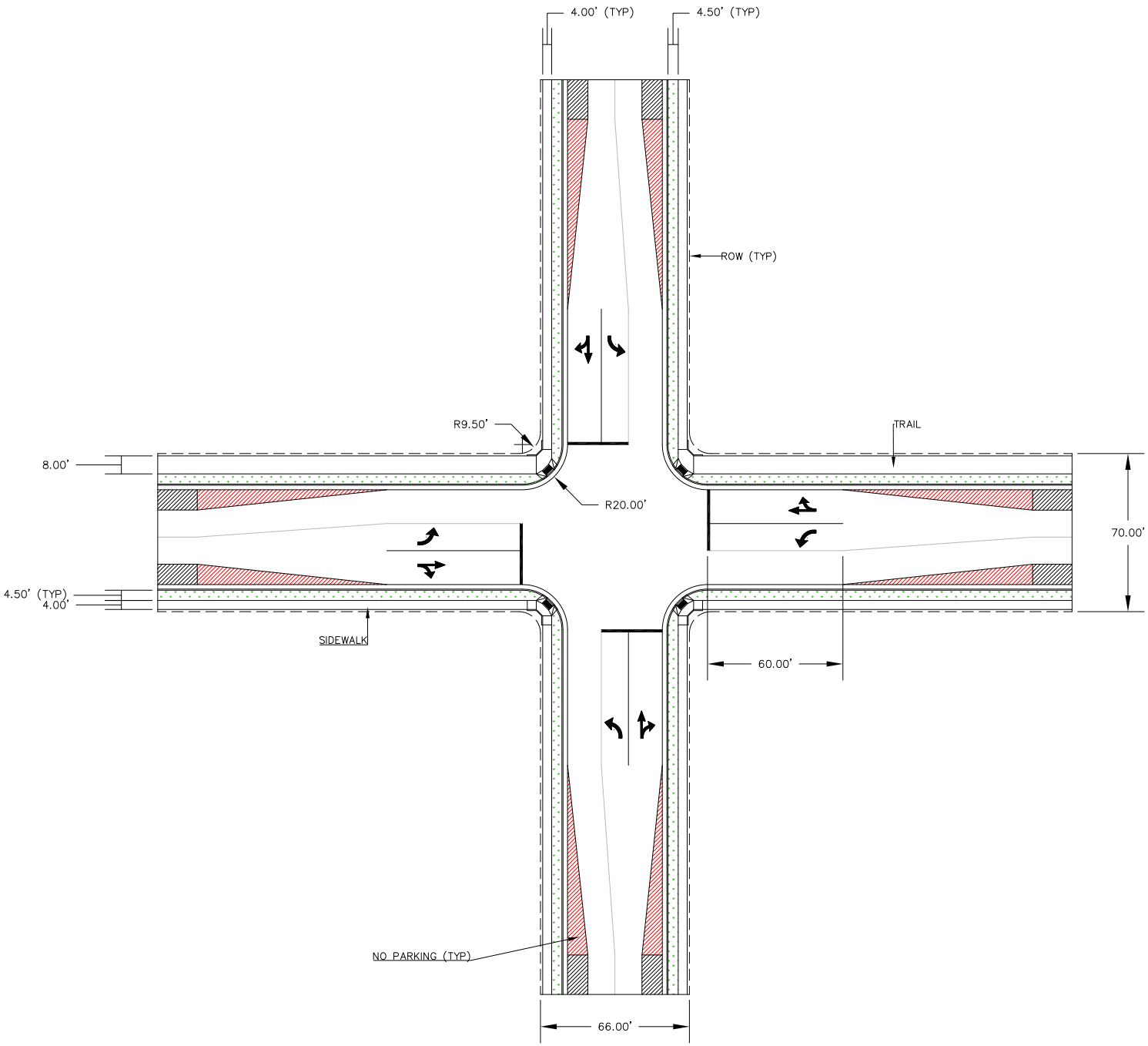
# COLLECTOR (66') TO COLLECTOR (66')



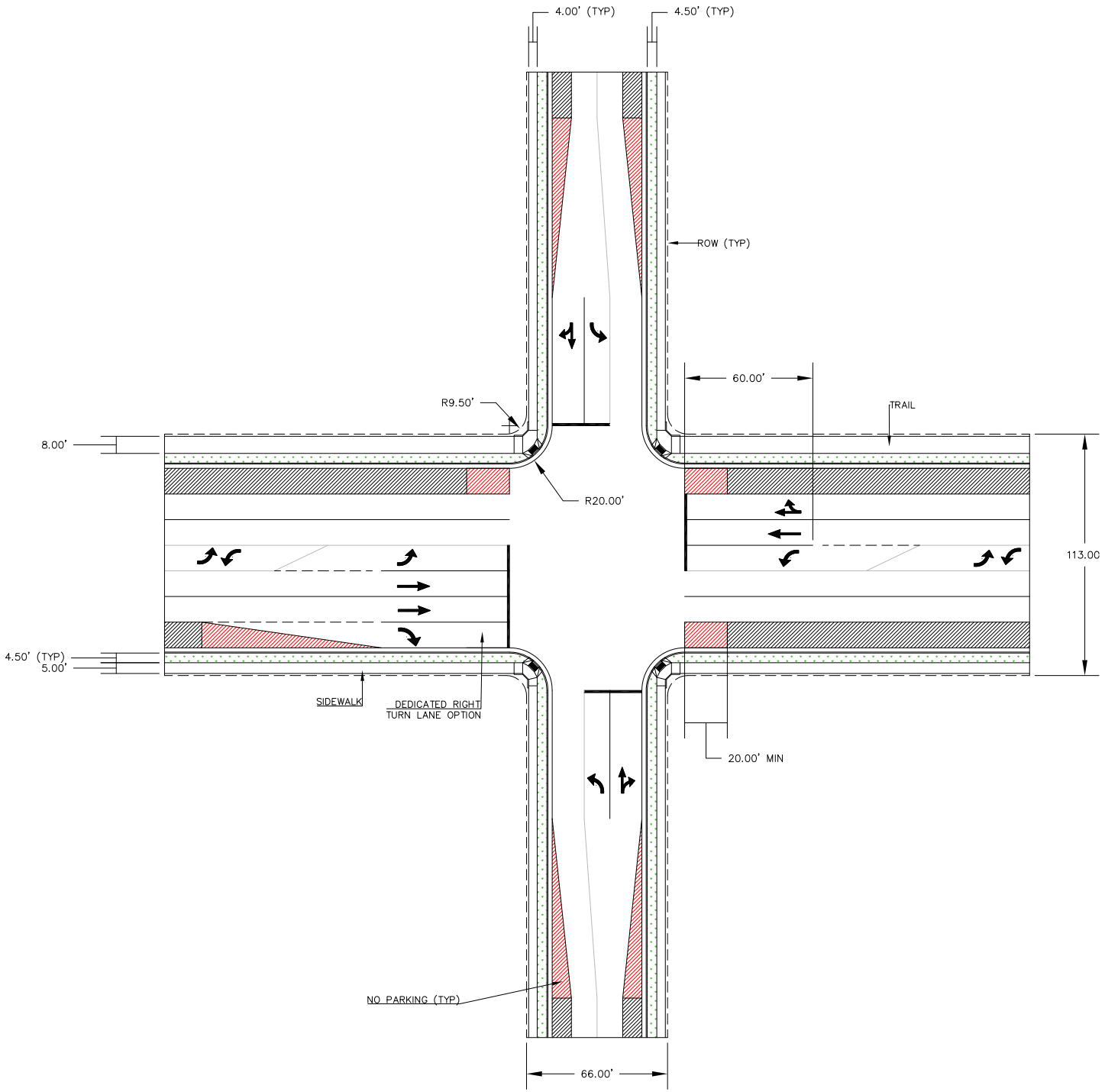
# COLLECTOR (66') TO COLLECTOR W/TRAIL (66')



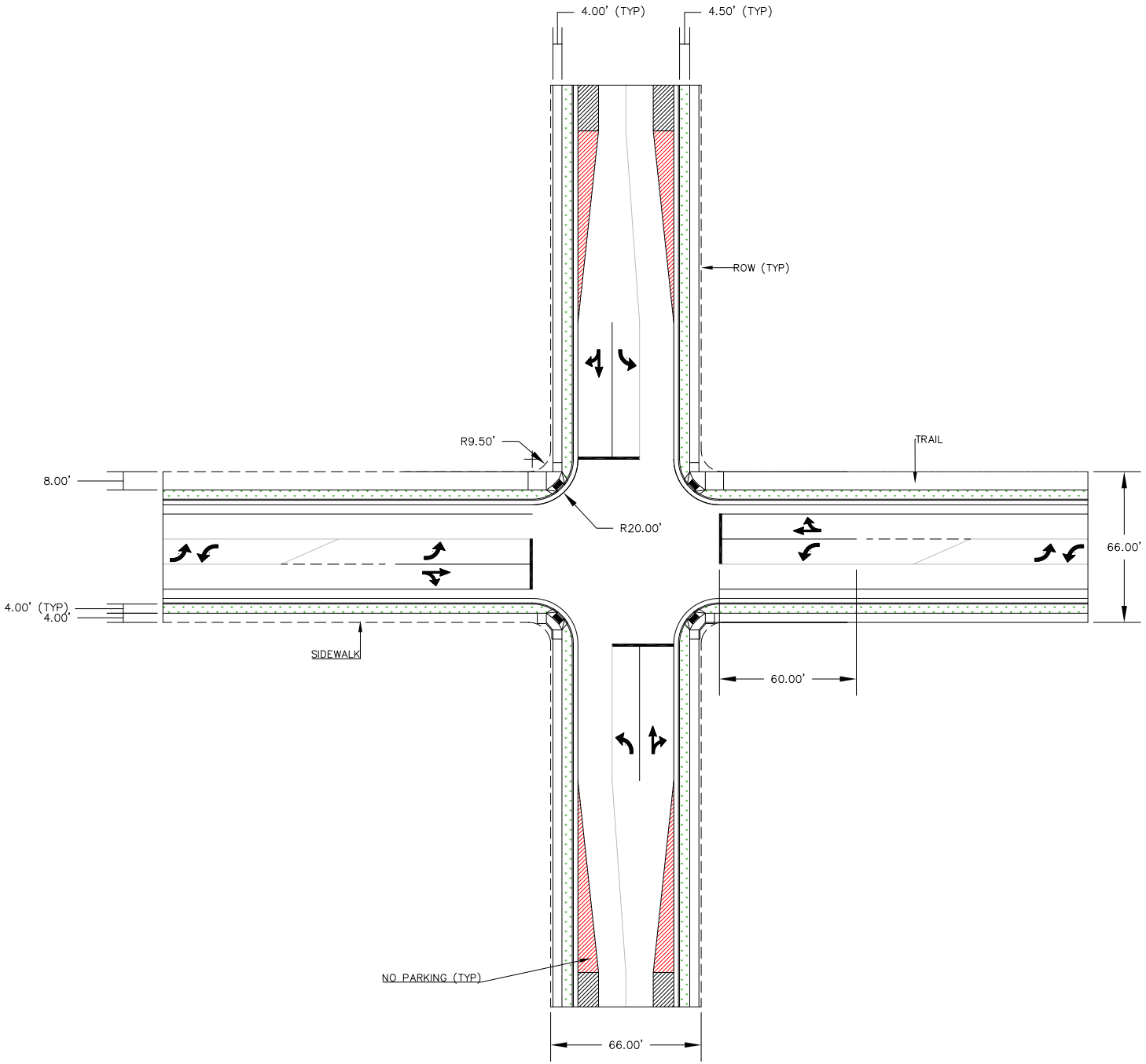
# COLLECTOR (66') TO EXTENDED COLLECTOR W/TRAIL (70')



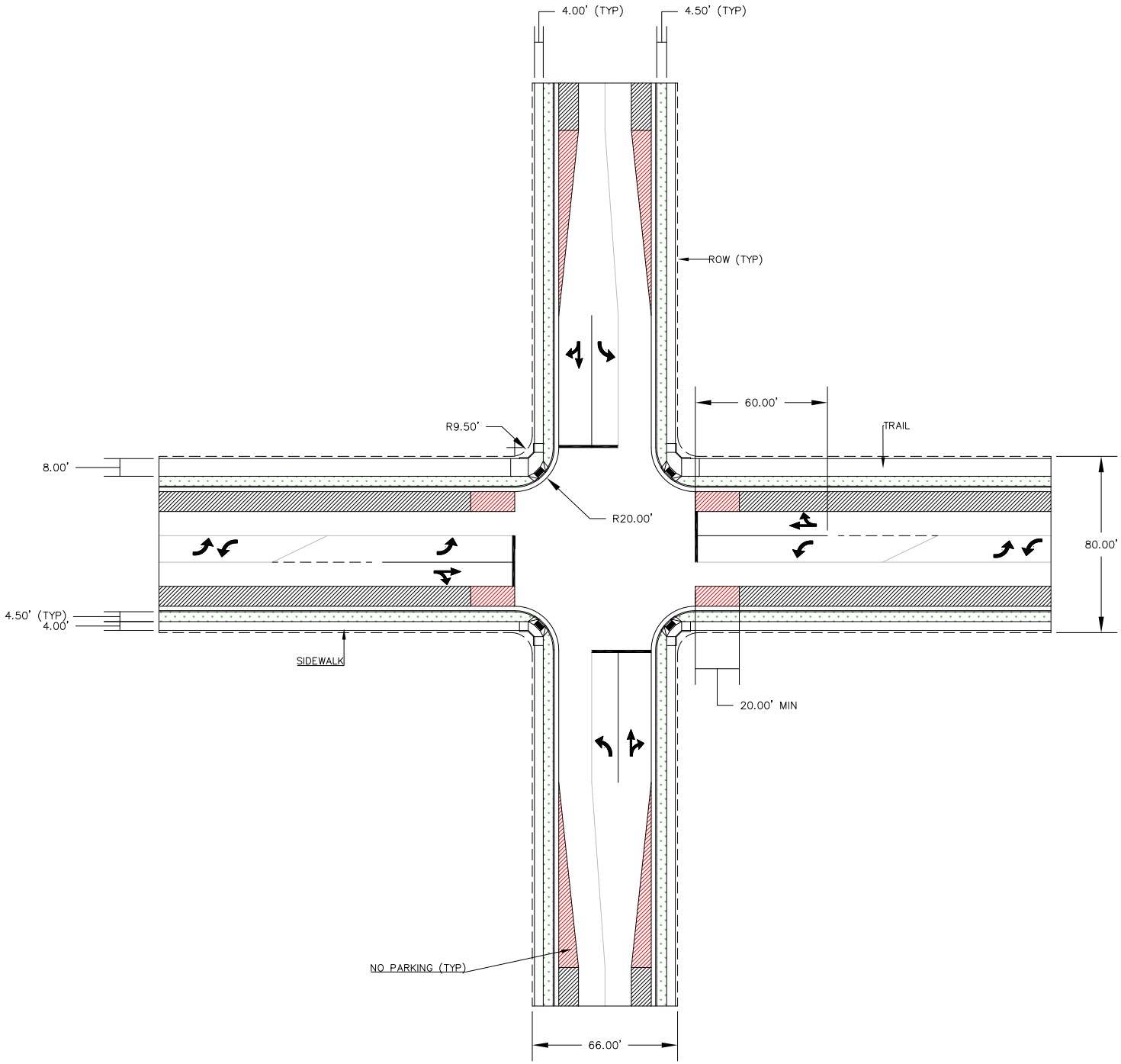
# COLLECTOR (66') TO MAJOR ARTERIAL (113')



