*Draft Report*

# Draft Lebanon Transportation System Plan

Prepared for

**City of Lebanon, Oregon, and the**

**Oregon Department of Transportation**

October 2006

Prepared by

CH2MHILL

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# Preface

The City of Lebanon Transportation System Plan (TSP) was funded by the Oregon Department of Transportation (ODOT). This document does not necessarily reflect the views or policies of the State of Oregon. The preparation of the TSP was guided by the Technical Advisory Committee (TAC), the Citizen Advisory Committee (CAC), and the consultant team identified on the next page.

# Acknowledgments

## Technical Advisory Committee

### City of Lebanon

Jim Ruef, Director of Public Works

Malcom Bowie, City Engineer

Rob Emmons, Senior Engineer

Doug Parker, Community Development Manager

Terry Lewis, Assistant Planner

### Linn County

Darren Lane, County Roadmaster

### Oregon Department of Land Conservation and Development

Marguerite Nabeta

### Oregon Department of Transportation

John Detar, Area 4 Planner

### CH2M HILL Consultant Team

Steve Perone

Todd Slind

Lisa Fall

Terry Yuen

Jimmy Wong

## Citizen Advisory Committee

Kent Hawworth

Stan Usinger

Bobbi Birch

Sue Mulbery

Christine Francois

Christine Ruck

Russ Canaga

Jim Robinson
Rick Franklin
Ken Toombs
Sally Skaggs

# Acronyms and Abbreviations

| | |
|---|---|
| ADA | Americans with Disabilities Act |
| ADT | Average Daily Traffic |
| AERC | Albany and Eastern Railroad Company |
| CIP | Capital Improvement Program |
| DLCD | Department of Land Conservation and Development |
| DMV | Department of Motor Vehicles |
| GPS | Global Positioning System |
| HCM | Highway Capacity Manual |
| IRIS | Integrated Roadway Information System |
| ISTEA | Intermodal Surface Transportation Act |
| ITS | Intelligent Transportation System |
| LOS | Level of Service |
| LURA | Land Use Regulation Amendments (City of Lebanon) |
| MP | Milepost |
| MPH | Miles Per Hour |
| MPO | Metropolitan Planning Organization |
| MUTCD | Manual on Uniform Traffic Control Devices |
| OAR | Oregon Administrative Rule |
| OBPP | Oregon Bicycle and Pedestrian Plan |
| ODOT | Oregon Department of Transportation |
| OHP | Oregon Highway Plan |
| ORS | Oregon Revised Statute |
| OTIA | Oregon Transportation Investment Act |
| OTP | Oregon Transportation Plan |
| ROW | Right-of-Way |
| SDC | Systems Development Charge |
| STA | Special Transportation Area |

| | |
|---|---|
| SOV | Single Occupancy Vehicle |
| STIP | Statewide Transportation Improvement Program |
| STP | Surface Transportation Program |
| TAC | Technical Advisory Committee |
| TDM | Transportation Demand Management |
| TEA-21 | Transportation Equity Act for the 21st Century |
| TGM | Transportation and Growth Management |
| TPR | Transportation Planning Rule |
| TRB | Transportation Research Board |
| TSM | Transportation System Management |
| TSP | Transportation System Plan |
| TWLTL | Two-Way Left-Turn Lane |
| UBA | Urban Business Area |
| UGB | Urban Growth Boundary |
| URD | Urban Renewal District |
| v/c | Volume-to-Capacity |

SECTION 1

# Introduction

The City of Lebanon's Comprehensive Plan was adopted in 1981. Updates to the plan were adopted by the City in December 2004. The 2004 Draft Lebanon Transportation System Plan (TSP) was used to update elements of the new Comprehensive Plan and subsequent TSP updates are incorporated into Comprehensive Plan by reference.

The City of Lebanon, in conjunction with the Oregon Department of Transportation (ODOT), initiated a study of the City's transportation system in 1999. These efforts have resulted in development of a Transportation System Plan (TSP) and associated implementing policies and ordinances that comply with the Transportation Planning Rule (TPR). Preparation of the draft TSP is consistent with the recent comprehensive plan update process.

The City of Lebanon TSP identifies planned transportation facilities and services needed to support planned land uses as identified in the Lebanon Comprehensive Plan in a manner consistent with the TPR (Oregon Administrative Rule [OAR] 660-012) and the Oregon Transportation Plan (OTP). Preparation and adoption of this TSP for the City provides the following benefits:

- Ensures adequate planned transportation facilities to support planned land uses for the next 20 years.
- Provides guidance and predictability for the siting of new streets, roads, highway improvements and other planned transportation improvements.
- Provides predictability for land development.
- Helps reduce the cost and maximize the efficiency of public spending on transportation facilities and services by coordinating land use and transportation decisions.

The contents of the Lebanon TSP are guided by Oregon Revised Statute (ORS) 197.712 and the Department of Land Conservation and Development (DLCD) administrative rule known as the TPR. These laws and rules require that jurisdictions investigate and where appropriate develop the following:

- Plan for a network of arterial and collector roads
- Public transit plan
- Bicycle and pedestrian plan
- Air, rail, water, and pipeline plan
- Transportation financing plan
- Policies and ordinances for implementing the TSP

The TPR requires that alternative travel modes be given equal consideration with the automobile, and that reasonable effort be applied to the development and enhancement of the alternative modes in providing the future transportation system. In addition, the TPR

requires that local jurisdictions amend land use and subdivision ordinances to implement the provisions of the TSP. Finally, local communities must coordinate their respective plans with the applicable county, regional, and state transportation plans.

This TSP will guide the management and development of appropriate transportation facilities in Lebanon, incorporating the community's vision, while remaining consistent with state, regional, and local plans. A system of transportation facilities and services adequate to meet the City's transportation needs to the planning horizon year of 2027 is established in this plan. This document provides the necessary elements to be adopted as the transportation element of the City's comprehensive plan.

# Goals and Policies

The formulation of goals and objectives represent an important component of the TSP process. Goals and objectives are intended to reflect the vision and character of the City of Lebanon as the community develops its transportation system. The goals and objectives also are intended to implement and support the comprehensive plan.

The Lebanon TSP goals and objectives serve two main purposes: (1) to guide the development of the Lebanon transportation system during the next 20 years, and (2) to demonstrate how the TSP relates to other county, regional, and state plans and policies. The goal statements are general statements of purpose to describe how the City and the TSP intend to address the broad elements of the transportation system. The objectives are specific steps that illustrate how the goal is to be carried out.

The goals and objectives were formed as part of the Lebanon TSP planning process. They reflect the input of residents, businesses, and agencies obtained during the course of preparing the TSP. They also reflect current local, regional and State goals and policies, and are intended to support these policies.

## Goal 1: Transportation System Level of Service

Preserve the function, capacity, level of service, and safety of roadway facilities in the City of Lebanon.

### Objectives:

- Develop access management standards that meet the requirements of the Transportation Planning Rule (TPR) and take into account the needs of the community.
- Identify existing and future roadway capacity deficiencies and their appropriate remedies.
- Develop alternative routes for both local and regional through traffic to reduce congestion.
- Improve connectivity throughout the city to reduce traffic demand on major arterials and key collectors.

## Goal 2: Multimodal Transportation System

Integrate automobiles with other transportation modes to develop a multi-modal transportation system.

### Objectives:

- Identify areas of conflict between trucks, automobiles, bicyclists, rail traffic and pedestrians, particularly in residential areas, and create improvements that reduce those and other potential conflicts.
- Coordinate multimodal system integration between automobiles, trucks, rail, transit and non-motorized modes (bicycles and pedestrians).

## Goal 3: Mobility and Safety

Enhance transportation mobility and safety on the local street system.

### Objectives:

- Adopt appropriate level-of-service standards for city intersections.
- Develop a local street plan to determine the transportation network that would be established during the neighborhood development planning process.
- Improve safety in neighborhoods and locations adjacent to schools and other activity centers.
- Monitor local traffic problems and recommend solutions.

## Goal 4: Freight Mobility and Access

Provide a safe and efficient system for freight that balances the need to move goods with other uses of the city's street system, and recognize the importance of maintaining efficient freight movement on truck routes and city streets.

### Objectives:

- Create an alternate freight route for freight trips without local origins and destinations. This would minimize truck traffic through downtown Lebanon on US 20 and other local routes.
- Maintain and develop efficient truck routes that provide direct connections to highways, railroads, and the airport and minimize impacts to residential areas and the downtown Special Transportation Area (STA).
- Enhance local access for truck traffic serving local businesses. Consideration should be given to improving truck loading zones and turning radii at local street intersections.
- Consider the facilitation of truck movements when developing and maintaining the local street network in the city's industrial areas.

## Goal 5: Bicycle and Pedestrian Safety

Improve and enhance bicycle and pedestrian safety.

### Objectives:

- Develop standards for bicycle pedestrian facilities in compliance with state and federal requirements.
- Construct missing sidewalks on both arterial and collector streets.
- Identify needed safety enhancements at locations with a demonstrated history of accidents involving bicycles or pedestrians.

## Goal 6: Bicycle and Pedestrian System Continuity and Connectivity

Create a continuous system of bicycle and pedestrian facilities that connect local activity centers such as parks, schools, residential neighborhoods, shopping centers, and public facilities.

### Objectives:

- Identify activity centers that should be connected by bicycle and pedestrian facilities.
- Identify measures to improve bicycle and pedestrian connectivity.
- Adopt street standards that provide bicycle and pedestrian facilities and amenities.
- Identify needed connections from Lebanon's bicycle and pedestrian facilities to the regional system and provide continuity between the city's and the county's bicycle and pedestrian facility planning.

## Goal 7: Land Use Regulations to Support Non-motorized Modes

Encourage development patterns that promote and facilitate bicycle and pedestrian activity through development code (zoning ordinance and subdivision ordinance) requirements.

### Objectives:

Accomplishment of the following objectives will be coordinated with the City's proposed Land Use Regulation Amendments.

- Evaluate the existing development code for deficiencies in supporting bicycle and pedestrian friendly development.
- Based on identified development code deficiencies, modify the zoning and development code to encourage more bicycle and pedestrian friendly development patterns.

Institute comprehensive plan policies that support the development of a continuous bicycle and pedestrian system.

## Goal 8: Reduce Reliance on the Automobile

Increase the use of alternative modes of transportation (walking, bicycling, rideshare, carpooling, and transit) through improved access, safety, and service.

### Objectives:

- Promote alternative modes and rideshare/carpool programs through community awareness and education.
- Plan for future expanded transit service by coordinating with regional transit service efforts.
- Seek grants and loans from state and federal agencies and other funding for projects that evaluate and improve the environment for alternative modes of transportation.
- Seek further improvement of transit systems in the city.

## Goal 9: Provide for the Transportation Disadvantaged

For its transportation disadvantaged citizens, the City of Lebanon seeks to maintain and enhance the customer-oriented, regionally-coordinated public transit system that is efficient, effective, and founded on present and future needs.

### Objectives:

- Continue to support inter- and intra-community programs for the transportation disadvantaged where such programs are needed and are economically feasible.
- Increase all citizens' transportation choices.
- Hold all regional transportation systems accountable for level and quality of service.
- Enhance public transportation sustainability.
- Pursue a program that retrofits existing pedestrian facilities to ensure ADA compliance.

## Goal 10: Prepare for Future Transit Services

Create a system of bus stops and park-and-ride lots for existing transit service and carpools that can be expanded into a fixed-route transit system in the future as transit-service demand increases.

### Objectives:

- Identify fixed-route bus stop locations and future park-and-ride lots to support carpooling, vanpooling, ride sharing, and transit use.
- Refine standards for future development projects to provide adequate public transportation facilities.

