

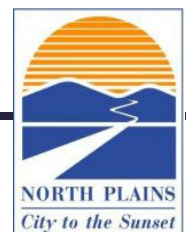


TRANSPORTATION SYSTEM PLAN

2019-2040

City of North Plains

Adopted April 15, 2019



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The contents of this document do not necessarily reflect views or policies of the State of Oregon.

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1.0 INTRODUCTION

The North Plains Transportation System Plan (TSP) provides the City with a long-range vision for the transportation system. Through coordination with Washington County, ODOT, and the community of North Plains, the TSP was created to help guide the City in prioritizing and budgeting for the transportation needs through the year 2040.

This plan provides an evaluation of system-wide deficiencies and needs, as well as future impacts on the system as the City continues to grow. The TSP outlines improvement projects and strategies to accommodate a balanced and safe transportation system and to enhance the quality of life for North Plains residents.

The plan is organized into a strategy for implementing priority projects and a vision for the future implementation of aspirational projects. The priority project plan provides the City with guidance on the priority of projects and funding sources and sets a foundation for budgeting, grant sources, and development driven projects. The aspirational project plan provides a longer-range vision of projects that the City would like to implement in the future if additional funding is available.

This plan is intended to provide the City with flexibility on the timing and implementation of projects and to allow the city to make improvements responsive to how the community grows in the next 20 years.

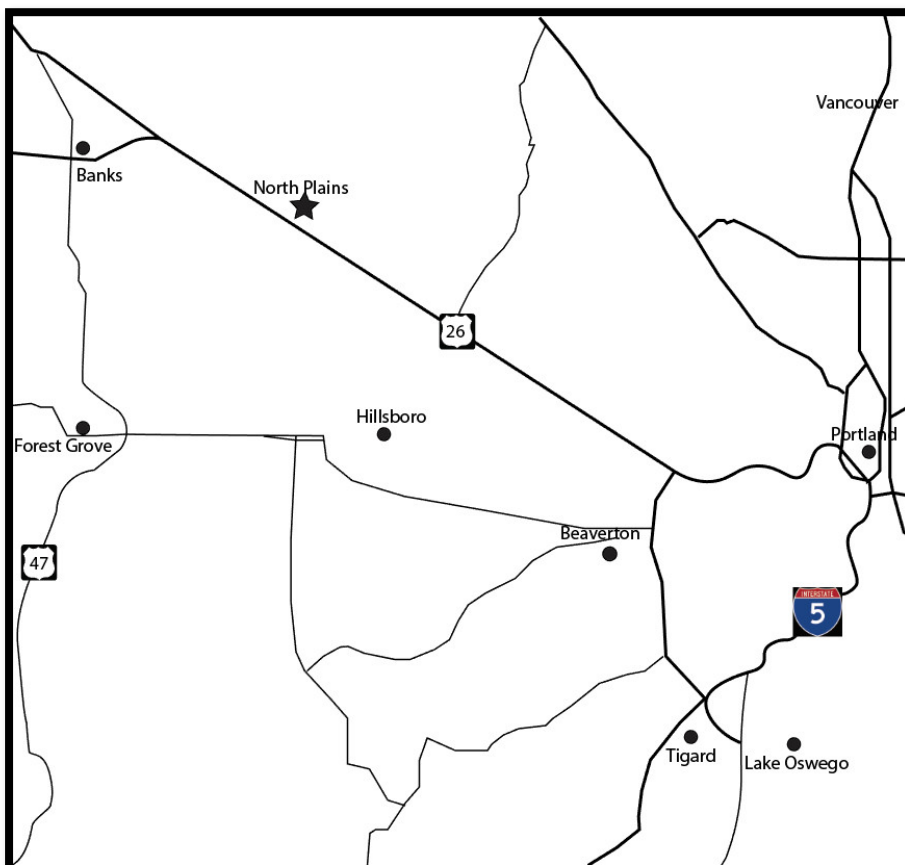


Figure 1: North Plains
Vicinity Map

PLAN BACKGROUND

North Plains' previous TSP was adopted in the year 2004 and provided system improvement recommendations through the year 2020. Since adoption, there have been several impactful changes to the City including widening and upgrades to the Highway 26/Glencoe Rd interchange, substantial increase in residential home building, expansion of the City to the east along West Union Road, increase in commercial/industrial use along West Union Road, and an increase in employment opportunity within a relatively short distance to North Plains.

The City has seen a significant number of residential homes built within the past 5 years with more than 500 homes slated to be built in the next few years north of North Ave. The population and employment projections within the area indicate that North Plains will triple the number of homes in the next 20 years and almost double the number of jobs. North Plains is located within 15 minutes from Portland and Hillsboro where many of the residents work. The large commuting population and increase in housing will require transportation improvements along the City's major roadways to ensure that roadway mobility, vehicle safety, and community goals are met. Additionally, the City will need to provide citywide bicycle and pedestrian improvements to improve safety and efficiency of these modes of travel.

This TSP was developed in conjunction with, and provides the transportation element of, the City's Comprehensive Plan. The TSP is based on the Comprehensive Plan's land use assumptions, anticipated growth in population and employment, and provides the policy and project framework to guide the city in transportation project needs through the year 2040.

The Oregon Transportation Planning Rule, Oregon Administrative Rule 660-012-000, requires that cities develop a coordinated plan between transportation planning and land use planning and that plans provide a network of transportation facilities that provide for all modes of transportation options. Consistent with this ruling, this plan considers the needs of pedestrians, bicycles, and automobiles, and provides for a balanced improvement plan that will benefit all modes of transportation.

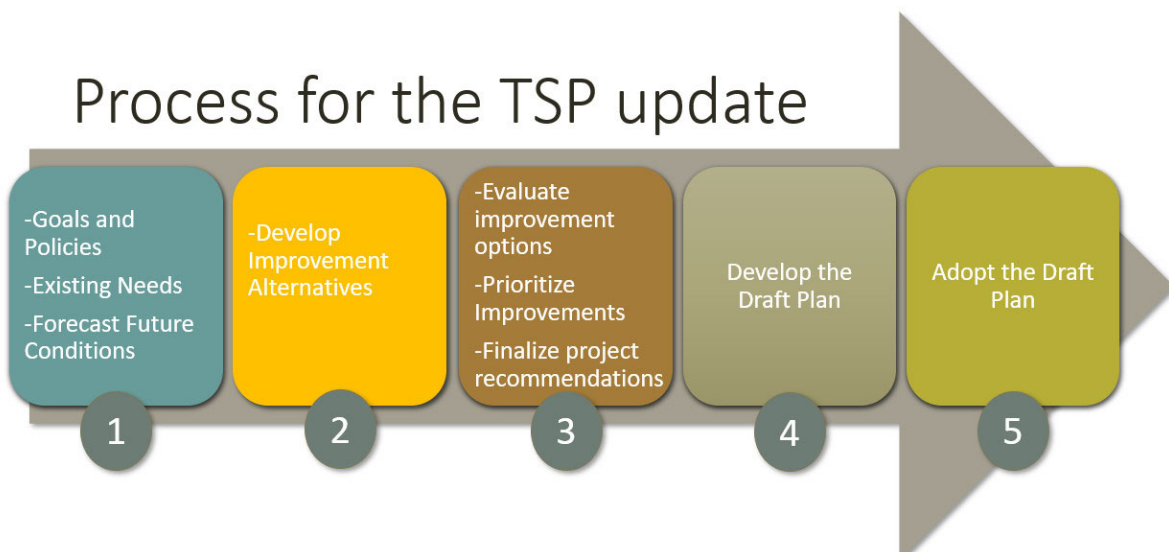
PLAN DEVELOPMENT AND PUBLIC PROCESS

PLAN DEVELOPMENT

The development of this TSP followed a 5-step planning and evaluation process. The process provided a systematic method for evaluation and feedback of the system deficiencies, needs, future growth, and comprehensive systemwide improvement needs.

- **Evaluation of Needs:** The planning process began with a discussion of the prioritization of the City's Goals and Objectives for the transportation system and how transportation projects will be evaluated and prioritized. The current transportation system was evaluated for existing gaps and deficiencies highlighting the areas in which improvements were needed. Using the comprehensive plan land uses (lot zoning), population and employment forecasts, as well as anticipated locations of development and growth, the future impacts to the system were determined and evaluated for safety, capacity, and functionality. The locations where improvements were needed were identified for project considerations.
- **Develop Improvement Alternatives:** Transportation system improvement projects that addressed all the identified needs and deficiencies were developed. The projects included improvements for safety, intersection and roadway capacity, pedestrian travel needs, and bicycle travel needs.
- **Prioritize Improvements:** Each of the projects were evaluated using the previously developed Goals and Objectives and ranked according to how the improvements met the goals. The ranked projects were evaluated for cost and presented to the community for feedback on improvement priority. The Goals and Objectives criteria, project cost, community support, and practicality for implementation guided which projects are included on the Financially Constrained List and which ones are considered future aspirational projects.
- **Develop the Draft Plan:** The draft TSP document was developed and provided to the stakeholders and community for review.
- **Plan Adoption:** The Draft Plan was discussed through a series of public adoption hearings.

Process for the TSP update



PUBLIC PROCESS

The TSP planning process was guided by the City, community, and agency representatives that made up the Technical Advisory Committee (TAC) and Project Advisory Committee (PAC).

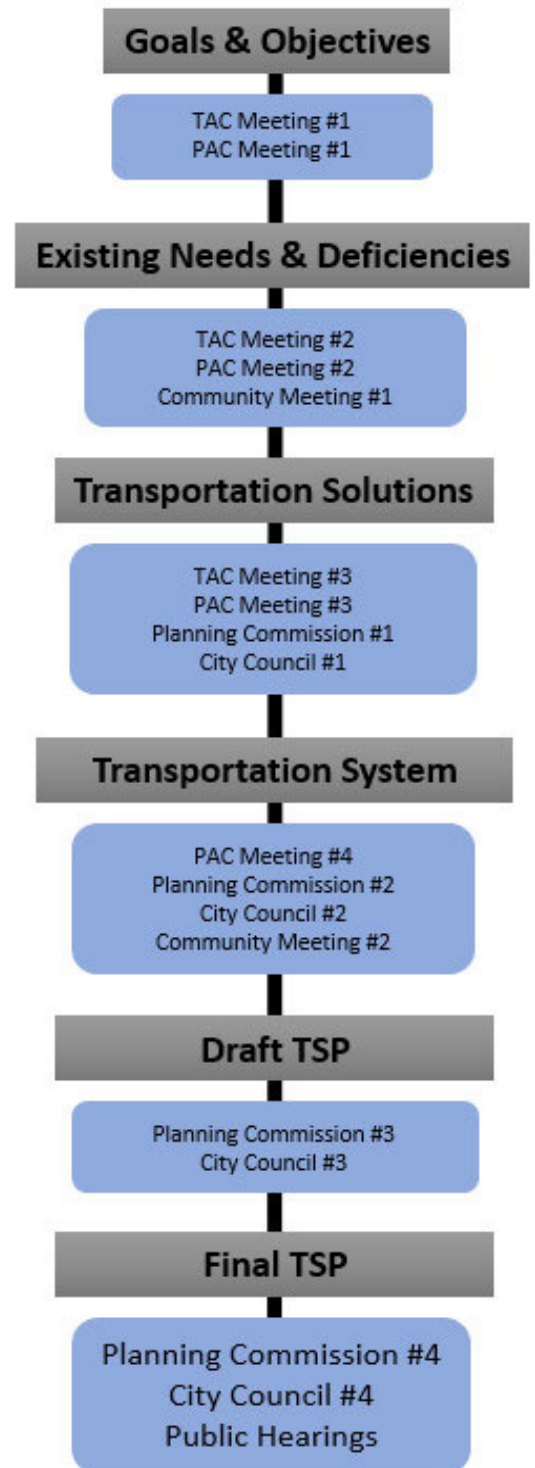
The TAC is a committee comprised of local, county, and state agency representatives that provided the technical and policy evaluation and guidance. Throughout the process, the TAC members reviewed and provided feedback on the evaluation of system needs and alternatives, policies, and ensured that the City's TSP collaborated with County and State goals and regulations.

The PAC is a committee made of community members that helped to carry out the community goals and vision. The PAC worked to ensure that the future transportation system, transportation projects, and implementation of the projects met the community goals and visions.

Members of the TAC and PAC provided review and feedback during the evaluation and development of the plan. The TAC/PAC participated in 4 meetings that focused on goals and objectives, existing needs and deficiencies, future needs and deficiencies, and project prioritization.

During the plan development phase, two public open houses were held at key periods in the process where the community was invited to attend, participate, and provide feedback. The first open house was held to gather information about existing needs and deficiencies in the transportation system and to encourage the community to discuss values, goals, and visions for the future transportation system. The second open house presented the high priority projects and allowed the community to learn what the future growth would look like, development of system alternatives, and to provide feedback on which projects were important to the community. Additionally, a website was created where all documents were provided to the community, and the community was given a chance review and provide written response to the documents.

Two work sessions and two presentations were held with the City Council and Planning Commission (and open to the public) to discuss key elements of the plan development and process.



2. GOALS AND OBJECTIVES

The Transportation System Plan goals and objectives were developed to guide the priorities of projects and improvements and to guide the timing of system projects. The goals and objectives were developed through collaboration with the City and the advisory committee members.

The City developed 5 Goals which guide how the system and improvements should provide an overall function. The goals set a standard for determining the prioritization of transportation system improvements. The objectives outline the intermediate steps that support the system goals.

Goal 1: Balanced and connected multi-modal system: Provide a system of roads, bikeways, pedestrian amenities, and transit which link each part of the community into a unified whole, and one which will safely, efficiently, and economically move traffic to and through the area.

- Objective 1.A The City shall participate in, and plan for an expansion of the transit system.
- Objective 1.B The City shall require all new developments and redevelopment of properties to provide amenities that facilitate pedestrian and bicycle travel as per the Transportation System Plan.
- Objective 1.C The City shall provide a network of interconnected streets to allow for efficient travel and reduce out of direction travel. Streets will have roadway classifications that support the intended use of the street.
- Objective 1.D The City shall prioritize improvement projects that provide complete access for pedestrians and bicycles to key locations.
- Objective 1.E The City shall provide policies to require future connectivity to parcels that could be added to the UGB in the future.

Goal 2: Convenient and safe bicycle and pedestrian access to key destinations: Provide safe and convenient access for pedestrians and bicycle.

- Objective 2.A All construction of new roadways and reconstruction of existing roadways shall include pedestrian and bicycle amenities as per the street standards for the roadway classification.
- Objective 2.B The City will prioritize projects that provide safe pedestrian access to schools, parks, shopping, and jobs to make walking a realistic alternative to driving within the City.
- Objective 2.C The City shall improve pedestrian and bicycle usage by identifying and infilling system gaps.
- Objective 2.D The City shall identify and provide a system for the completion of potential or needed sidewalk and crossing improvements.

Objective 2.E Pedestrian connections to adjoining properties shall be provided except where such a connection is impracticable.

Objective 2.E Integrate the City Parks and Trails Master Plan vision and applicable goals.

Goal 3: Safety: Encourage Design and provide facilities that improve the safety of all users of the transportation system.

Objective 3.A Improve areas where crash risk factors are present.

Objective 3.B Improve and maintain transportation infrastructure to safe standards.

Objective 3.C Establish and design for safe routes to schools from residential neighborhoods.

Objective 3.D Transportation facilities should be designed to meet safety standards

Objective 3.E City shall implement plans to educate the public and provide enforcement on transportation safety.

Goal 4: Economic Vitality: Improve the economic vitality of North Plains businesses by providing safe and convenient access for all users.

Objective 4.A Develop a system that provides safe and efficient movements of good.

Objective 4.B Develop a system that allows for good access to businesses within the community.

Objective 4.C Support improvements that make downtown and access to businesses safe and convenient for pedestrians and bicycles.

Goal 5: Environment: Encourage design and improvements that reduce the environmental impact of the transportation system.

Objective 5.A Reduce emissions by encouraging connectivity and design that reduces vehicle miles traveled.

Objective 5.B Design and construct projects that encourage walking and biking.

Objective 5.C Design and construct projects that minimize impacts to waterways and other sensitive environments.

Objective 5.D Encourage street cross sections to include width and storm water treatment systems that minimize environmental impacts.

Objective 5.E Encourage strategies to reduce single-vehicle occupancy trips.