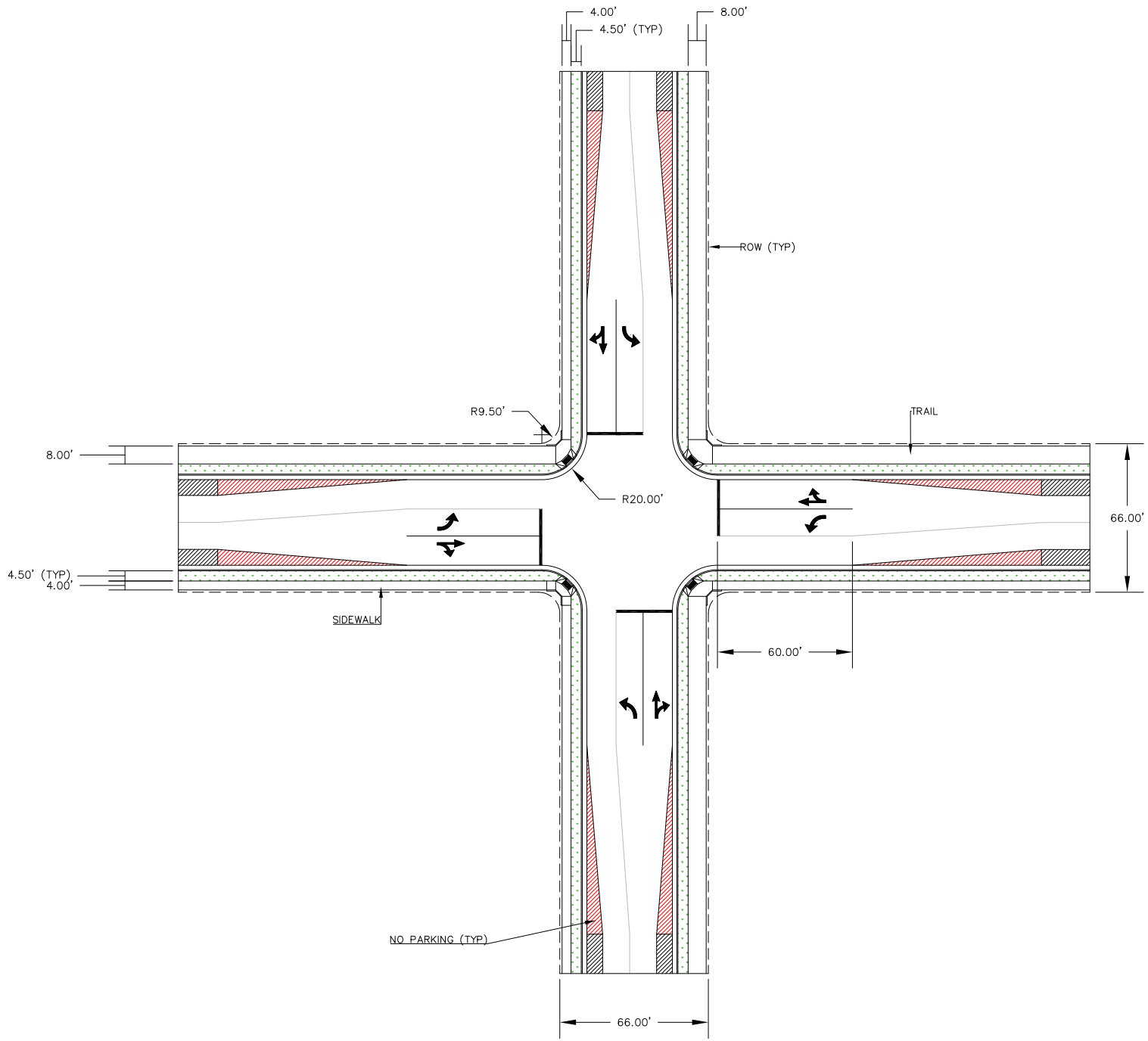
# COLLECTOR (66') TO MINOR ARTERIAL W/TRAIL (66')



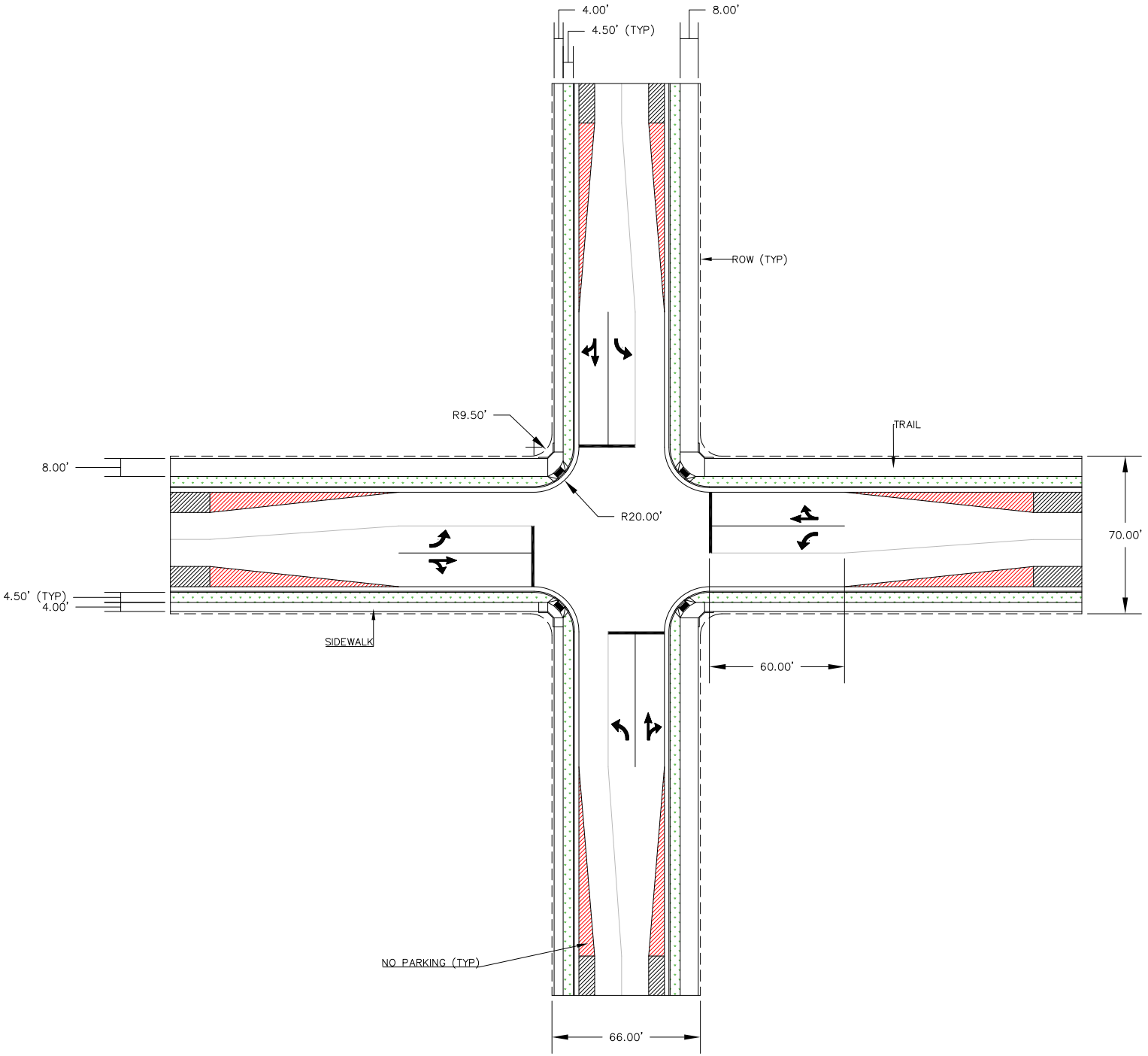
# COLLECTOR (66') TO MINOR ARTERIAL W/TRAIL (80')



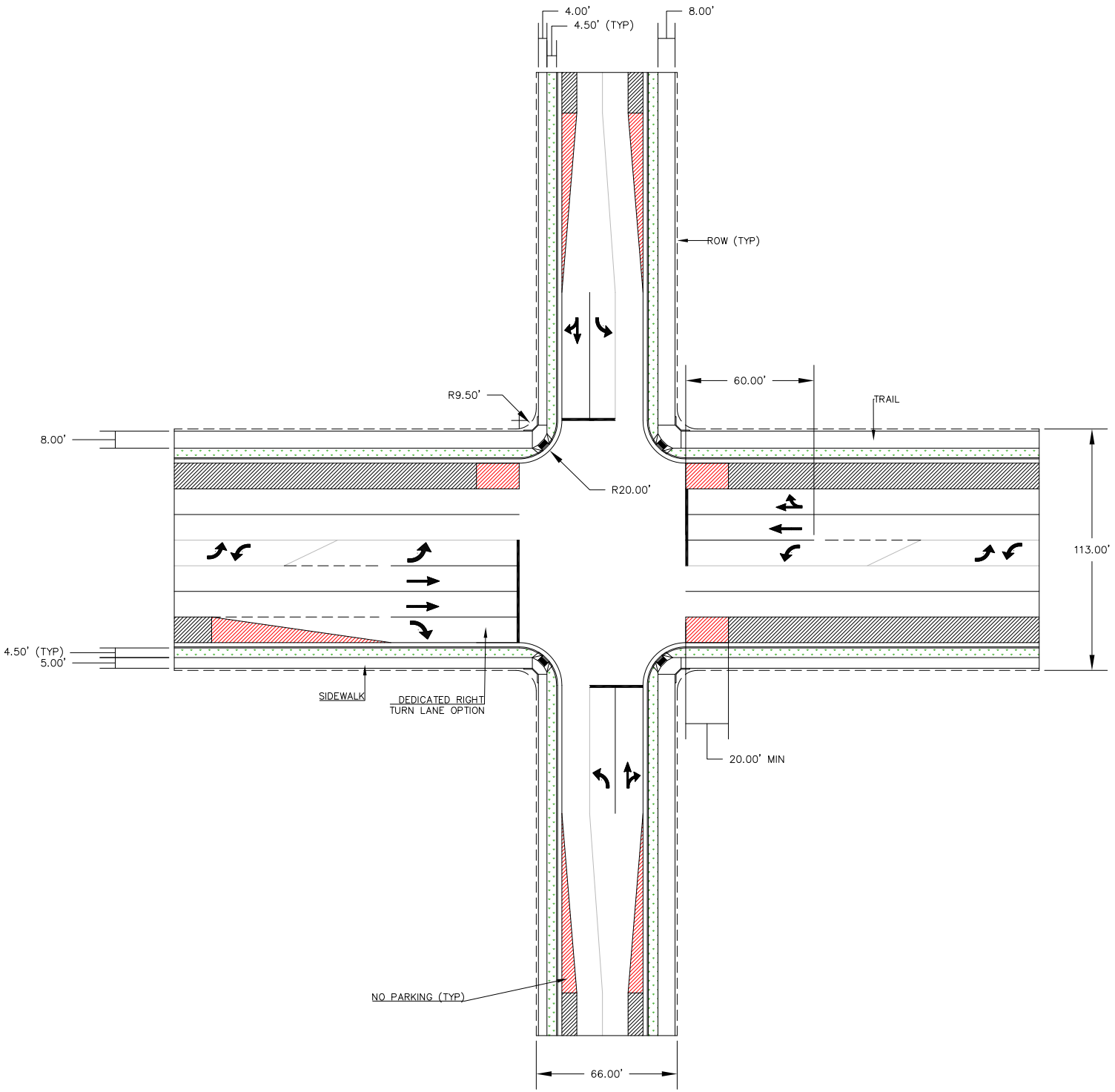
# COLLECTOR W/TRAIL (66') TO COLLECTOR W/TRAIL (66')



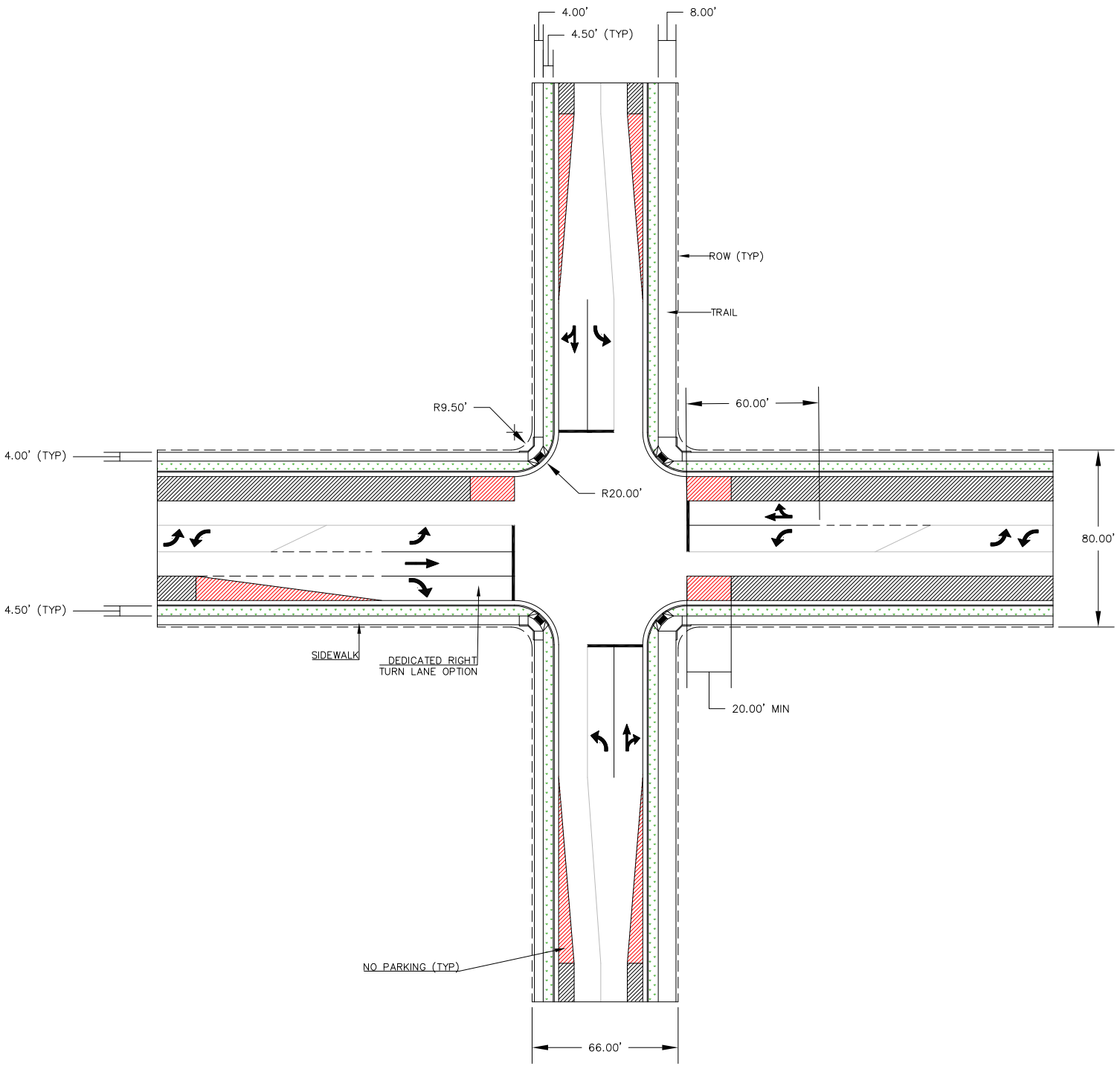
# COLLECTOR W/TRAIL (66') TO EXTENDED COLLECTOR W/TRAIL (70')



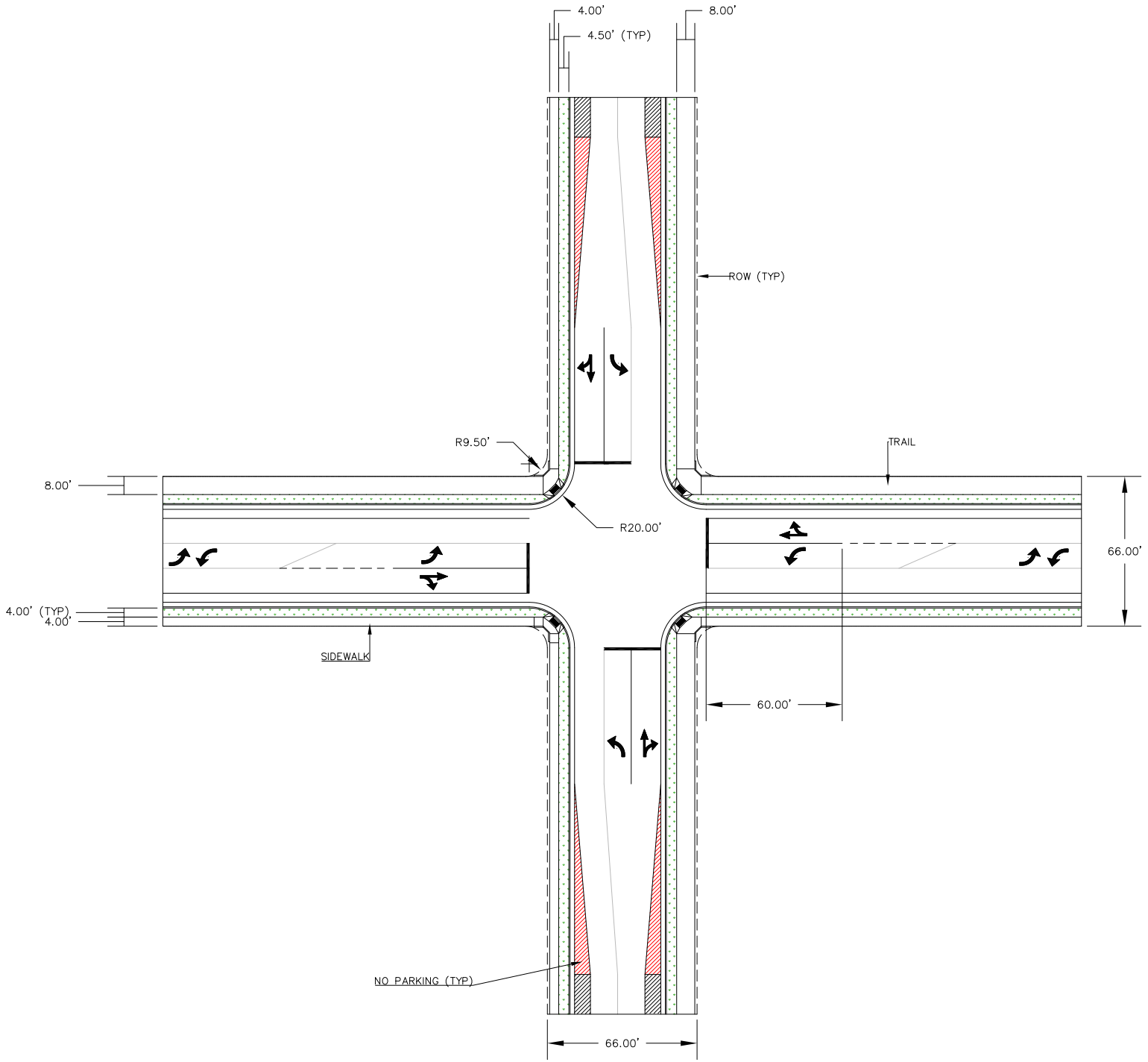
# COLLECTOR W/TRAIL (66') TO MAJOR ARTERIAL (113')