**SECTION 2**

# Reviewed Plans and Policies

This section summarizes the plans and policies at the state, regional, and local levels that directly impact transportation planning in the City of Lebanon. Although each document reviewed contains many policies, only the most pertinent policies and information were chosen to help focus the discussion. This section provides a policy framework for the remainder of the Lebanon TSP process, and new policies considered as part of this study should be consistent with the currently adopted policies listed. This review also serves as the basis for identifying policies that may be out of date or inconsistent with other policies and can serve as the basis for updating policies to reflect current conditions and to achieve consistency with other local, regional, and state plans.

## Documents Reviewed

The following federal, state, regional, and local documents were reviewed. The general intent of these documents and the relevance to system and facility plans are summarized in the remainder of this section of the plan.

- Transportation Equity Act for the 21st Century
- 23 CFR 450
- 49 CFR 613
- Statewide Planning Goals
- 1992 Oregon Transportation Plan
- 1999 Oregon Highway Plan
- Oregon Highway Plan Implementation Handbook
- 1995 Oregon Bicycle and Pedestrian Plan
- 2001 Oregon Rail Plan
- Freight Moves the Oregon Economy (1999)
- Western Transportation Trade Network Phase II Final Report (1999)
- 1997 Oregon Public Transportation Plan
- 1995 Oregon Transportation Safety and Action Plan
- Transportation Planning Administrative Rule
- Access Management Administrative Rule
- Willamette Valley Transportation Strategy (1995)
- US 20/OR 34 Interim Corridor Strategy (1998)
- Linn County Comprehensive Plan and Transportation System Plan (1999)
- City of Lebanon/Linn County Urban Growth Management Agreement
- Lebanon Land Use Regulations (Comprehensive Plan, Zoning Ordinance, and LURA)
- City of Lebanon Transportation Master Plan (1991)
- Downtown Lebanon Transportation Enhancements (2000)

# Federal Policies

The Transportation Equity Act for the 21st Century (TEA-21) specified changes to transportation planning activities for states and metropolitan planning organizations (MPOs) instituted by the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). The regulations for these state and MPO planning activities are specified in 23 CFR 450 and 49 CFR 613. The planning activities encompass a continuing, cooperative, and comprehensive process that considers all transportation modes. The resulting plans lead to the development and operation of an integrated, intermodal system that facilitates the efficient, economic movement of people and goods. The planning activities also need to specifically address freight movement and bicycle and pedestrian facilities. Additional air quality and congestion management requirements apply to certain MPOs. The state planning requirements are addressed by the Oregon Transportation Plan and related modal plans and corridor plans. MPO planning requirements are addressed through regional transportation system plans.

Lebanon is not part of an MPO, and is therefore not subject to TEA-21 or ISTEA planning requirements for MPOs.

# State Policies

## Statewide Planning Goals

Since 1973, Oregon has maintained a strong statewide program for land use planning. The foundation of that program is a set of 19 statewide planning goals. The TPR and the transportation system plans identified in the TPR are the results of implementation of Goal 12—Transportation. Oregon's statewide goals are achieved through local comprehensive planning, of which transportation system plans must be made a part. The goals which apply to transportation system planning are described below; other goals may apply depending on the area addressed by a particular transportation system plan or facility plan.

- **Goal 1—Citizen Involvement:** Develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process.
- **Goal 2—Land Use Planning:** Establish a land use planning process and policy framework as a basis for all decisions and actions related to use of land to assure an adequate factual base for such decisions and actions.
- **Goal 6—Air, Water and Land Resources Quality:** Maintain and improve the quality of the air, water and land resources of the state.
- **Goal 9—Economic Development:** Provide adequate opportunities for a variety of economic activities vital to the health, welfare, and prosperity of Oregon’s citizens.
- **Goal 11—Public Facilities and Services:** Plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.

- **Goal 12—Transportation:** Provide and encourage a safe, convenient, and economic transportation system.
- **Goal 13—Energy Conservation:** Conserve energy.
- **Goal 14—Urbanization:** Provide for an orderly and efficient transition from rural to urban land use.

## 1992 Oregon Transportation Plan

The Oregon Transportation Plan (OTP) is a policy document developed by the Oregon Department of Transportation (ODOT) in response to federal and state mandates for systematic planning for the future of Oregon's transportation system. It recognizes the need to integrate all modes of transportation and encourages the use of the mode that is the most appropriate for each type of travel. The Plan defines goals, policies, and actions for the state for the next 40 years. The Plan's System Element identifies a coordinated multimodal transportation system, to be developed over the next 20 years, which is intended to implement the goals and policies of the Plan. The goals and policies of the OTP cover a broad range of issues. The goals and policies most directly applicable to transportation system and facility plans are as follows:

- Goal 1: Characteristics of the System
  - Policy 1A – Balance
  - Policy 1B – Efficiency
  - Policy 1C – Accessibility
  - Policy 1D – Environmental Responsibility
  - Policy 1E – Connectivity among Places
  - Policy 1F – Connectivity among Modes and Carriers
  - Policy 1G – Safety
- Goal 2: Livability
  - Policy 2A – Land Use
  - Policy 2B – Urban Accessibility
  - Policy 2C – Relationship of Interurban and Urban Mobility
  - Policy 2D – Facilities for Pedestrians and Bicyclists
  - Policy 2E – Minimum Levels of Service
  - Policy 2H – Aesthetic Values
- Goal 3: Economic Development
  - Policy 3B – Linkages to Markets
  - Policy 3E – Tourism
- Goal 4: Implementation
  - Policy 4G – Management Practices
  - Policy 4K – Local Government Responsibilities
    - ♦ Local governments shall define a transportation system of local significance adequate to meet identified needs for the movement of people and goods to local destinations within their jurisdictions; and

    - ♦ Local government transportation plans shall be consistent with regional transportation plans and adopted elements of the state transportation system plan.
  - Policy 4L – Federal and Indian Tribal Governmental Relationships
  - Policy 4M – Private/Public Partnership
  - Policy 4N – Public Participation

## 1999 Oregon Highway Plan

The 1999 Oregon Highway Plan (OHP) is one modal element of the Oregon Transportation Plan. The OHP defines the policies and investment strategies for Oregon's state highway system over the next 20 years. Regional and local TSPs must be consistent with the State Transportation System Plan, which includes the OHP. OHP policies requiring consistency in TSPs are as follows:

- **Policy 1A: State Highway Classification System.** The state highway classification system includes six classifications: Interstate, Statewide, Regional, District, Local Interest Roads, and Expressways. The OHP emphasizes designation of Expressways as a subset of Statewide, Regional and District Highways to provide a high level of access control along highway segments (long access spacings and limited turning movements).
  - State classified highways in Lebanon include U.S. Highway 20 and OR Highway 34, both of which are classified as regional highways.
- **Policy 1B: Land Use and Transportation.** This policy recognizes the role of both state and local governments regarding the state highway system and calls for a coordinated approach to land use and transportation planning. The policy identifies the designation of highway segments as Special Transportation Areas (STAs), Commercial Centers, and Urban Business Areas (UBAs). Within STAs and UBAs, highways may be managed to provide a greater level of access to businesses and residences than might otherwise be allowed. Commercial Centers encourage clustered development with limited access to a state highway.
  - OHP adopted amendments on January 14, 2004 acknowledge STA designations on both US 20 and OR 34 in Lebanon. The US 20 STA couplet boundaries are southbound from mile point (MP) 13.08 (Rose Street) to MP 13.45 (Oak Street) and northbound from MP 13.45 (Oak Street) to MP 13.17 (Rose St). The OR 34 STA boundary is from MP 17.89 (railroad crossing) to MP 18.13 (US 20). These boundaries are acknowledged by the City of Lebanon in Section 6 of the TSP under street functional classification. Review of additional downtown improvements follows at the end of this section under Downtown Lebanon Transportation Enhancements 2000.
- **Policy 1C: State Highway Freight System.** This policy calls for balancing the need to move freight with other highway users by minimizing congestion on major truck routes.
  - Both US 20 (OR34 south to OR 228 – Sweet Home) and OR 34 (I-5 to Lebanon) were added to the State Highway Freight System as part of the 2005 Freight Route designation update.

- **Policy 1D: Scenic Byways.** This policy promotes the preservation and enhancement of scenic byways by considering aesthetic and design elements along with safety and performance considerations on designated byways.
  - Neither US 20 nor OR 34 is a designated scenic byway.
- **Policy 1F:** Highway Mobility Standards Access Management Policy. This policy provides specific mobility standards for the state highway sections, signalized intersections, and interchanges. Alternative standards are provided for certain locations and under certain conditions.
- **Policy 1G: Major Improvements.** This policy identifies the state's priorities for responding to highway needs: protect the existing system; improve efficiency and capacity of existing system; add capacity to existing system.
- **Policy 2G: Rail and Highway Compatibility.** This policy emphasizes increasing safety and efficiency through reduction and prevention of conflicts between railroad and highway users.
- **Policy 3A: Classification and Spacing Standards.** This policy addresses the location, spacing and type of road and street intersections and approach roads on state highways. It includes standards for each highway classification, including specific standards for Special Transportation Areas (STAs) and Urban Business Areas (UBAs).
  - The special standards for STAs apply to the adopted Downtown Lebanon STA for US 20 and OR 34 as defined above under Policy 1B.
- **Policy 3B: Medians.** This policy establishes the state's criteria for the placement of medians.
- **Policy 3C: Interchanges.** This policy addresses the management of grade-separated interchanges to ensure safe and efficient operation between connecting roadways.
- **Policy 4A: Efficiency of Freight Movement.** This policy emphasizes the need to maintain and improve the efficiency of freight movement on the state highway system.
  - US 20 and OR 34 through Lebanon are designated as part of the State Highway Freight System.

## 2002-2005 Statewide Transportation Improvement Program

The Statewide Transportation Improvement Program (STIP) identifies the transportation projects that the state will fund during its next four-year program. The STIP is updated every two years. These projects will be integrated into the Lebanon TSP planning process. The 2002-2005 STIP includes $1.1 million for a safety project on US 20 to reconstruct turning radii and interconnect traffic signals between Wheeler and Market Streets and $0.6 million for creating a one-way grid on three streets, including the US 20 couplet, from Vine Street to Maple Street and reconfiguring parking. In addition, $2.8 million in 2002 Oregon Transportation Improvement Act (OTIA) funds have been allocated for the reconstruction of US 20 from Reeves Parkway to the Union Pacific Railroad tracks to urban standards.

## 1995 Oregon Bicycle and Pedestrian Plan

The Oregon Bicycle and Pedestrian Plan provides guidance to regional and local jurisdictions for the development of safe, connected bicycle and pedestrian systems. The plan is a modal element of the Oregon Transportation Plan. The plan includes two major sections: policies and implementation strategies; and design, maintenance and safety information. The plan also outlines the elements of the bicycle and pedestrian plan required for TSPs. The goal of the plan is "To provide safe, accessible and convenient bicycling and walking facilities and to support and encourage increased levels of bicycling and walking."

## 2001 Oregon Rail Plan

The 2001 Oregon Rail Plan includes two major elements: freight and passenger. The 2001 Rail Plan identifies federal and state policies applicable to passenger and freight rail planning, but does not identify any additional policies specific to the plan.

The freight element describes existing conditions in the different regions of the state and improvements that are needed. Freight rail through Lebanon is offered by the Albany and Eastern Railroad on the former Santiam Branch of the Burlington Northern and Santa Fe Railroad and the Mill City branch of the former Southern Pacific Railroad. The Oregon Rail Plan indicates that $1.9 million is needed for cross tie renewal, rail renewal, and bridge repair on the Albany and Eastern rail tracks.