3. NORTH PLAINS IN 2040

POPULATION & EMPLOYMENT GROWTH

North Plains is projected to experience significant growth in population, resulting in an increase in residential homes and commercial employment through the year 2040. Today, North Plains has a population of about 3,095 residents and 1,110 households. The population is projected to increase at a rate of 5.4% (AAGR) per year, resulting in an estimated population of 6,350 residents and 2,440 total households by the year 2040. The City expects to add 755 homes in the next 5 years and anticipates the need to add 1,570 total homes in the next 20 years.

Currently, there are about 950 jobs within the city. Employment is projected to increase at a rate of 5.4 % (AAGR) per year, resulting in 1,720 new jobs by the year 2040.

FUTURE LAND USE

Land use is a key factor affecting the demands placed on the North Plains transportation system. The location, density, type, and mixture of land uses have a direct impact on traffic levels and travel patterns. Employment and commercial growth within Hillsboro, Portland, and outlying areas also impact the transportation system, as many residents are employed outside the city.

Housing

It is estimated that the City will add approximately 1,570 homes by 2040. The 2017 Housing Needs Analysis identified that the currently vacant land could accommodate approximately 755 development units. There is a shortage of 815 units and 118 acres of vacant land. The City does have plans to further expand the UGB at a later date to accommodate the needed housing.

The Housing Needs Analysis has identified that the needed housing will be a mix of single-family detached homes, single family attached homes, and multi-family units. Using the data within the Housing Needs Analysis, the estimated home types are:

- | | |
|---------------------------------|-------|
| • Single Family Detached (70%): | 1,100 |
| • Single Family Attached (10%): | 157 |
| • Multi-Family (20%): | 313 |

EMPLOYMENT

The 2018 Economic Opportunities Analysis describes the existing and future employment estimates. The City is anticipating the growth of about 750 employees in the commercial based industries and about 960 employees in the industrial based industries.

2018 Current Employment	966
2040 Future Employment	2,685
Added Employees (2018-2040)	<u>1,719</u>

The 2018 Economic Opportunities Analysis has identified that the employment will be a mix of Industrial, Retail, Office, and Government as per the following:

- Industrial (56%): 962
- Retail (8%): 137
- Office (36%): 620

AREAS OF GROWTH

Development and growth within the Urban Growth Boundary are estimated based on an inventory of existing uses, expected build-out of vacant or underdeveloped lands, and Comprehensive Plan zoning. To facilitate the process of distributing land use growth, groups of tax lots were combined into Transportation Analysis Zones (TAZ).

Commercial growth by TAZ projected through the year 2040 is shown in Figure 2. The majority of commercial employment growth will happen along Glencoe Road and Commercial Street corridors with a small amount added to the north and east expansion areas.

Industrial growth by TAZ projected through the year 2040 is shown in Figure 3. The majority of industrial employment growth will occur along West Union Road, Commercial Street, Glencoe Road, and Gordon Road.

Household growth by TAZ, projected through the year 2040, is shown in Figure 4. The majority of household growth is expected to occur on the north side of North Avenue and the South Side of West Union Road. The larger vacant residential land not part of the North and East development areas have been developed within recent years. Therefore, the majority of new homes will be built within the new expansion areas. The north and east development areas were assumed to have more homes built on them than what is previously assumed in the planning documents. This is done so that all the assumed increase in population is accounted for.

TRENDS IN TRANSPORTATION GROWTH

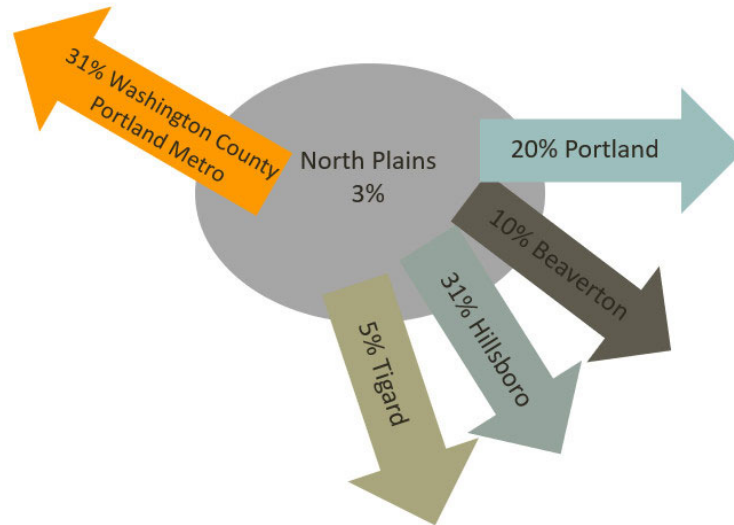
The major areas of development will occur along North Avenue, West Union Road, Glencoe Road, and Commercial Street. These major corridors will experience the highest increase in vehicle usage.

North Plains has a large population of commuting residents. The 2018 Economic Opportunities Analysis indicates that people who work in North Plains currently reside in the following locations:

- 3% in North Plains
- 17% in Hillsboro
- 8% in Portland
- 6% in Beaverton
- 5% in Forest Grove
- 61% Elsewhere in Washington County and Portland Metro region

The 2018 Economic Opportunities Analysis also indicates that people who live in North Plains currently work in the following locations:

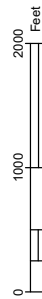
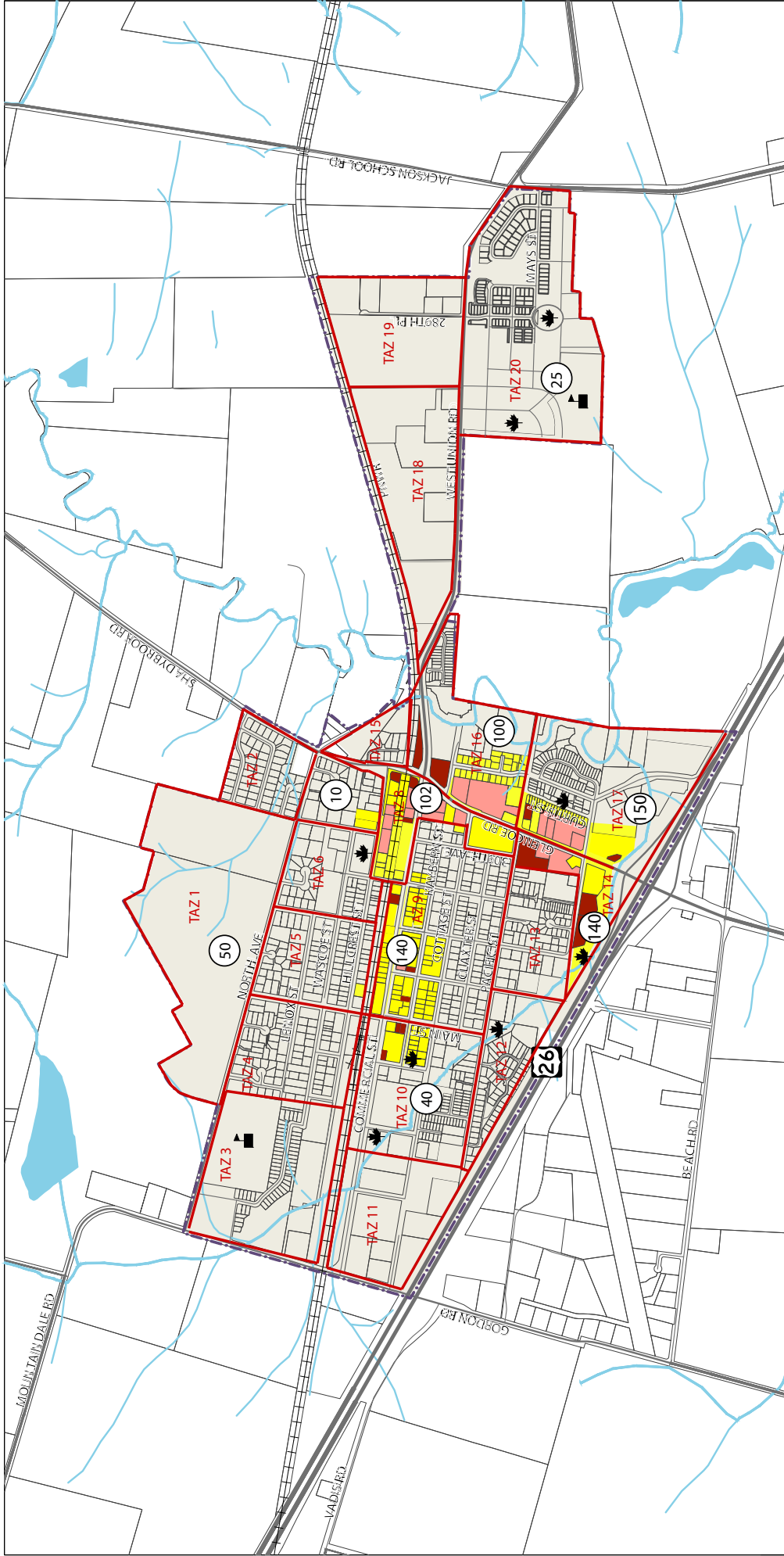
- 3% in North Plains
- 31% in Hillsboro
- 20% in Portland
- 10% in Beaverton
- 5% in Tigard
- 31% Elsewhere in Washington County and Portland Metro region



Where residents in North Plains work

Therefore, a majority of existing and new trips added to the system will be trips along the major corridors. It is anticipated that as development occurs there will be increased demand for vehicle traffic along the roadways of:

- North Avenue
- Glencoe Road
- West Union Road
- Main Street
- Commercial Street



URBAN GROWTH BOUNDARY

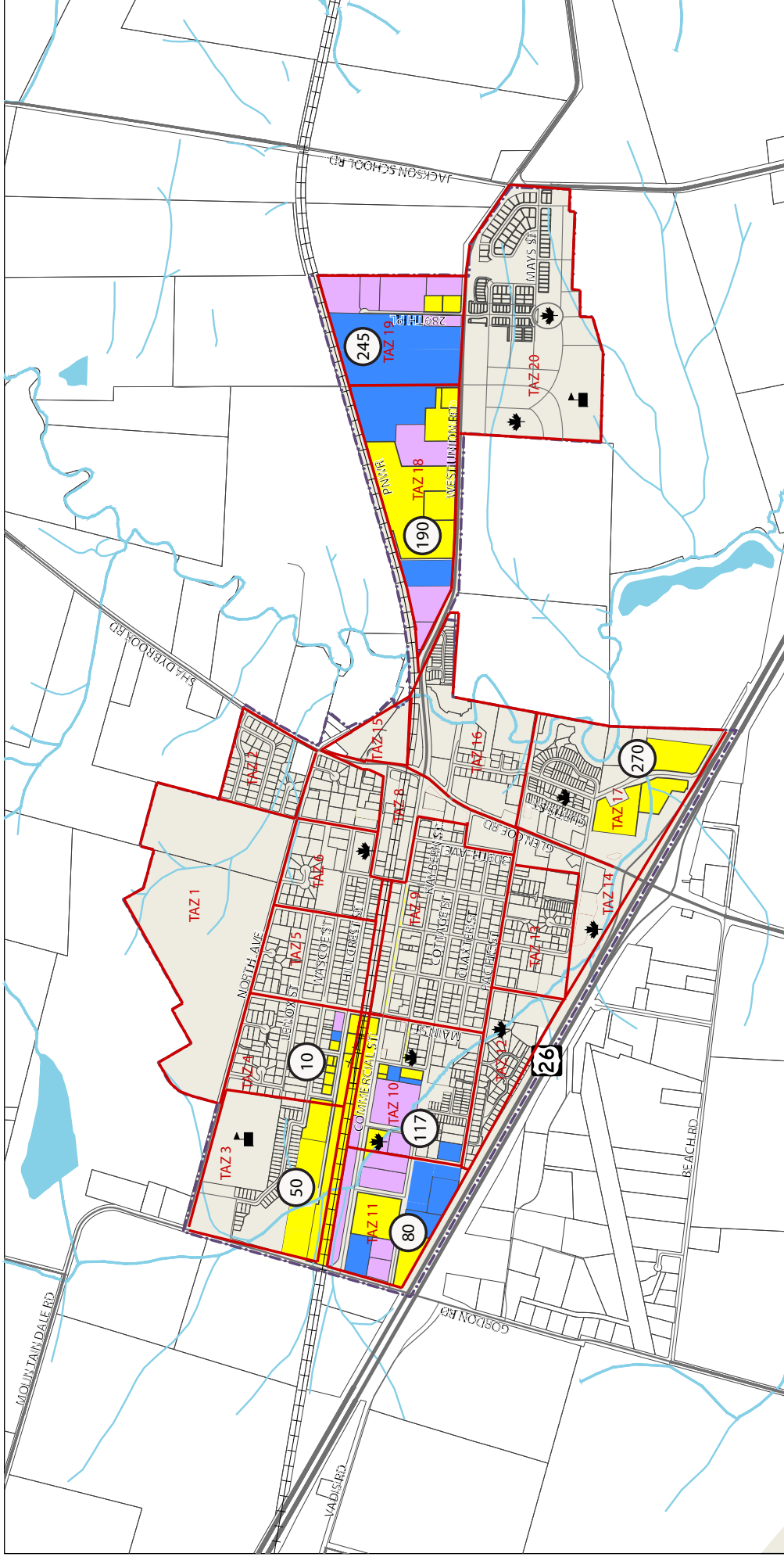
- TAX LOTS
- CITY LIMITS
- RAILROAD
- STREAMS
- LAKES

- Points of Interest
- School
 - Park

- VACANT COMMERCIAL LOTS
- PARTITIONABLE COMMERCIAL LOTS
- COMMERCIAL LAND

North Plains Transportation System Plan

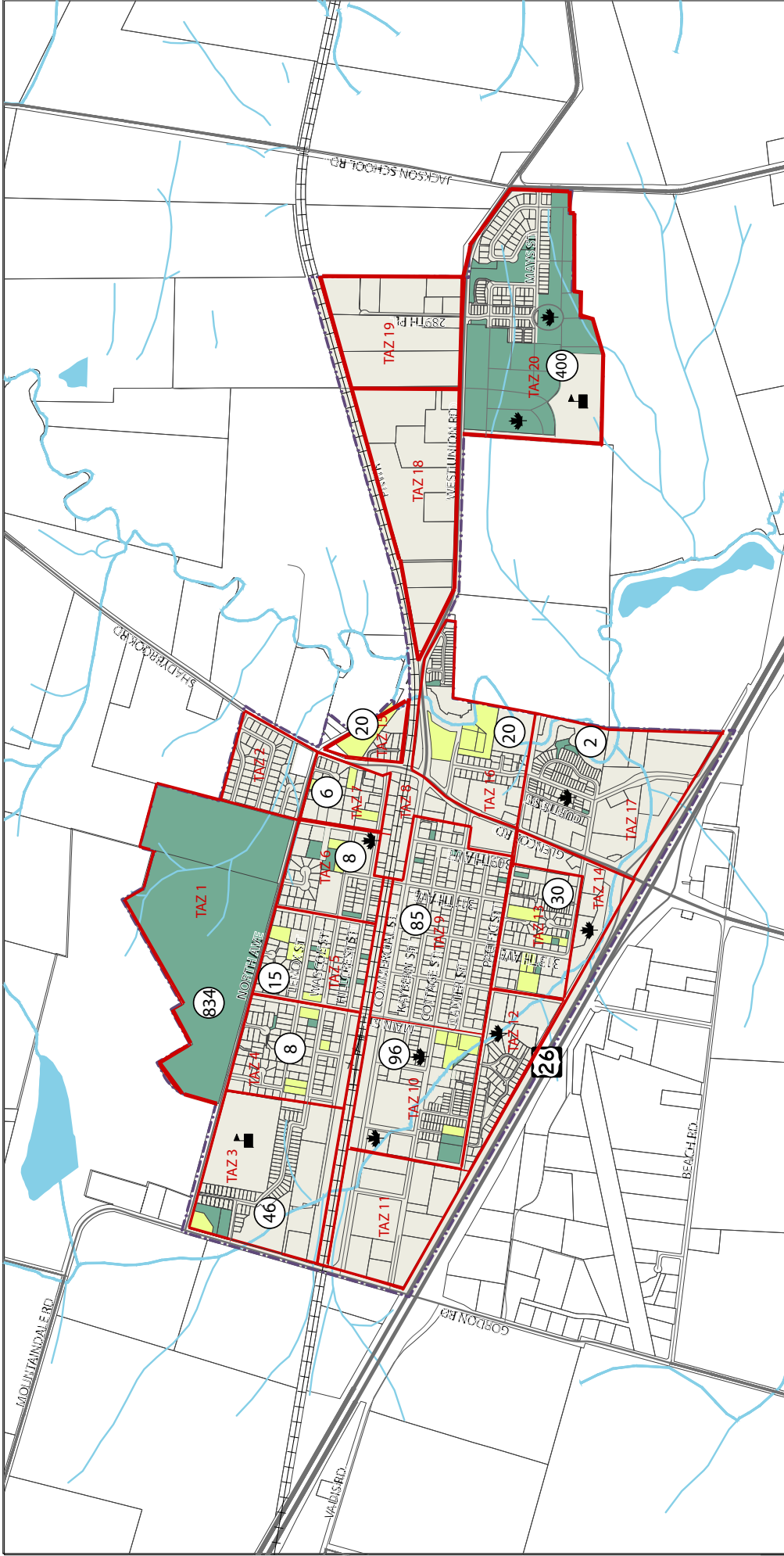
Figure 2 Commercial Employment Growth



- URBAN GROWTH BOUNDARY**
- TAX LOTS
 - CITY LIMITS
 - STREETS
 - RAILROAD
 - STREAMS
 - LAKES
- Points of Interest**
- School
 - Park
- VACANT INDUSTRIAL LOTS**
- PARTITIONABLE INDUSTRIAL LOTS
 - INDUSTRIAL LAND

North Plains Transportation System Plan

Figure 3 Industrial Employment Growth



0

1000

2000

Feet

URBAN GROWTH BOUNDARY

TAX LOTS

CITY LIMITS

RAILROAD

STREAMS

LAKES

VACANT RESIDENTIAL LOTS

PARTITIONABLE RESIDENTIAL LOTS

Points of Interest

School

Park

North Plains

Transportation

System Plan

Figure 4 Growth in Housing

4. NEEDS

The following provides an overview of the pedestrian, bicycle, and automobile deficiencies, gaps, and needs that the City should address in the next 20 years.