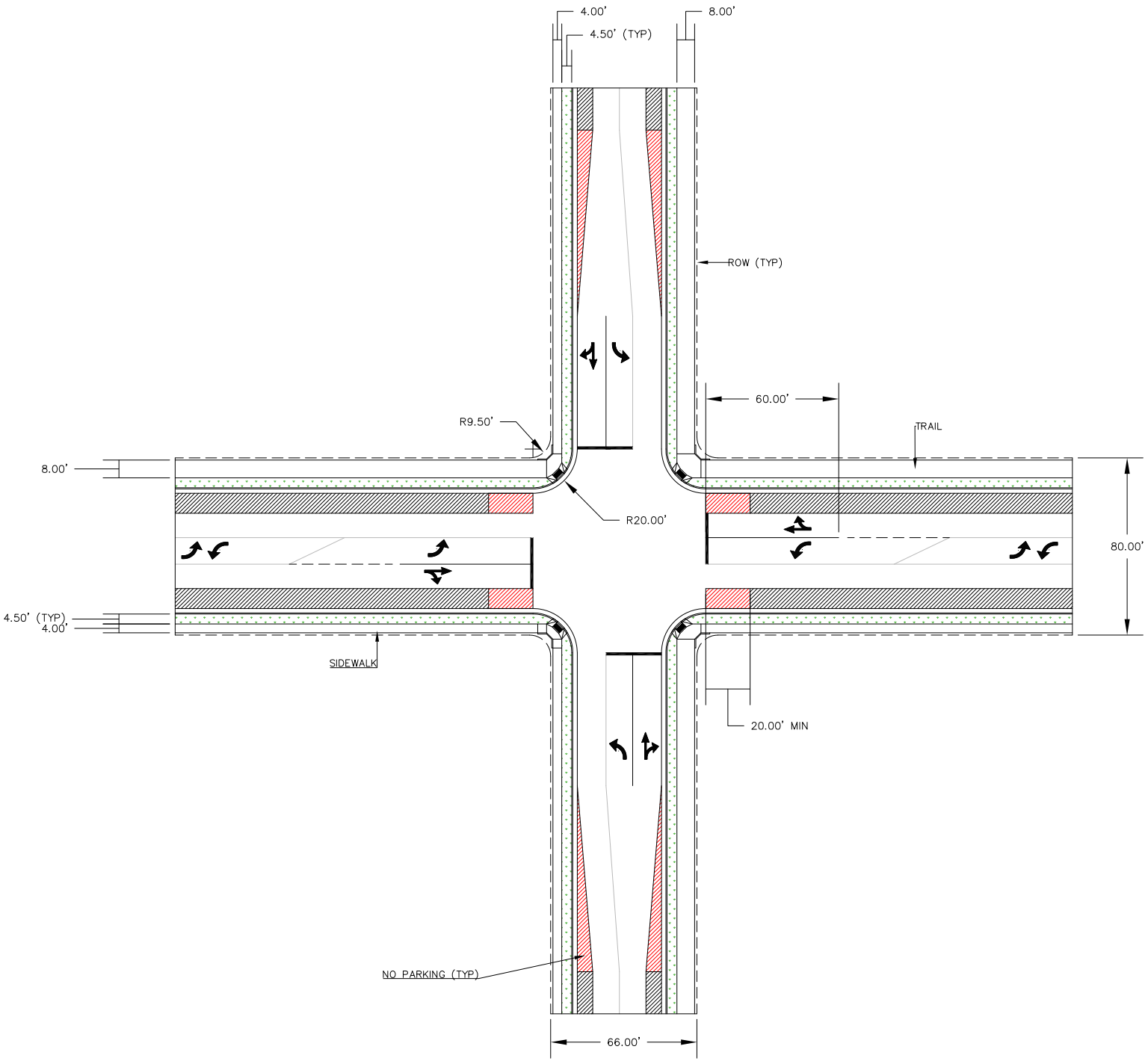
# COLLECTOR W/TRAIL (66') TO MINOR ARTERIAL (80')



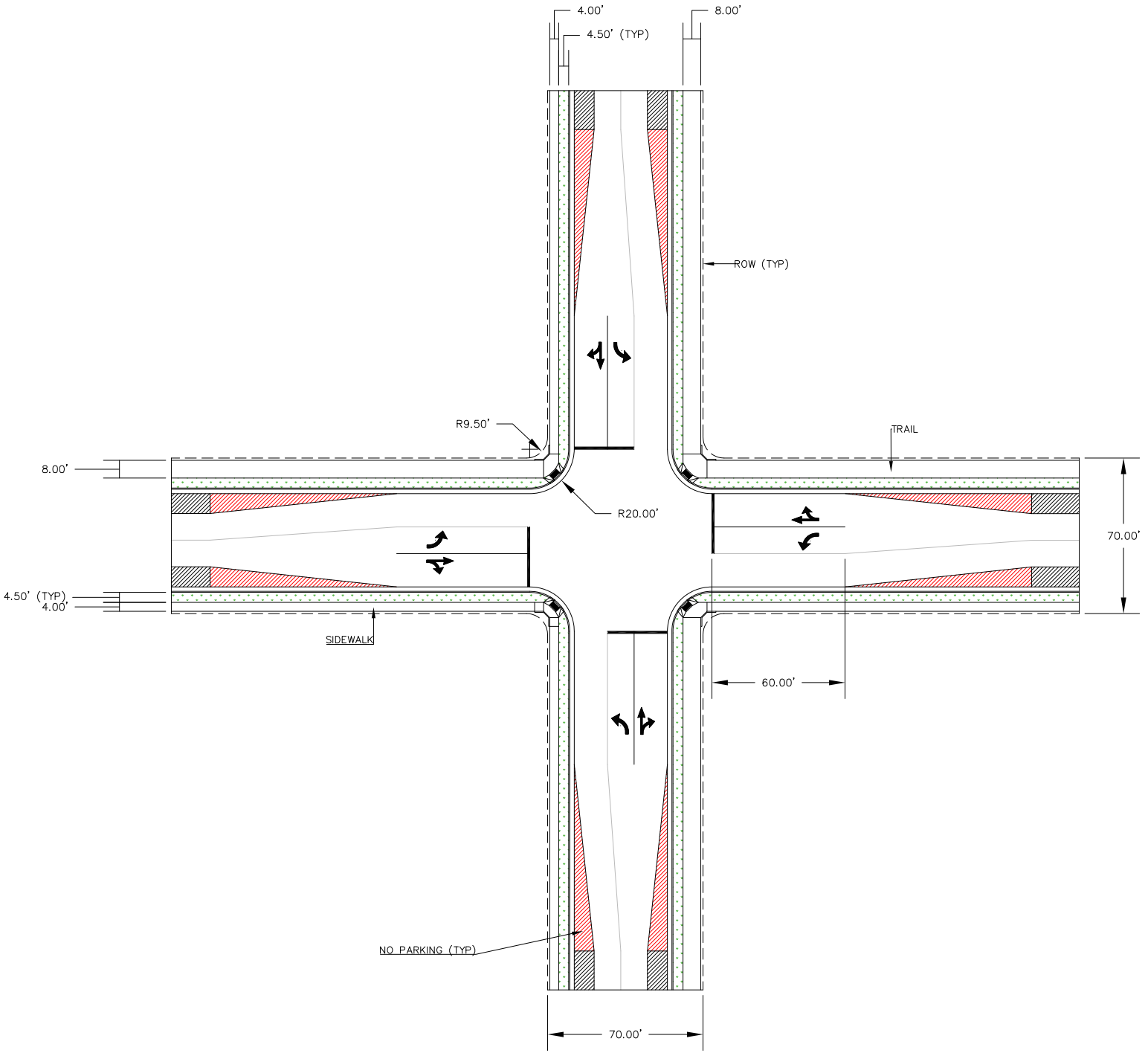
# COLLECTOR W/TRAIL (66') TO MINOR ARTERIAL W/TRAIL (66')



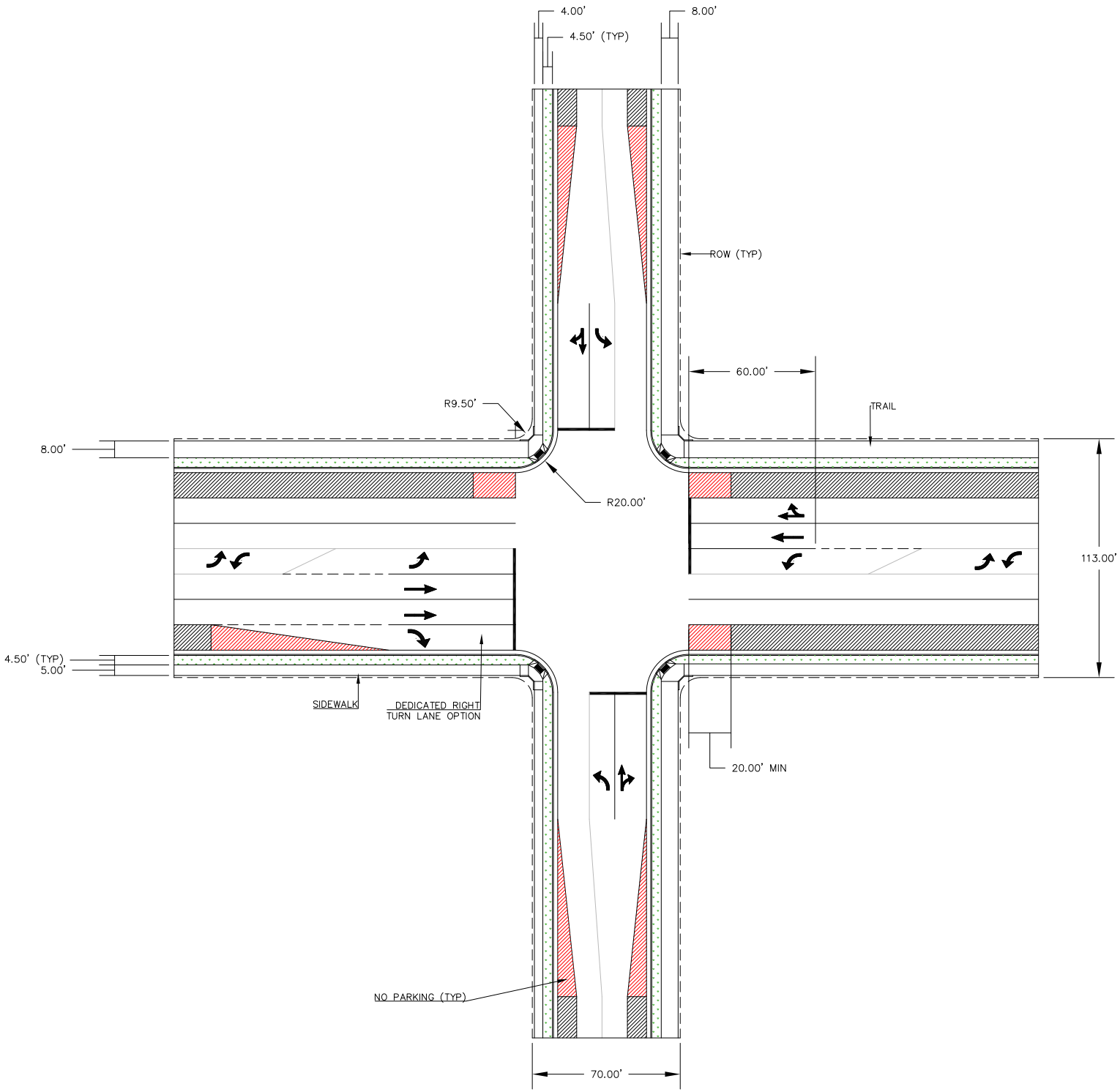
# COLLECTOR W/TRAIL (66') TO MINOR ARTERIAL W/TRAIL (80')



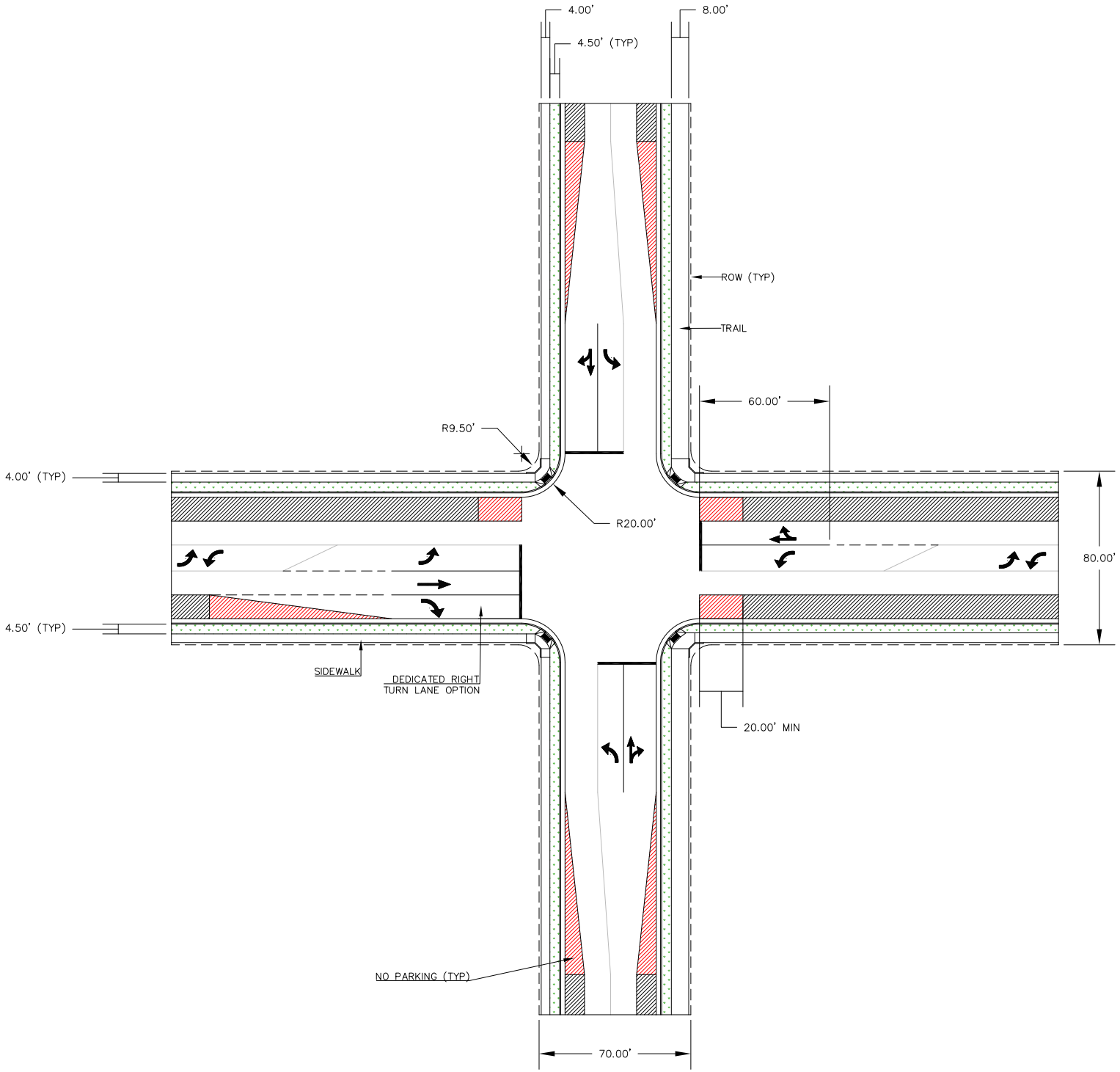
# EXTENDED COLLECTOR W/TRAIL (70') TO EXTENDED COLLECTOR W/TRAIL (70')