The 2001 Oregon Rail Plan also identifies issues that should be considered in rail planning during local land use planning like preparation of a TSP and comprehensive plan policies to support the TSP. The passenger element identifies the need or feasibility of certain passenger and commuter rail improvements in Region 2; none of these proposed lines would have stops in Lebanon.

## Freight Moves the Oregon Economy (1999)

This plan's stated purpose is to demonstrate the importance of freight to the Oregon economy and identify concerns and needs regarding the maintenance and enhancement of current and future mobility within the state of Oregon. The plan discusses the relationship among freight, the economy, and transportation planning, as well as road, rail, waterway, and pipeline facilities, and intermodal facilities. Although the report does not identify any general freight policies to be addressed by transportation system plans or facility plans, it does identify improvements needed in the state freight system.

As mentioned previously, neither US 20 nor OR 34 through Lebanon are part of the State Highway Freight System; however, US 20 is acknowledged to be important for moving local and regional freight. One of the concerns about moving freight is pavement conditions. In 2002, US 20 from Reeves Parkway to Albany received a structural overlay, which improved pavement conditions along a stretch of highway formerly determined to be in poor condition. In addition, center turn lanes were added at some critical intersections, helping traffic flow.

## Western Transportation Trade Network (1999)

The Western Transportation Trade Network (WTTN) Phase II Final Report was prepared for the 17 states that belong to the Western Association of State Highway and Transportation

Officials (WASHTO). As such, the report does not identify specific plans or policies of the State of Oregon; however, it does identify deficiencies and potential performance improvements to the trade corridors passing through and serving Oregon. I-5 is one the WTTN-identified trade corridors. Even though Lebanon is not on I-5, railroads and highways serving the corridor also serve Lebanon.

## 1997 Oregon Public Transportation Plan

The Oregon Public Transportation Plan forms the transit modal plan of the Oregon Transportation Plan (OPTP). The vision guiding the public transportation plan is as follows:

- A comprehensive, interconnected and dependable public transportation system, with stable funding, that provides access and mobility in and between communities of Oregon in a convenient, reliable and safe manner that encourages people to ride.
- A public transportation system that provides appropriate service in each area of the state, including service in urban areas that is an attractive alternative to the single-occupant vehicle, and high-quality, dependable service in suburban, rural, and frontier (remote) areas.
- A system that enables those who do not drive to meet their daily needs.
- A public transportation system that plays a critical role in improving the livability and economic prosperity for Oregonians.

The plan contains goals, policies, and strategies relating to the whole of the state's public transportation system. The plan is intended to provide guidance for ODOT and public transportation agencies regarding the development of public transportation systems. The OPTP also identifies minimum levels of service, by size of jurisdiction, for fulfilling its goals and policies. The minimum levels of service applicable to Lebanon are as follows:

- Provide daily peak hour commuter service to the core areas of the central city, in this case Corvallis and Albany.
- Provide a guaranteed ride home program to all users of the public transportation system and publicize it well.
- Provide park-and-ride facilities along transit route corridors to meet reasonable peak and off-peak demand for such facilities.
- Maintain vehicles and corresponding facilities in a cost-effective manner and replace vehicles when they reach the manufacturers' suggested retirement age.
- Establish ridematching and demand management programs in communities of 5,000 where there are employers with 500 or more workers who are not already covered by a regional ridematching/demand management program.
- Establish ridematching and demand management programs in communities of 10,000.

The Public Transportation Plan also has minimum level of service standards for intercity public transportation, intercity bus, and intercity rail in 2015. The minimum levels of service applicable to Lebanon are as follows:

- Intercity public transportation services would:
  - Provide east/west and north/south connections to places outside the state based on travel density within Oregon's interstate corridors.
  - Provide intercity passenger terminals subject to public control to assure open access to all intercity carriers throughout the state.
  - Provide direct connections, where possible, between intercity services and local public transportation services.
  - Provide services in compliance with the ADA requirements for all modes and transfer facilities.
  - Maintain vehicles and corresponding facilities in a cost-effective manner and replace vehicles when they reach the manufacturers' suggested retirement age.
- Intercity bus services would:
  - Provide hourly service to major communities within the Willamette Valley in conjunction with passenger rail service.
  - Provide service on a daily basis for round trip purposes, for an incorporated city or group of cities within 5 miles of one another having a combined population of 2,500 and located 20 miles or more from the nearest city with a larger population and economy.
  - Provide a coordinated, centralized scheduling system in each county and at the state level for rural and frontier areas.
  - Coordinate intercity bus services with intercity senior and disabled services, local senior and disabled services and local public transportation services.
- Intercity rail services would:
  - Provide regional rail service offering frequent schedules, through trains, extensive feeder bus networks with convenient connections, and an aggressive marketing and passenger amenities program to stimulate changes in transportation preferences and a per-capita reduction in highway travel.
  - Coordinate with intercity bus and local public transportation services to ensure timely and convenient connections.

## 1995 Oregon Transportation Safety Action Plan

The Oregon Transportation Safety Action Plan forms the safety element of the Oregon Transportation Plan (OTP). The intent of the plan is to improve safety on Oregon's highways for all users. The policy for safety in the OTP (Policy 1G) is as follows: "It is the policy of the State of Oregon to improve continually the safety of all facets of statewide transportation for system users including operators, passengers, pedestrians, recipients of goods and services, and property owners." Many of the actions identified in the plan are programmatic in nature and may not be best addressed through transportation system or facility plans. The following lists the actions that TSPs and corridor plans could address:

- Action 19—Safety Considerations in Transportation Planning Documents

Consider the roadway, human, and vehicle elements of safety in modal, corridor, and local system plan development and implementation. These plans should include the following:

  - Involvement in the planning process of engineering, enforcement, and emergency service personnel as well as local transportation safety groups
  - Safety objectives
  - Resolution of goal conflicts between safety and other issues
  - Application of access management standards to corridor and system planning

- Action 20—Access Management
  In planning, consider access management techniques which show significant improvements in safety for the roadway user. Access management techniques, which can stand alone or be combined, may include:

  - Appropriate access and public street spacing and design
  - Proper spacing and coordination of traffic signals
  - Installation of non-traversible medians
  - Proper spacing and design of median openings
  - Provision of lanes for turning traffic
  - Inter-parcel circulation
  - Use of city and county road infrastructure as an alternative to increase access
  - Protection of the functional area of an intersection
  - Proper spacing of interchanges

- Action 27—Airports and Surrounding Land Uses
  Continue to consider land use when siting airports to reduce the potential for a crash involving aircraft hitting persons on the ground. Ensure that corridor and local system plans identify existing and proposed public use airport facilities and services and provisions for compatibility with surrounding land use activities.

- Action 64—Rail Crossing Safety
  Reduce the potential of crossing crashes by eliminating redundant highway-rail intersections. Upgrade warning devices or construct grade separations at the most heavily traveled intersections.

## Transportation Planning Rule (OAR 660-012)

The Transportation Planning Rule (TPR), OAR 660 Division 12, implements Oregon's Statewide Planning Goal 12 (Transportation) and promotes the development of safe, convenient, and economic transportation systems that reduce reliance on the automobile. The TPR requires the preparation of regional transportation systems plans by metropolitan planning organizations (MPOs) or counties and local TSPs by counties and cities. TSP requirements vary by type (regional vs. local) and community size. Through TSPs, the TPR provides a means for regional and local jurisdictions to identify long-range (20-year) strategies for the development of local transportation facilities and services for all modes, to integrate transportation and land use, to provide a basis for land use and transportation

decision-making, and to identify projects for the State Transportation Improvement Program. TSPs need to be consistent with the State TSP and its modal and multimodal elements.

Preparation of this TSP follows the requirements of the TPR. The TPR requires the determination of transportation needs and the development of modal plans (the road system, public transportation, bicycles, pedestrians, and air, rail, water, and pipeline transportation) to meets those needs. These plans must include an inventory of existing services and facilities and a system of planned facilities, services and major improvements, indicating their location and who is responsible for providing them. Preparation of these plans includes the evaluation and selection of system alternatives, which include the following elements: improvements to existing facilities or services; new facilities and services; transportation system management measures; demand management measures; and a no build system alternative. The evaluation and selection of alternatives is based on consistency with the community's comprehensive plan; consistency with state and federal standards for the protection of air, water, and land; minimization of adverse social, economic and environmental impacts; minimization of conflicts and facilitation of connections between transportation modes; avoidance of relying on one principal transportation mode; and reduction of the reliance on the automobile. The TSP also includes a financing plan. Section 6 evaluates this TSP's consistency with the requirements of the TPR.

The TPR also requires communities to amend their land use regulations to implement the TPR and their TSPs. Section 1.4.5 evaluates Lebanon's land use regulations for consistency with the TPR. Where inconsistencies occur, changes are recommended.

### Access Management Rules (OAR 734-051)

OAR 734-051 states that the purpose of the rules is to govern the issuance of permits for approaches onto state highways. The policy promotes the protection of emerging development areas rather than the retrofit of existing built-up roadways. The rules also provide access management spacing standards for approaches for various types of state roadways and for interchanges. OAR 734-051-0190 specifies that theses standards are to be used in planning processes involving state highways, including corridor studies, refinement plans, state and local TSPs, and local comprehensive plans. The access management rules also include provisions for UBAs and STAs, as discussed under the OHP. The access management rules also describe the development of access facility management plans and interchange area management plans. Access management rules for statewide and regional highways and STAs will be used in preparation of this TSP.

## Regional and Local Plans and Policies

### Willamette Valley Transportation Strategy (1995)

The Willamette Valley Transportation Strategy (WVTS) is a multimodal element of the OTP. The WTVS identifies strategies for addressing eleven key issues influencing transportation development in the Valley. These strategies address the following issues:

- Highways/Roadways

  - Select highway projects that maximize the net benefits to the Valley's transportation system as a whole.
  - Coordinate highway projects with land use policies and other transportation improvements.
  - Make strategic capacity enhancements to controlled access highways.
  - Maintain regional highway linkages upon which rural communities depend to build viable communities.
  - Improve north-south and east-west links to the existing state highway system.

- Local/Regional Transit
  - Expand existing urban transit district services and systems to serve all parts of the more developed portions of their regions especially when service can help relieve congestion and reduce the need for costly street improvements.
  - Provide transit service from metropolitan centers to neighboring cities with populations of 2,500 or more.

- Freight
  - Improve local and state highway networks that provide direct connections to industrial areas and intermodal facilities such as rail/truck reload centers and air and marine ports.

- Aviation
  - Consider consolidation of some general aviation facilities where necessary to reduce operational costs and improve efficiency.
  - Through public-private partnerships, improve freight and passenger access to commercial airports by highway, transit and rail.
  - Manage land uses adjacent to airports to minimize conflicts with airport operations and public safety.

- Bicycles and Pedestrians
  - Include provisions for bicycle and pedestrian use in all new facilities and major construction.
  - Build a stronger network of bicycle and pedestrian facilities, including routes off highway rights-of-way.

- Interchange Development
  - Encourage local governments to adopt land use policies and implement transportation strategies that help achieve planned interchange utilization.

- Transportation Demand Management Programs (TDM)
  - In cooperation with the state, local jurisdictions develop transportation demand management programs which educate and inform the public about motor vehicle use.

  - Institute or expand programs such as ridesharing, park-and-ride, transit promotion and parking management, especially in metropolitan areas.
  - In partnerships between public and private sectors, expand programs such as trip reduction (commute options), flex time, telecommuting and parking "cashout" programs, especially in metropolitan areas for both public and private employees.
  - Coordinate employer-based programs with community transportation plan objectives.
  - Expand prepaid group transit pass programs in local communities.
- User Fees
  - Increase parking prices in urban areas of the Valley through a variety of means.
  - Introduce peak period pricing techniques on key transportation facilities.