PEDESTRIAN NEEDS

The City of North Plains is a small community with a majority of commercial, housing, and employment centered within a 1 ½ mile walking distance. Most of the activity generators are located along the major routes of Commercial Street, Glencoe Rd, and North Ave with housing dispersed through the remaining areas of the city. The City has an existing elementary school located on North Avenue with a future plan to include a second elementary school on the east side of the City off West Union Road. North Plains has the potential to have a well-utilized pedestrian network given the proximity of activity centers to housing and the distance between activity centers.

PEDESTRIAN FACILITIES

Sidewalks

Sidewalks are the primary facility type for pedestrian travel within cities. Sidewalks installed along major roadways provide pedestrians with safe and convenient access to the same streets used by motor vehicles. Sidewalk design should allow for convenient routes and access for all pedestrian abilities. Sidewalks should be continuous along arterial and collector streets with connectivity to pedestrian facilities and access key attractions/areas in the city. Typical travel by pedestrians to commercial and employment areas is ½ to 1 mile. Most of the city's commercial and employment areas are accessible by residential neighborhoods within a 1-mile walking distance. Therefore, there is an excellent potential within the city to create a well utilized complete system of access to key attractions for pedestrians.

North Plains is an older small community where roadways in the past were built without sidewalks or bike lanes. All roadways were shared-use facilities for all users. Most of the City's older streets do not have sidewalks.

To promote pedestrian use, sidewalks should be provided and prioritized according to the needs as they fall into the following categories:

- Arterial and Collector streets: Provide safe and efficient pedestrian access to commercial, employment, and civic services.
- Routes to School: Provide sidewalks or multi-use paths along all major routes to school regardless of roadway classification.
- Routes to Key Locations: Provide sidewalks or multi-use path along all major routes to key locations regardless of roadway classification.
- Local Streets: Provide sidewalks along existing local streets that will experience large pedestrian usage such as walking routes identified as part of the new trail system. All new local streets shall have sidewalks installed. Sidewalks should be provided as part of development driven projects.

Sidewalks at a minimum, need to conform to ADA standards for width, slope, and curb ramp design. In locations along commercial areas, sidewalk width should increase to allow for higher pedestrian usage and gathering in community areas.

Sidewalk needs along the major pedestrian routes, arterial and collector streets, and routes to key locations such as schools were identified. The locations where sidewalks are needed are highlighted in Table 1.

TABLE 1: LOCATIONS WHERE SIDEWALKS ARE NEEDED

Segment	NEED		
	Arterial and Collector Streets	Routes to School	Routes to Key Destinations
Main Street	South of Commercial St	South of Commercial St	X
Pacific Street	X	X	X
Cottage Street	X	X	
313 th Avenue	X	Lennox St to Wascoe St	X
Gordon Road	X	X	
Wascoe Street		Between 313 th and 309 th	
Lennox Street		Between Main St and 313 th St	
Commercial Street	X	X	X
West Union Road	X	X	X
North Avenue	X	X	X
Glencoe Road	X		X
309 th Ave		X	X
311 th Ave		X	X
318 th Ave			X
Hillcrest St	X	X	X
Kaybern St			X

STREET CROSSINGS

Street crossings expose pedestrians to conflicts with motor vehicles. Therefore, the lack of safe crossings may act as barriers for pedestrians choosing to walk to make trips within the community. The comfort and perceived safety of a crossing are affected by such factors as vehicle speed, vehicle volume, crossing width, and visibility.

The locations where the identified main pedestrian routes cross major roadways are locations that should be considered for pedestrian crossing treatments. Table 2 describes the crossing locations that

are identified for improvements. There are 4 levels of treatment options appropriate for crossings in North Plains. Table 3 discusses these options.

TABLE 2: LOCATIONS NEEDING CROSSING IMPROVEMENTS

Project Name	Location	Comments
P4	Main Street at Commercial Street	Level 2 crossing- all 4 crossings
P5	Glencoe Road at Pacific Street	Level 3 crossing-Across north side of Glencoe Road for improved safe routes to school and access to trail system.
P6	Glencoe Road at Commercial Street	Level 3 crossing-Across south side of Glencoe Road for improved access from east side to downtown
P7	Main Street at Lenox Street	Level 2 crossing-on south side
P12	Commercial Street at 311 th Avenue	Level 2 crossing-all 4 crossings
P13	Pacific Street at 313 th Avenue	Level 2 crossing- all 4 crossings
P21	North Avenue at Future Street Connection	The future north/south street connections should provide a Level 3 crossing across North Avenue near the school.
P22	North Avenue at Main Street	Level 3 crossing as this is a major route to the school

TABLE 3: TYPICAL CROSSWALK TREATMENTS

<p>Level 1 No Treatment- At locations where local streets intersect, locations with low traffic and pedestrian conflicts, or low exposure areas do not need any specific treatments alerting vehicles to crossing pedestrians.</p>	
<p>Level 2 Standard Crosswalk- At locations where pedestrian travel crosses a collector or higher street, high level of pedestrian crossings, safe routes to school, or locations with a medium level exposure risk, the pedestrian crossing will typically include crosswalk striping and signage.</p>	
<p>Level 3 High Visibility Crossing- At locations where pedestrians cross higher order streets or locations with a higher exposure risk the pedestrian crossing will typically include striping, signage, and a flashing warning beacon.</p>	
<p>Level 4 Traffic Signal- Traffic Signals can be installed at locations with higher exposure to risk and the traffic levels make it difficult to cross.</p>	

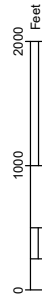
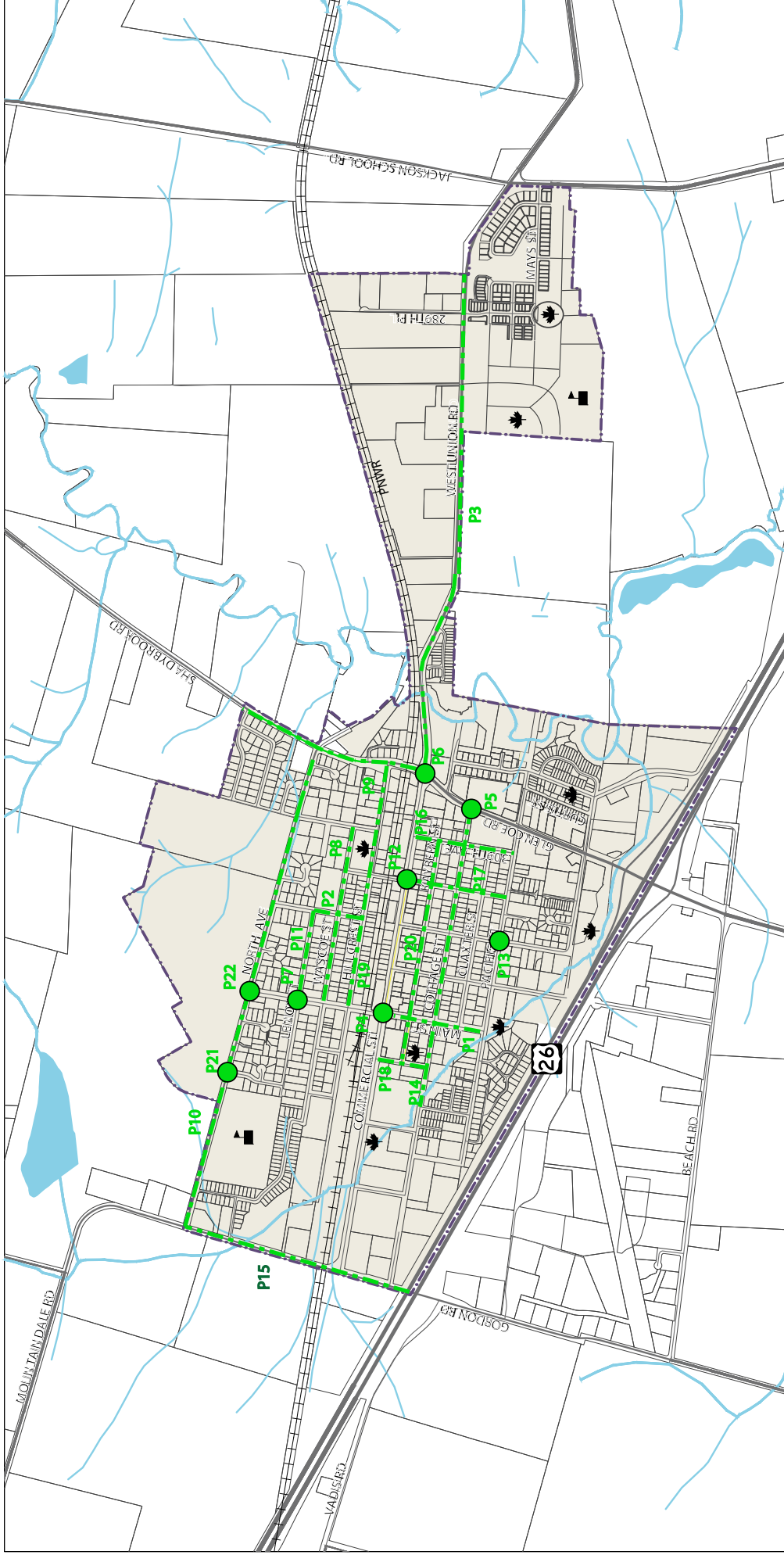
PEDESTRIAN SYSTEM IMPROVEMENTS

The pedestrian improvement projects were determined by evaluating the existing facilities, pedestrian route demands, and where future growth and expansion will occur that will increase the needs of pedestrian amenities for safety and access. The following pedestrian improvements were identified to be needed within the next 20 years.

TABLE 4: PEDESTRIAN IMPROVEMENT PROJECTS

Project Name	Location	Comments
P1	Main Street	Install sidewalks between Commercial and Pacific Street
P2	313 th Avenue	Install sidewalks between Hillcrest and Lenox
P3	West Union Road	Provide Sidewalks along both sides of West Union Road from Jackson School Road to Glencoe Road.
P4	Main Street at Commercial Street	Level 2 crossing- all 4 crossings
P5	Glencoe Road at Pacific Street	Level 3 crossing- across the north side of Glencoe Road between Pacific St and Kaybern Street
P6	Glencoe Road at Commercial Street	Level 3 crossing- across intersection for improved access from the east side to downtown.
P7	Main Street at Lenox Street	Level 2 crossing-across north side of Main Street already exists, add additional crossing on the south side.
P8	Wascoe Street	Add sidewalks (or other) from 309 th Avenue to Main Street
P9	Shadybrook Road	Install sidewalks on both sides north of Commercial Street
P10	North Avenue	Install sidewalks on north and south sides
P11	Lenox Street	Install sidewalks on Lenox St from Main Street to 313 th Ave

P12	Commercial Street at 311 th Avenue	Level 2 crossing-all 4 crossings
P13	Pacific Street at 313 th Avenue	Level 2 crossing- all 4 crossings
P14	Cottage Street	Add sidewalks from west termini to Glencoe Road
P15	Gordon Road	Add Sidewalks from Commercial Street to North Ave
P16	309 th Avenue	Upgrades include sidewalks, planter strips, on-street parking, and traffic calming measures.
P17	311 th Avenue	Install sidewalks from Wascoe to Commercial
P18	318 th Avenue	Install sidewalks from Cottage to Commercial
P19	Hillcrest Street	Install sidewalks from Glencoe to Main
P20	Kaybern Street	Infill missing sidewalks between 309 th & 318 th
P21	North Avenue at Timeric Street	Crosswalk to be installed as an interim improvement until a traffic signal or roundabout is installed
P22	North Avenue at Main Street	Crosswalk to be installed as an interim improvement until a traffic signal or roundabout is installed



- URBAN GROWTH BOUNDARY**
- TAX LOTS
 - CITY LIMITS
 - RAILROAD
 - STREAMS
 - LAKES

- Points of Interest**
- School
 - Park

- PEDESTRIAN INTERSECTION IMPROVEMENTS**
- SIDEWALKS

North Plains Transportation System Plan

Figure 5 Pedestrian Improvement
Projects

BICYCLE NEEDS

Bicycle travel is important to safely accommodate movement within the city as it allows for longer trips beyond the ½-1-mile comfortable walking distance for pedestrians. Increased bicycle travel has community, environmental, and health benefits. At a minimum, bikeways are required along arterial and collector roadways to comply with OAR-660-045. Bikeways can be in the form of bike lanes, shared-use paths, or shared roadways. The following describes the existing bicycle facilities and bicycle needs in North Plains.

BIKE FACILITIES

BIKE LANES

Bike lanes are 6-foot-wide areas on roadways designated exclusively for bicycle travel. Bicycle lanes are typically present on arterial and collector streets where the higher vehicle speed and vehicle numbers warrant greater space. Glencoe Road between the Highway 26 interchange and Commercial Street is the only location with full bike lanes within the City. As West Union Road is developed, bike lanes should be added along the development street frontage.

SHOULDERS

Shoulder bikeways are a shoulder along a roadway that is wide enough for bicycle travel but is not specifically designated as such. In general, a shoulder should be 6 feet in width to be considered adequate for bike usage. Glencoe Road north of West Union Road and sections of West Union Road have shoulder widths wide enough for bike travel. All other roads have minimal shoulders.

SHARED-ROADWAYS

Shared roadways are any roadways in which bicycles and vehicles share the same space. Shared roadways are typically those that have speeds less than 30 mph and traffic volumes of less than 3,000 AADT. In locations with safety concerns or to delineate a bike route, shared lane pavement markings can be used.

Most roadways in North Plains are shared roadways. However, there are no facilities where “shared” lane pavement markings are used.

BIKE ACTIVITY

The major routes for bike travel are:

- Glencoe Road (arterial)
- Shadybrook Road (collector)
- West Union Road (arterial)
- North Avenue (collector)
- Gordon Road (collector)
- Main Street (collector)
- Commercial Street (collector)

CONNECTION TO REGIONAL BIKE ROUTES

Washington County has identified future biking routes as part of the Regional Trails and Greenways that pass through North Plains. Route 21-Helvetia Trail will likely use Jackson School Road, West Union Road, Commercial Street, and Gordon Road for a future connection. There is no timeline identified for the future connection.