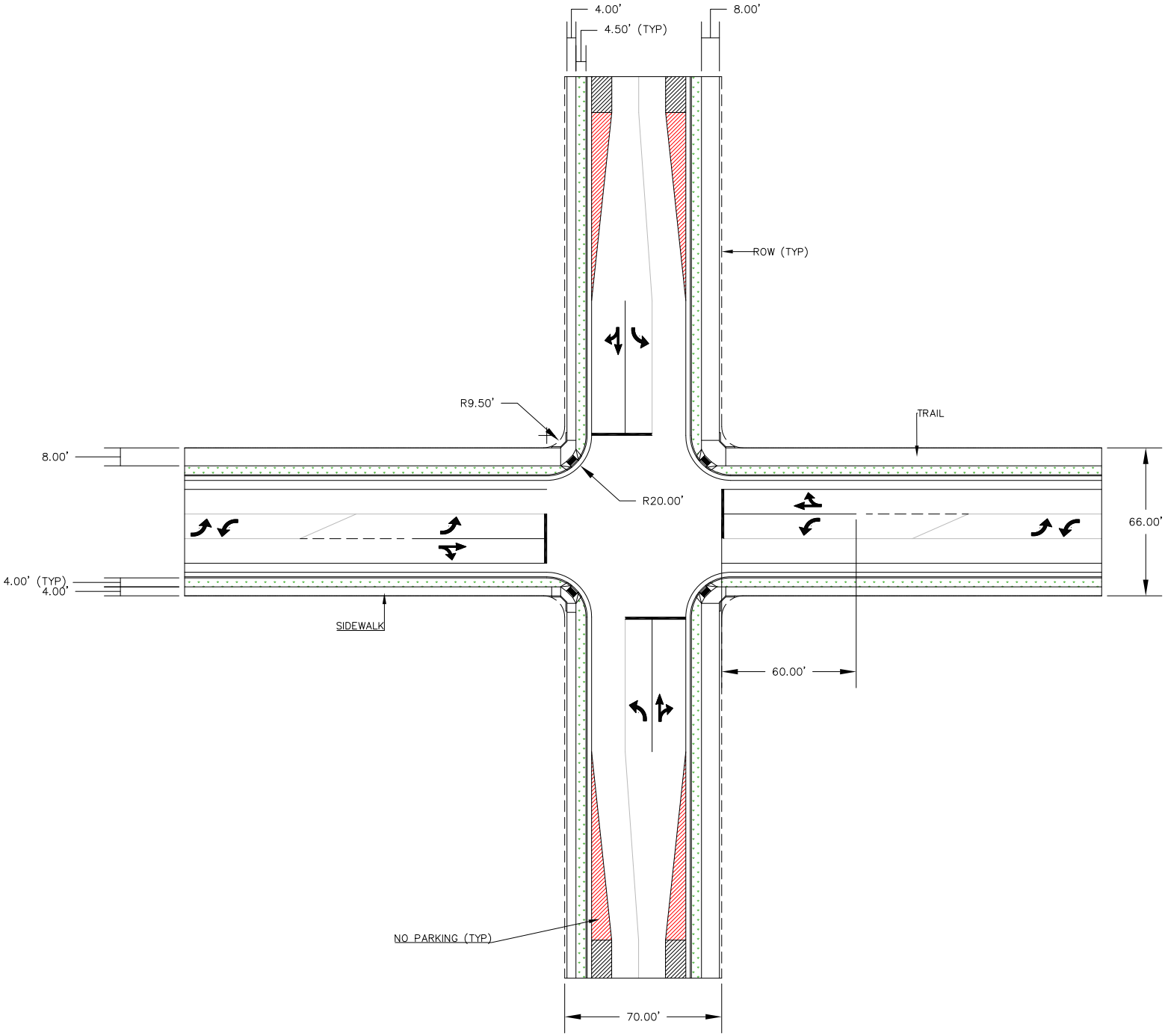
# EXTENDED COLLECTOR W/TRAIL (70') TO MAJOR ARTERIAL (113')



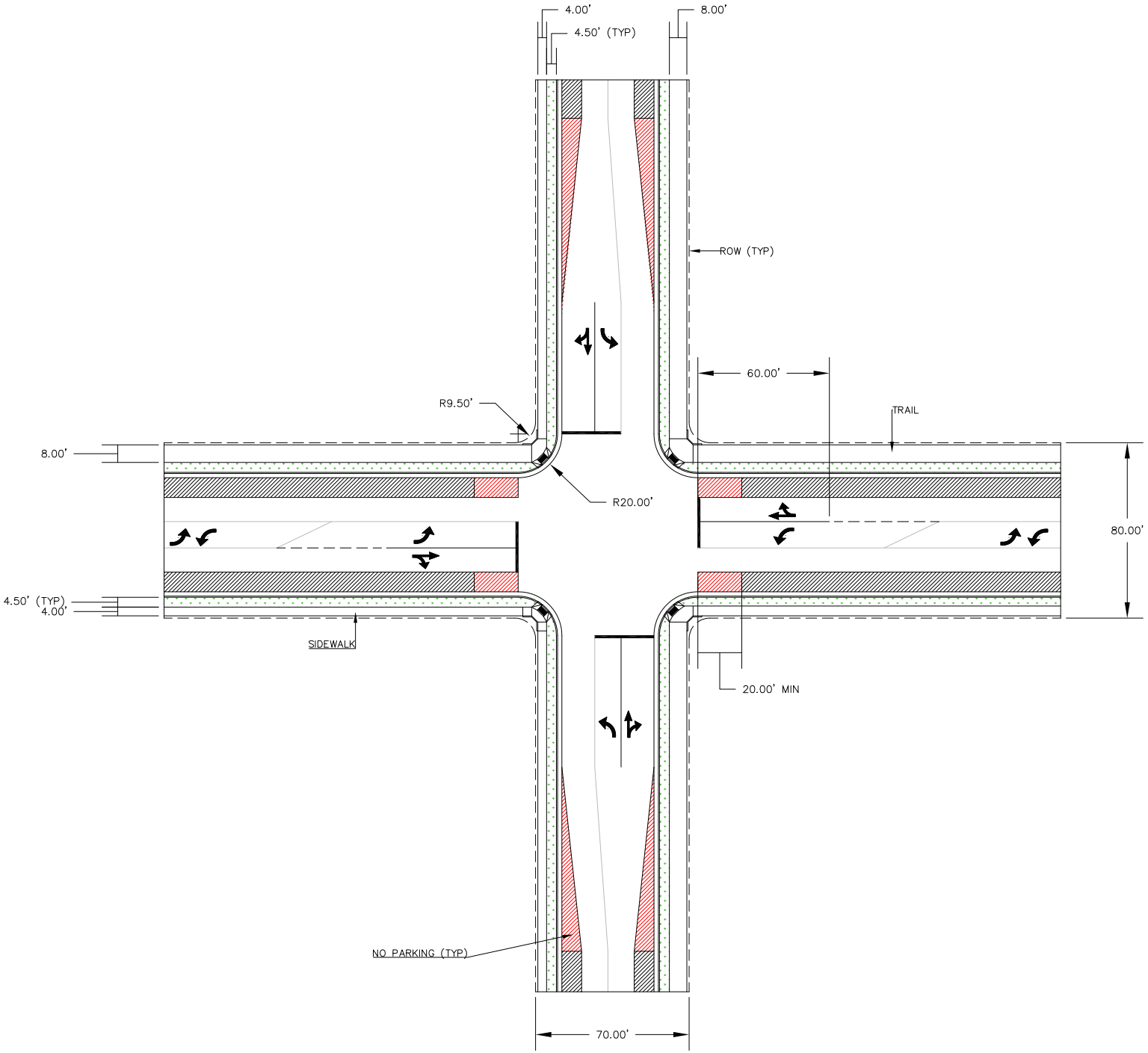
# EXTENDED COLLECTOR W/TRAIL (70') TO MINOR ARTERIAL (80')



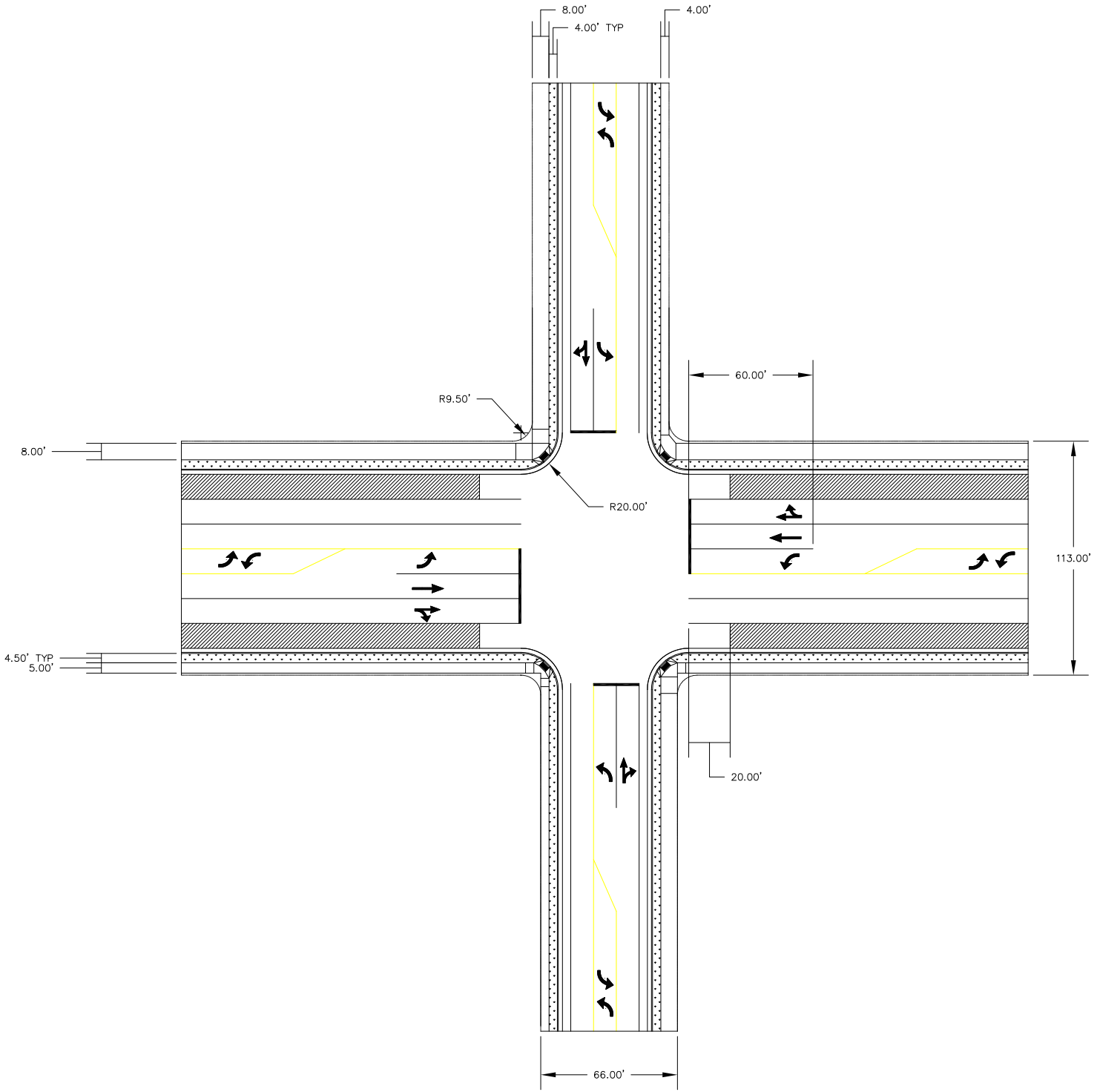
# EXTENDED COLLECTOR W/TRAIL (70') TO MINOR ARTERIAL W/TRAIL (66')



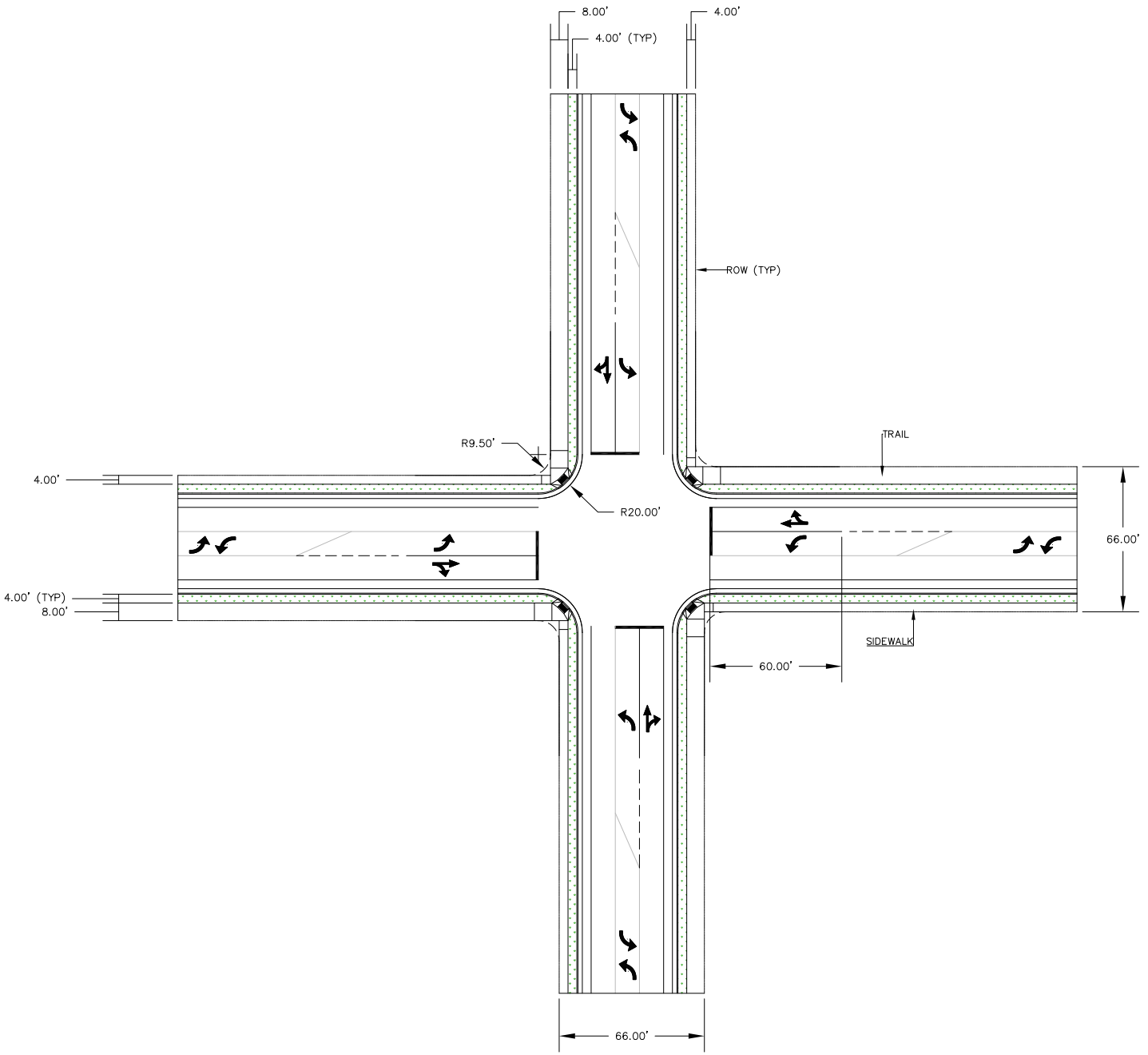
# EXTENDED COLLECTOR W/TRAIL (70') TO MINOR ARTERIAL W/TRAIL (80')



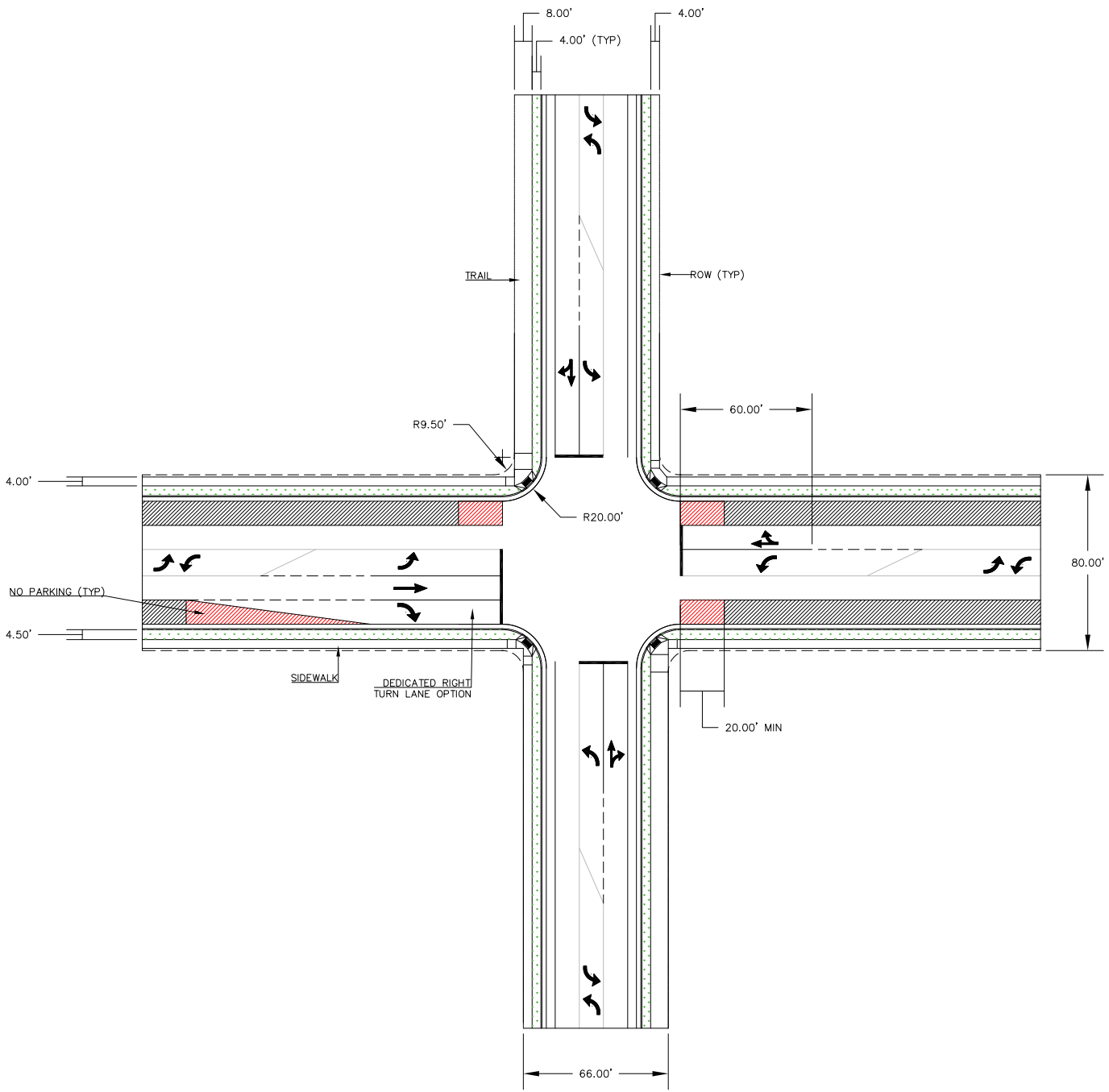
# MINOR ARTERIAL W/TRAIL (66') TO MAJOR ARTERIAL (113')



