Section 4

Alternatives Analysis

Alternatives Analysis

INTRODUCTION

This section presents a summary of future land use and transportation improvement alternatives that could be implemented to mitigate existing and projected future transportation system deficiencies. The remainder of this section is organized into three parts. First, land use issues and alternatives are presented. Based on the land use discussion, an overview of transportation improvement needs and associated ramifications is presented. A discussion of specific improvement alternatives, including estimated costs, and recommendations for implementation then follows.

As potential deficiency mitigation projects were developed, consideration was given to how a multi-modal approach could contribute to individual projects. Thus, while the primary impetus for a given mitigation alternative may center on increasing vehicular capacity, provision of appropriate bicycle and pedestrian amenities was given equal consideration. Special effort was provided in considering and recommending improvements to the pedestrian and bicycle systems. Recommendations were developed that create direct linkage to all identified pedestrian/bicycle generators and provide for a core pedestrian and bicycle transportation system. The alternative analysis and subsequent recommendations process were handled separately to ensure that a complete system for each mode was identified without constraint.

It should be noted that, in this section, formal alternatives development and analysis have only been presented for the roadway network and its components. Other elements of the transportation system such as pedestrian access, bicycle access, etc. currently exist at a level such that an entire network needs to be developed. The **Transportation System Plan** section of this report contains the recommended improvements to all of the modal systems.

LAND USE ALTERNATIVES/TRANSPORTATION SYSTEM RELATIONSHIP

The existing and future land uses within the City of Boardman have a substantial impact on the local transportation system. As a result, the city's transportation system will continue to reflect a strong relationship to local land use well into the future. The following discussion focuses on the transportation impact associated with various land uses and the implications associated with future land use alternatives.

Background

As stated in the **Existing Conditions** section, approximately 90 percent of the city's future residential development will occur south of the freeway based on the city's vacant land inventory. Further, at least a 20-year supply of land exists for both single family and multi-family residential development.

As such, land use alternatives in Boardman primarily relate to infill and redevelopment of future commercial development. The large supply of commercial land, relative to the current and projected population base of Boardman and its market area, is a challenge to manage efficiently. In 1997, there were 37 acres of developed commercial land and 237 acres of vacant commercial land within the Boardman urban growth boundary.

Commercial uses are scattered among four different areas of the city: 1) North Main Street area; 2) Front Street between North Main and Olson Road; 3) South Main at the I-84 interchange; and 4) on South Main Street between Interstate 84 and Wilson Road. A fifth area between South Main Street and Olson Road along the south side of Interstate 84 is also planned for commercial development but does not currently have street access.

The community lacks a focal point or center for commercial development. When a visitor to Boardman exits the freeway at Main Street, a decision needs to be made about whether one turns left

or right to find the center of town. Even after finding needed commercial services, there is an uncertainty about whether you are in "the center". Upon driving around, the uncertainty remains – there is the nagging feeling that you are missing something that might or might not be there, if only you knew where to turn. Without the distinctive commercial core that marks most communities, even very small towns, the community appears very disconnected and dysfunctional. This problem, if perceived as such by the community, cannot be cured if the existing pattern of scattered commercial development continues.

Scattered commercial development has these disadvantages:

- increased auto-dependency and the difficulty of creating pedestrian-oriented commercial districts; auto-dependency increases vehicle trips and can disadvantage those who cannot drive automobiles to access needed services;
- the inability to create synergistic effects where businesses can benefit themselves and the community through co-location such as customer patronage and increased sales, shared parking and signage, landscaping, managed access, etc;
- the difficulty in establishing a strong business district identity that in turn can attract more businesses;
- the difficulty in establishing a strong community identity that contributes to the community's social fabric and sense of well being;
- auto-dependent land use and site design, large parking lots with excessive parking and disconnected development; and
- over-building of infrastructure to address potential build-out demands at all locations.

The excess commercial land contributes to the diffused pattern of commercial development and detracts from the objective to create a focal point such as a downtown. While it would seem that the city is attractive for commercial development because it has such a large supply, the opposite can actually be the case to achieve long-term, stable business development. Commercial businesses may be able to obtain land inexpensively, a plus for emerging small businesses, but they face a high risk in choosing a location that will have long-term viability and stability. Most businesses do better in an environment with other similar uses. If they are spread-out, they do not benefit from the synergy that businesses within more compact centers can achieve. This is why shopping centers have been so successful in America's retail history. While Boardman may not be able to attract major shopping centers because of its small population, it can create a similar synergistic environment through planning a center that promotes small independent businesses.

With a large supply of commercial land, the city runs a risk that property owners will eventually request either a zone change or change to allow other uses within commercial zones. For example, if the city's supply of multi-family housing runs in short supply relative to commercial, there may be requests to rezone it to multi-family. This puts the city in a reactive mode based on the opportunity that a property owner has rather than what might be best for the community as a whole. If these requests are granted on a piecemeal basis, it can result in an even more incoherent development pattern.

Boardman has the opportunity to create a downtown or main street. Traditionally, downtowns and main streets have these characteristics:

- grid system of streets;
- 200' – 300' blocks;
- wide sidewalks;

- combination of on-street and off-street parking;
- shallow front yard set-backs;
- zero side yard setbacks with attached buildings;
- rear alleys and loading areas; and
- mix of uses – retail, services, public buildings and residential (often above retail businesses).

Many, but not all downtowns and main streets, have landscaping, distinctive street fixtures such as lighting and design themes. Main streets usually consist of one major retail street whereas downtowns are larger retail business districts that incorporate a larger range of uses.

Most downtowns and main streets were established when the original townsites were platted. It is rare for a community to create a downtown in a contemporary situation and it will be a challenge to create a new downtown or main street in Boardman. However, there are essentials that urban designers strive for in "neo-traditional" commercial centers: street design that comfortably accommodates pedestrians and autos; pedestrian-oriented building design at street level; compact development; and on-street and off-street parking (preferably shared). These are characteristics not usually typical of freestanding retail centers.

The existence of a downtown or main street for retail business is important to cities, regardless of size, for a variety of reasons, as summarized below.