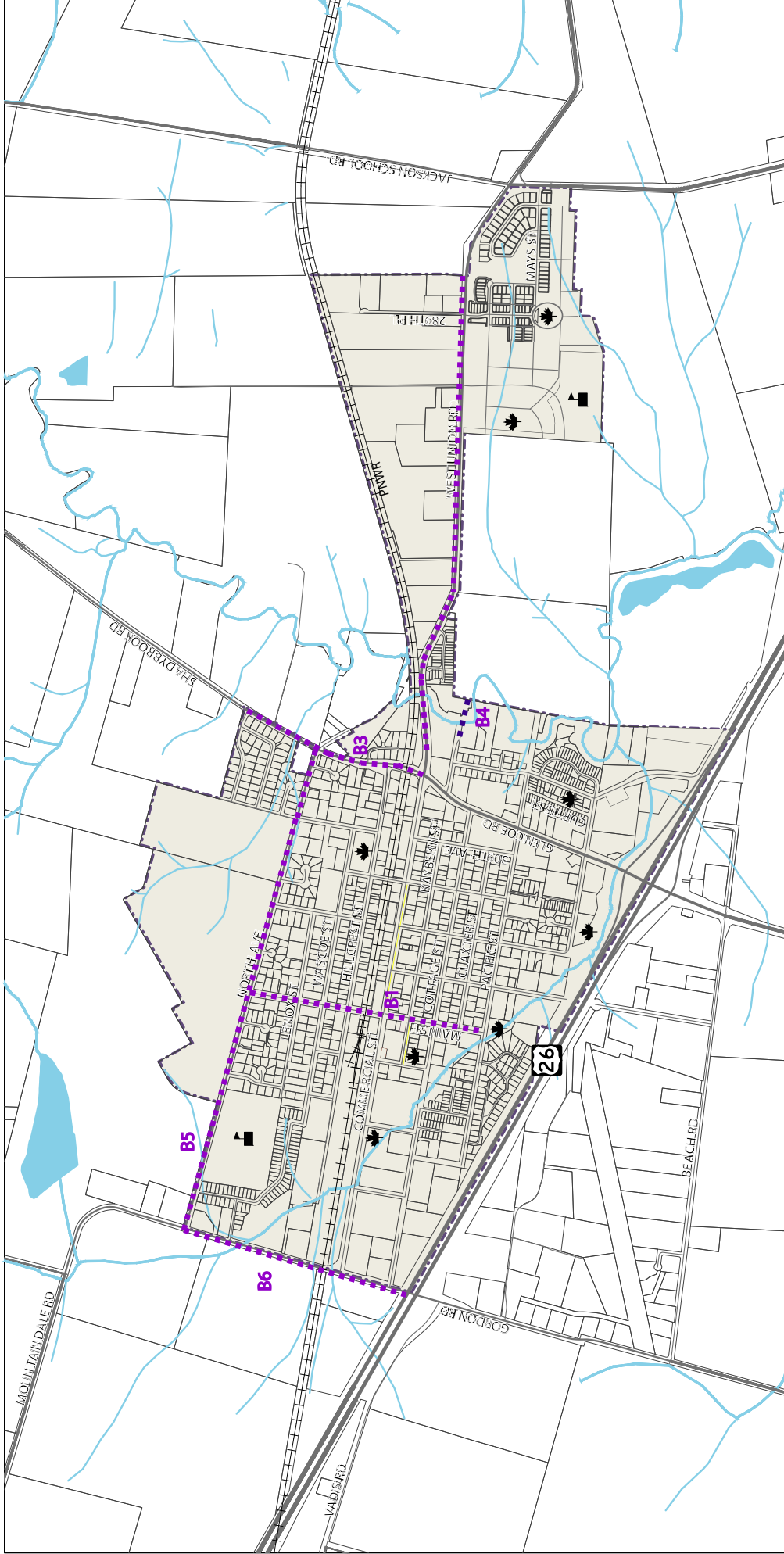
Washington County has identified Glencoe Road, West Union Road, Gordon Road, and North Avenue as Major Street Bikeways. The Washington County TSP Active Transportation Element identifies that Major Street Bikeways should at a minimum have a 6-foot bike lane. Glencoe Road is the only road that currently meets this standard. West Union Road, Gordon Road, and North Avenue need to provide 6' bike lanes, buffered bike lanes, or a multi-use path.

BICYCLE SYSTEM IMPROVEMENTS

To comply with Oregon Administrative Rule at a minimum, bikeways need to be provided along arterial and collector streets. As stated, these can be in the form of bike lanes, multi-use paths, or shared use facilities. Bikeways should be provided along major ped routes regardless of street classification. Table 5 provides recommended improvements for the major bikeways within the City. Figure 6 provides an illustration of bicycle improvement locations.

TABLE 5: NEEDED BIKEWAY IMPROVEMENTS

Project Name	Location	Comments
B1	Main Street	Shared roadway facility with bike markings
B2	West Union Road	Provide bike lanes on both sides of the road
B3	Shadybrook/Glencoe Road north of Commercial Street	Provide bike lanes or wide shoulders on both side of the road
B4	East-West Multi-Use Path Connector	Extension of Kaybern from 307 th Ave to UGB
B5	North Avenue	Construction of bike lanes outside of the north development area
B6	Gordon Road	Provide bike lanes or 6' minimum shoulders on both sides of the road
V3	Commercial Street	Bikeway improvements to be completed with future study and design
V2	Pacific Street	Bikeway improvements combined with the overall street upgrade project.



- URBAN GROWTH BOUNDARY**
- URBAN GROWTH BOUNDARY
 - TAX LOTS
 - CITY LIMITS
 - RAILROAD
 - STREAMS
 - LAKES
- Points of Interest**
- School
 - Park
- BICYCLE IMPROVEMENTS**
- BICYCLE IMPROVEMENTS



North Plains Transportation System Plan

Figure 6 Bicycle Improvement Projects

TRANSIT NEEDS

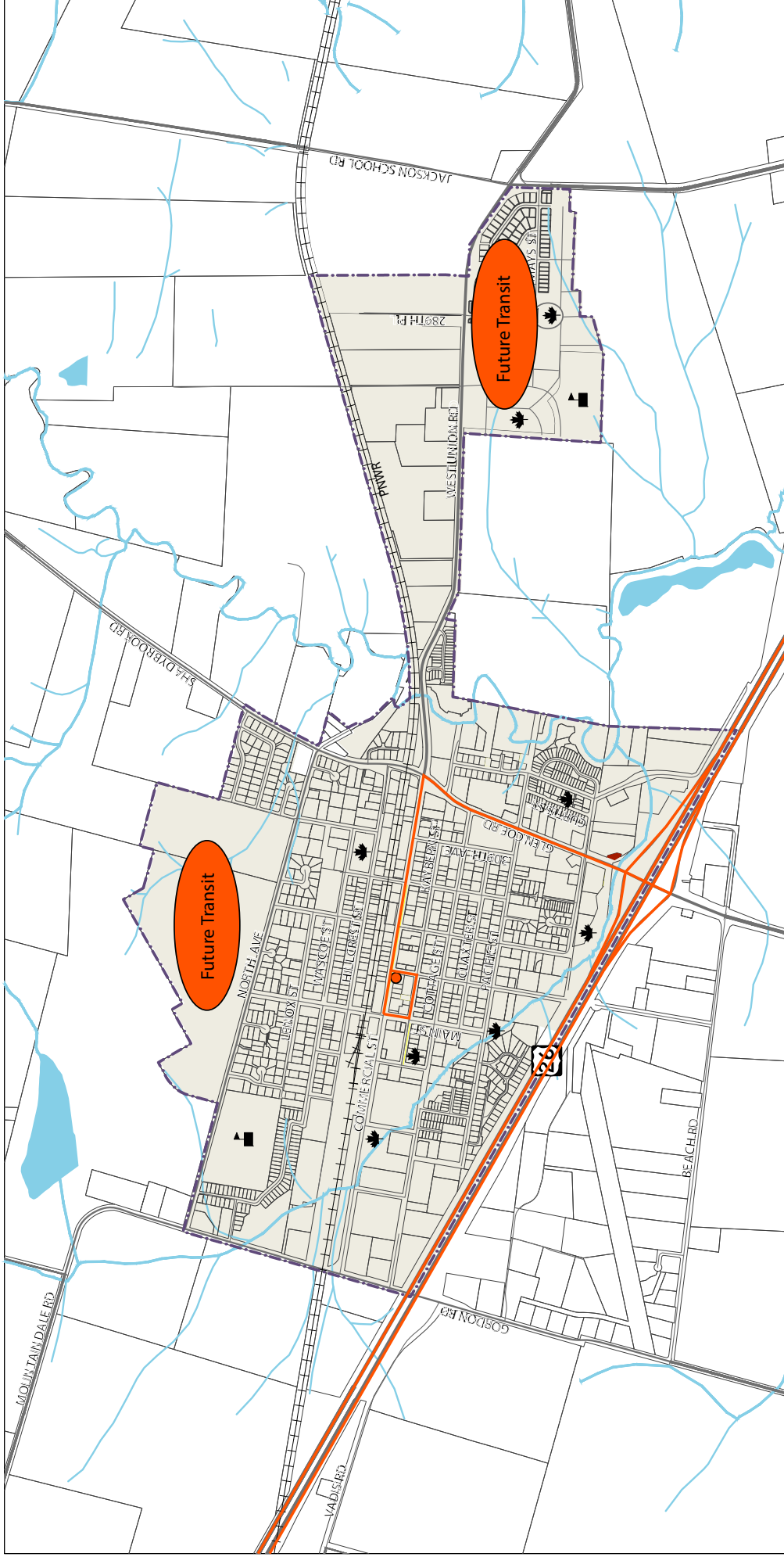
North Plains is served by a fixed route service through Ride Connection. The service begins at Forest Grove Community Center, travels through Banks to North Plains, then continues to the Hillsboro Transit Center. At this point, the bus returns along the same route. Throughout the day the bus makes 2 trips Eastbound and 2 trips Westbound, once each in the AM and once each in the PM.

Additionally, there is transit to North Plains provided by Tillamook County Transportation district. This service is known as “The Wave.” The Wave provides service via Route 5 between Portland and Tillamook with stops in North Plains. Service is provided twice daily in the eastbound direction and twice daily in the westbound direction.

As the population of North Plains increases, there will be an increased need to improve transit options. Improvements to transit service should include:

- Increase in transit stops
- Increase in service area: areas with rapid growth and expansion should have service provided
 - North expansion area
 - West Union Road neighborhood

The transit routes should be expanded to the north and east development areas as highlighted in Figure 7.



North Plains Transportation System Plan

- URBAN GROWTH BOUNDARY
 - TAX LOTS
 - CITY LIMITS
 - RAILROAD
 - STREAMS
 - LAKES
- Points of Interest
 - School
 - Park
- Existing Transit Facilities
 - Transit Route
 - Transit Stop

Figure 7 Transit Facilities

AUTOMOBILE NEEDS

The increase in development within the City will result in an increase in vehicle travel throughout the City. Safe and efficient vehicle travel is essential for the economic vitality of the City. The TSP evaluated the vehicle system for improvement needs for the next 20 years based on:

- Safety
- Mobility
- Connectivity
- Complete Streets
- Traffic Calming

MOBILITY

Traffic within the City is anticipated to increase along the major roadways of North Avenue, Glencoe Road, and West Union Road. An evaluation into the transportation system needs shows the major intersections along Glencoe Road will need system improvements to maintain efficient travel without unnecessary delays by the year 2040.

Intersections needing capacity/mobility improvements

- NW Glencoe Rd at NW Highland Ct
- NW Glencoe Rd at NW Pacific St
- NW Glencoe Rd at NE Commercial St/West Union Rd
- NW Glencoe Rd at NW North Ave

These improvements are detailed below. However, the improvements are anticipated to be completed with development. The recommended improvements will result in the intersections meeting standards. These intersections have been added to the project list and are anticipated to be improved as part of private development projects and could potentially have some cost sharing between the County, City, and private developments

Glencoe Road at North Avenue

Glencoe at North Avenue will handle the majority of traffic from the new development area north of North Avenue. Most of the added vehicles will utilize the northbound left turn lane and the eastbound right turn lane. This intersection will need a traffic signal or other traffic control to allow traffic to move efficiently prior to the year 2040. Additionally, a separate northbound left turn lane will need to be constructed. With these improvements, the intersection will meet mobility standards.

Glencoe Road at Commercial Street

Glencoe Rd at Commercial St will have a substantial increase in traffic volumes due to the increase in housing, industry, and commercial uses within the City. Traffic volume increases are expected on

all four of the intersection approaches. This intersection will need to be signalized or be built as a roundabout. The roundabout should be a single lane with northbound and eastbound right turn slip lanes. With either the signalization or the roundabout, the intersection will meet the mobility standards. The roundabout will need to consider the existing proximity to the railroad crossing.

Glencoe at Pacific Avenue

The turning movements into and out of Pacific Avenue will only slightly increase over the next 20 years. However, with the substantial increase in north and southbound traffic along Glencoe Avenue, the side streets (such as Pacific Street and Highland Court) will not meet the County's mobility standards. The improvement for this intersection is either a traffic signal or a roundabout. With either option, the intersection will meet the standard.

Glencoe at Highland Court

The area east of Glencoe Road within the UGB has the potential to be a significant buildout of commercial and industrial uses adding a significant amount of traffic through this intersection onto/off of Highland Court. This intersection will experience significant capacity issues. There are two options for dealing with the capacity concerns at this intersection. This option is the preferred option in the US 26/Glencoe Road interchange area management plan. The first recommendation is to restrict the movements out of Highland Court to eliminate the left turn out but still allow right turns and the left turn into Highland. This is a reasonable mitigation strategy given the proximity of this intersection to the US 26 Ramp Signals. However, with the large amount of growth that will occur east of Highland Ct, the restriction of movements would have a substantial impact on the development traffic as it will be difficult for the industrial uses to access US 26. It is recommended that if this option is chosen, that the intersection of Glencoe and Pacific be built as a roundabout so the traffic from east of Glencoe can make a u-turn at the roundabout and access US 26.

The second option is a roundabout. The roundabout would eliminate the queueing issues that could be present with a traffic signal but still will allow all movements into and out of Highland Court.

CONNECTIVITY

The City of North Plains is made of a street grid system consisting of arterial, collector, and local streets. New development within the northern parcels and eastern parcels recently annexed into the city will expand the street network to the north and east. In general, the City has a well laid out grid system providing good connectivity while limiting out of direction travel for vehicles, pedestrians, and bicycles. There are limited dead-end streets, and there is the potential for most of the existing dead-end streets to extend with future development.

There are a few existing streets within the city that dead end into undeveloped parcels and should be extended as part of future development or future street projects. Those streets are:

- Cottage Street: 321st Avenue west to Gordon Road
- Lenox Street: Timeric St to 260 feet east of Timeric St (Short section of roadway currently exists. However, the southern edge is not completed with adequate roadway width and sidewalk)
- Pacific St: Between 307th Street and the eastern UGB (Right of way exists)
- Kaybern St: Between 307th Street and the eastern UGB (Right of way exists)
- Wascoe St: From Main Street to 80' east of Main Street (Right of way exists)

There are larger areas of redevelopment potential that should include new streets. These streets will likely be constructed with development/redevelopment and include:

- 322nd Ave: A North-South collector street connector should be made connecting Pacific Street to Cottage Street. (Right of way exists)
- 325th Ave: A new north-south collector street connecting Cottage Street with Commercial Street

TRAFFIC CALMING

There were a couple of streets that were identified to have issues with traffic speed. Additionally, each one of the roadways were also identified as having high pedestrian and bicycle usage since they are along walking routes. The following are streets that should have traffic calming:

- 313th Street
- Pacific Street
- Commercial Street

313th Street

313th Street is a main North/South collector. The only sidewalks present are along the South end of the street. Citizens have expressed concern that vehicles and commercial trucks use this road as a cut through between Commercial Street and Glencoe Road. Additionally, the vehicle speed is a concern for pedestrians who are using the street. This street should have full urban upgrades with additional traffic calming measures as determined through a study at the time of design

Pacific Street

Pacific Street is a major E/W collector connecting a large portion of residential parcels with Glencoe Road. Pacific Street will also act as a main walking/biking route between residential parcels on the east side, the school, and the downtown area. Pacific street has 60 feet of right of way. Pacific Street should have streets upgrades consistent with the collector street classification, should include additional traffic calming improvements, and on-street parking.

Commercial Street

Commercial Street is a major East/West connector serving the downtown area. It has a high potential for pedestrian and bike usage. Additionally, trucks use Commercial Street to access the industrial area near Gordon Road, driving clear through to Glencoe Road.