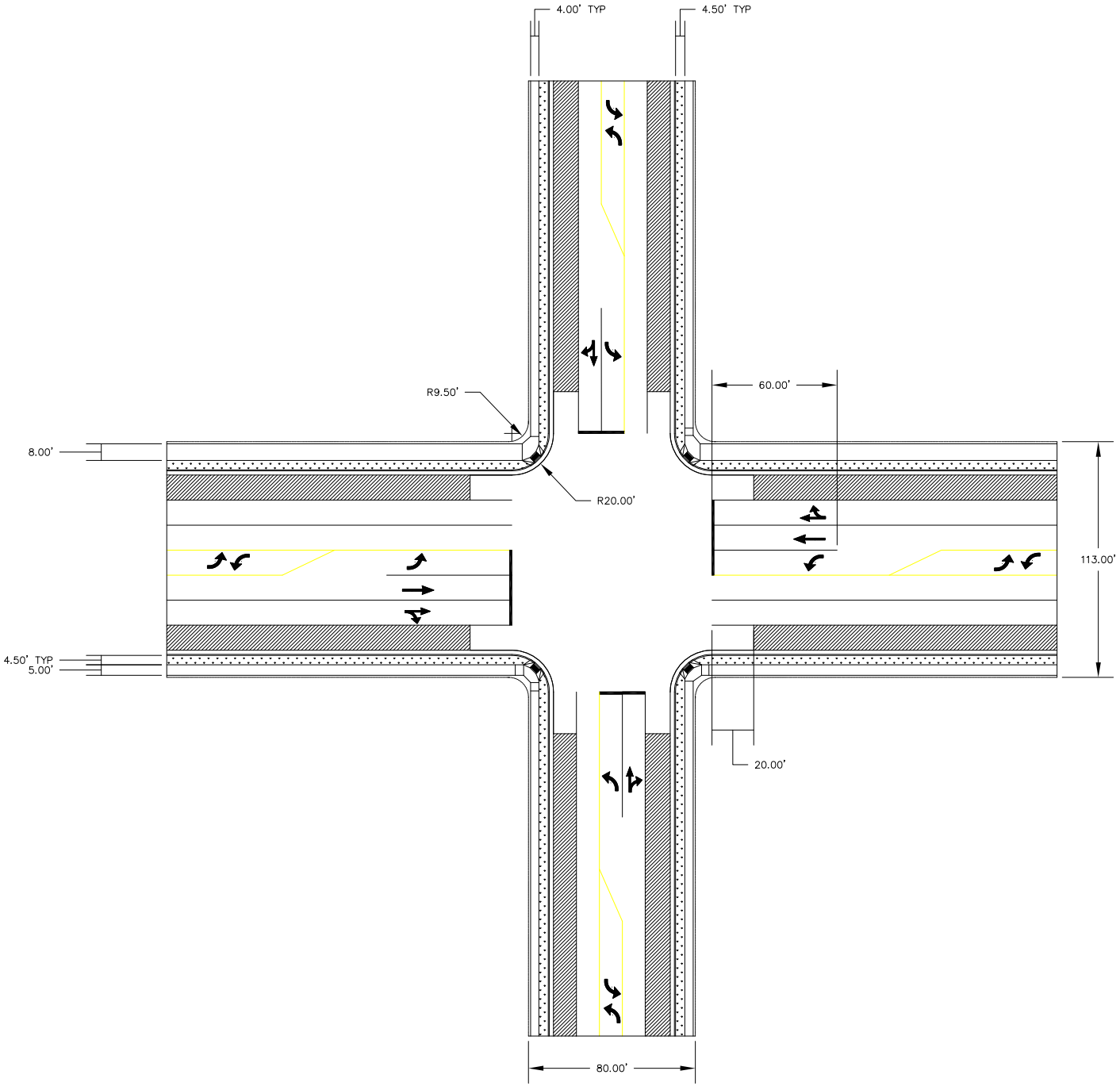
# MINOR ARTERIAL W/TRAIL (66') TO MINOR ARTERIAL W/TRAIL (66')



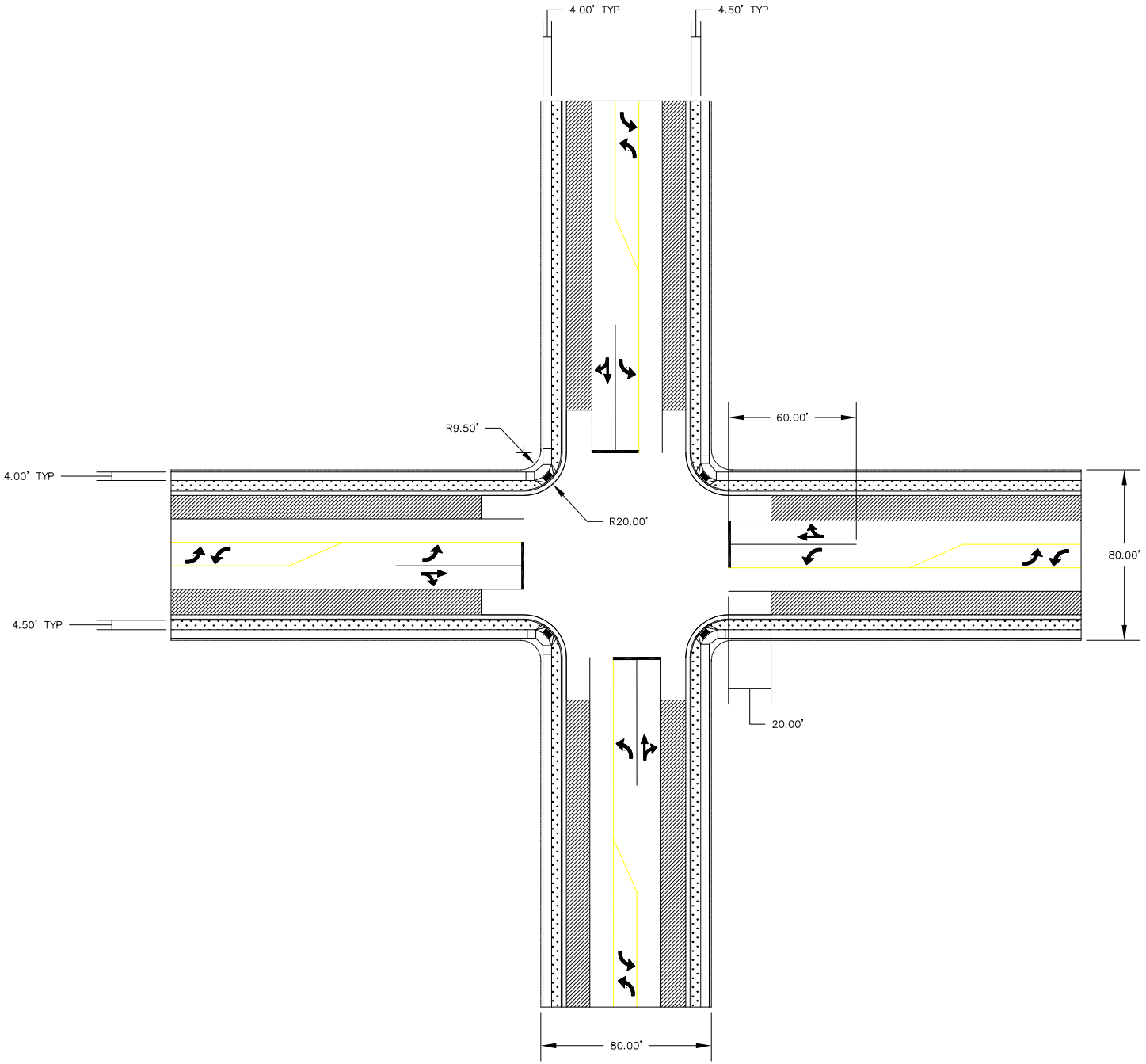
# MINOR ARTERIAL W/TRAIL (66') TO MINOR ARTERIAL (80')



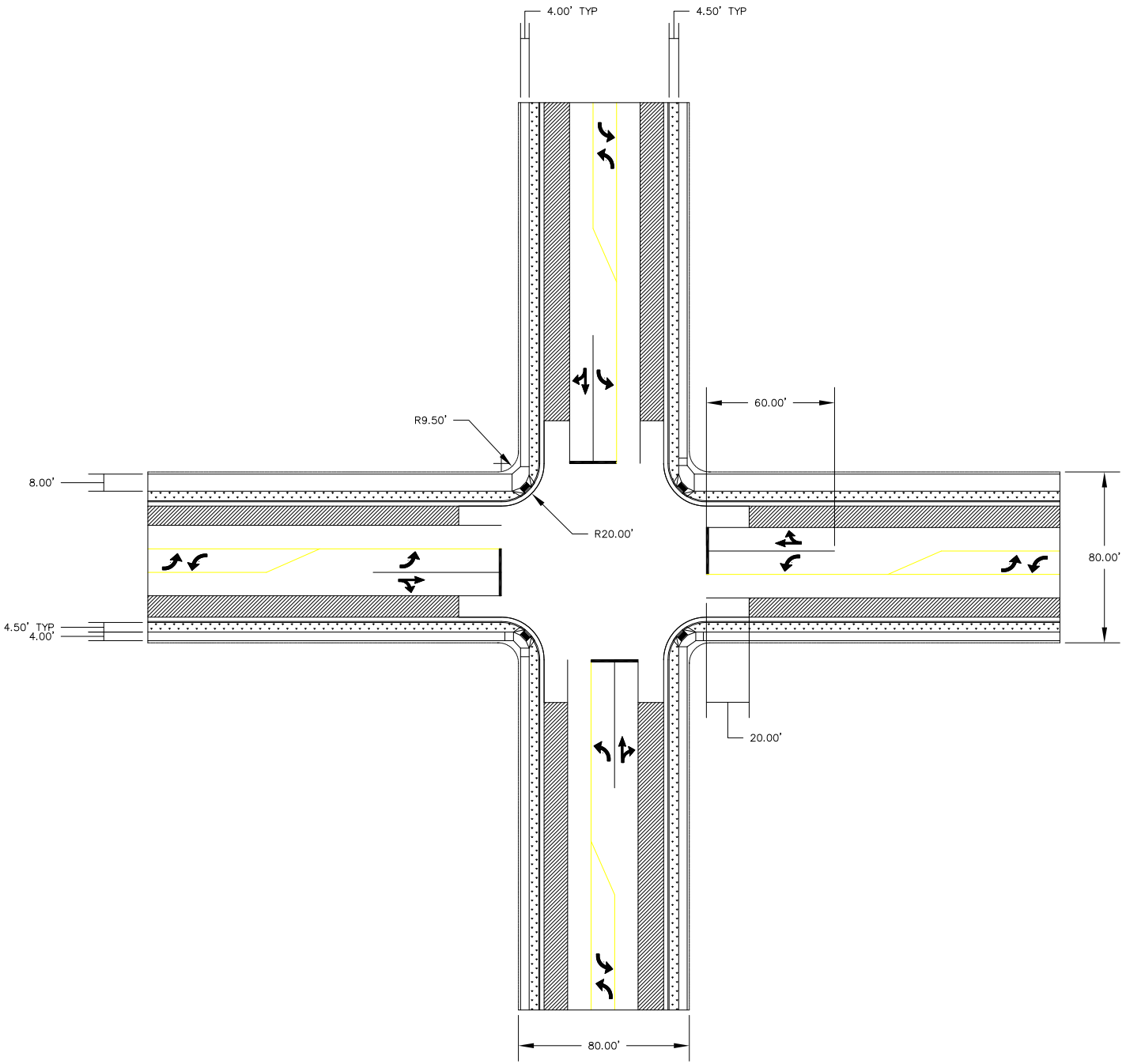
# MINOR ARTERIAL (80') TO MAJOR ARTERIAL (113')



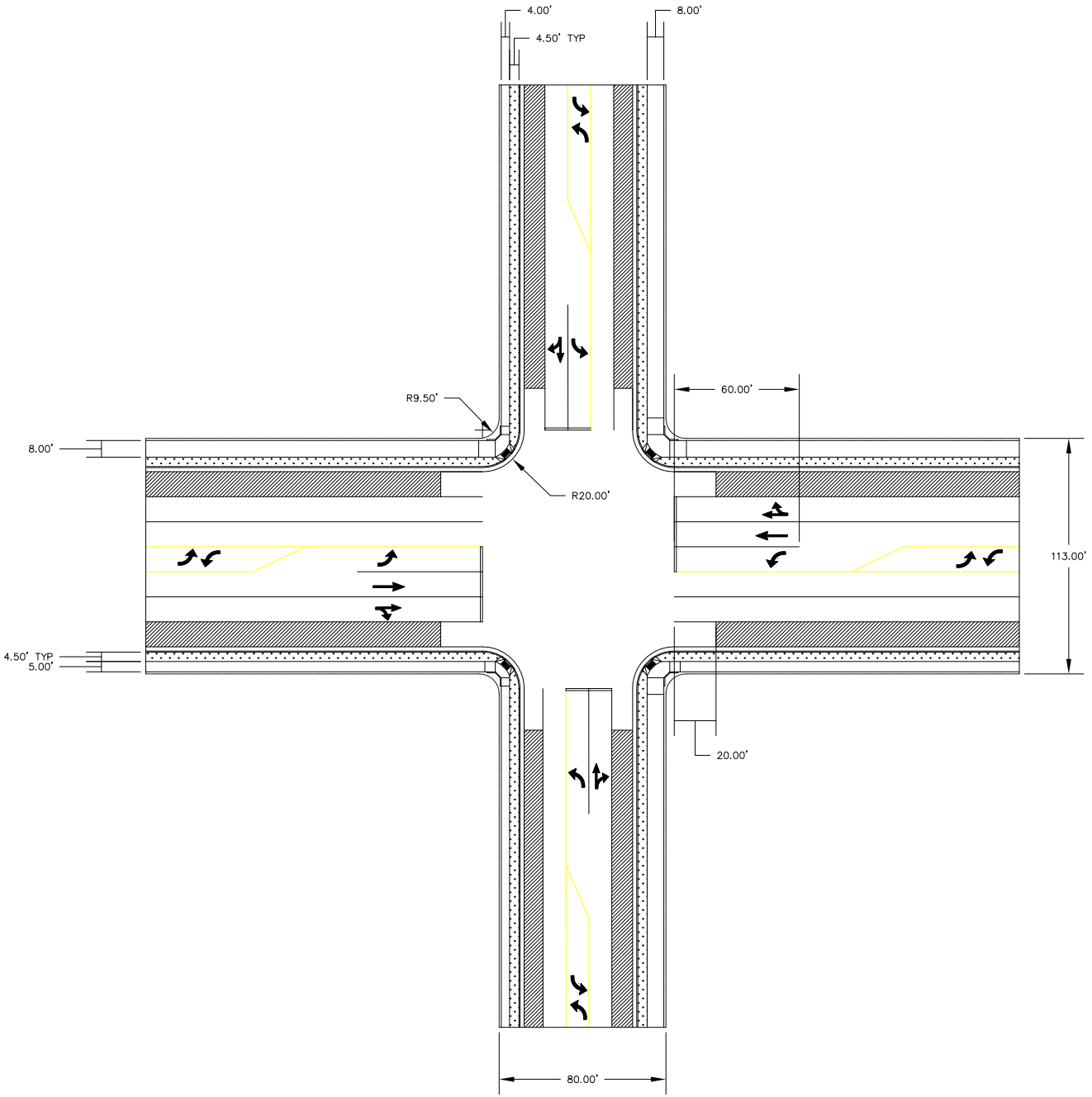
# MINOR ARTERIAL (80') TO MINOR ARTERIAL (80')