The strategies emphasize connections between places and modes, reduction of reliance on the automobile, development of facilities with maximum benefit for the Valley, and compact development.

## US 20/OR 34 Interim Corridor Strategy (1998)

The US 20/OR 34 Interim Corridor Strategy was prepared by ODOT and the Oregon Cascades West Council of Governments in May 1998. The Interim Corridor Strategy is the first step in the development of a corridor plan and refinement plans for areas addressed by the strategy; one tool for its implementation is this local transportation plan. The US 20/OR 34 Interim Corridor Strategy has not been adopted by the Oregon Transportation Commission. The following Interim Corridor Strategy actions and objectives are applicable to the Lebanon TSP.

- Transit and Services for the Transportation Disadvantage
  - Prepare a feasibility study for regional bus service, with the highest priorities being the linkage of Albany, Corvallis, Philomath, and Lebanon.
- Bicyclists and Pedestrians
  - Within the urban sections of the corridor, improve bicycle facilities.
  - Improve pedestrian facilities within the urban sections of the corridor by closing gaps in sidewalk and multi-use path systems and designing pedestrian facilities for safety and to create a sense of security . . .
  - When highway and bridge improvements are made, improve pedestrian and bicycle facilities and avoid creating new bicycle and pedestrian barriers.
- Transportation Demand Management
  - Development and implement transportation demand management programs which assist in the reduction of single-occupant vehicle trips and lessen congestion.
  - Establish park-and-ride lots, including the leasing of existing, available parking spaces. . . . In particular, locations that encourage the formation of carpools and are

near important intersections . . . should be explored [including] Lebanon (Santiam Travel Station).

- Promote increased vehicle occupancy by expanding the current ride-sharing program.

- Passenger Rail Service
  - Explore the long-range opportunities for passenger rail service within the corridor, and preserve opportunities for future development, as appropriate.

- Freight Rail Facilities
  - Expand intermodal service connections between truck and rail, including the development of ramp, terminal, and reload facilities.
  - Preserve existing railroad rights-of-way.
  - Develop a list of vacant industrial sites in the corridor that are currently served by rail or could be served by rail with a modest investment.

- Airports
  - Ensure that land uses surrounding public airports are developed in a fashion that maintains the airports' ability to function as important elements of the transportation system.
  - Convene the affected city, county and ODOT representatives to address the issues identified in the July 1996 Linn County Regional Airport Feasibility Study and Site Investigation Study, in order to develop a long-range strategic plan for airports in Linn County, including their linkage with regional and state airports.

- Regional Connectivity
  - Improve and maintain good local road systems and complement the regional effectiveness of Highway 20/34.
  - Improve access to industrial and commercial sites by integrating local road networks with Highway 20/34. This may involve access management tools, improvements to local roads and intersections, and as appropriate, street and driveway closures.
  - . . . review and evaluate not only the use of state highways for local trips, but also the use of city and county arterials as state highway substitutes for regional trips.

- Highway Congestion
  - Proceed immediately with construction of . . . the Highway 34 widening project from I-5 to Main Street (Lebanon) [completed Fall 2000] . . . including the pavement and shoulder widening from Denny School Road to the city limits, and urban improvements from the city limits to Main Street. Also, surface Highway 20 between I-5 and Lebanon, with development of the highway to "3-R" standards, with full urban standards in north Lebanon.
  - Identify, as soon as feasible, the rights-of-way required for future projects; protect the rights-of-ways from development that is inconsistent with future projects; acquire rights-of-way in advance of project construction. . .

- After construction of the Highway 34 I-5 to Lebanon project and the Highway 20 I-5 to Lebanon "3-R" resurfacing project:
  - ♦ Update the 1993 ODOT Pacific Highway-Main Street (Lebanon) reconnaissance report to determine a specific OR 34 realignment with US 20;
  - ♦ Determine through a city, county and ODOT partnership, a right-of-way acquisition strategy; and
  - ♦ Construct the OR 34 realignment with US 20 (Lebanon).

  Highway 34 improvements were completed in Fall 2000 and Highway 20 was resurfaced from Lebanon (Reeves Parkway) to Albany (I-5) in Summer 2002.
- Identify and implement transportation system management improvements such as:
  - ♦ Improved traffic signal timing or inter-connect systems;
  - ♦ Additional left-turn and right-turn lanes at major intersections; and,
  - ♦ Access management programs involving streets and driveways that contribute to congestion.
- Avoid installation of new traffic signals in non-urban sections of the corridor and install traffic signals in urban sections where needed.

- Safety
  - Evaluate safety solutions, with significant input from local communities, for the following high-priority intersections:
    - ♦ US 20 and Weirich/Crowfoot (Lebanon)
    - ♦ US 20 and Cascade Drive (Lebanon)

## Linn County Comprehensive Plan and Transportation System Plan (1999)

Chapter 907 of the Linn County Comprehensive Plan is the County's Transportation System Plan. The following lists the recommended improvements and policies in the 1999 Linn County Comprehensive Plan/TSP that should be taken into consideration in the development of Lebanon TSP. The city and the county also have an urban growth management agreement that addresses the coordination of transportation issues. Pertinent information from that agreement is presented in Section 1.4.4 of the County Comp. Plan

### Access Management

- Access points onto arterials and collectors shall be limited to one access point where practical. Wherever possible, it is the intent to limit access onto arterial and collectors.
- If property access is feasible on a local road, then that local road access will be given preference over access onto a collector or arterial. When access cannot be accommodated on a local road then collector access will be given preference over arterial access.
- Access onto county-owned major and minor arterials will be consistent with Category 4 access, which offers limited access. Public road access is spaced at no less than every

1 mile; driveways are spaced at no less than every 1,200 feet; and traffic signals and median control are not present.

- Access onto county-owned major and minor collectors is considered Category 5 access, which is partial access. Public road access is spaced at no more than every ½ mile; driveways are spaced at no less than every 500 feet; traffic signals are spaced at no less than every ½ mile; and no median control is present.

### Level of Service and Capacity

- The level of service (LOS) on the County-owned arterial and collector systems will be an LOS D or better over the next 20 years (2019).
- Because current arterial and collector network will be adequate for the foreseeable future, no new arterial or collector roads are anticipated in the next twenty years in the unincorporated areas outside of the UGBs with the exception of a Lebanon bypass.
- The Highway 34/Airport Road/Oak Street/Denny School Road network will experience traffic volumes and general congestion by 2010 that could compromise mobility in the area. To avoid these problems the construction of a bypass to route Highway 34 traffic around Lebanon before it merges with Highway 20 is recommended.
- Although not likely to exceed capacity the following roadways within the Lebanon planning area may have heavy traffic volumes by 2010:
  - Airport Road, Oak Street, and Denny School Road near Lebanon
  - State-owned Highway 20 between I-5 and Lebanon
  - State-owned Highway 34 between I-5 and Lebanon

### Transportation Projects and Road Network

- Transportation projects are prioritized as Level I, II, or III projects. Level I projects have the highest priority and Level III projects have the lowest priority. The following future transportation improvement project have been identified in the Lebanon planning area:
  - Lebanon Bypass (state facility), Level I – 10 years
  - Airport Road, Level I – 5 years (if bypass is built, improvement is unnecessary)
  - Oak Street, Level I – 5 years (if bypass is built, improvement is unnecessary)
  - Denny School Road, Level II – 10 years (if bypass is built, improvement is unnecessary)
  - Crowfoot/Cascade Drive Intersection, Level III – 10 years
  - Tangent Drive/Highway 34 (state facility), Level III – 10 years

### State Highways

- Traffic from Highway 34 needs to be routed around Lebanon before connecting with Highway 20. A Lebanon bypass is a State road project that the County strongly supports. . . . The County realizes the size of this project will require cooperation and coordination with both the State and the City of Lebanon.

- Linn County strongly supports the improvement and upgrading of Highway 34 and Highway 20 between I-5 and Lebanon, which are State road projects. Improvements needed include better shoulders, additional travel lanes, continuous turn lanes and curve and intersection realignments. Ideally, both facilities need to be five lane facilities that are linked by a bypass around Lebanon. Highway 34 improvements are higher priority than Highway 20 improvements.
- Highway 34 improvements were completed in Fall 2000 and Highway 20 improvements were completed in Summer 2002.

### City/County Road Policy

- Linn County supports further coordination of city and county road networks so that they operate in an efficient fashion.
- Linn County supports the transfer of county roads to city jurisdictions when urban development and annexation occurs.
- Linn County supports better coordination of city and county road standards through the urban growth management agreement process.

### Public Transportation

- Linn County will be a nexus for high speed rail travel. The high speed rail plan calls for aggressive development of transit facilities. In Linn County that would be feeder buses linking Corvallis, Albany, Lebanon and Sweet Home along Highway 20.
- Linn County supports Lebanon's efforts to develop an intermodal connection, with eventual connection to high speed rail. Modes of access include automobile, air, bicycling, and pedestrian access.
- Linn County supports institution of passenger rail service between Albany, Lebanon and Sweet Home. . . . [As a result,] Linn County opposes abandonment of Southern Pacific or Burlington Northern rail lines that currently link these cities.

### Bicycling

- Provide and encourage facilities that serve the diverse needs of citizens traveling by bicycle. Those needs include: commuting to work and school; utilitarian transportation to shopping, public facilities, and for personal business; intermodal connections to transit stops and park-n-ride lots.
- The following criteria will be used to identify bicycle routes:
  - Safety of the road as it is and as it would be if improved.
  - Utility of the road/bike route to provide access to:
    - Cities and communities
    - Other transportation modes
    - City bicycle paths
    - Bicycle routes
    - Recreational routes and sites

- Current use as a bicycle route
- Existing road conditions such as shoulder width and pavement quality
- Road grade
- Cost of accomplishing improvements
- Scenic qualities and features

### Regional Airport

- Linn County is concerned that expansion plans for the Lebanon State Airport currently proposed by the State will seriously disrupt traffic on a County minor arterial—Airport Road. Impacts of airport expansion on the County road network must be addressed in any airport expansion plans.
- Linn County opposes expansion of the Lebanon Airport until a regional air facility study has been completed and a determination of airport needs have been made.

### Rail

- Linn County does not support further rail abandonments or diminishment of service.
- It is the goal of Linn County to protect industrial lands abutting freight lines and the connections between industrial lands and freight lines.

## City of Lebanon/Linn County Urban Growth Management Agreement

The City of Lebanon/Linn County Urban Growth Management Agreement addresses the manner in which certain issues, including transportation, will be handled between the City and the County in a designated "planning area." The planning area encompasses the Urban Growth Area and an area outside its boundary that can influence transportation. In general, the agreement calls for the coordination of construction, improvement, and maintenance standards; joint review of site developments and major state transportation projects; the opportunity for the City to comment on new County road projects as well as subdivision, partition, residential, commercial and industrial development proposals with respect to proper road standards; and the coordination and promotion of bicycle, transit, and rail development.

The agreement also contains road access management provisions that are additional to those identified in the County's comprehensive plan and TSP. Within the planning area, the County will require that the proposals for road access demonstrate that road access:

- Accommodates any potential neighboring urban-scale development
- Integrates with and connects to the future road network planned for the area
- Coordinates with City and County transportation plans
- Adequately accommodates the vehicular movements that will be associated with it
- Provides adequate ingress and egress and has sufficient line of sight distance
- Has adequate drainage associated with it
- Is adequate for the provision of emergency services

County-administered road access requests for new minor or major partitions, subdivisions, and commercial and industrial development in the UGA will require the following:

- County-owned major and minor arterials will be developed to the following standards:
  - Road access spaced at no more than one per mile
  - Driveways spaced at no more than one per 1,200 feet
  - No traffic signals
  - No median control
- County-owned major and minor collectors will be developed to the following standards:
  - Road access spaced at no more than one per 1/2 mile;
  - Driveways spaced at no more than one per 500 feet;
  - No traffic signals; and
  - No median control.