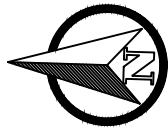
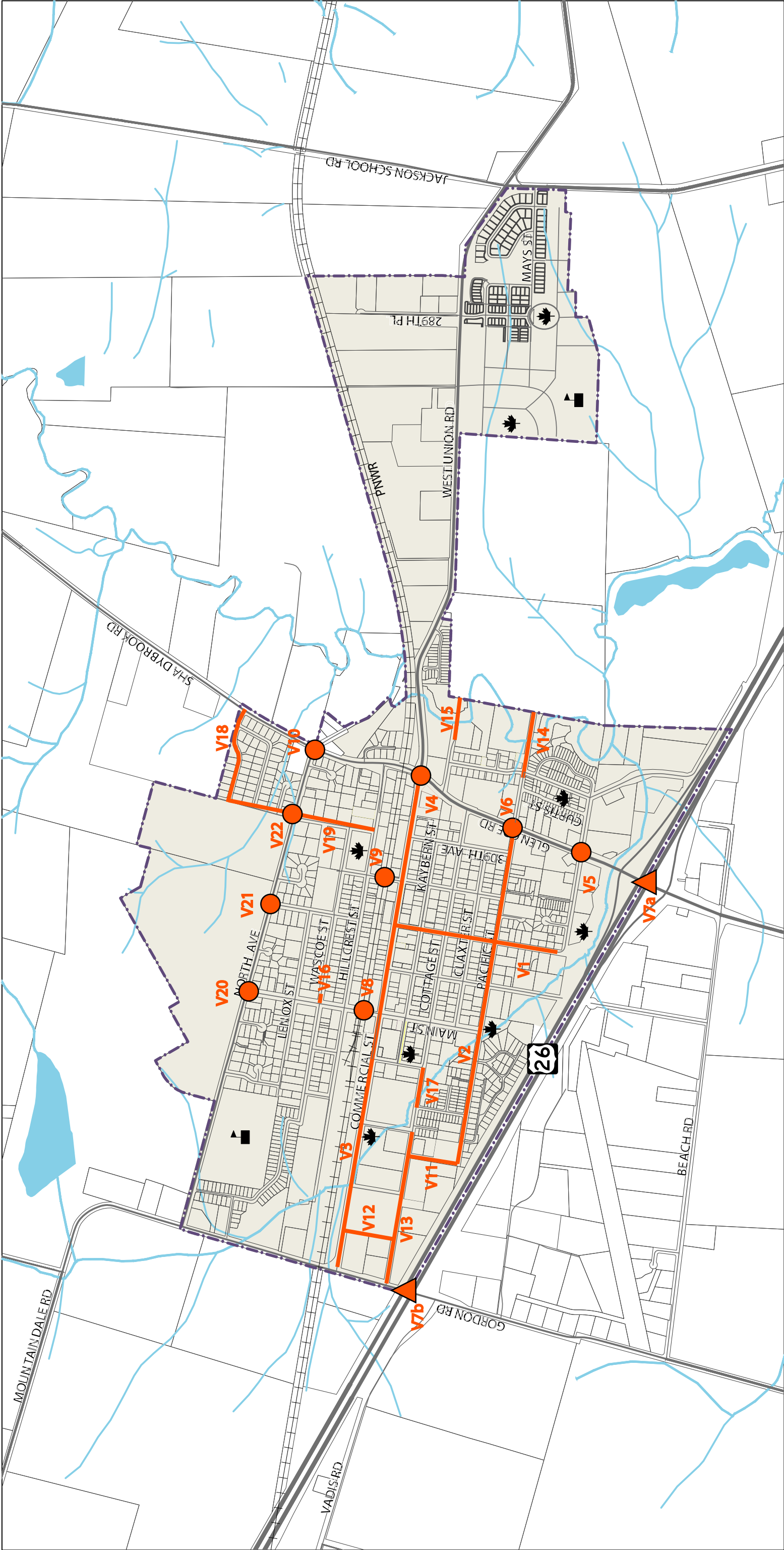
Traffic calming measures should be implemented from Main Street to Glencoe Road. Commerical Street will be part of a study which will identify specific upgrade and traffic calming treatments.

AUTOMOBILE SYSTEM IMPROVEMENTS

The following roadway and intersection improvements are recommended to be completed within the next 20 years to help the City create a safe and efficient transportation network.

TABLE 6: VEHICLE PROJECT LIST

Project Name	Road	Recommended Improvements
V1	313 th Street	Provide sidewalks, bike lanes, and planter strips
V2	Pacific Street	Provide sidewalks, bike lanes, planter strips, on-street parking, and intersection bulb outs
V3	Commercial Street	Provide traffic calming including sidewalks and bike lanes. Options to be evaluated as part of the Commercial Street Redevelopment Study.
V4	Glencoe Road at Commercial Street	Roundabout or traffic signal
V5	Glencoe Road at Highland Court	Restrict movements to Right-In Right-Out Left-In only or roundabout
V6	Glencoe Road at Pacific Street	Signalization/Roundabout
V7a	Glencoe Road at US 26 EB and WB Ramps	Second westbound right turn lane and a separate southbound right turn lane. Second Northbound through lane. This project is only needed after the future UGB expansion.
V7b	US 26 at Gordon Road	New Interchange located on the west edge of town. This project is only needed after the future UGB expansion.
V8	Main Street	Upgrade crossing
V9	311 th Street	Upgrade crossing
V10	Glencoe Road at North Avenue	Roundabout or traffic signal and left turn pocket
V11	322 nd Avenue	A North-South collector street connector should be made connecting Pacific Street to Cottage Street. (Right of way exists)
V12	325 th Avenue	325 th Ave should be built as a collector street connecting Cottage Street with Commercial Street
V13	Cottage Street	321 st Ave west to Gordon Rd (Right of way exists)
V14	Pacific Street	East of 307 th Ave as needed for development (Right of way exists)
V15	Kaybern Street	East of 307 th Ave as needed for development (Right of way exists)
V16	Wascoe Street	From Main Street 80' east of Main Street (Right of way exists)
V17	Cottage Street	318 th St over the creek to connect to 320 th St (Right of way exists)
V18	Yorkshire Street	Traffic Calming to reduce cut through traffic
V19	309 th Street	Yorkshire Avenue to Hillcrest Avenue: Upgrades include sidewalks, plater strips, on-street parking, and traffic calming measures
V20	North @ Main Street	Traffic Signal or Roundabout
V21	North @ 313 th Street	Traffic Signal or Roundabout
V22	North @ 311 th Street	Traffic Signal or Roundabout



- URBAN GROWTH BOUNDARY
- TAX LOTS
 - CITY LIMITS
 - RAILROAD
 - STREAMS
 - LAKES

- Points of Interest
- School
 - Park

- ROADWAY IMPROVEMENTS
- INTERSECTION IMPROVEMENTS
 - ILLUSTRATIVE INTERSECTION IMPROVEMENTS

North Plains Transportation System Plan

Figure 8
Vehicle Improvement
Projects

FREIGHT NEEDS

The main routes for commercial freight are Glencoe Rd (connecting to Hwy 26) and West Union Road. Areas of industry which receive freight are located off of Gordon Rd, Commercial St, Hillcrest St and West Union Rd. Glencoe Rd and Commercial St are where a majority of commercial properties are located. Future roadway changes need to consider the continued need for freight/truck access.

Shadybrook Road, Gordon Road, North Avenue, and West Union Road are frequently used by agricultural vehicles. These roadways are essential to the agricultural lands that surround the City. These roadways need to maintain 12-foot travel lanes, sufficient intersection curb radiuses, and should not have any in road traffic calming devices, to allow for ease of access for the agricultural traffic.

OTHER MODES

The TSP investigated the needs of rail, air, waterway, and pipeline transportation needs. There are no significant needs for air, waterway, or pipeline. The rail crossings across Main Street and 311th Street should be upgraded with signalized crossing arms to improve pedestrian and vehicle safety.

5.0 FINANCIALLY CONSTRAINED PLAN

The Financially Constrained Plan List is a list of transportation projects/solutions that can be implemented using committed, available, or reasonably available revenue sources. All other projects are included as aspirational and represent projects that can be provided through development or other funding sources.

The Financially Constrained Project List will drive how the City of North Plains improves the transportation network and how the City pursues outside funding for the improvements.

The City anticipates approximately \$5.5M in available funding from City SDC charges and \$17M from County TDT charges for roadways within the next 20 years. The financially constrained project list has an estimated total project cost of \$13M. The City can apply for grants, increase SDC fees or enact other local taxes or fees to help fund projects. Additionally, some of the projects can/will be completed as part of development projects within the City.

FUNDING CAPACITY

FUNDING SOURCES

The City has 4 main sources of funding for street improvements. The City's Transportation Systems Development Charges, the County's Transportation Development Tax, the City's Transportation Utility Fee, and State/County Gas Taxes.

SYSTEMS DEVELOPMENT CHARGE

The systems development charge is a fee applied to developments that occur within the City. The funds collected from these charges are restricted to projects identified within the Transportation System Plan. The annual SDC revenue is dependent on what is built within the City, and therefore, will fluctuate through the years.

TRANSPORTATION DEVELOPMENT TAX

The Transportation Development Tax is a Washington County capital improvement charge on new developments. The funds go towards the financing of new or improved sidewalks, signals, or other improvements for collector and arterial roadways. Eligible projects must be on the approved County TDT improvement list.

TRANSPORTATION UTILITY FEE

The transportation utility fee (Street Fund) is a fee collected on the monthly water bill that is used for the construction and maintenance of streets and pathways within the City.

CURRENT FUNDING

The anticipated annual revenue from these fees for the next 5 years are illustrated in Table 7 under the assumptions of collections and distributions at the existing levels. The City has the option of increasing the City SDC fees to meet the demands of the projects that the City would like to see implemented.

TABLE 7: FUNDING SOURCES AT CURRENT LEVELS FOR NEXT 5 YEARS
REVENUE

<i>FUNDING SOURCE</i>	ANNUAL REVENUE	REVENUE FOR 5 YEARS
<i>City System Development Charge</i>	\$69,100	\$345,500
<i>Washington County Transportation Development Tax*</i>	\$845,800	\$4,229,000 *
<i>Transportation Utility Fund</i>	\$30,350	\$151,750
<i>State and County Gas Tax, County Vehicle Registration Fees</i>	\$176,700	\$883,500
<i>Total Revenue</i>		\$ 5,609,755
EXPENDITURES		
<i>EXPENDITURE SOURCE</i>	ANNUAL EXPENSE	EXPENSE FOR 5 YEARS
<i>Personnel</i>	\$113,436	\$567,180
<i>Street Lights</i>	\$32,000	\$160,000
<i>Materials and Other Services</i>	\$21,100	\$105,500
<i>Total Expenditures</i>		\$832,680
AVAILABLE FUNDS FOR ROADWAY PROJECTS		
<i>TDT Eligible Roadways</i>		\$4,229,000
<i>All Other Roadways</i>		\$1,380,750

*funds to be used towards Arterial and Collector streets only

FUNDING FORECAST

At current funding levels, the city can anticipate the available funding levels as shown in Table 8 for the next 20 years.

TABLE 8: FUNDING SOURCES AT CURRENT LEVELS FOR NEXT 20 YEARS
REVENUE

<i>FUNDING SOURCE</i>	ANNUAL REVENUE	REVENUE FOR 20 YEARS
<i>City System Development Charge</i>	\$69,100	\$1,382,000
<i>Washington County Transportation Development Tax*</i>	\$845,000	\$16,916,000 *
<i>Transportation Utility Fund</i>	\$30,350	\$607,000
<i>Gas Tax</i>	\$176,700	\$3,534,000
<i>Total Revenue</i>		\$22,439,020
EXPENDITURES		
<i>EXPENDITURE SOURCE</i>	ANNUAL EXPENSE	EXPENSE FOR 20 YEARS
<i>Personnel</i>	\$113,180	\$2,268,700
<i>Street Lights</i>	\$32,000	\$640,000
<i>Materials and Other Services</i>	\$21,100	\$422,000
<i>Total Expenditures</i>		\$3,330,720
AVAILABLE FUNDS FOR ROADWAY PROJECTS		
<i>TDT Eligible Roadways</i>		\$16,916,000
<i>All Other Roadways</i>		\$5,523,000

*funds to be used towards Arterial and Collector streets only

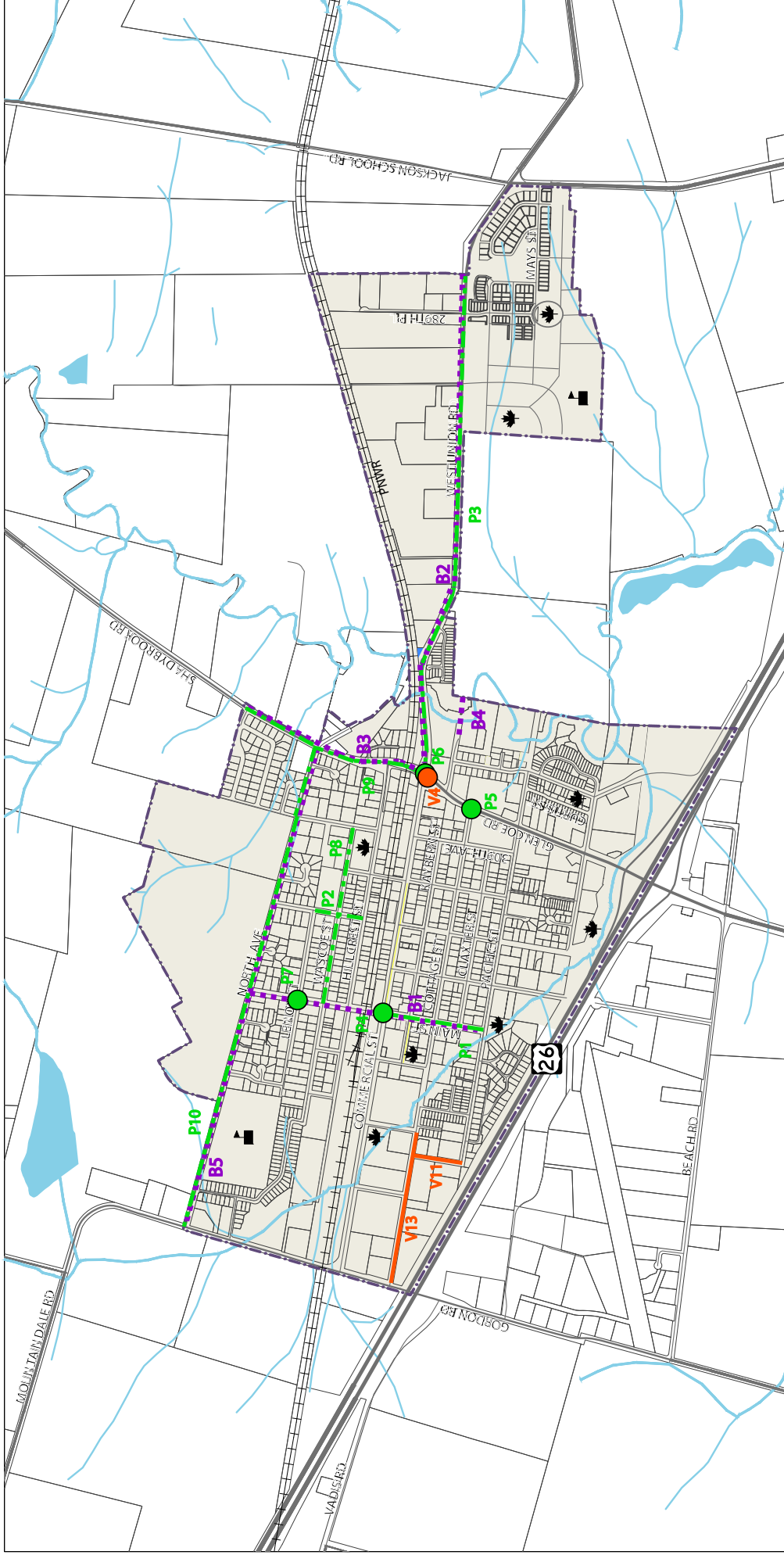
FINANCIALLY CONSTRAINED PROJECT LIST

Table 9 is a list of projects to be placed on the Financially Constrained Project List. Details of each project are included in The Appendix. Figure 9 is a map of the proposed projects.