- It performs an important economic function. A downtown provides a center where businesses can congregate and mutually support each other, providing a stronger benefit to each other and the community than when they are separated.
- It provides a convenient, central location where the community can obtain a variety of goods and services.
- It performs a social function, especially if civic buildings are located in the downtown, by bringing people together with a sense of pride and ownership in the community.
- It provides an organizing element to the physical growth and developments of the community, helping establish logical arrangements of land use that are mutually supportive.
- It helps a community establish its identity.

Whether in a downtown or main street, public investment is often a critical factor in creating successful new centers or revitalizing older ones. The location of post offices, city halls, libraries, public safety buildings and other similar facilities helps create the environment of community activity and supports retail businesses. These also help downtowns and main streets be more interesting places, become centers of community life and contribute to the community's identity and self-image.

Land Use Alternatives

The abundant land supply, while presenting problems and challenges, is also an opportunity: it presents the community with several possible choices in how to develop its commercial areas. Not many communities have such a range of choices.

This analysis presents three alternatives for consideration by the community: 1) a multi-center alternative; 2) a main street alternative; and 3) a downtown alternative.

Land Use Alternative 1: Multi-Center Development

The multi-center development alternative reflects a continuation of the existing trend for development at four to five locations. Commercial development would continue to locate based on land availability and market forces without community intervention. If the trend continues, the city can expect to see commercial development expand in all commercial areas, including the new area south of the freeway. However it will be hard to predict where development will occur, when and how much will occur at each location. A center may be proposed by a property owner, one could evolve over time or perhaps no one location would become the center, it would be left to chance. The city would react to development proposals on a case-by-case. As with the private market, the city and other public and non-profit organizations would locate their facilities without necessarily trying to focus them in any one area or along with retail uses.

Advantages of multi-center development include:

- allows market to operate freely, generally unconstrained;
- allows both sides of the freeway to serve local residents in different ways;
- multiple property owners;
- requires limited commitment by city to promote or regulate;
- plenty of area for expansion; and
- spreads out traffic impacts associated with commercial development.

Disadvantages include:

- continues disconnected, confusing development pattern;
- not conducive to pedestrian access; requires extensive driving to access the range of commercial services;
- development unrelated to residential development pattern;
- may be difficult to attract quality commercial development; and
- spreads out development making it virtually impossible to achieve a downtown character in any one area.

Land Use Alternative 2: Main Street Concept

The "Main Street Concept" alternative would focus future main street-type development on Boardman Avenue or other appropriate streets. Because land in this area is limited and constrained by needs of the street system to get traffic on and off the freeway, other commercial sites would continue to play a major role in providing services. Land-extensive retail, such as supermarkets, would continue to locate where large sites are available with ample parking, such as on Front Street (north or south side) or on South Main Street. Freeway-oriented services for travelers would continue to be located primarily south of the freeway interchange at the South Main Street exit. Location of public buildings may or may not occur on in the business district.

Advantages of "main street" development on Boardman Avenue include:

- creates a small, tight area as a commercial focus;
- builds on what is already developed;
- stimulates redevelopment activity;
- close to the industrial area, high school and riverfront; and

- provides the ability to achieve somewhat of a main street concept with pedestrian accessibility.

Disadvantages include:

- development pattern could cause traffic conflicts between freeway access, industrial traffic and local circulation needs;
- limited area for expansion over long period of time;
- existing development may not fit plan; and,
- locates commercial center on side of freeway away from most future residents, which will further exacerbate capacity constraints on the overpass.

While Boardman Avenue was chosen to demonstrate the Main Street alternative north of the freeway, the concept could be employed in other locations where both sides of a major street can be developed to meet the goals of a main street concept. Riverside High School is located on the north side of Boardman Avenue and is not zoned for commercial use. However, there might be enough land area to create a shallow tier of storefronts and still adequate provide access to the high school. Instead of Boardman Avenue, a new street could be created between Boardman Avenue and Front Street. A significant part of the commercial land between these streets is vacant and it appears that there is room to provide a street with commercial uses on both sides. The Main Street concept does not work well on a street where only one side can be developed for retail use, such as along Front Street.

Land Use Alternative 3: Downtown Concept

Under Land Use Alternative 3, a downtown would be created on South Main Street. The amount of vacant commercial land in this area would allow more uses with a range of site requirements and has adequate land to allow expansion for well beyond a 20-year planning horizon. A large public square or park would be the centerpiece. It could incorporate mixed use, including major public buildings, surrounded by a higher density area of multi-family housing within easy walking distance. While the central retail area would be developed on a 200-foot grid system, this would increase to 400 feet on the outer blocks for larger retail uses and multi-family housing. Commercial land north and south of the freeway exit on Main Street would continue to cater to travelers so that the new downtown could be oriented primarily to residents, thereby minimizing traffic conflicts on the freeway overpass.

Advantages of this alternative include:

- locates major services where most of future population will reside;
- reduces potential conflicts of industrial, freeway-oriented and residential traffic;
- large parcels are located along South Main Street that can be master-planned “from scratch” to adequately address development needs and different modes of transportation;
- potential to create a “close to traditional” downtown; and
- adequate area to expand over a long period of time.

Disadvantages include:

- would be located away from the older, established part of the community;
- development is dependent on one or two property owners to work with city to create; and
- requires strong public-private partnership and long-term commitment.

Land Use Alternatives Evaluation

Commercial development historically has been focused on the north side of I-84 since the town's relocation in the 1960's. Riverside High School, City Hall, the Post Office, Library and several commercial establishments are located in the North Main Street and Front Street area. A partially developed commercial business park is located on both sides of Columbia Avenue, west of Olson Road and near the Port of Morrow industrial area. The north side is constrained for future commercial development by residential uses on the west and north toward the river, industrial uses to the north and east, and the freeway on the south.

The previous discussion identified on- and off-ramps from I-84 to Main Street as a current location of pedestrian and traffic safety issues. The proximity of commercial development to the ramps coupled with the lack of definition of the roadways, driveways and parking areas cause driver confusion and safety problems for both vehicles and pedestrians. In addition, the two lane Main Street overpass is limited in its capacity for future traffic growth and has conflicts between its use for local traffic and for access to and from the freeway.