## Lebanon Land Use Regulations (Comprehensive Plan, Lebanon Development Code, and LURA)

The City of Lebanon adopted its first Comprehensive Plan in 1981 in response to mandates set in place in 1973 when the Oregon Legislature established the Land Conservation and Development Commission (LCDC) and empowered the Commission to subsequently adopt Statewide Planning Goals. This Comprehensive Plan was updated in 2004. In addition, a Transportation Master Plan was prepared in 1991.

The salient features of this TSP (especially Chapters 6 & 8) were included in the 2004 Lebanon Comprehensives Plan as the plan's transportation element (Chapter 8). Preparation of other elements of the 2004 Lebanon Comprehensives Plan, such as land use, were coordinated to ensure consistency between the two documents.

As part of the TSP preparation process and to conform to the requirements of the TPR, the City of Lebanon also previously prepared draft land use regulation amendments (LURA). [1] Depending on the level of detail, the LURA has been applied to the following land use regulations: 2004 Comprehensive Plan, the new draft (2006-2007) Lebanon Development Code (combining the Zoning Ordinance and Subdivision Ordinance), Public Improvement Standards, and Engineering Standards, Specifications, and Drawings. Currently most of the LURA material is being integrated into the new (2006-2007) Lebanon Development Code. The draft LURA contains blanks, like Table 8.02-1: City of Lebanon Right-of-Way and Street Design Standards. The blanks are being filled in with completion of the TSP and the new (2006-2007) Lebanon Development Code.

Table 2-1 summarizes Transportation Planning Rule (TPR) requirements from OAR Section 660-012-0045, and indicates where the current zoning ordinance and LURA do or do not comply with the TPR and the steps that can be taken to comply.

[1] City of Lebanon. Work Product for TGM Agreement Number 18165: Transportation Planning Rule Revisions to City of Lebanon's Land Use Regulations. June 29, 2001.

TABLE 2-1
Transportation Planning Rule Requirements and Lebanon Land Use Regulations

| TPR Requirement (OAR 660-012-0045) | Lebanon Land Use Regulation Compliance/Recommendations |
|---|---|
| (1) Each local government shall amend its land use regulations to implement the TSP. | |
| (a) Certain transportation facilities, services and improvements need not be subject to land use regulations except as necessary to implement the TSP and, under ordinary circumstances do not have a significant impact on land use. | Current Lebanon land use regulations do not expressly address transportation facilities, services or improvements that may be permitted outright; however LURA 6.0 (1) identifies those transportation improvements to be permitted outright. |
| (b) A transportation facility, service, or improvement may be allowed without further land use review if it is permitted outright or if it is subject to standards that do not require interpretation or the exercise of factual, policy or legal judgment. | Current Lebanon land use regulations do not expressly address transportation facilities, services or improvements that may be permitted outright; however LURA 6.0 (1) proposes transportation uses permitted outright. |
| (c) Local governments shall provide a review and approval process that is consistent with 660-012-0050 (Transportation Project Development). Local governments shall amend regulations to provide for consolidated review of land use decisions required to permit a transportation project. | Current Lebanon land use regulations do not expressly address OAR 660-012-0050.<br><br>Recommend that LURA 6.0 (2) (a) (3) be amended to specify a comprehensive consolidated review process for transportation projects. |
| (2) Local governments shall adopt land use or subdivision ordinance regulations, consistent with applicable federal and state requirements, to protect transportation facilities for their identified functions. | |
| (a) Access control standards | Current Lebanon land use regulations do not expressly address access control standards; however, LURA 7.023 provides standards for motor vehicle access and circulation. |
| (b) Standards to protect the future operations of roadways and transit corridors | Current Lebanon land use regulations do not expressly address standards to protect future operations of roadways and transit corridors; however, LURA 7.023 provides standards for motor vehicle access and circulation; LURA 7.027 provides standards for access to and placement of transit facilities and services, LURA 8.02 addresses design standards for streets, alleys, and pathways. |
| (c) Control of land use around airports | Section 4.510 of the Lebanon Zoning Ordinance addresses land use and other controls around the airport; however, LURA 4.5 is proposed to better meet the requirements of OAR 660-012-045(2)(c). |
| (d) Coordinated review of future land use decisions affecting transportation facilities | Section 5.300 of the Lebanon Zoning Ordinance describes the procedures for site review but does not explicitly address review of transportation concerns. To specifically address transportation-related site review issues, LURA 10.002(2), 10.003, and 10.004 has been proposed. |
| (e) Process to apply conditions to development proposals in order to minimize impacts and protect transportation facilities | Section 5.300 of the Lebanon Zoning Ordinance does not specifically identify a process for applying to transportation-related development conditions; however, LURA 10.004 and 10.005(3) have been |

TABLE 2-1
Transportation Planning Rule Requirements and Lebanon Land Use Regulations

| TPR Requirement (OAR 660-012-0045) | Lebanon Land Use Regulation Compliance/Recommendations |
|---|---|
| | proposed to address such concerns. |
| (f) Regulations to provide notice to public agencies providing transportation facilities and services, MPOs, and ODOT of: land use applications that require public hearings, subdivision and partition applications, applications which affect private access to roads, applications within airport noise corridor and imaginary surfaces which affect airport operations. | The Lebanon Zoning Code does not require identification of transportation service and facility providers as part of site review process. LURA 3.010(2) is proposed to meet the notification requirements of OAR 660-012-0045(f). |
| (g) Regulations assuring amendments to land use designations, densities, design standards are consistent with the function, capacities, and levels of service of facilities designated in the TSP. | Article 9 of the Lebanon Zoning Code discusses amendments to the code but it does not expressly address consistency of those amendments with the TSP. LURA 11.060 is proposed to require zoning code amendments to be consistent with the TSP and to provide a process for achieving that consistency. |
| (3) Local governments shall adopt land use or subdivision regulations for urban areas and rural communities as set forth in 660-012-0040(3)(a-d): | |
| (a) Provide bike parking in multifamily developments of 4 units or more, new retail, office and institutional developments, transit transfer stations and park-and-ride lots | Section 5.200 of the Lebanon Zoning Code presents off-street parking requirements but it does not address parking requirements for bicycles. LURA 9.200(7) and Table 9.200.7-1 have been proposed to address OAR 660-012-0045(3)(a), requiring 1.5 bicycle parking spaces per unit in a multi-family development. |
| (b) Provide “safe and convenient” (per subsection 660-012-0045.3(d)) pedestrian and bicycle connections from new subdivisions/multifamily development to neighborhood activity centers; bikeways are required along arterials and major collectors; sidewalks are required along arterials, collectors, and most local streets in urban areas except controlled access roadways | The Lebanon Zoning Code does not currently include specific requirements for pedestrian and bicycle connections. LURA 7.024 and 7.025 are proposed to address the requirements of 660-012-045(3)(b). |
| (c) Off-site road improvements required as a condition of development approval must accommodate bicycle and pedestrian travel, including facilities on arterials and major collectors | Section 5.350 of the Lebanon Zoning Code discusses conditions of development approvals but does not identify transportation-related conditions. LURA 10.005 (3) is proposed to provide for such conditions. |
| (d) Provide internal pedestrian circulation within new office parks and commercial developments | The Lebanon Zoning Code requires site plans to show pedestrian circulation. LURA 7.025 is proposed to provide standards for pedestrian access and circulation. |
| (6) As part of the pedestrian and bicycle circulation plans, local governments shall identify improvements to facilitate bicycle and pedestrian trips to meet local travel needs in developed areas. | Existing Lebanon land use regulations do not currently include pedestrian and bicycle circulation plans that specify improvements to facilitate local trips. LURA 8.01(b) proposes standards that create circulation patterns that facilitate bicycle and pedestrian trips to meet local travel needs. |

TABLE 2-1
Transportation Planning Rule Requirements and Lebanon Land Use Regulations

| TPR Requirement (OAR 660-012-0045) | Lebanon Land Use Regulation Compliance/Recommendations |
|---|---|
| (7) Local governments shall establish standards for local streets and accessways that minimize pavement width and total right-of-way (ROW) consistent with the operational needs of the facility. | Existing Lebanon land use regulations do not currently include standards to minimize pavement width. LURA 8.02 proposes standards for local streets and accessways that minimize pavement width and total right-of-way. |

## Transportation Master Plan (1991)

The *1991 Transportation Master Plan* is the city's most current adopted TSP. Completed just before the implementation of the TPR, many elements address TPR requirement; however much of the information is outdated. The limited goals and policies in the *1991 Transportation Master Plan* are as follows:

- Overall Goal
  - To provide a transportation policy plan as a guide for development of a systematic network of trafficways related to the patterns and needs of community activity.
- General Policies
  - The city shall seek to develop a balanced transportation system which includes all transportation modes appropriate to the city's needs.
  - Transportation proposals shall be reviewed to determine whether they enhance or hinder the overall growth policy for the Urban Growth Area.
  - Transportation proposals shall be reviewed to minimize adverse social, economic, energy and environmental impact and costs.

The arterial improvements identified in the master plan include the following:

- US 20: Widen to five lanes between Carolina Street to the City of Albany.
- Highway 34: Widen to five lanes from I-5 to the proposed truck loop/beltway. (Highway 34 was widened to four lanes in Fall 2000).
- Truck Loop/Beltway: Construct a new roadway around the City of Lebanon to create a truck by-pass and beltway around the west side of the city.
- Tangent/Morton Street: Realign Tangent Street west of 2nd Avenue to connect with Morton Street through a portion of the Santiam School athletic field.
- Oak Street: Extend Oak Street from its current eastern terminus to Grant Street and reconstruct Grant Street to "T' into Oak Street.
- Airport Road (eastern terminus): Extend from its eastern terminus to River Road as a three-lane roadway.
- Airport Road (between Airway Road and new Truck Loop/Beltway): Vacate Airport Road from Airway Road to the new Truck Loop/Beltway to provide for the expansion of the Lebanon State Airport runway.

- Walker Road: Reclassify Walker Road from a collector to an arterial street and widen Walker Road from Main Street to 2nd Street to four lanes. Extend Walker Road from Stoltz Hill Road to the new Truck Loop/Beltway with three travel lanes plus bike lanes.
- Stoltz Hill Road: Realign Stoltz Hill Road at its northern terminus to connect directly to 12th Street at Walker Road.

The collector improvements proposed by the 1991 Lebanon Transportation Master Plan are as follows:

- 5th Street: Extend from its northern terminus at Mary Street to the new Truck Loop/Beltway.
- Hansard Avenue: Pave Hansard Avenue as a two-lane industrial collector between OR 34 and the new Truck Loop/Beltway.
- 12th Street: Build 12th Street as a continuous collector from the new Truck Loop/Beltway to Stoltz Hill Road.

This project has been completed.

Other key elements of the 1991 Transportation Master Plan are the development of street standards and a street functional classification system. These classifications and standards, shown in Table 2-2, will be used as a starting point for determining the street standards and classifications to be included in this TSP.

TABLE 2-2
1991 Transportation Master Plan Street Standards and Classifications

| Classification | Pavement Width | Right-of-Way Width | Design Capacity Vehicles per Day |
|---|---|---|---|
| Cul-de-Sac: serves abutting land in residential areas | 28 feet | 50 feet | 200 |
| Local Residential: serves abutting land without carrying through traffic | 32 feet | 60 feet | 1,200 |
| Collector: serves abutting lands and through traffic from within the neighborhood | 40-50 feet | 60-70 feet | 10,000-18,000 |
| Arterial: provide for the movement of traffic between areas and across portion of a city or region | 44-54 feet | 64-74 feet | 18,000 |
| | 68-78 feet | 90-100 feet | 32,000 |

The 1991 Master Plan also includes figures showing the truck route and bikeway plans. Public transportation and rail service plans indicate that those services were adequate but should be maintained or expanded as needed.