TABLE 9: FINANCIALLY CONSTRAINED PROJECT LIST

Project ID	Project Description	Estimated Cost
Pedestrian		
P1	Main Street Sidewalks-Installation of Sidewalks between Commercial and Pacific Streets	\$360,000
P2	313th Avenue Sidewalks- Install sidewalks between Hillcrest and Lenox	\$185,000
P3	West Union Road -Installation of sidewalks where missing between Jackson School Road and Glencoe Road.	\$900,000-\$2,505,000
P4	Main Street at Commercial Street -crosswalks on all 4 approaches	\$5,000
P5	Glencoe Road Crosswalk -Crosswalk across Glencoe at intersection or between Pacific and Kaybern	\$45,000
P6	Glencoe Road at Commercial Street -Crosswalks on all 4 approaches as an interim condition until Commercial is upgraded	\$5,000
P7	Main Street at Lenox Street -crosswalk across the south side of the intersection	\$2,000
P8	Wascoe Street -Sidewalks from 309 th to Main Street	\$605,000
P9	Glencoe Road -Sidewalks on both sides north of Commercial Street	\$315,000
P10	North Avenue -Sidewalks on north and south sides of the roadway	\$990,000
Total Cost for Pedestrian Improvements		\$3,412,000-\$5,017,000
Bicycle		
B1	Main Street -Shared roadway bike markings	\$8,000
B2	West Union Road -Bike lanes on both sides from Jackson School Road to Glencoe	\$915,000-\$2,640,000

B3	Glencoe Road -Bike lanes on both sides north of Commercial	\$555,000
B4	East-West Multi-Use Path Connector -Multi-Use path from Kaybern east to UGB	\$510,000
B5	North Avenue - Installation of Bike Lane on both sides of the roadway outside of the developable area	\$1,445,000
Total Cost for Bicycle Improvements		\$3,433,000-\$5,168,000
Vehicle		
V4	Glencoe Road at Commercial Street - Roundabout or signalization	\$1,100,000
V11	322nd Avenue -A North-South collector street connector should be made connecting Pacific Street to Cottage Street. (Right of way exists)	\$395,000
V13	Cottage Street -321 st Ave west to Gordon Rd (Right of way exists)	1,228,000
Total Cost for Vehicle Improvements		\$2,723,000
Total Cost for All Improvements		\$9,568,000-\$12,908,000



North Plains Transportation System Plan

- PEDESTRIAN IMPROVEMENTS
- VEHICLE IMPROVEMENTS
- BICYCLE IMPROVEMENTS

- Points of Interest
- School
- Park

- URBAN GROWTH BOUNDARY
- TAX LOTS
- CITY LIMITS
- RAILROAD
- STREAMS
- LAKES



Figure 9 Financially Constrained Projects

6.0 ASPIRATIONAL SOLUTIONS

ASPIRATIONAL PROJECTS

This section details aspirational projects that have been identified as necessary and have community support. However, these projects are not feasible within the financially constrained budget at the current funding levels. These projects can be funded and implemented by the City with additional available outside funding sources.

TABLE 10: ASPIRATIONAL PROJECT LIST

Project ID	Project Description		Estimated Cost
	PEDESTRIAN IMPROVEMENTS		
P11	Lenox Street	Install sidewalks on Lenox St from Main Street to 313 th Ave	\$405,000
P12	Commercial Street at 311 th Avenue	Level 2 crossing-all 4 crossings	\$5,000
P13	Pacific Street at 313 th Avenue	Level 2 crossing- all 4 crossings	\$5,000
P14	Cottage Street	From west termini to Glencoe Road	\$965,000
P15	Gordon Road	Add Sidewalks from Commercial Street to North Ave	\$765,000
P16	309 th Avenue	Upgrades include sidewalks, planter strips, on-street parking, and traffic calming measures.	\$253,000
P17	311 th Avenue	Sidewalks from Wasco to Commercial	\$350,000
P18	318 th Avenue	Sidewalk from Cottage to Commercial	\$350,000
P19	Hillcrest Street	Sidewalks from Glencoe to Main	\$852,000
P20	Kaybern Street	Infill missing sidewalks between 309 th & 318 th	\$525,000
	TRAFFIC CALMING		
V1	313 th Avenue	Provide sidewalks, bike lanes, and planter strips	\$1,305,000

V2	Pacific Street	Provide sidewalks, bike lanes, planter strips, on-street parking, and intersection bulb outs	\$2,695,000
V3	Commercial Street	Provide traffic calming including sidewalks and bike lanes. Options to be evaluated as part of the Commercial Street Redevelopment Study.	\$3,660,000
V18	Yorkshire Street	Traffic calming to reduce cut through traffic	\$200,000-\$625,000
V19	309 th Avenue	Upgrades include sidewalks, planter strips, on-street parking and traffic calming measures	\$1,350,000
BICYCLE IMPROVEMENTS			
B6	Gordon Road	Provide bike lanes or 6' minimum shoulders on both sides of the road	\$605,000-\$1,220,000
CAPACITY IMPROVEMENTS			
V5	Glencoe Road at Highland Court	Restrict movements to Right-In Right-Out Left-In only or roundabout	\$280,000
V6	Glencoe Road at Pacific Street	Signalization or roundabout	\$380,000
RAILROAD CROSSING			
V8	Main Street	Upgrade crossing	\$600,000
V9	311 th Street	Upgrade crossing	\$600,000
PROJECTS TO BE COMPLETED WITH DEVELOPMENT			
INTERSECTION IMPROVEMENTS			
V10	Glencoe Road at North Avenue	Roundabout or signalization and left turn pocket	\$380,000-\$750,000
V20	North Avenue @ Main Street	Traffic Signal or Roundabout	\$750,000
V21	North Avenue @ 313 th Street	Traffic Signal or Roundabout	\$750,000
V22	North Avenue @ 311 th Street	Traffic Signal or Roundabout	\$750,000

NEW STREET CONNECTIONS			
V12	325 th Avenue	Built as a collector street connecting Cottage Street with Commercial Street	\$410,000
V14	Pacific Street	East of 307 th Ave as needed for development (Right of way exists)	\$495,000
V15	Kaybern Street	East of 307 th Ave as needed for development (Right of way exists)	\$395,000
V16	Wascoe Street	From Main Street 80' east of Main Street (Right of way exists)	\$47,000
V17	Cottage Street	318 th St over the creek to connect to 320 th St (Right of way exists)	\$960,000
CROSSWALKS IMPROVEMENTS			
P21	North Avenue at Future Street Connection	The future north/south street connections should provide a Level 2 crossing across North Avenue near the school	\$5,000
P22	North Avenue at Main Street	Level 2 crossing as this is a major route to the school	\$5,000
Total Cost for All Improvements			\$21,097,000-\$22,507,000

FUNDING GAP

The City will need to acquire additional funding to bridge the gap between the needed projects and available revenue. Possible funding sources for transportation improvement projects are included in Table 11.

TABLE 11: ADDITIONAL FUNDING SOURCES

All Roads Transportation Safety (ARTS)	Funding for projects related to improving safety
Connect Oregon	Grants using lottery dollars to fund transportation projects
Debt Financing	Borrowing of funds to provide transportation projects
General Fund	Divert funds from other City programs

Immediate Opportunity Funding (IOF)	Grant funding for transportation projects that support economic growth, generally specific to sites
Local Improvement Districts (LID)	Creation of areas/districts to share in the cost of the improvement. These improvements generally provide a special benefit to the properties within the LID.
Oregon Parks and Recreation Local Government Grants	Grants funding for non-street projects such as multi-use paths
Oregon Transportation Infrastructure Bank (OTIB)	Loans to support improvement projects on streets classified as collector or higher.
Statewide Transportation Improvement Program (STIP)	ODOT funding for roadway projects
Transportation Growth Management (TGM)	Grants awarded for the planning of transportation projects
Transportation Alternatives Program (TAP)	Grant funding for pedestrian and bicycle facilities focused on transit access, safe routes to school, and recreational trails
Urban Renewal District	Use of the future increase in property taxes due to the rehabilitation of urban areas to finance infrastructure improvements within that district.
Major Streets Transportation Improvement Program	Roadway improvement funding source from Washington County through property taxes.

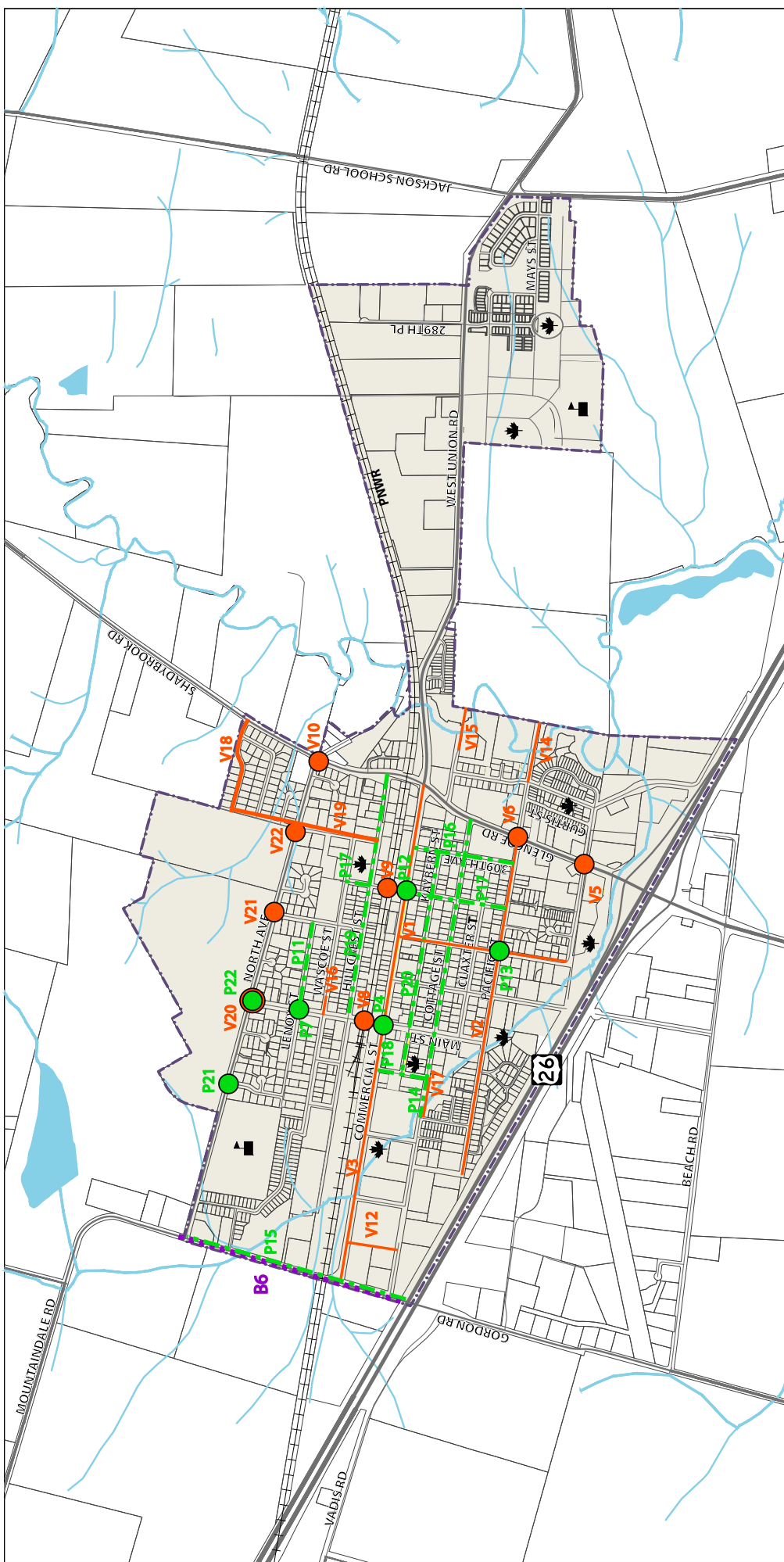
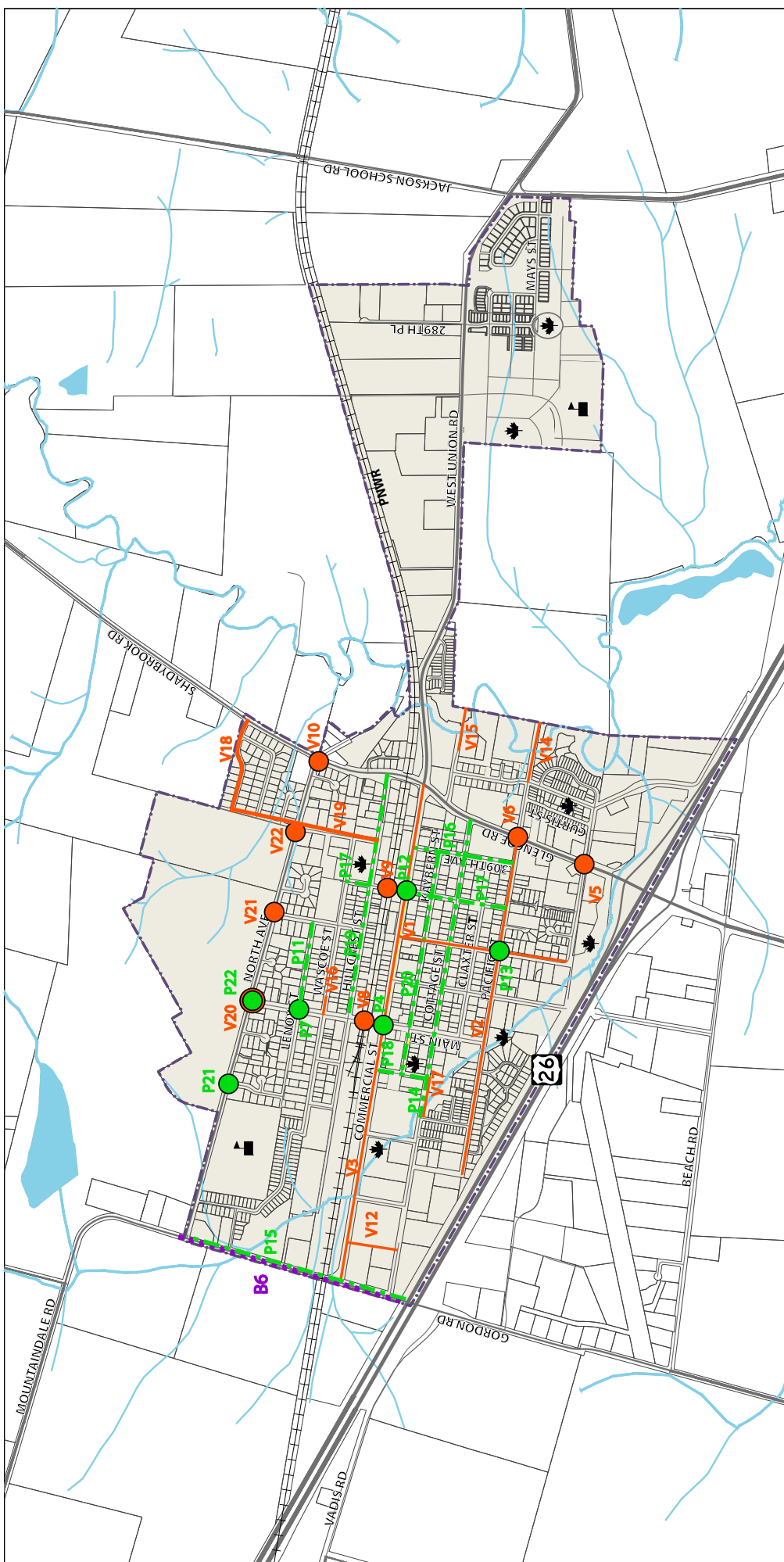
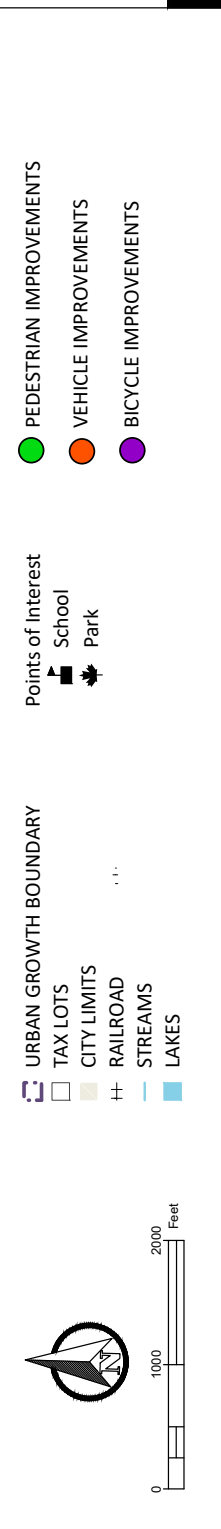


Figure 10 North Plains Transportation System Plan Aspirational Projects



North Plains Transportation System Plan



ILLUSTRATIVE PROJECTS

The projects listed within the Financially Constrained and Aspirational lists are projects needed when the City has increased the population and employment to levels beyond what can reasonably fit within the existing UGB. To reach the full population and employment forecast numbers, the City will require a UGB expansion. When this occurs, there are additional project improvements that are needed to facilitate the additional traffic. The Glencoe Highway 26 interchange will need upgrades to operate within mobility standards with the additional traffic.

The interchange improvement projects are only necessary after a UGB expansion, and the full population and employment forecasts are actualized. They are listed for illustrative purpose only and are not needed until after the UGB is expanded. The projects are illustrated below.