Alternative 1, "Multi-Center Development", which is a continuation of the existing development trends, is not a desirable pattern for future commercial development. Accordingly, it is recommended that either Alternative 2, "Main Street Concept," or Alternative 3, "Downtown Concept," be given further consideration.

Alternative 2 could only work if part of the Riverside High School site along Boardman Avenue could be utilized for commercial development, which would require relocating the existing driveway entrance and main parking lot to the school. Even if feasible, land area for future commercial development is limited and the ability of the North Main Street alternative to serve as a downtown for the community would probably suffice for only about 20 years. During that period, auto and truck traffic will increase causing more traffic safety issues and making the north side more inaccessible for the growing number of residents to the south of the freeway.

There has also been some interest in future commercial development along the north side of Front Avenue, perhaps transforming this area into the city's downtown. Its visibility to the freeway could be beneficial to commercial development, especially travelers. However, without developable land on both sides of the street, it will be impossible to develop an attractive pedestrian-oriented commercial area. Furthermore, freeway-related traffic and circulation in the vicinity of Main Street and Front Street will make this area increasingly difficult to access. Current safety and auto-truck conflicts could be seriously exacerbated by encouraging high trip-generating commercial uses along Front Street. Therefore, it is recommended that this commercial area be de-emphasized as an area for future intensive commercial activity.

Preferred Land Use Alternative

For all of the reasons discussed, the Downtown Concept (Land Use Alternative 3) is the recommended preferred alternative. The downtown should develop on commercial land on both sides of South Main Street, some of which is already developed for commercial use. The primary benefits of the Downtown Concept at this location are:

- sufficient vacant and redevelopable commercial land for well over 20 years of community growth in retail and service needs;
- proximity to future residential development that will change the "center of population" of the community from the north side of the freeway to the south side over the next 20 years;
- the capacity of the current and future street system to accommodate growth of commercial and residential development over a long period of time;

- the ability to develop a grid system pattern of streets within and surrounding the downtown that will disperse traffic and promote the use of alternative modes of travel;
- the ability to incorporate and surround the downtown with public uses, mixed use and multi-family development within walking distance of commercial services;
- the ability to provide a range of parcel/block sizes to promote a variety of commercial uses;
- the distance from freeway on- and off-ramps to avoid conflicts with interchange traffic, including trucks that are accessing the industrial area;
- large parcels that allow platting in a grid pattern of blocks and streets;
- the potential to establish a strong identity for the city that will foster community cohesion and pride; and,
- improvement of Boardman as an economic center and residential community.

Section 5 of this TSP, **Transportation System Plan**, provides additional information on the implementation of the preferred land use alternative.

There are also several transportation improvements that will also be necessary in the future. The remainder of this section provides an overview of improvement alternatives that could be implemented to mitigate existing and anticipated transportation system deficiencies.

OPERATIONAL IMPROVEMENT NEEDS

The need for mitigation of existing and future roadway/intersection operations is interrelated with pedestrian and bicycle infrastructure needs as well as access management issues. The existing and long-term future forecast conditions analyses identified several specific capacity-related roadway and intersection deficiencies. In addition, several issues related to traffic operational improvements were identified by community members and the project team. These issues are discussed below.

North Main Street Improvement Needs

North Main Street is in need of several improvements that would benefit vehicular, pedestrian, and bicycle modes of travel. The need for these improvements is directly impacted by the operations of Front Street, the Interstate 84 Interchange, Boardman Avenue, and the location of existing and future land use development in the city. Access management and pedestrian/bicycle infrastructure needs also dictate the need for improvements, as discussed below.

Front Street/Interstate 84 Interchange Operational Issues

Analysis of year 2020 future forecast volumes revealed that the Interstate 84 Westbound Ramp/Main Street intersection would require capacity improvements to restore intersection operations to an acceptable level of service. The forecast year 2020 analysis results described in Section 3 further noted that, as a result of the close spacing between the Interstate 84 ramps and the two respective frontage roads (North Front Street and South Front Street), it is expected that several geometric changes will be required to accommodate future traffic volume growth.

There are several interrelated factors that will determine whether, and how, the capacity of the Interstate 84 interchange and Main Street can be ensured. These issues include:

- *Intersection Spacing*. The existing intersections of Main Street/North Front Street, Main Street/Interstate 84 Westbound Ramp, Main Street/Interstate 84 Eastbound Ramp, Main Street/South Front Street are too closely spaced and will not function efficiently as traffic volumes grow. Overlapping functional areas of intersections make it especially difficult for drivers on side streets (such as Front Street) to safely enter Main Street because of the numerous conflicting vehicle movements that must be simultaneously monitored. For example, a driver trying to turn left from North Front Street onto Main Street must find an

adequate gap in the Main Street traffic stream while also coordinating with vehicles entering Main Street from the Westbound Interstate 84 ramp, Boardman Avenue, and any number of adjacent commercial properties.

- *Circulation Patterns*. Ill-defined circulation patterns along North and South Front Streets, in conjunction closely spaced intersections, make minor street turning operations at intersections difficult for drivers.
- *Access Management.* The lack of access management along Main Street complicates intersection operations as drivers are able to make turns onto and off of Main Street at virtually any location. The lack of access management results in a multitude of cut-through trips that create safety issues in parking lots. The situation is especially evident when Riverside High School students are released and drivers cut through local commercial parking lots to avoid queuing at the North Main Street/Boardman Avenue intersection.
- *North-South Connectivity*. The lack of alternative north-south connections across Interstate 84, which focuses the majority of north-south travel through the city via Main Street and the Interstate 84 interchange, further complicates intersection/interchange operations. The lack of continuity is further exacerbated by the existing development pattern in Boardman that funnels many of the residences across the interstate at Main Street on a daily basis to access employment and service centers.

In addition to these issues, the existing pedestrian and bicycle facilities in this area are inadequate. Given the large demand for north-south pedestrian facilities, especially along Main Street, any improvement project(s) should incorporate improved pedestrian/bicycle facilities.

Front Street/Interstate 84 Interchange Improvement Needs

There are several potential improvements that could be made to the Interstate 84 interchange to increase capacity as identified below:

- signalize the north leg of the interchange;
- provide a left-turn lane across the Interstate 84 Interchange;
- widen the eastbound and westbound Interstate 84 ramps to accommodate separate left- and right-turn lanes; or
- enhance circulation on the north and south sides of the interchange.