## Downtown Lebanon Transportation Enhancements (2000)

In November 2000, ODOT and the Oregon Department of Land Conservation and Development prepared the Downtown Lebanon Transportation Enhancements. This document presents an eight-block streetscape concept that promotes the community's desire to recreate a vital, pedestrian friendly downtown while considering the functional

requirements for State Highway 20. Implementation of the concept plan includes the adoption of a Special Transportation Area management plan in coordination with this TSP. A Special Transportation Area has been adopted by ODOT in the OHP and includes the State Highway 20 couplet (between Rose and Oak) and portions of OR 34 (between the railroad crossing and US 20).

The transportation-related goals and objectives for the project are as follows:

- Develop a pedestrian friendly downtown.
- Reduce traffic speed.
- Improve safety.
- Provide convenient access within downtown.

Designation of a part of US 20 and OR 34 as an STA segments means that these sections will be subject to mobility and access management standards within this area that differ from those applied to other sections of state highway.

SECTION 3

# Existing Transportation Conditions

This section summarizes the state of existing transportation conditions in Lebanon, Oregon. It provides an inventory and a deficiencies assessment of the existing transportation facilities within the Lebanon Urban Growth Boundary and will serve as a baseline for the 20-year planning horizon. It is based on prior analysis completed in 1999 and updates performed in 2003 and 2005-6.

The following transportation system elements are discussed in this section:

- Study Area and Land Use
- Roadway Facilities
- Public Transportation Facilities
- Pedestrian Facilities
- Bicycle Facilities
- Rail Facilities
- Air, Pipeline and Water Facilities

## Study Area and Land Use

### Location and Boundary

The City of Lebanon is located in Oregon's Willamette Valley at the western edge of the Cascade Mountain foothills. Lebanon is approximately 7 miles east of Interstate 5 (I-5) via Oregon Highway 34 (OR 34) , which meets with U.S. Highway 20 (US 20 / Santiam Highway) in the northern portion of the city (Figure 3-1). US 20 is a major roadway link for eastern Oregon and the Willamette Valley. Two railroads and a general aviation airport serve the community. Lebanon is located approximately 80 miles south of Portland, 12 miles and 17 miles southeast of Corvallis and Albany, respectively, 45 miles north of Eugene, and 70 miles east of the Oregon coast.

### Land Use

The Study Area for this TSP is the area within the city and its urban growth boundary (Figure 3-1). The Lebanon UGB encompasses approximately 6,600 acres, of which approximately3,800 of these acres are currently included within Lebanon city limits. According to the Center for Population Research and Census at Portland State University, Lebanon has a 2002 population of approximately 13,110. There is a growing population living within the urban growth boundary but outside the city. The largest employers in town are Lebanon Community School District, Entek Manufacturing Inc., Walmart, and Linn Gear.

Commercial development within Lebanon is concentrated in the central business district and extends to the south along Highway 20. Commercial uses in the central business district are primarily retail and service. Industrial development is primarily located in the

northeastern and southeastern portions of Lebanon adjacent to the railroad and the Santiam River. A significant industrial center, with Entek, Linn Gear, Pennington Seed, and Lowe's Distribution Warehouse is also located in northwestern Lebanon along the railroad. Light industrial development is also present in vicinity of the Lebanon State Airport.

Residential development is the major land use. Residential uses encircle the commercial areas of the city, except in the southeast quadrant.

#### Future Development

Several locations within Lebanon and its Urban Growth Boundary were identified as areas where growth and development are expected in the next 20 years. Residential development is anticipated in the following locations:

- North of the imaginary extension of Crowfoot Road between 5th Street and South Main Road
- Vicinity of Kees Street and Stoltz Hill Road
- Ridgeway Butte Area
- Area generally bounded by Walker, 12th, "F," and 7th Streets (next 10 to 20 years)
- North of Reeves Parkway and west of Santiam Highway (next 15 to 20 years)

Mixed use (residential and commercial) development is anticipated in the area east of River Drive and west of South Santiam River in the vicinity of the Mt. River Dr. (next 10 years) and in the area south of Reeves Parkway and west of Santiam Highway across from the Lebanon Community Hospital.

Industrial development is expected to expand in the far northwest portion of the city over the next 10 years. Commercial and light industrial uses are planned in the area west of the airport and south of Oak Street. The extension of public improvements to this area will likely encourage development north of Oak Street.

# Transportation Modes and Facilities

## Roadway Facilities

The City of Lebanon has approximately 90 miles of roadway within the City Limits. These roadways provide access and mobility to a number of modes for a variety of purposes.

#### Ownership

Lebanon roadways and bridges are operated and maintained under either state, county, or city jurisdiction. The majority of these are under City jurisdiction. The Oregon Department of Transportation (ODOT) maintains OR 34 and US 20, both of which pass through Lebanon. The city is responsible for most other roadways within the city limits. Linn County maintains roadways outside of the city limits that are within the urban growth boundary, and a few roadways within the city limits have not had their jurisdiction transferred to the City. Figure 3-2 indicates road ownership within the City of Lebanon TSP study area.

FIGURE 3-1 Study Area, 11x17

Figure 3-1 Study Area, 11x17

Figure 3-2 Road Ownership, 11x17

Figure 3-2 Road Ownership, 11x17

## Functional Classification

The City of Lebanon uses a four-category classification system to characterize roadways based on their primary function. The four functional classifications are cul-de-sac streets, local residential streets, collector streets, and arterial streets. Cul-de-sacs serve the same function as local residential streets, but do not provide connectivity. For the purpose of the TSP, they are included in the discussion of the local street classification.

Functional classification represents a hierarchy of streets based on the access and mobility that they provide to vehicular users of the roadway. Arterial streets provide a high degree of mobility, but limit access, as they are meant to efficiently move traffic around or between urban areas. Local streets are at the other end of the spectrum, with limited mobility and full access. Local streets are typically found in residential neighborhoods. The following definitions serve as a general guide in determining street classifications.

### *Arterials*

Intra- and inter-community roadways connect community centers with major facilities. In general, arterials serve both through and local traffic. Access should be partially controlled with infrequent access to abutting properties. ODOT provides access standards specifying access spacing and other criteria where state routes serve as arterials. Residential property in general should not have direct access to arterials. Both ODOT-maintained facilities in the City, OR 34 and US 20, function as arterials and are classified as Regional Highways by ODOT.

### *Collectors*

Collectors are streets connecting residential neighborhoods with smaller community centers and facilities, as well as access to the arterial system. Property access is generally a higher priority for collector arterials; through-traffic movements are served as lower priority.

### *Local Streets*

The local street classification refers to streets within residential neighborhoods that provide connection between mainly residential land uses and the collector and arterial system. Local streets primarily serve to provide property access, so through traffic is not encouraged.

Figure 3-3 shows Lebanon's existing roadway system with functional classification.

## Traffic Operations

The agency responsible for the operations and maintenance of a transportation facility will determine what level of service is acceptable. The acceptable level of service may vary by intersection type, roadway classification, or surrounding land use. The quality of traffic operations is typically expressed in terms of Level of Service (LOS). LOS is defined using different methods depending on whether the subject of traffic operations is a roadway segment or an intersection. Intersection operations for signalized (signal-controlled) and unsignalized (stop-controlled) are calculated differently as well. Capacity of the roadway system is metered by intersections and their allocation of right-of-way to more than one route. Therefore, intersections provide the most relevant assessment of overall traffic operations.

The City of Lebanon Transportation System Plan acknowledges the mobility standards defined in the 1999 OHP for State highways and local facility intersections. With the 1999

OHP, ODOT has simplified its measurement for highway performance by adopting specific volume-to-capacity (v/c) ratios for different types of roadway facilities. Table 3-1 summarizes the 1999 OHP v/c ratio standards by type of roadway facility.

TABLE 3-1

Level of Service Standards (Maximum Volume-to-Capacity Ratios) for Peak Hour Operating Conditions within the City of Lebanon Urban Boundary

| | Inside Urban Growth Boundary | | | |
|---|---|---|---|---|
| | **STAs** | **Non-MPO Outside of STAs Where Non-freeway Speed Limit ≤35 mph** | **Non-MPO Outside STAs Where Nonfreeway Speed Limit >35 mph** | **Non-MPO Where Non-freeway Speed Limit ≥ 45 mph** |
| Freight Routes on Regional or District Highways | 0.90 | 0.85 | 0.80 | 0.75 |
| Regional Highways | 0.95 | 0.85 | 0.80 | 0.75 |
| District/Local Interest Roads | 0.95 | 0.90 | 0.85 | 0.80 |

Source: 1999 Oregon Highway Plan (OHP).

### *Roadways Segments*

The v/c ratio is a measure of the percentage of used capacity on the roadway. A value of 0.00 indicates no traffic on the roadway, and a value of 1.00 indicates that the entire capacity of the roadway is being utilized. This condition cannot be maintained and will spontaneously result in traffic breakdown – stop-and-go conditions. The 1999 OHP indicates that for regional freight route highways such as OR 34 and US 20, the maximum acceptable v/c is 0.90 within a Special Transportation Area (STA). Outside an STA, the v/c ratio is 0.85 within the urban growth boundary with a speed limit of 25, 30, or 35 mph, 0.80 for a 40 mph speed limit, and 0.75 for speed limits of 45 mph or greater. The 0.75 v/c ratio standard applies only to US 20 south of Market Street and OR 34 west of the western city limits (12th Street).

### *Intersections*

Two methods are used by the City to evaluate intersection level of service. The v/c ratio measure described above is also applied to assess intersection deficiencies. This is done by evaluating each intersection approach. Intersection delay is also used to determine operating conditions and define standards. Either method may be used to determine where improvements, to meet mobility, standards are required.

For unsignalized intersections, the 1999 OHP sets the following standard:

> "At unsignalized intersections and road approaches, the volume-to-capacity ratios shall not be exceeded for either of the state highway approaches that are not stopped. Approaches at which traffic must stop, or otherwise yield the right-of-way,

> shall be operated to maintain safe operation of the intersection and all of its approaches and shall not exceed the volume-to-capacity ratios for District/Local Interest Roads within urban growth boundaries or 0.80 outside of urban growth boundaries."[2]
>
> Non-highway approaches have a mobility standard of 0.95 within the STAs, 0.90 outside of these areas where the highway speed is 25, 30 or 35 mph, 0.85 where the highway speed is 40 mph, and 0.80 where the highway speed is 45 mph or greater.

For signalized intersections, the *1999 OHP* sets the following standard:

> "At signalized intersections other than crossroads of freeway ramps, the total volume-to-capacity ratio for the intersection considering all critical movements shall not exceed the volume-to-capacity ratios (identified in Table 3-1). Where two state highways of different classifications intersect, the lower of the volume-to-capacity ratios in the table shall apply. Where a state highway intersects with a local road or street, the volume to capacity ratio for the state highway shall apply."[3]

A secondary measure of LOS for intersection operations is based on the 2000 Highway Capacity Manual (HCM) is also used in the Transportation System Plan to evaluate the performance of transportation facility operations. The HCM is a standard practice level of service methodology used in transportation planning. Levels of service are described by the HCM based on a letter scale from "A" to "F", where "A" represents the least congestion and delay, and "F" represents the highest level of congestion. The levels of service values are correlated to control delay in seconds. Control delay is defined as the delay associated with the traffic control device. It includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. A detailed level of service description is provided in Appendix A.