TABLE 12: ILLUSTRATIVE PROJECT LIST

Project ID	ILLUSTRATIVE (LONG RANGE WITH FUTURE UGB EXPANSION)		Estimated Cost
V7a	Glencoe Road at WB Ramps	Second westbound right turn lane and separate southbound right turn lane	\$10,250,000
	Glencoe Road at EB Ramps	Second northbound through lane.	
V7b	US 26 at Gordon Road	New Interchange located on the west edge of town.	\$20,000,000



North Plains Transportation System Plan

ILLUSTRATIVE INTERSECTION
IMPROVEMENTS

Points of Interest
School
Park

URBAN GROWTH BOUNDARY
TAX LOTS
CITY LIMITS
RAILROAD
STREAMS
LAKES

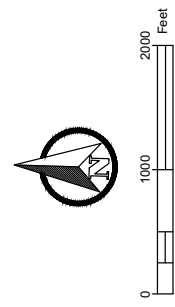


Figure 11 Illustrative Projects

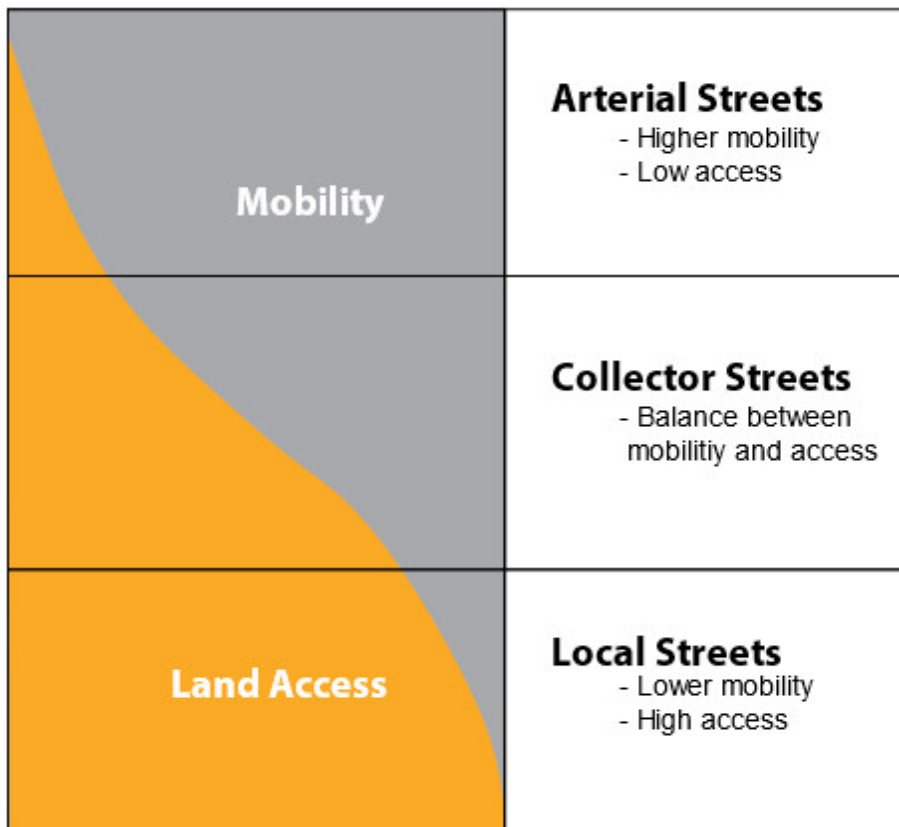
7.0 STANDARDS

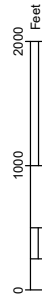
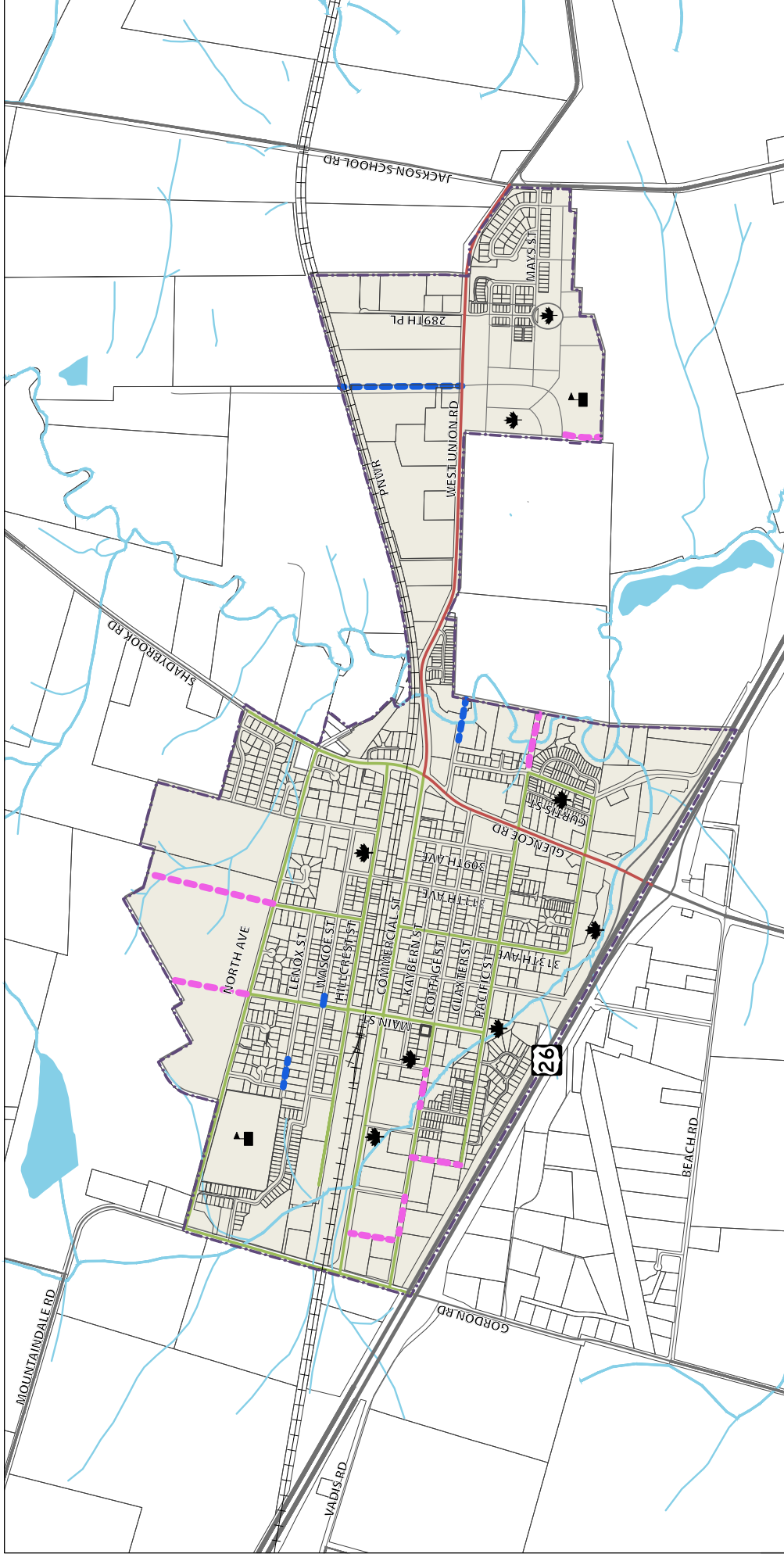
FUNCTIONAL CLASSIFICATION OF STREETS

The functional classification system organizes the roadway network into a hierarchy of mobility and access based on the intended purpose of the roadway including types and levels of vehicle use, roadway design standards, and provisions for bicycle and pedestrian use.

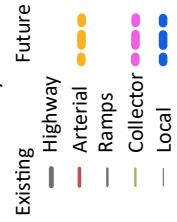
The functional classification of North Plains roadway network includes arterials, collectors, and local streets.

- **Arterial Streets** are considered the “highest” order of street. They are designed to be the major urban streets, generally characterized by the highest volume of traffic, higher speeds, frequent use by freight, and separate pedestrian and bicycle facilities. Arterials generally serve the larger commercial areas and connect the city to areas outside the city.
- **Collector Streets** connects the residential or commercial areas of town to the arterial streets. Collector streets serve higher traffic volumes and speeds and serve emergency and transit needs. They typically have shorter trip lengths and fewer traffic volumes than arterial streets. Collectors may have on-street parking and bike lanes.
- **Local Streets** serve as direct access to adjacent lands. These streets are narrower, serve the lowest traffic volumes, have slower speeds, and may have shared roadways for bicycles.





Functionality Classification



URBAN GROWTH BOUNDARY



Points of Interest



North Plains Transportation System Plan

Figure 12

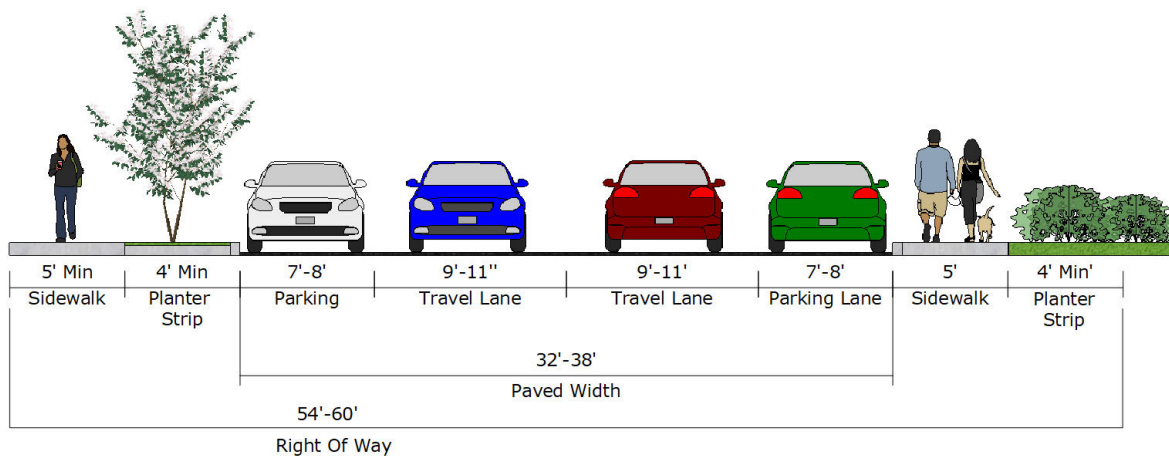
Street Classification

STREET DESIGN

The street design standards provide how streets should be designed and constructed based on the functional classification. New streets should follow these design standards. Reconstructed streets should follow the standards where practical and can make accommodations for existing restrictions. All widths shown are minimums. Widths can be increased based on design needs.

Local Street

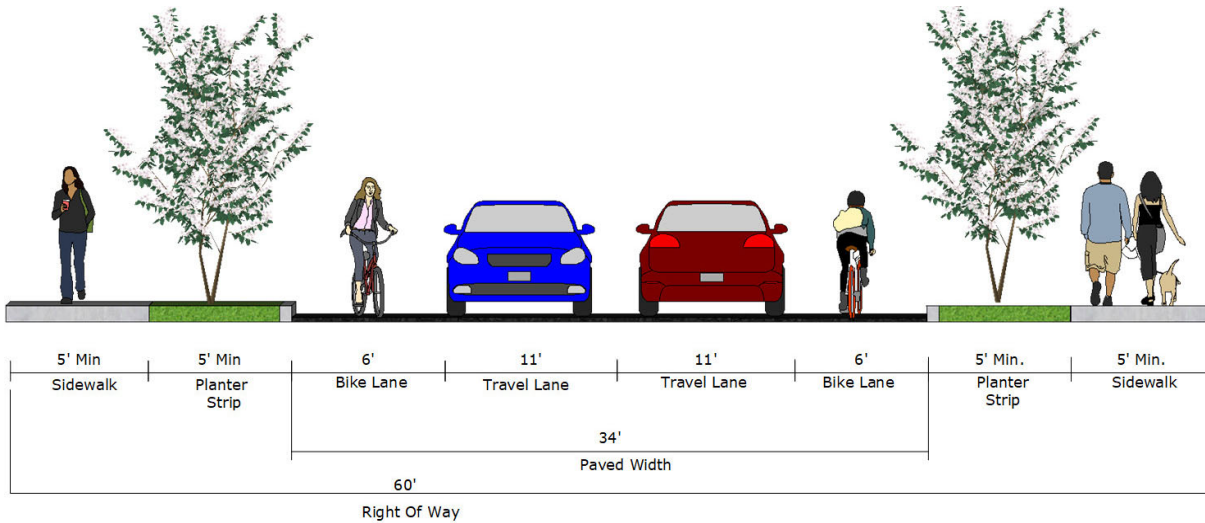
- 54'-60' Minimum right of way
- 5' Minimum sidewalks
- 9'-11' Travel lanes
- 4' Minimum planter strip/stormwater treatment
- 7-8' Parking



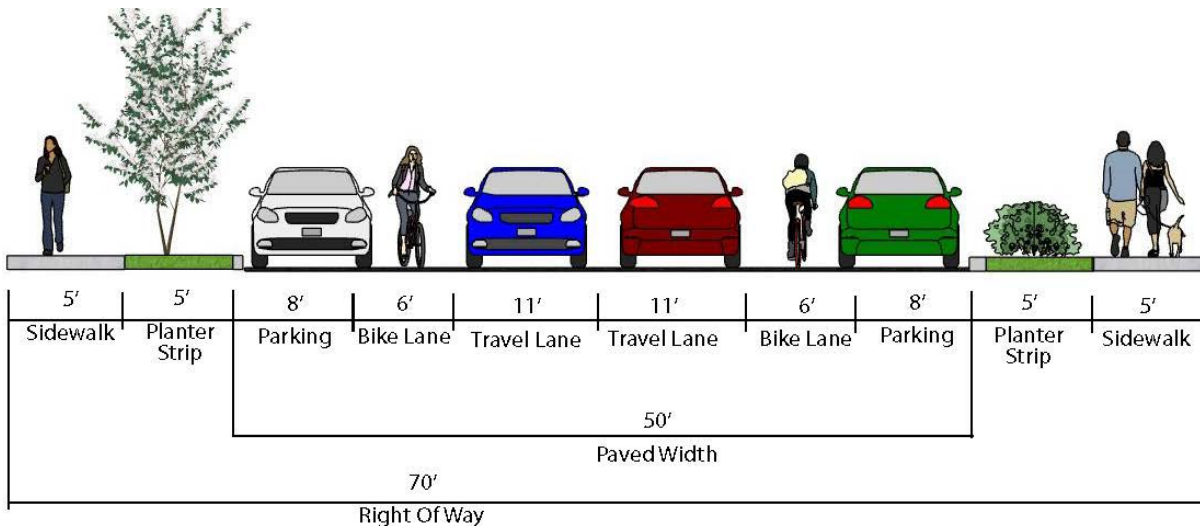
Collector Street

- 60'-70' Right of Way
- 11-12' Travel Lanes
- 6' Bike Lanes
- 5' Minimum Sidewalks
- 5' Minimum Planter Strip/Stormwater Treatment
- 8' Parking (optional)

Collector without parking:

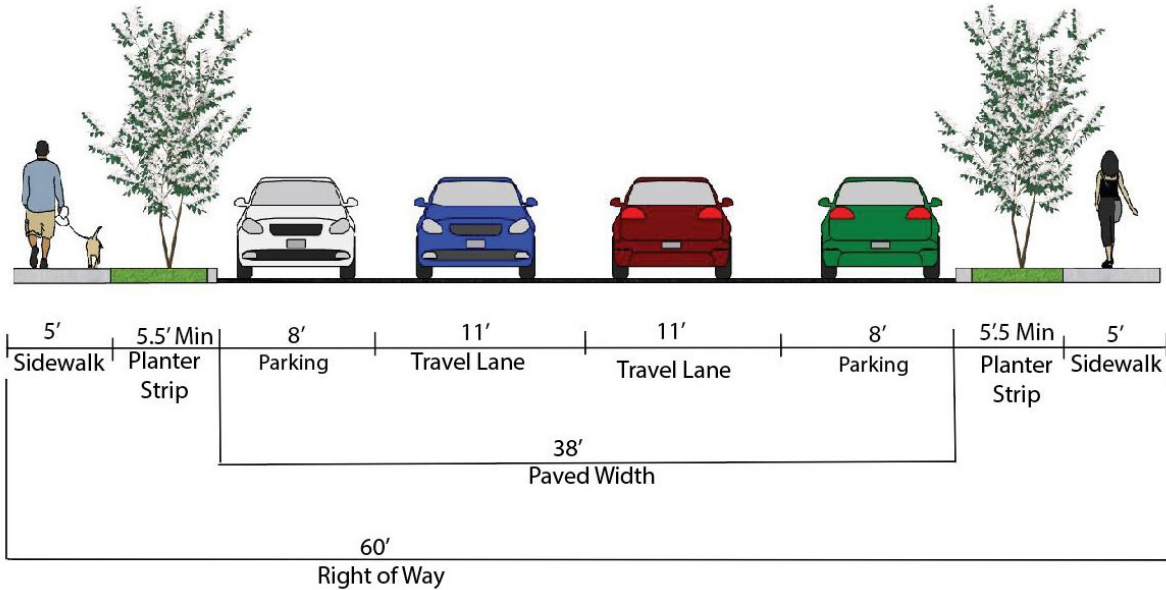


Collector with parking:



Residential Collector Street

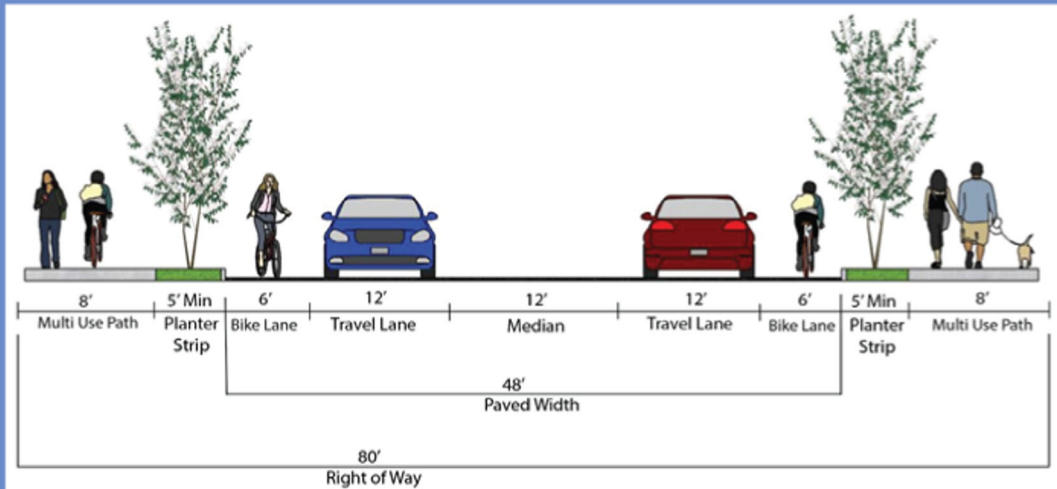
- 60' minimum Right of Way
- 11' Travel Lanes
- 5' Minimum Sidewalks
- 5.5' Minimum Planter Strips
- 8' Parking



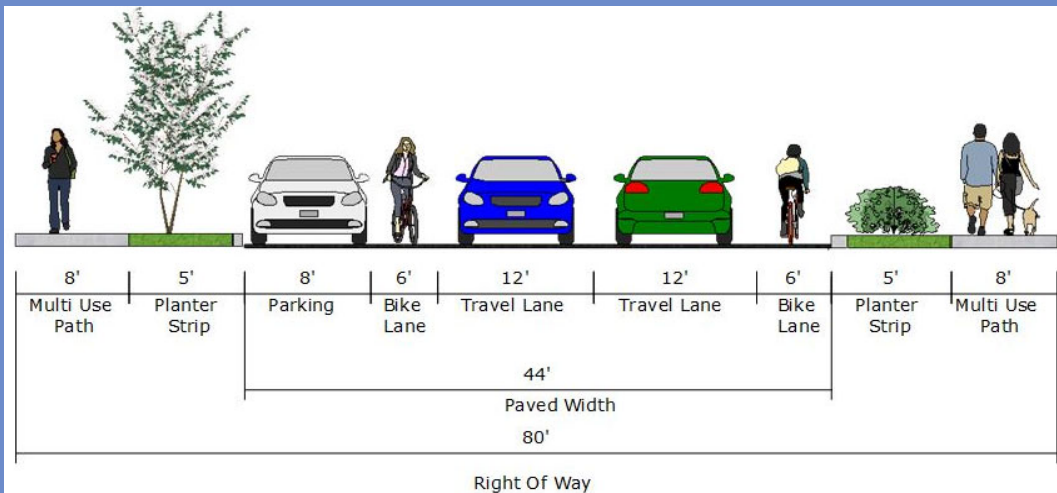
North Avenue Collector

Cross sections below are specific to North Avenue

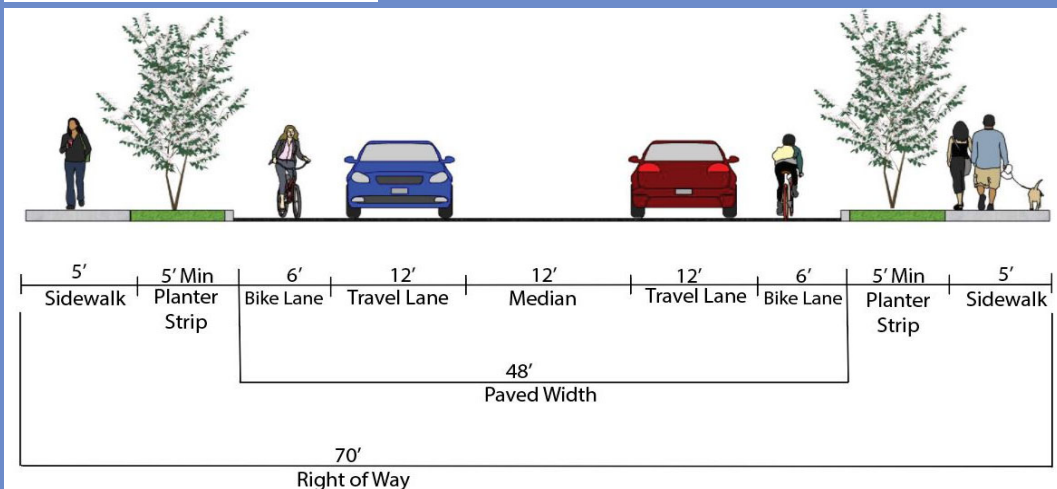
3a- West of Main Street



3b- 309th Avenue to Main Street- parking on North side only

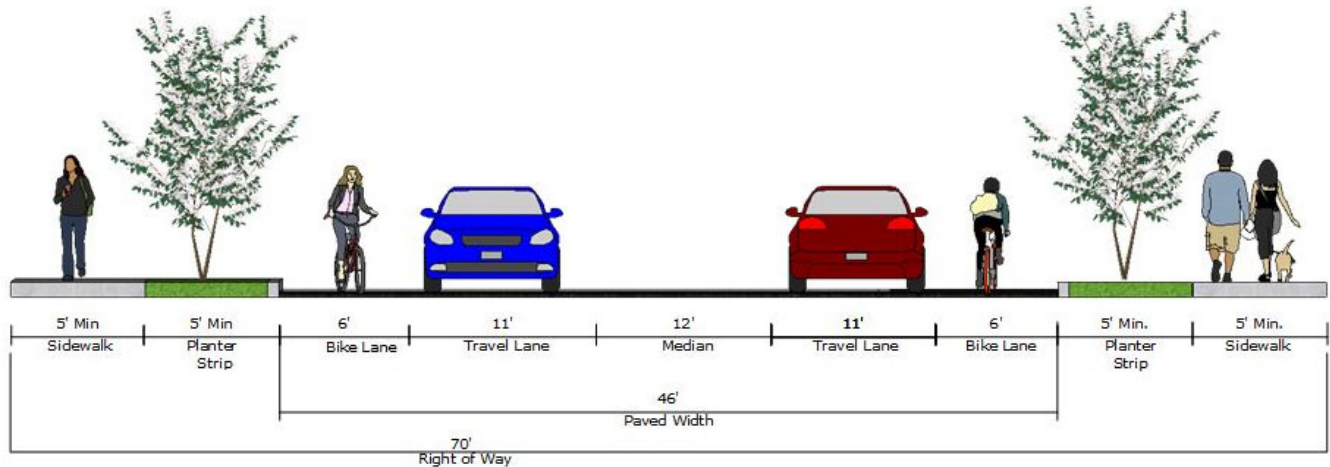


3c- Glencoe Avenue to 309th



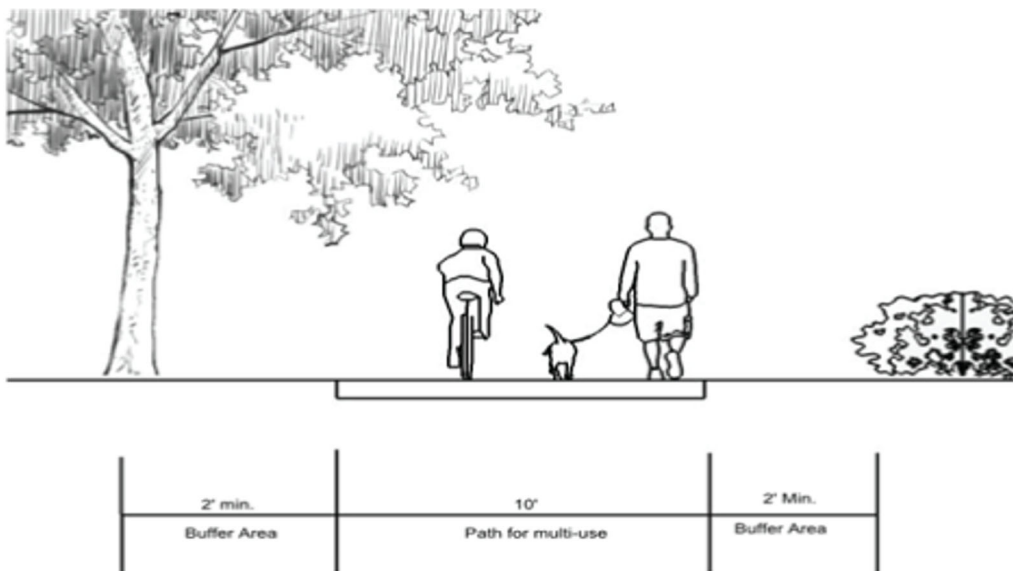
Arterial Street

- 70' Right of Way
- 11-12' Travel Lanes
- 12' Median
- 6' Bike Lanes
- 5' Minimum Sidewalks
- 5' Minimum Planter Strip/Stormwater Treatment



Shared Use Paths

- 15 foot right of way
- 10 foot path



ACCESS MANAGEMENT & SPACING

Access management allows the city to balance safe and efficient travel within the city with access needs of lots/parcels. On higher order streets (arterials and collectors), capacity and safety are preserved by reducing the frequency of automobiles entering and exiting the roadway.

City of North Plains

The recommended access spacing standards for streets within North Plains jurisdiction are provided in Table 13. The spacing standards are to be applied to new or reconstructed roadways or parcels that are redeveloping.

The access spacing standards are the distance to which driveways along the roadways can be placed from one another. The distance will be measured from the edge of one driveway to the edge of the adjacent driveway. For driveways into non-residential properties, the driveways should be aligned with any existing driveway across the street to the greatest extent possible.

TABLE 13: RECOMMENDED ACCESS SPACING STANDARDS

Functional Classification	Access Spacing
Arterial	200 feet
Commercial Collector	100 feet
Residential Collector	Individual lots
Local Street	Individual lots

County and ODOT Streets

Accesses onto roadways owned by ODOT and Washington County should follow the current access spacing standards for the respective jurisdictions.

Currently, Washington County has an access spacing policy of 600 feet between driveways along Arterials, and 100 feet along collector streets. There are multiple commercial driveways along Glencoe Avenue that do not meet the spacing standard. As these parcels redevelop, the accesses should be modified to meet the spacing standards. Additionally, there are multiple driveways along North Avenue that do not meet the spacing standards. These driveways are primarily residential and meeting the spacing standards will be difficult, even upon reconstruction/upgrade of North Avenue.

ODOT has identified in the Interchange Area Management Plan that no access or crossroad shall be provided between the westbound ramp terminal and Highland Court. All access both public and private north of Highland Court will adhere to Washington County and North Plains standards (section 3.2 of the IAMP). There are currently no access points between Highland Court and the westbound ramp terminals.

MOBILITY TARGETS

North Plains uses the motor vehicle level of service (LOS) standards to evaluate acceptable vehicle operations at intersections. Several of the intersections within the City are under the jurisdiction of Washington County and ODOT and must maintain the operational standards of those jurisdictions. Washington County uses LOS standard, and ODOT uses a volume to capacity (v/c) standard for vehicle operations at their intersections.

The LOS and v/c standards are the basis for determining when an intersection is in need of improvements. The standards provide a measure in which improvements should be considered to reduce congestion, reduce safety issues, and improve traffic flow.

The LOS and v/c are further defined as:

LOS: LOS is a concept developed to quantify the degree of comfort (including such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles) afforded to drivers as they travel through an intersection or along a roadway segment.

Intersection LOS is based on average delay, defined as the average total elapsed time from when a vehicle stops at the end of a queue until the vehicle departs from the stop line. The average delay is measured in seconds per vehicle per hour and then translated into a grade or “level of service” for each intersection. LOS ranges from A to F, with A indicating the most desirable condition and F indicating the most unsatisfactory condition. LOS A means that an intersection or roadway is moving at free-flow conditions and a driver experiences limited to no delay. LOS F is congested conditions where the delay to the driver has become excessive, and long queues at intersections have formed. The LOS criteria, as defined by the Highway Capacity Manual, for intersections is provided in Table 14.

TABLE 14: HCM LEVEL OF SERVICE FOR INTERSECTIONS

Level of Service	Stopped Delay Per Vehicle (Seconds per Vehicle)	
	Unsignalized Intersections	Signalized Intersections
A	≤ 10.0	≤ 10
B	> 10.0 and ≤ 15.0	> 10 and ≤ 20
C	> 15.0 and ≤ 25.0	> 20 and ≤ 35
D	> 25.0 and ≤ 35.0	> 35 and ≤ 55
E	> 35.0 and ≤ 50.0	> 55 and ≤ 80
F	> 50.0	> 80

V/C: The v/c ratio describes the capability of an intersection to meet volume demand based upon the maximum number of vehicles that could be served in an hour. Lower ratios mean an intersection or roadway is operating smoothly and a driver experiences little to no delays. As a v/c ratio approaches 1.0 the intersection operates at capacity and the driver experiences long delays and excessive queuing.

The City of North Plains has adopted a LOS standard for all intersections. All streets and intersections need to perform at or better than the following standards:

- **Signalized:** The intersection must operate at a LOS D or better for the “Peak Hour” that occurs on a typical weekday defined as the AM or and/or PM period.
- **All way Stop Control:** Minimum overall level of service is during the weekday AM or PM peak period.
- **Unsignalized Intersection:** Each approach or lane group must operate at or better than LOS D.
- **Roundabout:** Minimum overall LOS “D” during the weekday peak hour.

All intersections within Washington County jurisdiction must comply with Washington County standards. All intersections within ODOT jurisdiction must comply with ODOT v/c standards as outlined within the Oregon Highway Plan.

TRAFFIC CALMING/TRAFFIC MANAGEMENT

Traffic calming is the use of physical measures within the Right of Way to reduce travel speeds and traffic volumes and to improve the safety and comfort of walking and bicycling.

Traffic calming techniques need to balance the need for slower vehicle speeds and usage with:

- Efficiency of the road system
- Access to property
- Maintain access for emergency vehicles

Table 15 provides options for traffic calming and which treatments are appropriate for collector and local streets. Traffic calming is not typically applied to arterial streets.

Purpose of Traffic Calming

- Reduce vehicle speeds
- Reduce traffic volumes
- Improve pedestrian safety
- Improve bicycle safety

TABLE 15: CALMING TECHNIQUES

Traffic Calming Measure	Collector	Local
Narrowing travel lanes	Yes	Calming measures are generally supported on local streets.
Placing buildings, street trees, on-street parking, and landscaping next to the street	Yes	
Curb Extensions or Bulbouts	Yes	
Roundabouts	Yes	
Mini-Roundabouts	Yes	
Medians and Pedestrian Islands	Yes	
Pavement Texture	Yes	
Speed Hump or Speed Table	No	
Raised Intersection or Crosswalk	Yes*	
Speed Cushion (provides emergency pass-through with no vertical deflection)	No	
Choker (Curb extension located at mid-block or intersection corner adjacent to parking)	Yes	
Traffic Circle	No	
Diverter (with emergency pass through)	Yes	

*On roadways with speeds of 30 MPH or less