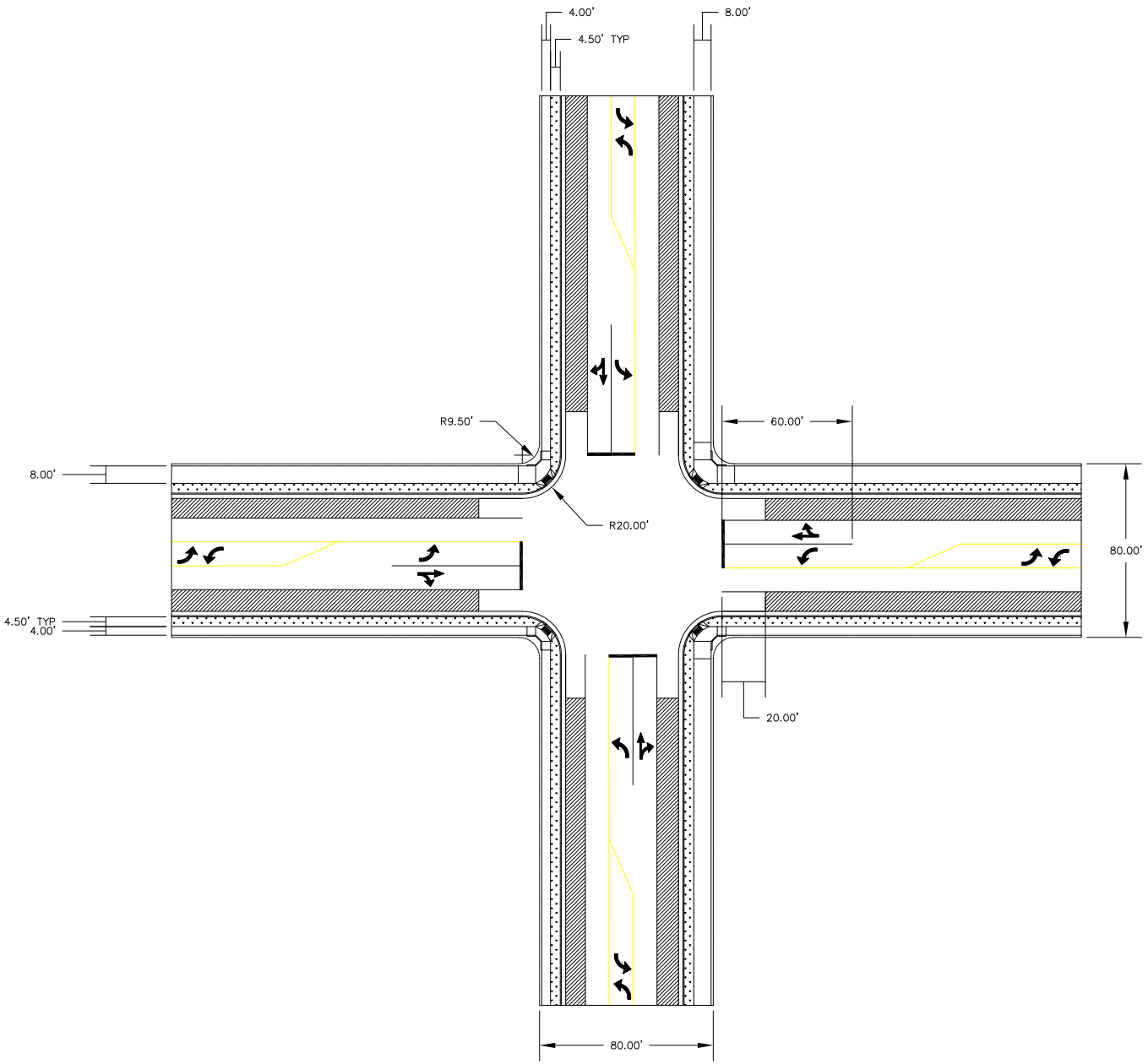
# MINOR ARTERIAL (80') TO MINOR ARTERIAL W/TRAIL (80')



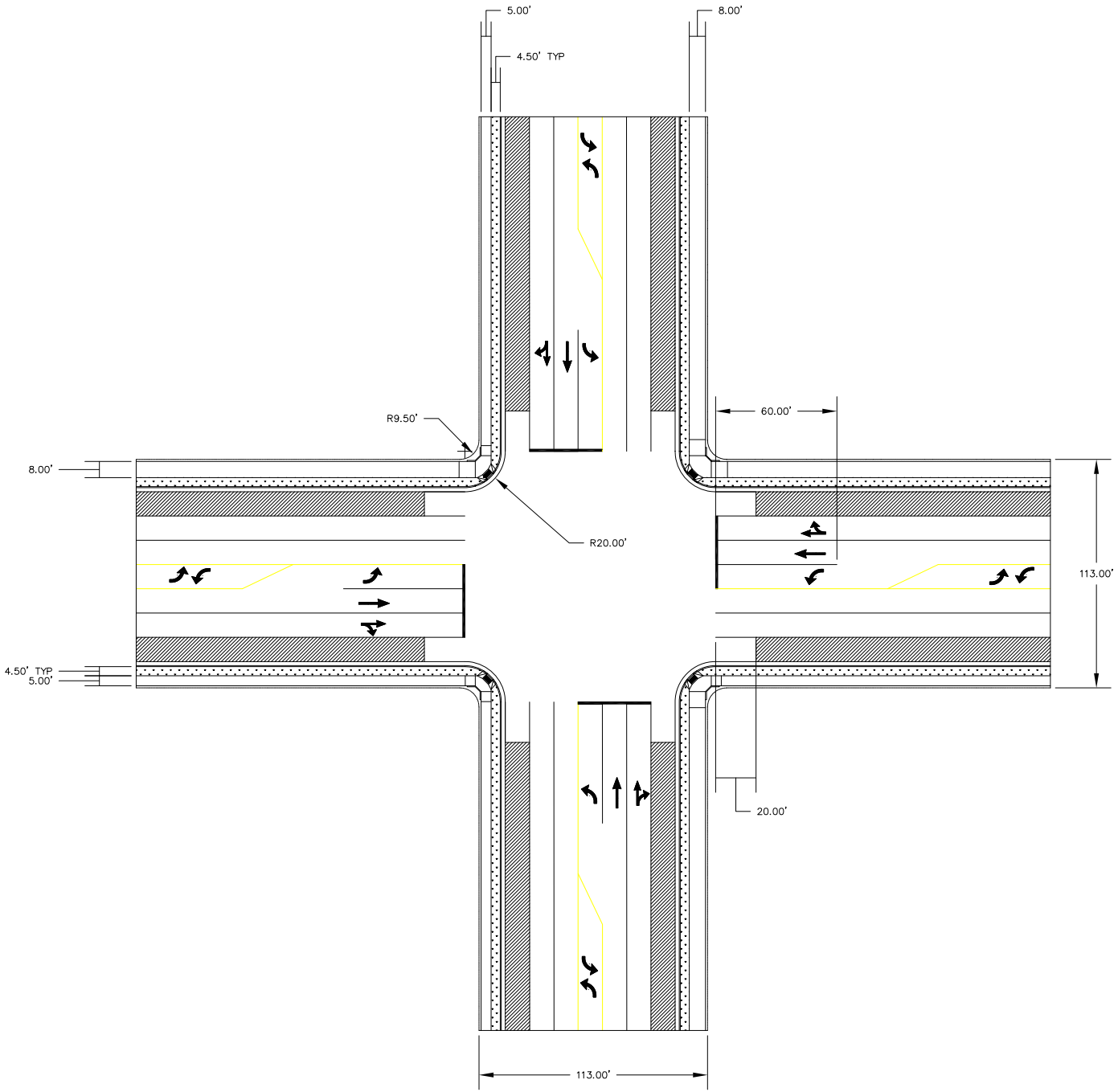
# MINOR ARTERIAL W/TRAIL (80') TO MAJOR ARTERIAL (113')