The decision to implement one or more of the improvements identified above is subject to several considerations. It is especially important to consider a system perspective in evaluating these alternatives. For example, signalization alone will not fully address the capacity needs of the interchange and adjacent intersections. Further, development of left-turn lanes at the interchange would require widening of the existing bridge deck, potentially necessitating a new interchange altogether. The effect of signalizing the Interstate 84 Westbound Ramp/Main Street intersection must also consider the impact signalization will have on adjacent intersections.

Considering a more global system perspective, if alternative links across Interstate 84 can be implemented in conjunction with access management and circulation improvements along Main Street, it is conceivable that future traffic volume demands at the existing interchange can be accommodated. There are also issues as to how the interchange will operate in the future with respect to the frontage roads located on either side of the interchange. The following paragraphs highlight some of the other issues that need to be considered.

Circulation Improvements

The City of Boardman's roadway system is comprised of a number of streets that collectively feed the two Interstate 84 interchanges. The east-west orientation of the Columbia River, Interstate 84, the Union Pacific Railroad right-of-way, and the Bonneville Power Administration's right-of-way all limit the number and extent of north-south connections through the city and have shaped the local roadway network.

As more properties develop in the southern and northeast quadrants of the city, the city needs to ensure that adequate facilities are provided such that the city does not become entirely dependent on any one roadway to facilitate local trips. As properties develop in the these parts of the city, careful consideration should be given to the type and locations of connections to the existing street system, and to connectivity and access issues within any new subdivisions. It is essential to provide pedestrian, bicycle, and vehicular access both to and within new developments and to provide a sense of linkage to and continuity with the existing developments in town. Care should also be taken to avoid "cul-de-sac" developments in these and other residential areas that may be developed in town.

North-South Connectivity

There are several potential opportunities to strengthen north-south connectivity within the City of Boardman. Ideally, roadway circulation alternatives should provide routes for local trips while accommodating industrial/heavy vehicle traffic destined to the Port and other locations on separate facilities. Opportunities to strengthen north-south connectivity include:

- provision of a new interchange or overpass on the west side of Boardman; and/or,
- extension of Olson Road across Interstate 84.

East-West Connectivity

In addition to improving north-south connectivity, there is also a need to ensure that the city develops adequate east-west facilities parallel to Interstate 84 such that these facilities provide access to local commercial and residential properties in a safe and efficient manner. It will be especially important to ensure that convenient east-west connectivity is preserved such that the city does not become entirely dependent on interstate access to facilitate local east-west trips. In addition, with the large amount of development occurring on the south side of the city, there is a need to ensure that the city's east-west roads are connected in a logical manner. Potential opportunities to strengthen east-west connectivity within the City of Boardman include:

- extension of South Front Street between South Main Street and Olson Road; and/or,
- construction of "Future Boulevard," a proposed east-west roadway along the BPA easement, to provide additional east-west connectivity south of the Interstate 84.

In addition to connectivity enhancements, the city should also consider development of access management techniques to further circulation needs. These techniques should provide for the consolidation of access points along collector and arterial level roadways as property develops or redevelops and allow for more focused crossings of roadways in areas outside of the downtown as discussed below.

Access Management and Safety

The spacing of access points along roadways impacts the capacity, safety, and overall performance of a given facility. Accordingly, access locations on roadway sections need to be properly located to ensure safe and efficient travel along roadway corridors. Access locations should be placed appropriately to limit potential conflicting turning movements, weaving maneuvers over short distances, and congestion along facilities.

In general, as the number and proximity of access points along a given road increases, there is an increase in the number of potential conflicting turning movements into and out of those access points. These turning maneuvers ultimately can adversely affect the operations of traffic on the roadway itself.

TRANSPORTATION IMPROVEMENT ALTERNATIVES EVALUATION

The following discussion presents specific improvement alternatives that were considered for inclusion as part of the recommended City of Boardman Transportation System Plan. Each of the alternatives has been identified by number for reference purposes, with the relative location of each improvement identified in Figure 9.

It should be noted that the order in which the alternatives are presented is not intended to convey the relative rank or significance of the respective projects. Further, the identified improvement alternatives were evaluated based on construction costs and ability to meet identified transportation needs. Other factors, including potential environmental impacts, were not specifically considered. Some environmental impacts that could occur have the potential to increase costs or require project modifications. The required modifications or increased costs could be significant enough to make the project impractical.

ZONING CODE REVISIONS

Alternative #1 – Reduce Vehicular Reliance Through Zoning and Development Code Revisions

In part, Oregon's Transportation Planning Rule seeks to reduce the reliance on personal vehicles as a mode of travel through the creation of environments that foster alternative modes of transportation. Local land uses can have a significant impact on the form of transportation necessary to travel from one location to another. Specifically, by carefully structuring local zoning and development codes, development activities can be focused such that a more self-contained community can be achieved. Construction of mixed-use developments, the location of commercial and service businesses in the vicinity of residential land uses, and the provision of employment opportunities near residential areas are all means by which the need for travel by personal automobile can be reduced.

In relatively rural areas such as Boardman, the need to travel long distances to employment, commercial, and service opportunities fosters a travel environment dependent on personal automobiles. Implementation of the "Downtown Concept" land use alternative will help reduce the need for vehicular reliance.

Figure 9
Improvement Alternatives

Zoning Recommendation

Implementation of the preferred land use alternative, the "Downtown Concept," is recommended. Provision of appropriate zoning and development code revisions should be made by the city. Examples of appropriate revisions are summarized in Section 7.

ENHANCED PEDESTRIAN, BICYCLE, AND VEHICULAR ACCESS ACROSS INTERSTATE 84

Alternative #2 – Develop a Split-Diamond Interchange along Interstate 84

As a means by which to mitigate the existing and forecast future congestion at the Main Street/Interstate 84 interchange and to provide additional pedestrian, bicycle and vehicular access between the land uses north and south of the freeway, consideration was given to developing a new split-diamond interchange in Boardman. The split diamond concept would include ramps at Olson Road (westbound off-ramp and eastbound on-ramp) and Main Street (eastbound off-ramp and westbound on-ramp) connected by a frontage road along North Front Street and South Front Street. In concept, the new interchange would provide an alternative north-south crossing of Interstate 84 as well as a capacity improvement that would relieve the existing Interstate 84 interchange. Further, North Front Street and South Front Street could be developed to capitalize on a frontage road concept that would, in part, serve local access and land use needs.