For City streets in this plan a combination of LOS and v/c ratio analysis is used. Plan recommendations for signalized intersections meet or exceed LOS "E" and have a v/c ratio of less than 1.00 regardless of LOS. At unsignalized intersections the goal is to maintain a v/c ratio of less than 0.90 on the critical movement, provided the queues on the critical approach can be appropriately accommodated.

There are currently 16 (in 2003) traffic signals in the City of Lebanon. Twelve traffic signals were in place at the time of the existing conditions analysis in 1999. Each of these signalized intersections was evaluated to determine LOS and identify current deficiencies. Twenty unsignalized intersections were analyzed along key travel corridors within the City of Lebanon to identify deficiencies. Existing traffic operations analysis was performed for the 1999 p.m. peak hour condition. The p.m. peak hour represents the highest overall travel demand within the City of Lebanon. Intersections experiencing LOS D or below for any one movement were deemed to have existing or imminent deficiencies in terms of traffic operations. All of the existing intersection deficiencies occur at unsignalized intersections. Intersections analyzed as part of the existing conditions analysis are illustrated in Figure 3-4. In order to illustrate the relative congestion at each of the intersections analyzed in the

[2] 1999 Oregon Highway Plan (OHP), Oregon Department of Transportation, March 1999, page 68.

[3] 1999 Oregon Highway Plan (OHP), Oregon Department of Transportation, March 1999, page 68.

figure, the LOS letter grades for intersections with deficient movements were converted to ratings of *under capacity* (LOS A through C), *near capacity* (LOS D and E), and *over capacity* (LOS F). Two of the intersections illustrated on the figure, Oak/5th Streets and Market Street/South Main Road, have been signalized and currently operate below capacity (LOS C or better) In addition, the Cascade Drive approach has been reconfigured as part of Weldwood Drive improvements.

Figure 3-3 Roadway Functional Classification, 11x17

Figure 3-3 Roadway Functional Classification, 11x17

Figure 3-4 Intersection Level of Service (1999), 11x17

Figure 3-4 Intersection Level of Service (1999), 11x17

### Bridge Condition

There are a number of bridges and culverts within the City of Lebanon, crossing the Santiam River, Burkhart and Oak Creeks and the Lebanon-Santiam Canal. In 2002, all Lebanon area bridges were inspected by ODOT. Most of these are currently in acceptable condition with the exception of two bridges. One bridge, along US 20 at milepost 11.89 where the highway crosses the Santiam Canal. This bridge has a sufficiency rating of 47.80. ODOT's sufficiency rating system utilizes a formula that considers a number of factors affecting bridge performance. These are pavement (surface) conditions; bridge (structural) conditions; geometric adequacy (including lane width, shoulder conditions, substandard curvature, intersection sight distance, signing adequacy and pavement markings); and accident rates. The Grant Street Bridge, which is under City jurisdiction, received a rating of 47.20 (structurally deficient). Typically, bridges with a sufficiency rating of 80 or below are scheduled for additional maintenance, rehabilitation, or replacement. Grant Street bridge has received funding from the State and is scheduled for replacement in 2006-08.

### Access Management

General observations can be made regarding the appropriate levels of access according to functional classification for roadway facilities within the City of Lebanon. A review of current access along state highway and arterial roadways within the City of Lebanon indicates general concurrence with ODOT access standards. Some instances of deficient access spacing and substandard intersection geometry (acute angle intersections) exist but are mainly limited to US 20. Some of the most severe locations of substandard geometry occur at the intersections with Crowfoot Road and Dewey Street/Walker Street.

Oregon Administrative Rule 734-051 specifies approach road spacing standards for state highways. Where the posted speed is 40-45 mph, the approach spacing is to be 750 feet; where the speed is 30-35 mph, spacing is 425 feet; and at 25 mph or less, spacing is to be 350 feet. Approaches within the two Special Transportation Areas are to meet the existing city block spacing. Public approach roads are preferred and private approach roads are discouraged in STAs, but if private approach roads are allowed, the spacing standard is 175 feet, or mid-block if the city block is less than 350 feet. These spacing standards are not met within the existing city limits largely due to historic development patterns. The standards apply to new approach roads and when the use of an existing approach changes.

### Traffic Safety

In order to determine the location and severity of current traffic safety issues within the City of Lebanon, a four-year accident history (1997 to 2001) was obtained from ODOT. High accident locations during this period occur where traffic volumes and speed are high. Seventeen of the top 25 highest frequency accident locations are along US 20. Two accidents, resulting in pedestrian fatalities, occurred during the four-year period. Both accidents occurred along US 20—one near its intersection with Milton Street and the other near its intersection with Maple Street. Major accident locations also occur in more than one place along Oak Street, 2nd Street, Sherman Street and Williams Street. Figure 3-5 illustrates the top 25 intersections experiencing high accident frequencies. In addition, a number of traffic safety concerns were identified by residents during a public involvement process:

- Excessive traffic speeds through downtown and residential areas (To address this and other traffic complaints, the City has instituted a motorcycle traffic enforcement team.)

- Better enforcement of bicycle and pedestrian rules of the road
- Improvements to crosswalk visibility and to crosswalks near schools
- Poor lighting on 10th, 12th, and the outskirts of downtown
- Dangerous intersections with staggered crosswalks
- Need for better enforcement of speed limits and red light running
- Need for a traffic signal at US 20 at Russell Street
- More pedestrian facilities in subdivisions and around schools

The top priorities for improving traffic safety as expressed by Lebanon residents include addressing speeds in areas of high pedestrian activity, especially around schools, improving lighting and visibility at a number of locations, and managing truck traffic through the City.

### Truck Freight Transportation

The primary north-south truck route through Lebanon is US 20. As US 20 approaches downtown Lebanon from the north, truck traffic is routed away from US 20 to Wheeler Street to the east. The truck route follows Wheeler Street to Williams Street and turns south paralleling US 20 on Williams Street until reaching Milton Street. Trucks are then routed west on Milton Street to US 20. At the Milton Street/US 20 intersection, trucks are routed back onto US 20. This alignment directly avoids having trucks travel through downtown Lebanon, which is designated as Special Transportation Area (STA) along US 20 in this area minimizing conflicts with a congested, high pedestrian activity area. Even though US 20 south of OR 34 south through Lebanon has recently (August 2005) been added to the State Highway Freight System the existing Wheeler/Williams route is well known, signed and utilized by the freight industry. This local designation is consistent with Oregon Highway Plan (policy 1C) recognizing the need for locally designated freight route systems that are compatible with or complementary to the designation of routes in the State Highway Freight System and the Oregon Transportation Commission authorized/adopted these local street truck routes when they were created. Appendix E contains available information which documents the truck route through Lebanon.

Other roadways designated as truck routes within the City of Lebanon include Oregon 34 (Tangent Street) from the west city limits to US 20 which is also designated as part of the State Highway Freight System, Oak Street from the west city limits to Park Street, and Grant Street from Williams Street to the east city limits. Figure 3-6 illustrates existing truck routes. The majority of freight in and out of Lebanon moves via truck. Almost all of the incoming and outgoing truck traffic travels between I-5 and Lebanon on either OR 34 or US 20.

The existing truck routes are a sensitive issue for both the truck drivers and the residents of Lebanon. The current routes direct trucks through residential neighborhoods and intersections poorly designed to accommodate the turning radii of large trucks. The most significant concerns are with the Wheeler/Williams/Milton Street truck route alignment. This alignment is adjacent to a residential area. The route is poorly lighted, has poor pavement markings, and the roadway is narrow and in poor condition. The truck route along Oak Street receives fewer complaints although it also is adjacent to a residential area and near Green Acres School.

### Summary of Roadway Facility Conditions

As indicated above, roadway facilities and operations within the City of Lebanon are quite good with few exceptions. There are a number of current and emerging deficiencies that should be addressed:

- Geometric deficiencies at intersections with US 20 in the vicinity of Crowfoot Road and at Dewey Street/Walker Street.
- Incompatibility with truck traffic and land use along current truck freight routes.
- High accident frequencies near intersections along US 20 and other arterials within the City.

Pockets of lighting deficiencies at crosswalk locations throughout the City.

Figure 3-5 Intersection Accident History (1997–2001), 11x17

Figure 3-5 Intersection Accident History (1997 – 2001), 11x17

Figure 3-6 Truck Routes, 11x17

Figure 3-6 Truck Routes, 11x17

## Public Transportation Facilities

Public transportation in Lebanon is limited. There is no city-operated fixed-route bus service. The existing public transportation providers are privately owned and operated. These services generally operate on an on-call basis with limited hours.

### On-demand Transportation Service

The Lebanon Senior Center operates a weekday Dial-A-Bus service. The service operates primarily within the Lebanon city limits and to Sweet Home and Corvallis. Dial-A-Bus has three buses available, however only one bus is in operation on any given day. (This is a recent reduction in operations due to decreases in state and local funding and city budget cuts.). Two buses have 10 regular seats with spaces for 2 wheelchairs, and the third has 12 seats and room for 1 wheelchair. Buses are equipped with a lift for loading wheelchairs.

### Fixed-route Shuttle Service

The Sweet Home Senior Center operates a weekday bus service called the Linn Shuttle. The bus makes 3 round trips between Sweet Home and Albany. Some of the fixed stops on the route include the Wal-Mart and Senior Center in Lebanon, downtown Albany, and Linn Benton Community College. The service has one 22-passenger mini-bus for the regular route and 2 vans used for special needs customers. Rider preference is given to seniors and disabled.

### Vanpool and Rideshare Commuter Services

Vanpool service between Lebanon and Salem is available through the Oregon Cascade West Council of Governments' (OCWCOG) Valley VanPool program. The pick-up points are the Lebanon Bethlehem Lutheran Church and the Albany Park-and-Ride. Space is currently limited and service is provided on a first-come, first-served basis.

OCWCOG also provides rideshare matching service for commuters traveling between points in the greater Willamette Valley including Portland, Salem, Newport, Albany, Corvallis and Eugene.

As indicated above, public transportation within the City of Lebanon is limited. Improvements to public transportation should be pursued in the following areas:

- Expanding commuter services to surrounding communities including Albany and Salem (consider improvements as commuting patterns warrant)
- Increasing transit services for the mobility challenged, including the elderly and physically impaired (the need will increase as the population ages).
- Enhancing public transportation services including the identification of future locations for park-and-ride lots, multimodal centers and transit supporting facilities such as sidewalks, shelters and other amenities.

## Pedestrian Facilities

Pedestrian facilities are an important component of the transportation system. As the 1995 Oregon Bicycle and Pedestrian Plan (OBPP) explains, virtually everyone is a pedestrian at some point during the day. For example, pedestrians include children walking to and from school, people using wheelchairs or other forms of mobility assistance, people at bus stops, and people walking to and from their vehicles. Walking meets transportation needs for a significant segment of the population that does not have access to a vehicle. Aside from providing a necessary mode of transportation, a community's pedestrian system also offers recreational opportunities for both local and out-of-town users.

In 1999 community input was sought on the City's transportation system. When asked about 11 issues of critical transportation concern, respondents to a public opinion survey ranked the two pedestrian-related issues listed—provide sidewalks on all streets and create a walkable community—as the second and sixth greatest concern, respectively. Information gathered at a town hall meeting indicated that safety was a concern both in terms of sidewalk conditions and street crossings: smooth and level sidewalks need to be provided and crosswalks should be clearly marked and visible. Stakeholder input emphasized safety concerns, indicating that crossing Main Street in downtown can be dangerous and street lighting would help increase pedestrian safety. (Since 1999, new lighting has been installed on Main Street from Vine Street to Maple Street to improve pedestrian safety.) Overall, these responses indicate that the community would like a comprehensive and safe pedestrian system.