# MINOR ARTERIAL W/TRAIL (80') TO MINOR ARTERIAL W/TRAIL (80')

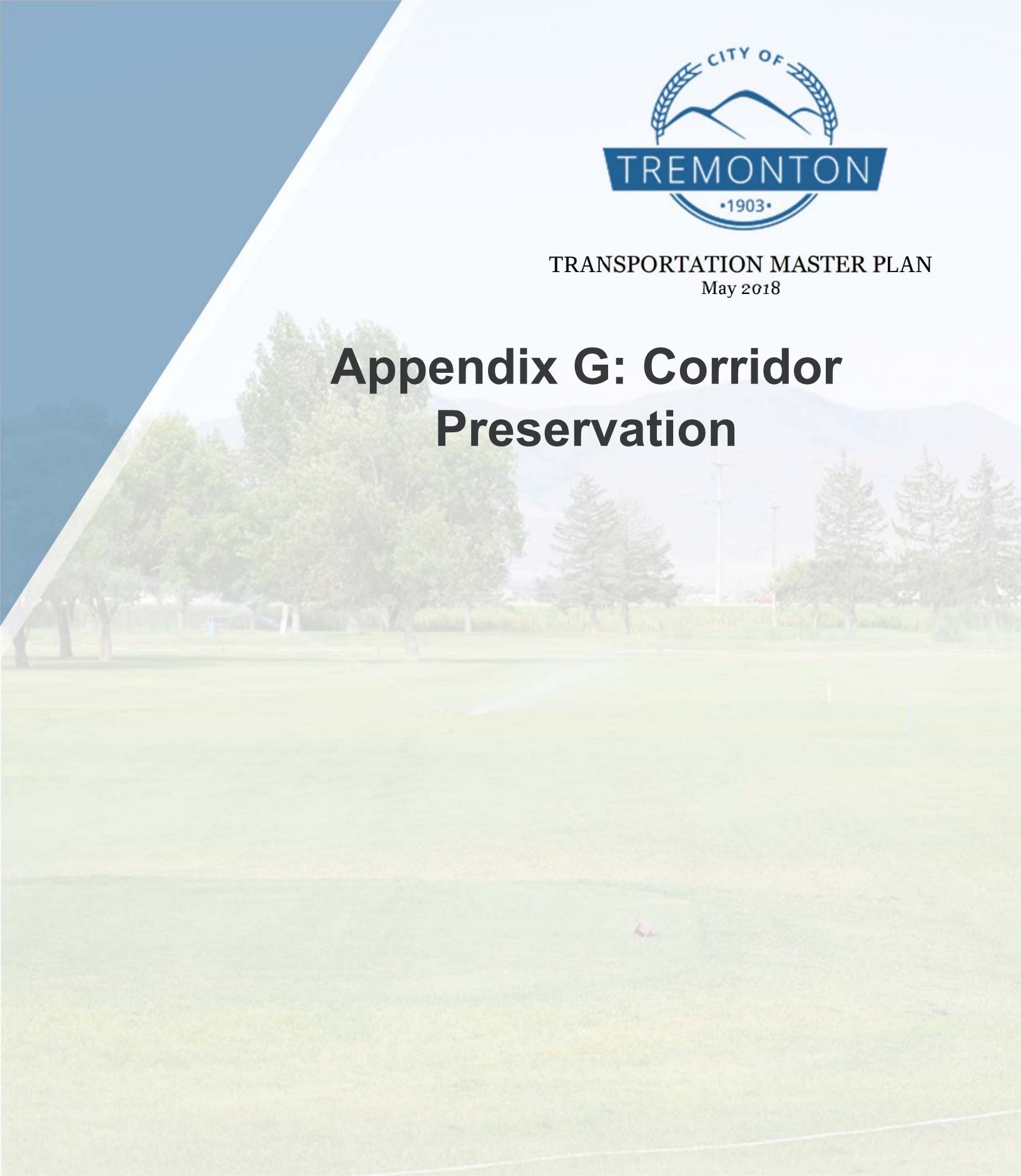


# MAJOR ARTERIAL (113') TO MAJOR ARTERIAL (113')

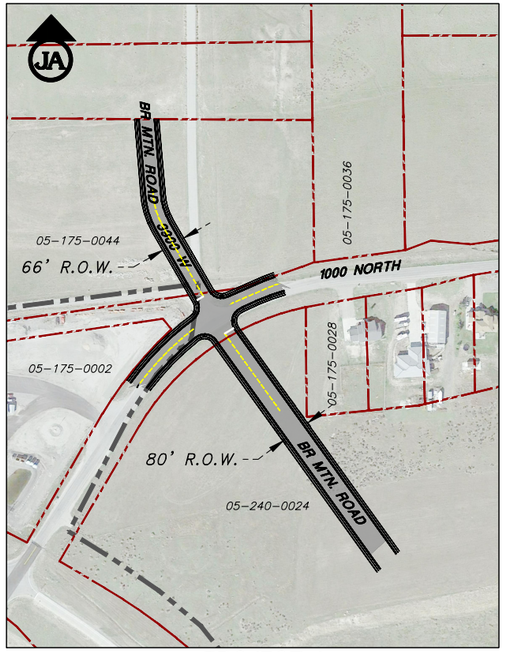


TRANSPORTATION MASTER PLAN
May 2018

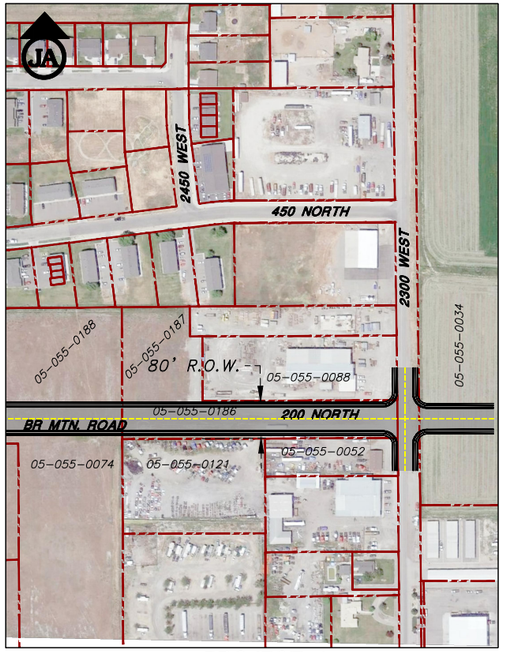
# Appendix G: Corridor Preservation



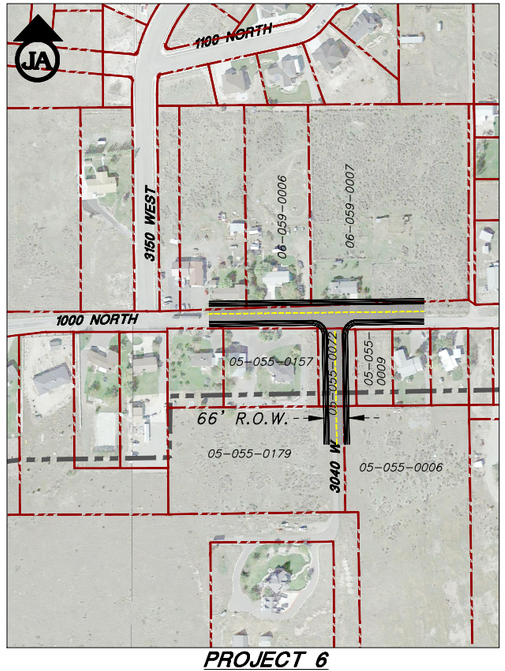
HORROCKS ENGINEERS



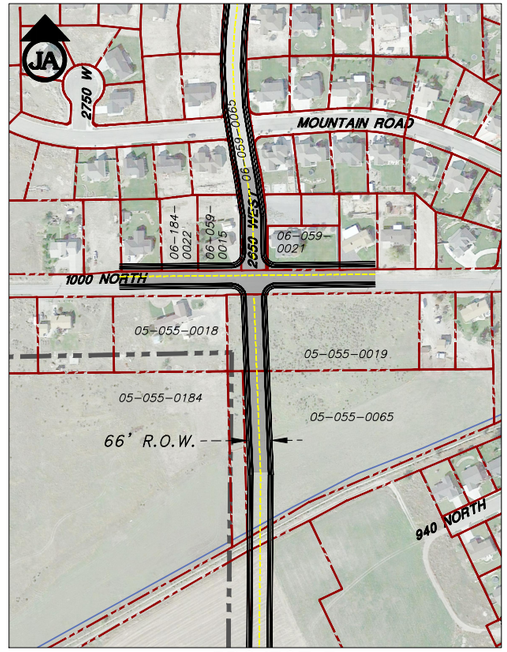

**PROJECT 1**
**NEW ROAD: 1000 NORTH TO PROJECT #3**



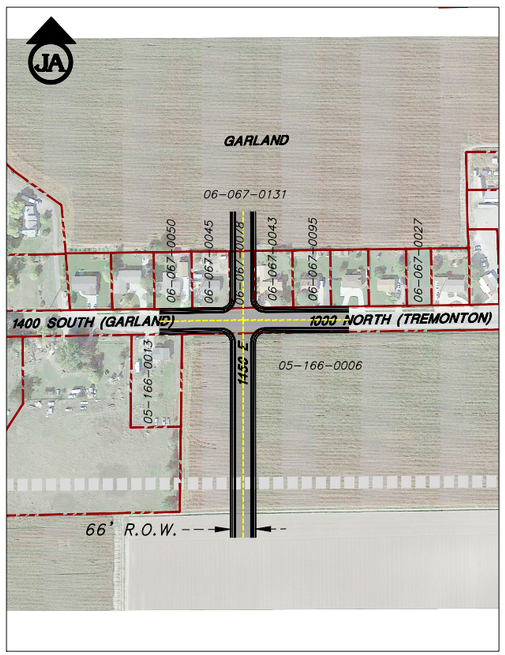

**PROJECT 4**
**NEW ROAD: 1000 NORTH TO 2300 WEST**



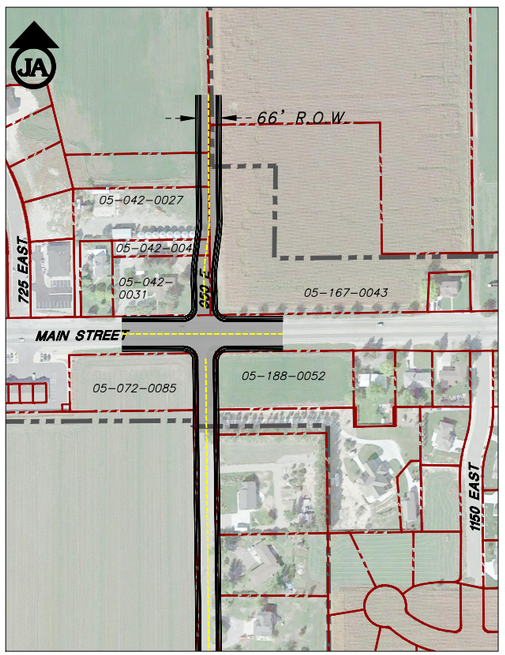

**PROJECT 6**
**NEW ROAD (3040 WEST): 1000 N TO PROJECT #4**



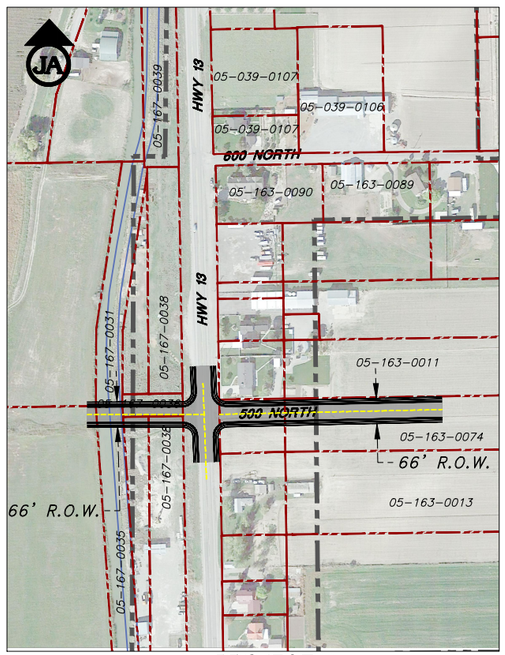

**PROJECT 7**
**2650 WEST EXTENSION TO 1000 NORTH**



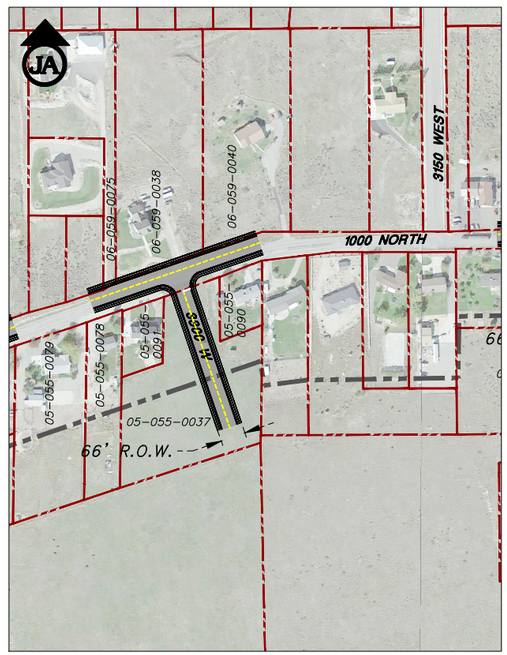

**PROJECT 16**




**PROJECT 16**
**NEW ROAD: 1000 NORTH TO MAIN STREET**




**PROJECT 17**
**NEW ROAD (11600 NORTH):**
**1600 EAST TO PROJECT #16**




**PROJECT 30**
**NEW ROAD (3300 WEST):**
**1000 NORTH TO PROJECT #4***


CONSULTING ENGINEERS
JA JONES & ASSOCIATES
1716 East 5600 South
South Ogden, Utah 84403
ph – (801) 476-9767 fx – (801)476-9768

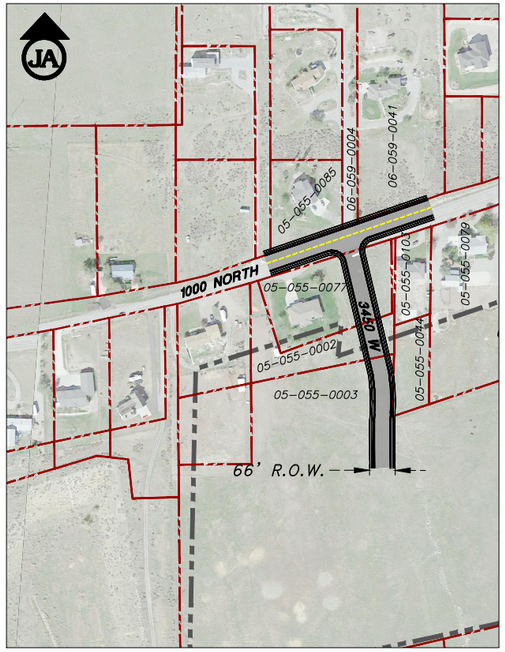

**TREMONTON CITY CORPORATION**
**TRANSPORTATION MASTER PLAN DETAIL INTERSECTIONS**

| REVISION | DATE |
|---|---|
| | |

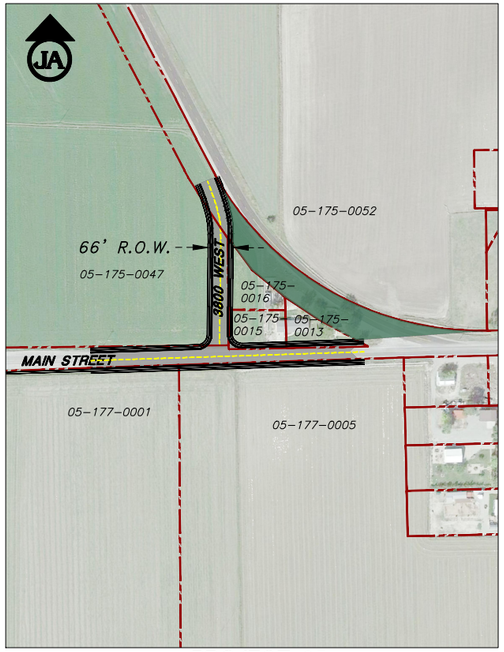
SLS DESIGNED
SLS DRAWN
CLB CHECKED

SCALE:
24"x36" 1" = 200'
11"x17" 1" = 400'

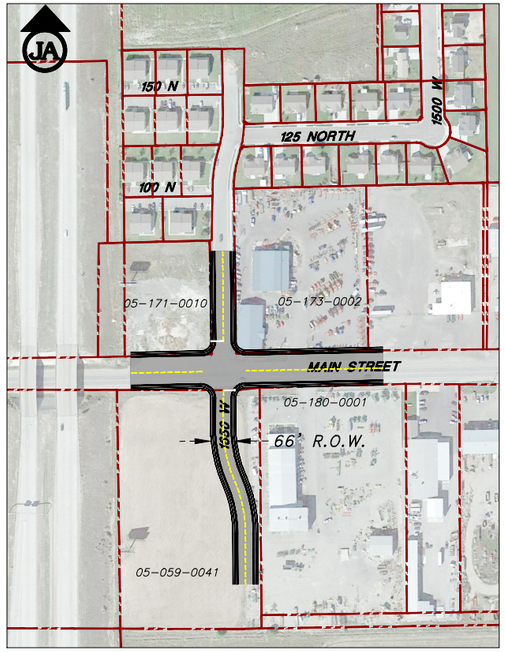
SHEET: 1 OF 1 SHEETS



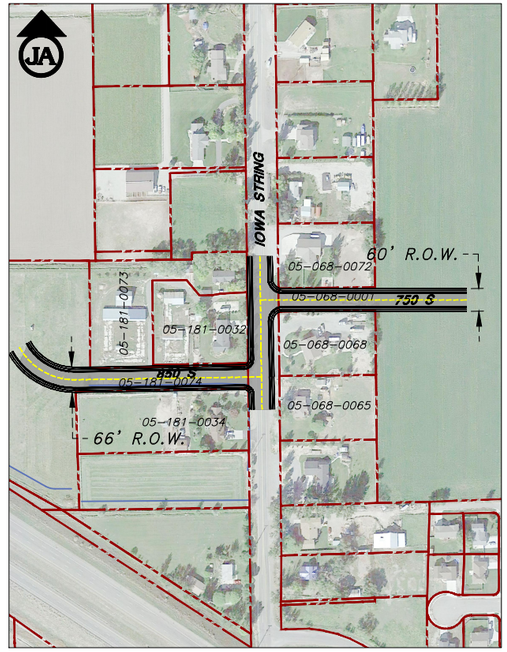

**PROJECT 31**
NEW ROAD (3450 WEST):
1000 NORTH TO PROJECT #4*



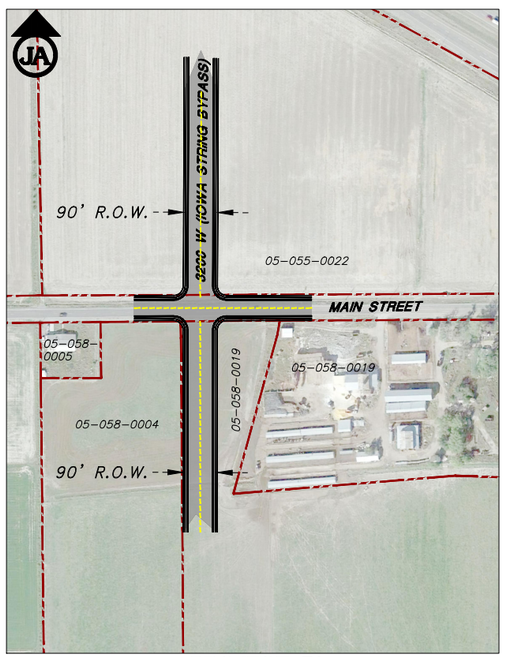

**PROJECT 35**
OLD ROCKY POINT RD: RE-ALIGN
TO CONNECT TO NEW ROCKY POINT RD. & MAIN ST.*




**PROJECT 48**
NEW ROAD: MAIN STREET TO 850 SOUTH




**PROJECT 48**




**PROJECT 71**
NEW ROAD: IOWA STRING ROAD TO MAIN ST.

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TREMONTON CITY CORPORATION
TRANSPORTATION MASTER PLAN DETAIL INTERSECTIONS

| DATE | REVISION |
|---|---|
| | |

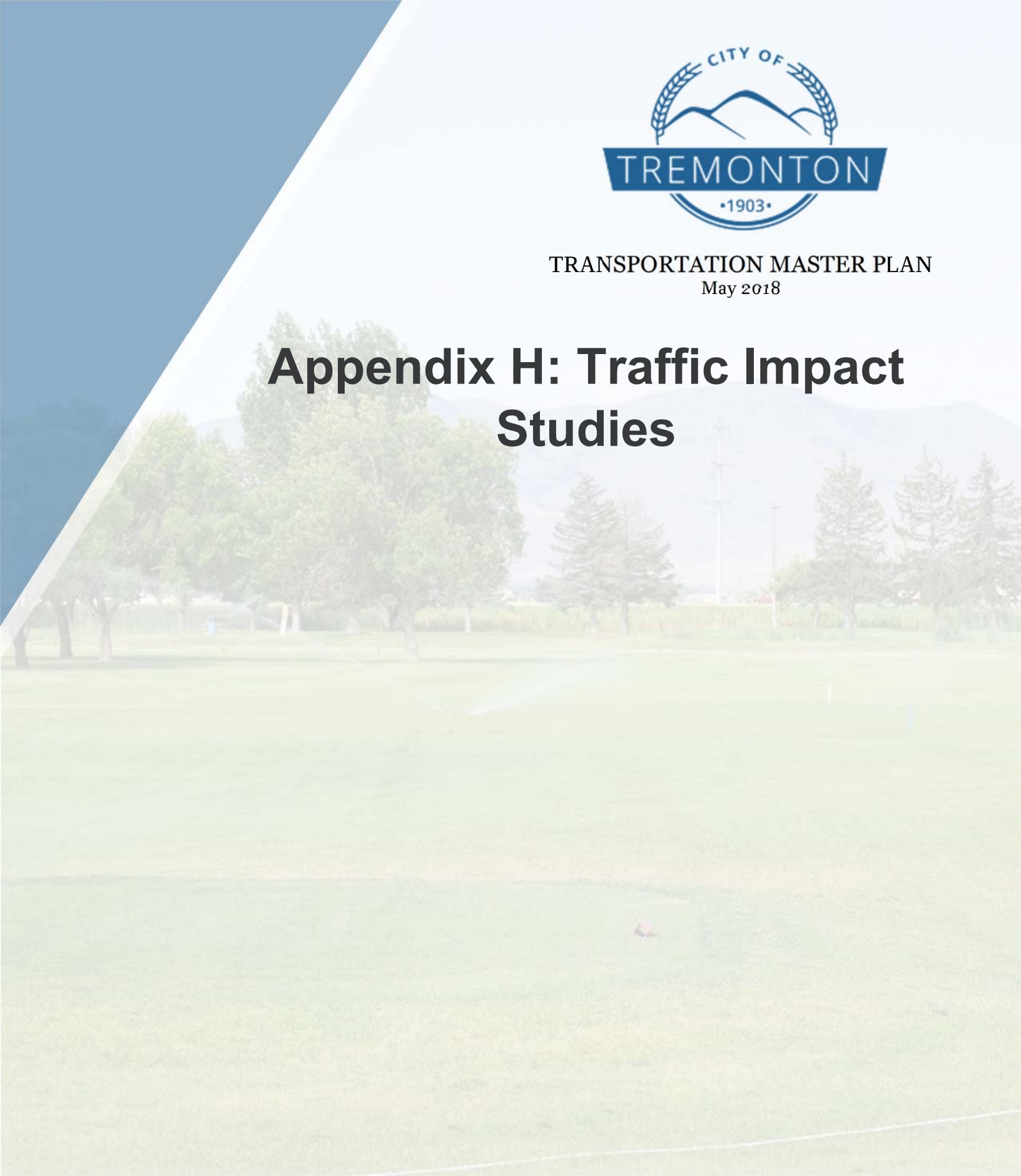
SLS DESIGNED
SLS DRAWN
CLB CHECKED

SCALE:
24"x36" 1" = 200'
11"x17" 1" = 400'

SHEET: 2
OF 1 SHEETS

TRANSPORTATION MASTER PLAN
May 2018

# Appendix H: Traffic Impact Studies



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# Traffic Impact Study Requirements

When a Traffic Impact Study is required the study must be prepared according to the appropriate TIS level as shown below. The traffic study shall, at a minimum, incorporate Tremonton City principles and standards and national practices. Additional requirements and investigation may be imposed upon the applicant as necessary.

**Traffic Study level I**
**Project ADT < 100 trips**

No proposed modifications to traffic signals or roadway elements or geometry.

1. Study Area.

The study area, depending on the size and intensity of the development and surrounding development, may be identified by parcel boundary, area of immediate influence or reasonable travel time boundary.

The study area may be limited to or include property frontage and include neighboring and adjacent parcels. Identify site, cross, and next adjacent up and down stream access points within access category distance of property boundaries.

2. Design year.
Opening day of project

3. Analysis Conditions and Period
Identify site traffic volumes and characteristics.
Identify adjacent street(s) traffic volume and characteristics.

4. Identify right-of-way, geometric boundaries and physical conflicts.
Investigate existence of federal or state, no access or limited access control line.

5. Generate access point capacity analysis as necessary.
Analyze site and adjacent road traffic for the following time periods: weekday A.M. and P.M. peak hours including Saturday peak hours if required by the City Engineer. Identify special event peak hour as necessary (per roadway peak and site peak).

6. Design and Mitigation.
Identify operational concerns and mitigation measures to ensure safe and efficient operation pursuant to appropriate state highway access category.

**Traffic Study Level II**
**Project ADT 100 to 500 trips**

1. Study Area.

The study area, depending on the size and intensity of the development and surrounding development, may be identified by parcel boundary, area of immediate influence or reasonable travel time boundary. Intersection of site access drives with state highways and any signalized and unsignalized intersection within access category distance of property line. Include any identified queuing distance at site and study intersections

*2. Design Year*

Opening day of project

*3. Analysis Period*

Identify site and adjacent road traffic for weekday A.M. and P.M. peak hours (Saturdays if required by the City Engineer).