Further analysis of the concept revealed that the split-diamond interchange concept would not meet ODOT's access spacing standards and would likely foster "strip commercial development" along the frontage roads. For these reasons, the concept was abandoned. No cost estimated was prepared for this improvement alternative.

Alternative #3 – Extend Olson Road across Interstate 84

Olson Road originally linked the north and south sides of Boardman but the connection was severed during the construction of Interstate 84. Conceptually, the extension of Olson Road could be constructed with or without access to Interstate 84; however, provision of another interchange with Interstate 84 in close proximity to the existing Main Street interchange would violate ODOT access spacing standards.

Assuming that no access was provided to Interstate 84, Olson Road could be expected to serve as a major local trip and commuter route between the north and south sides of the city. This in turn would provide an alternate route to Main Street and could be expected to relive congestion at the Interstate 84/Main Street interchange. An overpass at Olson Road could serve as an essential connection between the Port of Morrow, other industrial areas, and the southern residential areas. This connection would be desirable both for the convenience of access between these two areas and the fact that truck traffic would not be expected to use this route heavily (assuming no access were provided to Interstate 84). Limited truck activity would minimize potential conflicts between heavy truck movements destined for the industrial areas and local pedestrian, bicycle, and vehicular traffic. The Olson Road extension would be expected to relieve some of the existing concerns with respect to shift changes at the Port affecting operations of Main Street, specifically during the time Riverside High School classes end for the day.

It should be noted that the potential extension of Olson Road across Interstate 84 would likely impact potential wetland areas and that the environmental impacts of creating the roadway link will need to be evaluated as part of a project-specific design and engineering study.

Estimated cost for this improvement is $8-10 million.

Alternative #4 – Provide a New Interchange or Overpass West of Main Street

Some community comments indicated that a north-south connection across Interstate 84 on the west-side of the city would be desirable to serve local neighborhood traffic. This alternative, while potentially feasible, may be undesirable for a number of reasons, as summarized below.

- The northwestern portion of the city has previously been developed; hence the new connection would not necessarily facilitate access to developing areas on the north side of Interstate 84.
- Ideally, it would be desirable to create new north-south connections that link residential areas with service and employment areas to offer congestion relief to the existing Main Street overpass; however, the proposed connection serves only as a link between residential areas to the north and south of the interstate.
- Provision of a new interchange is not likely to serve the community well given ODOT's access spacing standards.
- There are several issues relating to obtaining access through the wildlife refuge located between Faler Road and Paul Smith Road that would need to be addressed.

Given the number of issues related to such a project, no cost estimated was prepared for this improvement alternative.

Enhanced Access Across Interstate 84 Recommendation

Based on a review of the preferred land use alternative, environmental and design issues, pedestrian and bicycle needs, and projected traffic operations at the existing Main Street interchange, it is recommended that Olson Road overpass is implemented in the mid- to long-term future. (NOTE: *The addition to or modification of any ODOT facility requires the approval of the State Traffic Engineer. Identification and documentation of the need in this TSP does not guarantee the provision or modification will occur).*

The split diamond concept was not recommended for implementation as it would be contrary to the objectives of the preferred land use alternative and would not satisfy ODOT access spacing standards. An overpass to the west of Main Street is not recommended because of the "fatal flaws" related to land use, environmental, concerns, and access needs identified above.

ENHANCEMENT OF EAST-WEST CONNECTIVITY

Alternative #5 – Extend South Front Street Between South Main Street and Olson Road

Assuming the future extension of Olson Road across Interstate 84 as recommended in Alternative #3, the extension of South Front Street between South Main Street and Olson Road was considered as an opportunity to enhance the city's east-west connectivity for pedestrians, bicyclists, and motorists. Based on a field visit, it was noted that such an extension would likely impact wetland areas and that the environmental impacts of creating the roadway link could be significant.

The potential extension of South Front Street was felt to conflict with the preferred land use alternative as it would likely result in the creation of a "strip" commercial center along the new frontage road. While the area's visibility to the freeway could be beneficial to commercial development, without developable land on both sides of the street it would be impossible to develop an attractive pedestrian-oriented commercial area. The east-west connectivity offered by a potential extension of South Front Street would also be expected to result in additional traffic at the Interstate 84 interchange, potentially exacerbating an already congested location.

Alternative east-west roadway alignments located to the south of South Front Street were considered to offer more potential benefits than the extension of South Front Street. Given the negative land use impacts associated with this project, no cost estimate was prepared for this alternative.

Alternative #6 – Construct Future Boulevard Along the BPA Easement

Alternative #6 involves the construction of "Future Boulevard" along the BPA easement to provide additional east-west connectivity south of the Interstate 84. Potentially, this roadway would extend from Paul Smith Road east to Olson Road. Again, assuming the future extension of Olson Road across Interstate 84 as identified in Alternative #3, such an east-west roadway would be expected to benefit the Interstate 84/Main Street interchange while also providing relief to the Main Street/Wilson Road intersection. Given that most of the traffic originating in or destined to the south part of town currently must pass through the Main Street/Wilson Road intersection, provision of an alternative east-west conduit could avert the need to provide major mitigation measures at the Main Street/Wilson Road intersection. In addition, the construction of Future Boulevard would serve as an essential east-west link into and through the proposed downtown located along South Main Street, as prescribed in the preferred land use alternative.

Estimated cost for this improvement is $3.5 million.

Alternative #7 – Extend NE Boardman Avenue to Olson Road

The extension of Boardman Avenue east to Olson Road would enhance the city's east-west connectivity while permitting more direct pedestrian and bicycle access between Riverside High School and the residential areas to the east. This connection would further facilitate east-west circulation if Olson Road is extended across Interstate 84, as recommended in Alternative #3.

Estimated cost for this improvement is $420,000.

East-West Connectivity Recommendations

To enhance east-west connectivity for pedestrians, bicyclists, and motorists in Boardman, two projects are recommended for implementation, as summarized below.

- The construction of Future Boulevard along the BPA easement is recommended in the mid-term and as properties develop. As part of this alternative, care should be taken to integrate the new roadway with the development of the downtown along South Main Street and to provide pedestrian and bicycle-friendly amenities along the street.
- The extension of Boardman Avenue to Olson Road is recommended for implementation in the mid- to long-term future and should be coordinated with any future development activity in the area.

Finally, in the future as properties develop, care should be taken to provide pedestrian, bicycle, and vehicular connections between the new development and the existing infrastructure within the City of Boardman. Several recent residential developments have incorporated cul-de-sacs or other street configurations that do not allow for connections to the existing street and pathway system.

MAIN STREET/WILSON ROAD INTERSECTION

Alternative #8 – Revise Traffic Control Devices and Improve Pedestrian Crossings at the South Main Street/Wilson Road Intersection

The South Main Street/Wilson Road intersection is currently stop-controlled on the northbound and southbound approaches. This intersection was identified in the **Existing Conditions Analysis** as having a higher than average accident history that has previously been identified as being of concern to the community. Several geometric features contribute to the accident history of the intersection.

These features include a vertical curve on Wilson Road east of the intersection that obstructs intersection sight distance and the intersection's curb radius (the existing curb returns allow for high speed turns from Wilson Road westbound onto Main Street which in turn affect the safety of pedestrians at the intersection).

The past accident history of the intersection and its ability to safely and efficiently accommodate future travel demand and safe pedestrian and bicycle movements is of significant importance to the city because of the many adjacent land uses that the intersection serves. The location of the intersection between residential housing and the school building generates pedestrian demand (along the multi-use path) across Main Street and it is a top priority of the city to ensure the safety of school children and other persons walking through the intersection. In addition, there is a fire station located west of the intersection on Wilson Road. Accordingly, any form of mitigation at the South Main Street/Wilson Road intersection needs to consider both the safety of pedestrians and the ability to allow for unimpeded emergency response from the fire station.

Potential Improvements

The South Main Street/Wilson Road intersection was reviewed to determine whether geometric improvements and/or traffic control devices modifications at the intersection could enhance both the efficiency and the safety of the intersection. Based on this analysis, it is recommended that the intersection be signed as all-way stop-control. In conjunction with this change, appropriate "Stop Sign Ahead" signing should be provided at the intersection.

This form of traffic control should enhance the safety of the intersection for both vehicles and pedestrians, while allowing for the efficient movement of traffic. Emergency vehicle access to the intersection is not expected to be significantly impeded by all-way stop control.

In addition to changing traffic control devices, curb extensions could be provided on the north side of the intersection (South Main Street) to link the existing multi-use pathway on either side of the street and to reduce the exposed crossing distance pedestrians must walk. The curb extensions would also serve as a "traffic calming" tool, resulting in reduced turning speeds at the intersection.

Long-Term Operations

Under long-term year 2020 forecast conditions, the intersection is expected to be approaching capacity. Further analysis determined that the intersection could be mitigated to maintain an acceptable level-of-service using all-way stop control by providing a free southbound right-turn. Installation of a free southbound right-turn would impact pedestrian crossings of South Main Street and would require geometric changes to the intersection.

Should future development drastically increase the number of left-turns at the intersection, left-turn lanes could be added at the intersection along with appropriate vehicle storage to increase intersection capacity. Based on the year 2020 traffic volume forecast, the eastbound and southbound approaches to the South Main Street/Wilson Road intersection are those that are the most likely to require left-turn lanes. The need for developing left-turn lanes at the intersection can be better evaluated in the future as land use and development proposals are initiated.

In lieu of providing a free southbound right-turn or some other form of mitigation measure that can successfully be implemented, it may be necessary to signalize the intersection in the long-term future. A review of the forecast future year 2020 traffic volumes determined that the traffic volumes may warrant installation of a traffic signal. Signalization of the intersection would include installation of pedestrian signals, thereby enhancing safety for both vehicles and pedestrians crossing South Main Street and Wilson Road. It should, however, be reiterated that mitigation of the intersection through provision of a free southbound right-turn would eliminate the need for a traffic signal on a level of

service criteria basis. The key to any intersection design that is investigated is to provide better definition of vehicular movements and facilitate the ease of pedestrian crossings at the intersection.

Main Street/Wilson Road Recommendation

Several improvements are recommended at the Wilson Road/Main Street intersection, as summarized below.

- All-way stop-control should be implemented at the intersection in the near-term future. Appropriate "Stop Sign Ahead" signing should also be provided at the intersection at the time the traffic control change is made. Estimated cost for this improvement is: $1,000.
- Curb extensions should be provided on the north side of the intersection (South Main Street) to link the existing multi-use pathway on either sides of the street and to reduce the exposed crossing distance pedestrians must walk. The curb extensions would also serve as a "traffic calming" tool, resulting in reduced turning speeds at the intersection. This project is recommended for completion in the near-term future. Estimated cost for this improvement is: $5,000.
- Long-term intersection operations should be monitored to ensure the intersection continues to operate safely and efficiently into the long-term future as development activities occur in the area. Appropriate mitigation measures may include construction of a southbound right-turn lane, left-turn lanes, signalization, or other traffic control measures. Costs of the improvement should be determined at the time an appropriate mitigation measure is identified.

MAIN STREET IMPROVEMENTS

As discussed in the existing conditions section of the Transportation System Plan, there are several conflicts between the multiple functions that Main Street serves. As a result, the following objectives need to be considered as part of the alternatives development for Main Street improvements:

- provide safe pedestrian and bicycle movements between Marine Drive and Wilson Road;
- provide better delineation of the travel lanes, pedestrianways, and adjacent property parking areas;
- provide access to adjacent parcels and the proposed downtown;
- provide efficient access to/from the Interstate;
- protect the north/south connectivity provided by Main Street;
- provide safe access to the schools;
- provide access to freeway-oriented uses along the corridor for both vehicles and heavy trucks; and,
- minimize cut-through traffic through private properties.

With these objectives in mind, several alternatives were developed and discussed with affected stakeholders in the community.