*4. Data Collection*

Identify site and adjacent street roadway and intersection geometries.
Identify adjacent street(s) traffic volume and characteristics.

*5. Conflict / Capacity Analysis*

Diagram flow of traffic at access point(s) for site and adjacent development.
Perform capacity analysis as determined by the City Engineer.

*6. Right-of-Way Access*

Identify right-of-way, geometric boundaries and physical conflicts.
Investigate existence of federal or state, no access or limited access control line.

*7. Design and Mitigation*

Determine and document safe and efficient operational design needs based on site and study area data. Identify operational concerns and mitigation measures to ensure safe and efficient operation pursuant to appropriate state highway access category.

**Project ADT 500 to 3,000 trips or peak hour < 500 trips.**

*1. Study Area*

The study area, depending on the size and intensity of the development and surrounding development, may be identified by parcel boundary, area of immediate influence or reasonable travel time boundary. An acceptable traffic study boundary is 1/4-1/2 mile on each side of the project site per the City Engineer.

Intersection of site access drives with state highways and any signalized and unsignalized intersection within access category distance of property line. Include any identified queuing distance at site and study intersections.

*2. Design Year*

Opening day of project and five year after project completion.
Document and include all phases of development (includes out pad parcels).

*3. Analysis Period*

Analyze site and adjacent road traffic for weekday A.M. and P.M. peak hours including Saturday peak hours if identified as a high Saturday use.. Identify special event peak hour as necessary (adjacent roadway peak and site peak).

*4. Data Collection*

a. Daily and Turning Movement counts.
b. Identify site and adjacent street roadway and intersection geometries.
c. Traffic control devices including traffic signals and regulatory signs.
d. Traffic accident data

*5. Trip Generation*

Use equations or rates available in latest edition of ITE Trip Generation. Where developed equations are unavailable for intended land use, perform trip rate study and estimation following ITE procedures or develop justified trip rate agreed to by the Department.

*6. Trip Distribution and Assignment*

Document distribution and assignment of existing, site, background, and future traffic volumes on surrounding network of study area.

*7. Conflict / Capacity Analysis*

Diagram flow of traffic at access point(s) for site and adjacent development.
Perform capacity analysis for daily and peak hour volumes

*8. Traffic Signal Impacts*

For modified and proposed traffic signals:
a. Traffic Signal Warrants as identified.
b. Traffic Signal drawings as identified.
c. Queuing Analysis

*9. Design and Mitigation.*

Determine and document safe and efficient operational design needs based on site and study area data. Identify operational concerns and mitigation measures to ensure safe and efficient operation pursuant to appropriate state highway access category.

**Traffic Study Level III**

Project ADT 3,000 to10,000 trips or peak hour traffic 500 to 1,200 trips.

*1. Study Area*

The study area, depending on the size and intensity of the development and surrounding development, may be identified by parcel boundary, area of immediate influence or reasonable travel time boundary.

An acceptable traffic study boundary should be based on travel time or by market area influence. Intersection of site access drives with state highways and any intersection within 1/2 mile of property line on each side of project site.

*2. Design Year*

Opening day of project, five years and twenty years after opening.
Document and include all phases of development (includes out pad parcels).

*3. Analysis period*

For each design year analyze site and adjacent road traffic for weekday A.M. and P.M. peak hours including Saturday peak hours if identified as needed per the City Engineer. Identify special event peak hour as necessary (adjacent roadway peak and site peak).

*4. Data Collection*

a. Daily and Turning movement counts.
b. Identify site and adjacent street roadway and intersection geometries.
c. Traffic control devices including traffic signals and regulatory signs.
d. Automatic continuous traffic counts for at least 48 hours.
e. Traffic accident data.

*5. Trip Generation*

Use equations or rates available in latest edition of ITE Trip Generation. Where developed equations are unavailable for intended land use, perform trip rate study and estimation following ITE procedures or develop justified trip rate agreed to by the Department.

*6. Trip Distributions and Assignment*

Document distribution and assignment of existing, site, background, and future traffic volumes on surrounding network of study area.

*7. Capacity Analysis*

a. Level of Service (LOS) for all intersections.
b. LOS for existing conditions, design year without project, design year with project.

*8. Traffic Signal Impacts. For proposed Traffic Signals:*

a. Traffic Signal Warrants as identified.
b. Traffic Signal drawings as identified.
c. Queuing Analysis.
d. Traffic Systems Analysis. Includes acceleration, deceleration and weaving.
e. Traffic Coordination Analysis

*10. Accident and Traffic Safety Analysis*

Existing vs. as proposed development.

*11. Design and Mitigation*

Determine and document safe and efficient operational design needs based on site and study area data. Identify operational concerns and mitigation measures to ensure safe and efficient operation pursuant to appropriate state highway access category.

**Traffic Study Level IV**

Project ADT greater than 10,000 trips or peak hour traffic > 1,200 vehicles per hour.

*1. Study Area*

The study area, depending on the size and intensity of the development, will include the surrounding roadways ½ mile from the parcel boundary or reasonable travel time boundary.

*2. Design Year*

Opening day of project, five years and twenty years after opening.
Document and include all phases of development (includes out pad parcels).

*3. Analysis period*

For each design year analyze site and adjacent road traffic for weekday A.M. and P.M. peak hours including Saturday peak hours as needed per the City Engineer. Identify special event peak hour as necessary (adjacent roadway peak and site peak).

*4. Data Collection*

a. Daily and Turning movement counts.
b. Identify site and adjacent street roadway and intersection geometries.
c. Traffic control devices including traffic signals and regulatory signs.
d. Automatic continuous traffic counts for at least 24 hours or obtain ADT from local or state agencies
e. Traffic accident data.

*5. Trip Generation*

Use equations or rates available in latest edition of ITE Trip Generation. Where developed equations are unavailable for intended land use, perform trip rate study and estimation following ITE procedures or develop justified trip rate agreed to by the Department.

*6. Trip Distributions and Assignment*

Document distribution and assignment of existing, site, background, and future traffic volumes on surrounding network of study area.

*7. Capacity Analysis*

a. Level of Service (LOS) for all intersections.
b. LOS for existing conditions, design year without project, design year with project.

*8. Traffic Signal Impacts. For proposed traffic signals:*

a. Traffic Signal Warrants as identified.
b. Traffic Signal drawings as identified.
c. Queuing Analysis.
d. Traffic Systems Analysis. Includes acceleration, deceleration and weaving.
e. Traffic Coordination Analysis.

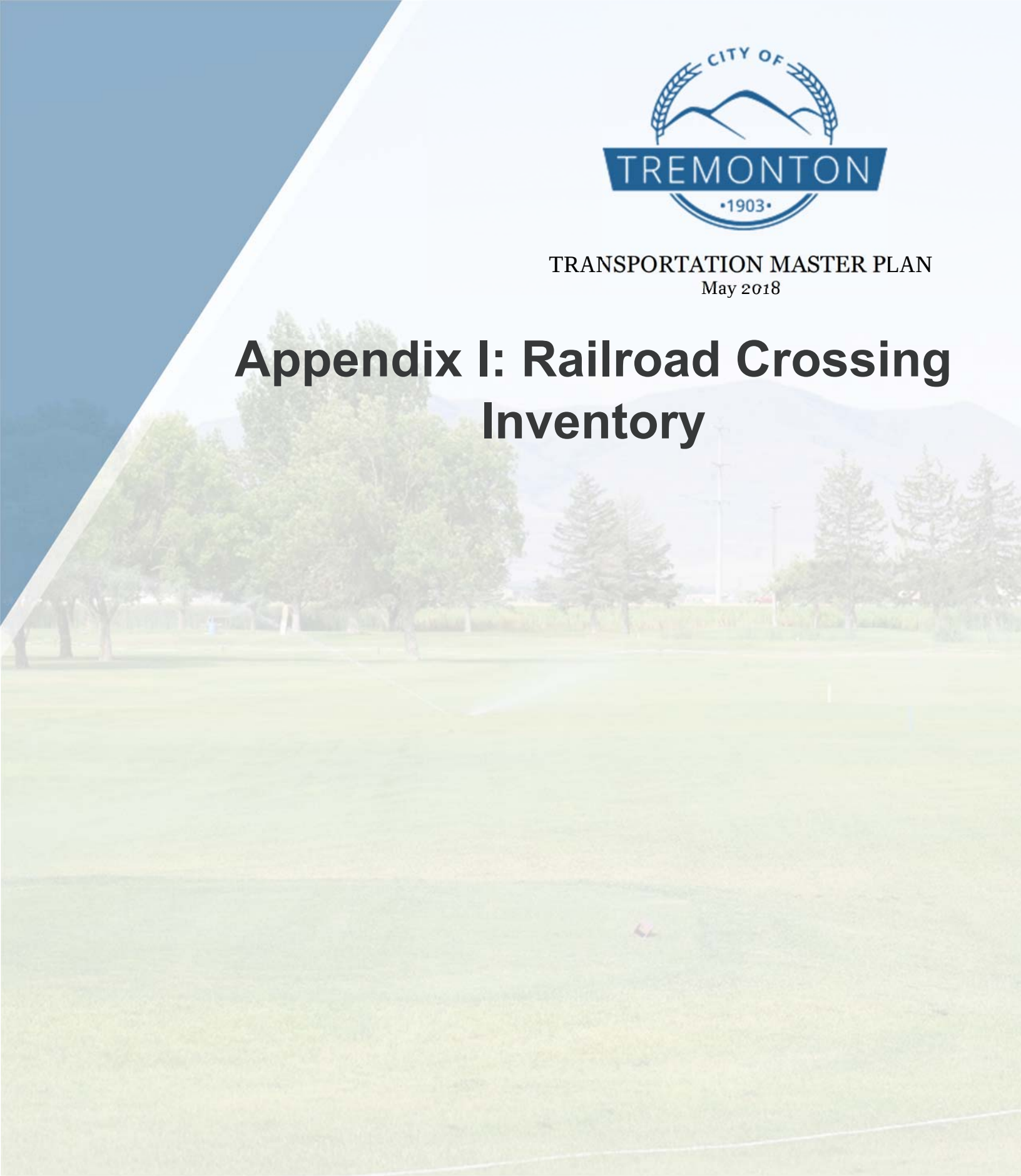
*9. Accident and Traffic Safety Analysis. Existing vs. as proposed develop*

*10. Design and Mitigation*

Determine and document safe and efficient operational design needs based on site and study area data. Identify operational concerns and mitigation measures to ensure safe and efficient operation pursuant to appropriate state highway access category.

TRANSPORTATION MASTER PLAN
May 2018

# Appendix I: Railroad Crossing Inventory



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# Tremonton Railroad Crossing Inventory

## Introduction

Railroad crossings, specifically pedestrian crossings are governed by the *UDOT Pedestrian Grade Crossing Manual*. The manual can be accessed online at *https://www.udot.utah.gov/*. Within the manual, guidelines are set forth concerning pedestrian crossings at railroads. Pedestrian control devices are also set forth, which include the following:

- Detectable warning surfaces
- Look Signs (MUTCD R15-8) and Grade Crossing (Crossbuck) Signs (MUTCD R15-1)
- Audible Devices
- Pavement Markings, such as "STOP" before the crossing
- Pathway delineation, which includes markings, colors and/or textures which guide pedestrians through the crossing
- Flashing-Light Signals (if train speed exceeds 35 mph)

The use of pedestrian control devices is guided by the following table for different categories of crossings as shown below (Table 4 of *UDOT Pedestrian Grade Crossing Manual)*. Additionally, some crossings may require additional safety treatments based on site specific evaluations.

| SAFETY TREATMENT | URBAN CROSSINGS | | RURAL CROSSINGS |
|---|---|---|---|
| | Semi-Exclusive Alignments | Street-Running Alignments | |
| Crossbuck Assembly | ● | | ● |
| Detectable Warning Surface | ● | ● | ● |
| Look Sign (R15-8) | ● | ● | |
| "Stop" Pavement Marking | ● | | |
| Pathway Delineation | ● | ● | ● |

When determining which pedestrian control devices to implement at crossings, pedestrian sight distance must also be taken into account. Minimum sight distances are based on train speed, with higher train speeds requiring larger sight distances (see also Table 5 of *UDOT Pedestrian Grade Crossing Manual*). If the minimum sight distance is not met, additional control devices, such as blackout signs, may be necessary based on results of an engineering study. Additionally, bicycle sight distances should be considered. These may be calculated based on train speed and bicycle speed (See Table 6 of *UDOT Pedestrian Grade Crossing Manual*).

Included in this report is an inventory of railroad crossings found within the current city limits of as well as the future annexation boundary of Tremonton City. The existing conditions as well as recommended improvements based on the *UDOT Pedestrian Grade Crossing Manual* are included for each crossing.

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# Iowa String Road


## Existing Facilities

- Two railroad crossing gates with stop bars located about 10 feet in front of the arm.
- Street markings and a railroad crossing sign are located approximately 235 feet before the crossing in both directions.
- Curbs and gutters are also installed on the side of the road.

## Recommended Improvements

- ADA pedestrian crossing facilities
    - Detectable Warning Surface
    - LOOK Sign (R15-8)
    - “Stop” Pavement Marking
    - Pathway Delineation
- Restriping crossing lines

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# 1000 North


## Existing facilities

- Two railroad crossing gates with stop bars located approximately 10 feet before the arm.
- Street markings and a railroad crossing sign are located approximately 235 feet preceding the crossing

## Recommended Improvements

- ADA pedestrian crossing facilities
    - Detectable warning surface
    - LOOK Sign (R15-8)
    - “Stop” Pavement Marking
    - Pathway Delineation
- Curb and Gutter

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# 600 North


## Existing facilities

- Stop bars with stop signs on either side of the crossing, with street markings and signage about 120 feet before the crossing.
- Curbside parking is available on the eastbound side of the crossing beginning 45 feet after the crossing.
- A curb and gutter are in place on the south side of the road.
- Existing pedestrian facilities consist of a crosswalk on the south side of the road with a slight jog in the crosswalk located 20 feet before the crossing to facilitate the on-street parking.

## Recommended Improvements

- ADA pedestrian crossing facilities
    - Detectable warning surface
    - LOOK Sign (R15-8)
    - Pathway Delineation
- Crossing Gates

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# 300 North


## Existing facilities

- Stop bars with stop signs on either side of the crossing, with street markings and signage approximately 120 feet before the crossing.
- Sidewalk located on the north side of the crossing.

## Recommended Improvements

- ADA pedestrian crossing facilities
  - Detectable warning surface
  - LOOK Sign (R15-8)
  - “Stop” Pavement Marking
  - Pathway Delineation
- Crossing Gates
- Curb and Gutter

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# 200 North


## Existing facilities

- Stop bars with yield signs on either side of the crossing
- The westbound crossing has street markings ending 10 feet before the crossing, and eastbound road markings end 110 feet before the crossing.

## Recommended Improvements

- ADA pedestrian crossing facilities
    - Detectable warning surface
    - LOOK Sign (R15-8)
    - “Stop” Pavement Marking
    - Pathway Delineation
- Crossing Gates
- Re-stripe roadway

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# Main Street

## Existing facilities

- Two railroad crossing gates with stop bars located about 10 feet in front of the arm.
- Street markings and a railroad crossing sign are located approximately 120 feet before the crossing in the westbound direction, and 220 feet before the crossing in the eastbound direction. The intersection of Main Street and 200 West is located in between the street markings and the crossing.
- A curb and gutter are installed on both sides of the street.
- Pedestrian facilities at this crossing include concrete sidewalks on both sides of the road. The sidewalks include detectable warning surfaces and jog outwards before the crossing to encourage pedestrians using the facility to look down the tracks before crossing.

## Recommended Improvements

- ADA Pedestrian Crossing Facilities
    - LOOK Sign (R15-8)
    - Pathway Delineation

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# 600 South


## Existing facilities

- Stop bars with stop signs on either side of the crossing.
- Street markings and railroad crossing signage are located 190 feet before the crossing in the westbound direction, and 140 feet before the crossing in the eastbound direction.
- A curb and gutter are installed on both sides of the crossing.
- Pedestrian facilities at this crossing consist of a crosswalk on the north side of the road.

## Recommended Upgrades

- ADA pedestrian crossing facilities
    - Detectable warning surface
    - LOOK Sign (R15-8)
    - Pathway Delineation
- Crossing Gates

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# 1200 South


## Existing facilities

- Two railroad crossing gates with stop bars located about 10 feet in front of the arm.
- Street markings and railroad crossing signage are located 250 feet before the crossing in both eastbound and westbound directions. The intersections of Century Drive & 1200 South and 6400 West & 1200 South are located between the crossings and the street markings on the west and east sides of the crossing respectively.

## Recommended Upgrades

- ADA pedestrian crossing facilities
  - Detectable warning surface
  - LOOK Sign (R15-8)
  - “Stop” Pavement Marking
  - Pathway Delineation
- Re-stripe Roadway
- Curb and Gutter

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# 10000 North


## Existing Facilities

- stop bar and yield sign located on both sides of the crossing as well as signage and street markings located approximately 165 feet before the crossing in the eastbound direction.

## Recommended Upgrades

- ADA pedestrian crossing facilities
  - Detectable warning surface
  - Pathway Delineation
- Crossing Gates
- Curb and Gutter