Alternative #9: Re-stripe Main Street to a 3-lane Section and Provide Pedestrian and Bicycle Facilities in the Corridor

To minimize turning movement conflicts along Main Street, the existing roadway could be restriped to a 3-lane section, including one through lane in each direction and a continuous two-way left-turn lane between intersections. This improvement will not require widening of the roadway and will begin to provide better delineation of the roadway within the corridor. The current shoulders would require reconstruction to support the additional traffic loading.

In addition, the City of Boardman has recently been awarded grant funding from the TEA-21 program to construct sidewalks and bicycle lanes along Main Street from just south of SW Front Street to Marine Drive. As properties redevelop to an urban intensity along Main Street south of SW Front Street, the multi-use path that currently exists could be replaced with sidewalks and bicycle lanes. Pedestrian amenities such as curb extensions could be used in the corridor to provide shorter roadway crossing distances and a more pedestrian friendly character. Other amenities such as textured and/or striped crosswalks and additional street lighting to enhance visibility of pedestrians at night could also be provided.

This improvement will provide clear definition between the roadway, pedestrian space, and adjacent property uses. Figures 10A and 10B illustrate the proposed location of private driveways, the proposed lane geometries, and proposed sidewalk locations.

The plan shown in Figures 10A and 10B was developed based on the constraints and opportunities associated with the existing land uses and transportation system in the corridor and represents a consensus amongst property owners in the corridor. The intent of this alternative was to define access locations to local businesses, minimize conflict points, and preserve the capacity of the existing interchange. This plan focuses solely on the area located within 750 feet of the interchange terminals on Main Street and one block to the east and west of Main Street on South Front Street, North Front Street, and Boardman Avenue.

It is estimated that this improvement will cost approximately $200,000. This cost includes provision of bicycle and pedestrian facilities, reconstruction of the shoulders, and restriping of the roadway 750 feet to the north and south of the I-84 interchange at Main Street.

Alternative #10 – Interchange Management on Main Street if Olson Road Overpass is Constructed

To manage interchange operations over the long-term, even if the Olson Road overpass is constructed, a number of improvements will likely be necessary in the Main Street corridor adjacent to Interstate 84. These improvements will likely include:

- provision of appropriately spaced curb cuts along North Main Street;
- reconstruction of East 1st Street and West 1st Street to a three-lane cross section to provide access to adjacent commercial properties and circulation between North First Street, Boardman Avenue, and North Main Street;
- off-street parking should be provided for businesses along Main Street on the respective commercial properties (as appropriate); all businesses should provide adequate parking for all modes of travel, including trucks;

Figure 10A
Conceptual Main Street Improvement Projects

Figure 10B
Conceptual Main Street Improvement Projects

- on-street diagonal parking stalls should be provided along North and South Front Streets; use of on-street angled parking spaces (striped to a 60-degree angle) would allow for large trucks to maneuver into and out of the on-street parking stalls and would ensure that adequate sight distance is available for passenger vehicles in the vicinity of the maneuvering trucks;
- on-street parking should be prohibited within 20 feet of an intersection to preserve sight distance at the intersection, enhance truck turning movements, and allow for a better defined crossing space for pedestrians;
- signalization of the both of the Main Street/Interstate 84 ramp terminals;
- provision of a left-turn lane across the Main Street overpass; the future conditions analysis indicated that both a northbound and southbound left-turn lane would be warranted at the interchange and the existing bridge deck does not have adequate width to accommodate a left-turn lane; and,
- widening the eastbound and westbound Interstate 84 ramps to accommodate separate left- and right-turn lanes; provision of separate left- and right-turn lanes would reduce delay to vehicles on the ramps and, consequently, would reduce queuing on the ramps; separate turn lanes would be especially valuable in enhancing the operations of a traffic signal at the Main Street/Interstate 84 Westbound ramp intersection.

Alternative #11 – Ultimate Reconstruction of Main Street if Olson Road Overpass is Not Constructed

If the Olson Road overpass is not constructed in the next 20 years, significant reconstruction will be required on Main Street to meet the future travel demand. This reconstruction will likely occur gradually at first on a parcel by parcel basis but at some point in the future will require significant public investment to widen the Main Street overpass and restrict public and private access to key locations along the corridor.

If future travel demands necessitate this improvement, the following measures, in addition to those listed in Alternative #10, will likely need to be implemented:

- conversion of the west approach of the North Main Street/North Front Street intersection to right-in, right-out operations (even if such changes were not implemented, traffic volumes on North Main Street will ultimately preclude safely making a left-turn from North Front Street onto North Main Street simply by virtue of increased traffic volumes on North Main Street);
- conversion of the east approach of the North Main Street/North Front Street intersection to right-in operations;
- the existing South Front Street intersection could be modified to prohibit left-turns into or out of South Front Street; these turning movements could be accommodated by a new east-west access to South Main Street located south of the existing commercial developments (i.e., the BP Gas station, truck parking, restaurants, etc.);
- the provision of a north-south access road to link South Front Street with a new east-west access road, providing for continued access and efficient circulation; and,
- the ultimate widening of Main Street to a 5-lane facility.

Main Street Recommendations

Main Street should be restriped to include two travel lanes and a center left-turn lane. Sidewalks and bicycle lanes should be provided on Main Street between Marine Drive and 750 feet to the south of

Interstate 84. The recommended driveway locations and intersection geometries corresponding to this improvement are shown in Figures 10A – 10B.

As properties develop to an urban-scale on South Main Street, the city should replace the multi-use path with sidewalks and bicycle lanes. In addition, when the sidewalks and curbing are installed, the city should strive to maintain appropriate spacing between private driveways and public roadways that intersect South Main Street. Recommended access spacing is summarized in Section 5, **Transportation System Plan**.

In the mid- to long-term, the city should continue to monitor operations along Main Street to determine if any of the improvements identified in Alternatives #10 and #11 are required, especially if the Olson Road overpass is not constructed and the travel demand exceeds the capacity of Main Street.

LOCAL STREET CONNECTIVITY

Alternative #12 – Provide Strategic Roadway Extensions

In reviewing the local roadway system, several gaps in the roadway network were identified. Recognizing the need to provide convenient roadway connections, the following roadways could be extended and/or connected as shown in Figure 9:

- Third Street between Boardman Avenue and North Front Street;
- Second Street between Boardman Avenue and Marshal Loop;
- Chaperell Drive between Kinkade Road and Faler Road;
- Kinkade Road extension to Wilson Road;
- East Kinkade Road extension from Main Street to Anderson Road; and
- Anderson Road north to the Future Boulevard along the BPA easement.

The need for the facilities identified in Figure 9 will be driven by future development. Accordingly, provision of one or more of these new roadway connections is likely to be completed in conjunction with development activities. The cost of the new roadway connections could be borne by a partnership between adjacent development activities and the city. *It should be stressed that the locations of the potential new roadways as shown in Figure 9 are approximate and that the actual roadway alignments will need to be determined based on identified constraints and specific development plans for individual areas.*

Local Street Connectivity Recommendation

The identified roadway extensions should be implemented as local development activities warrant. The City of Boardman should ensure that, as future development activities occur, roadways are oriented in an east-west/north-south grid orientation and appropriate connections are made. Cul-de-sacs and other roadway configuration that do not lend themselves to future connectivity should be avoided in instances where a grid network of roadways can be developed.

ACCESS MANAGEMENT

Alternative #13 – Promote Access Management

From an operational perspective, the City of Boardman should consider implementing access management measures to limit the number of redundant access points along roadways. Such measures will be especially valuable in developed areas such as the commercial portion of Main Street and other developing locales.

Recommendation

Access Management should be implemented in the immediate future. No specific construction need is evident to implement this improvement as it simply promotes compliance with existing roadway policy. No immediate land use actions would be required either. Instead, as property along city streets is developed or redeveloped, appropriate action should be taken by local and state agencies to ensure that the relevant access spacing standards are reasonably enforced. Section 5, **Transportation System Plan,** includes a full access management plan and corresponding implementation strategy complete with typical spacing standards, driveway widths, etc.

TRANSPORTATION DEMAND MANAGEMENT

Alternative #14 – Implement Transportation Demand Management Measures

Transportation Demand Management (TDM) measures identify opportunities to reduce the impact of trips generated by various land uses. Specifically, TDM techniques typically seek to reduce reliance on single-occupant vehicle trips and promote the use of alternative travel modes by persons accessing a given area or facility. The Transportation Planning Rule encourages the evaluation of TDM measures as part of the TSP development process.

TDM strategies often focus on major employers or other sources of traffic that can be influenced through scheduling changes, alternative transit opportunities such as carpools and buses, and other means. Oftentimes, financial disincentives are included in programs as a revenue generator to support other elements of an overall program. The success of fee parking and other commonly used disincentives is dependent on the environment in which a given employer is located.

Given the rural nature of Eastern Oregon and the City of Boardman, the TDM measures available to the city are limited in scope as compared to larger metropolitan areas. One of the most promising options available to the city is the provision of a carpool or vanpool service for people who live in Boardman and work at employers within the Port of Morrow or in neighboring communities such as Umatilla and Hermiston. Coordination of a vanpool and/or carpool(s) to the major employers in the area (such as the industries within the Port of Morrow, the Two Rivers Correctional Facility in Umatilla, the Wal-Mart Distribution Center in Hermiston, Union Pacific's Hinkle Railyards in Hermiston, and the U.S. Army Chemical Weapons Incinerator at the Umatilla Depot) could help to reduce the number of single occupant vehicle commute trips from Boardman and help the community to achieve transportation demand management objectives.

Provision of a park-and-ride facility at a key location(s) within the community is another means by which the use of non-auto dependent travel can be encouraged. Further, the city could also promote carpooling to out-of-town employers through education.

The cost of implementing a TDM program is dependent on the type and variety of measures selected. Facilitation of carpools, vanpools, or a park-and-ride facility could be completed through a volunteer network and/or coordination with major employers at minimal cost.

TDM Recommendation

It is recommended that the City of Boardman focus TDM efforts on supporting carpools and/or vanpools to major employers through education, coordination with employers, and provision of appropriate facilities such as park-and-ride areas.

The cost of implementing a TDM program is dependent on the type and variety of measures selected.

SUMMARY

This section has presented the alternatives that have been developed and evaluated to address the near-term and long-range transportation deficiencies within the City of Boardman urban growth boundary. Table 6 summarizes the potential improvement alternatives. Section 5, which follows, incorporates the recommended improvements for each transport mode into the city's transportation system.

TABLE 6
SUMMARY OF IMPROVEMENT ALTERNATIVE RECOMMENDATIONS

Alternative Number	Improvement Description	Estimated Cost*	Implementation Timeline	Responsible Jurisdiction
#1	Reduce Vehicular Reliance Through Zoning and Development Code Revisions	Administrative	As appropriate	City
#2	Develop a Split-Diamond Interchange along Interstate 84	Not Estimated	Not recommended for implementation	—
#3	Extend Olson Road across Interstate 84	$8-10 million	Mid-to long-term future	City/ODOT
#4	Provide a new Interchange or Overpass West of Main Street	Not Estimated	Not recommended for implementation	—
#5	Extend South Front Street between South Main Street and Olson Road	Not Estimated	Not recommended for implementation	—
#6	Construct Future Boulevard	$3.5 million	Mid-to long-term future	Private
#7	Extend NE Boardman Avenue to Olson Road	$420,000	Concurrent with local development	Private
#8	Revise Traffic Control Devices and Improve Pedestrian Crossings at the South Main Street/Wilson Road Intersection	$6,000	Short-term	City
#9	Re-stripe Main Street to a 3-lane Section and provide pedestrian and bicycle facilities	$200,000	Short-term	City
#10	Interchange Management at Main Street with the construction of the Olson Road Overpass	Not Estimated	Long-Term	City
#11	Ultimate Reconstruction of Main Street without the Olson Road Overpass	Not Estimated	Long-Term if Olson Road isn't constructed	City
#12	Provide Strategic Roadway Extensions	Not Estimated	Concurrent with local development	Private
#13	Promote Access Management	Administrative	As appropriate	City
#14	Implement Transportation Demand Management Measures	Administrative	As appropriate	City

*Estimated costs are in 1999 dollars and do not include right-of-way acquisition