Continuous sidewalks should connect neighborhoods and employment centers to pedestrian attractions, be integrated with transit stops, and separate pedestrians from vehicular traffic. In addition, pedestrians need opportunities to cross streets safely. Supporting access and connectivity, the Transportation Planning Rule (TPR), Oregon Administrative Rules (OAR) 660-012-0045, requires that sidewalks be provided on all new public roadways. These include arterials, collectors, and most local streets in urban areas, but exclude controlled access roadways.

### Existing Sidewalk Locations

The existing sidewalks in Lebanon are generally concentrated in the downtown commercial core (Main Street) and the residential areas surrounding downtown. Fewer streets in the city's southwest quadrant have sidewalks compared to elsewhere. Figure 3-7 shows the location of sidewalks in the community.

The majority of streets have sidewalks on both sides, while a smaller proportion have sidewalks on just one side of the street. As mentioned previously, a number of local streets do not have sidewalks, and pedestrians share the roadway with bicycle and vehicle traffic. Similarly, pedestrians may also share the multi-use pathways on Reeves Parkway from 5th Street to Highway 20 and on 7th Street from "E" Street to Walker Road with bicyclists and other users.

Sidewalks generally range from 4 feet to 8 feet wide. However, some sidewalks on residential local streets are less than 4 feet wide, while sidewalks along Santiam Highway through the downtown core are greater than 8 feet wide. The city standard sidewalk width is 5 feet.

With the exception of some poor condition sidewalks in the northwest quadrant of Lebanon, sidewalks are generally in fair to good condition. Sidewalk conditions were identified through a comparison of a 1988 pedestrian needs assessment map presented in the 1999 City of Lebanon Transportation Master Plan with sidewalk improvements constructed by 1999.

### Existing Crosswalks

Crosswalks are located at all signalized intersections and at some unsignalized intersections. The signalized intersections with crosswalks are as follows:

- 5th Street and Oak Street
- 2nd Street and Oak Street
- 2nd Street and Airport Road
- South Main Road and Market Street
- South Main Road and Walker Road
- Santiam Highway and Wheeler Street
- Santiam Highway and Ash
- Santiam Highway and Sherman
- Santiam Highway and Grant Street
- Santiam Highway and Oak Street
- Santiam Highway and Milton Street
- Santiam Highway and Airport Road
- Santiam Highway and Dewey Street
- Park Street and Grant Street
- Park Street and Oak Street
- Williams Street and Grant Street

### Existing Pedestrian Facilities at Pedestrian Generators

It is important for a city's pedestrian system to connect residential areas with commercial centers, schools, and community focal points. These activity centers, known as pedestrian generators, are shown on Figure 3-7. The majority of these pedestrian generators are accessible by streets with sidewalks. Cascades Elementary School and Christopher Columbus Park are in areas under served by sidewalks. However, Cascade Elementary School is served by a multi-use path along 7th Street and recent residential development near Christopher Columbus Park has resulted in the extension of sidewalks in the park's vicinity. Downtown Lebanon has sidewalks that can accommodate and encourage pedestrian activity.

As indicated above, pedestrian facilities in Lebanon are extensive and generally in fair to good condition. Gaps in the existing pedestrian system are shown in Figure 3-7 and listed in Appendix B. Some gaps in the street system are small, such as one or two lots in length; these small gaps are scattered throughout the City. There are also entire street segments do not have a sidewalk on either side while other segments have a sidewalk on just one side.

## Bicycle Facilities

Cycling is an important recreational activity but also serves as a viable transportation option to meet the needs of commuters, children and others. Cycling is also a transportation alternative for people who do not own vehicles. These sentiments are reflected in the City of Lebanon Comprehensive Plan, which states: "Bikeways can help meet daily travel needs

and can particularly contribute to meeting recreation needs. Bikeways help in the conservation of energy and contribute to overall physical fitness."

The OBPP defines several different types of bicycle facilities including bikeways and multi-use paths. Bikeways are design treatments located on roadways to accommodate bicycles, such as signage or striped shoulders. The following types of bikeways are found in Lebanon:

- ***Shared Roadway:*** Shared roadways include roadways on which cyclists, motorists, and pedestrians share the same travel lane. (Shared roadways occur primarily on residential local streets in the southwest quadrant of the city where there are no sidewalks.)
- ***Shoulder Bikeway****:* Paved roadways are striped shoulders wide enough for bicycle travel. According to the OBPP, most rural bicycle travel on state highways occurs on shoulder bikeways. Sometimes shoulder bikeways are signed as a signal to motorists to expect bicycle travel along the roadway.
- ***Bike Lane****:* Bike lanes are portions of the roadway designated specifically for bicycle travel via a striped lane, and are particularly appropriate on arterials and major collectors. Bike lanes are often signed. An example of a Lebanon roadway with bike lanes is Airport Road.
- ***Multi-use Path***: Multi-use paths are facilities separated from a roadway for use by cyclists, pedestrians, skaters, runners, or others. The city has multi-use pathways on Reeves Parkway from 5th Street to Highway 20, on 7th Street from "E" Street to Walker Road, and along Grant Street in River Park.

The City's existing bikeway plan, which consists of the adopted 1981 bicycle master plan and additional new roadways, is included in the 1991 Transportation Master Plan. The bikeway plan includes the following elements:

- Bike lanes are located on arterials and collectors.
- Bike lanes are one-way and 5 feet wide.

Figure 3-7 Pedestrian Facilities (11x17)

Figure 3-7 Pedestrian Facilities

- Bike lanes are located adjacent to the curb, except where there is curb parking or a right-turn lane. Where these conditions occur, the bike lane would be located between the through travel lane and the parking or right-turn lane.
- Bike lanes are marked in the same direction as the adjacent travel lane.
- Striping is applied in conformance with the Manual of Uniform Traffic Control Devices.

The Lebanon bicycle system generally consists of either shared roadways (particularly on local roads) or shoulder bikeways. The bicycle system lacks connectivity throughout Lebanon, with many bikeways spanning short distances, often less than 1 mile, and not joining with other bikeways.

Bicycle facilities should be provided on major streets where the vehicular travel speeds are much greater than the bicycle speeds. The Transportation Planning Rule (OAR 660-012-0045) requires that on-street bicycle facilities be provided on all new arterials and major collectors. Bicycle facilities should connect residential areas to schools, retail, and employment centers. Permitting bicycles to mix with vehicles on the roadway is acceptable where the average daily traffic is less than 3,000 vehicles per day. Most local roads in Lebanon support bicycle use without the need for designated bike lanes based on the low volumes on those roadways.

### Existing Bikeway Locations

The existing bikeways in Lebanon are primarily located along arterials and collectors, such as 2nd Street/South Main Road and Walker Road. Figure 3-8 shows roadway segments with bike lanes and Table 3-2 identifies roadways striped with bike lanes. Most facilities are shoulder bikeways. The primary east-west bike facilities are located on Tangent Street and Airport Road; both are bike lanes. 7th Street, 5th Street, and 2nd Street/South Main Street are the primary north-south facilities; all are bikeways.

TABLE 3-2
Lebanon Area Bikeways

| Bikeways with Striped Bike Lanes | |
|---|---|
| Tangent Street (OR 34) | 12th Street ("F" Street to Oak Street) |
| Sherman Street (West of 12th Street) | 7th Street (Walker Road to "E" Street)* |
| Grant Street (Williams to Santiam River) | 5th Street (Oak Street to Reeves Parkway & Airport Rd. to F St.) |
| Airport Road | 2nd Street/South Main Road ("H" Street to Vaughn Lane) |
| Walker Road (7th Street to S Main Road) | Brewster Road |
| Reeves Parkway (5th Street to US 20)* | Mt. River Drive (Eagles Drive to River Road) |

*Multi-use path.

### Existing Bicycle Facilities at Major Community Focal Points

Because the bike system is not well connected, it is difficult to get from one point in the city to another exclusively using bike lanes and bikeways. As a result no community focal point is well served by the City's bikeway system. However, some parks and schools are adjacent to either a bikeway or a bike lane.

The following parks are adjacent to at least one bike facility: Century Park, River Park, Gill's Landing, and Booth Park. Parks not directly served by bicycle facilities are Ralston Square, Jaycee Park, Vaughn Park, and Had Irvine Park.

The following schools are adjacent to at least one bike facility: Lebanon High School, Cascades Elementary School, Riverview School, and Pioneer School. Seven Oaks Middle School is not served by a bike lane or a bikeway.

The library is not served by any bicycle facilities. Two bike lanes are located near downtown but do not go into the central business district.

As indicated above, bicycle facilities in Lebanon have little connectivity between residential areas, schools, and commercial centers. Ideally, all of the arterial and collector roadways should have bicycle lanes. In an effort to promote bicycle traffic and reduce vehicle traffic, bicycle lanes should be considered along all major travel paths. The following arterials and collectors do not have bicycle lanes:

- Highway 20
- Oak Street
- Vaughn Lane
- Crowfoot Road
- Stoltz Hill Road
- Russell Drive
- Rose Street from 5th Street to 10th Street
- Sherman Street from Park Street to 12th Street
- Grant Street from 2nd Street to Williams Street
- E Street from 2nd to 7th Street
- Walker Road from 7th Street to Stoltz Hill Road
- 12th Street from Highway 34 to Airport Road
- 5th Street from Oak Street to Walker Road
- Central Avenue
- Cascade Drive
- Dewey Street
- River Drive
- Berlin Road
- 7th Street from Oak Street to "F" Street
- 10th Street from Highway 34 to Oak Street
- 2nd Street from Highway 34 to "H" Street
- 10th Street from Walker Road to Vaughn Lane
- South Main Street from Vaughn Lane to Stoltz Hill Road
- Williams Street from Wheeler Street to Milton Street
- Park Street from Carolina Street to Elmore Street
- Franklin Street from Milton Street to Russell Drive

Figure 3-8 Bicycle Facilities, 11x17

Figure 3-8 Bicycle Facilities, 11x17

## Rail Facilities

Railroad service in the Lebanon area is provided by the Albany and Eastern Railroad Company (AERC). The AERC main rail line from Albany connects with the Burlington Northern Santa Fe mainline in Lebanon and continues to Mill City for a total distance of 48.4 miles. Due to rail line limitations, the maximum gross weight of equipment and loading is restricted to 240,000 pounds per four-axle car. Typical cargo includes a variety of lumber, forest products, agriculture, and industrial concerns. Most businesses served by rail are located on the northern end of town. Trains generally operate weekdays with daily trains between Albany and Lebanon. A second local train, run by AERC travels daily from Lebanon to Mill City and Sweet Home. This railroad mainly operates south of town, but at times will service in-town customers. In addition to the daily trains, switching is provided for customers as needed. Rail service provides important commodity shipments to and from the City of Lebanon. Figure 3-9 illustrates railroads and crossings within the study area.

### Rail Crossings

There are 31 at-grade railroad/roadway crossings within the City of Lebanon. This number includes all mainline and spur rail lines. Fourteen of these crossings are gated. These gated crossings are located at major intersections throughout the City. Delays to roadway users occur as a result of routine railroad operations including train movements though the city, train assembly, switching, and loading. Blockages at railroad crossings due to railroad operations may also impact emergency vehicle access and the provision of public safety services.

### Intermodal Facilities

Lebanon currently has one intermodal facility, a truck-rail reload facility. It is located along the west side of the AERC rail line between Ash and Sherman Streets in downtown Lebanon. The local street system around this intermodal facility is inadequate for the associated truck traffic. Pavement deterioration and inadequate turning radii are constant problems. The facility is comprised of a short rail spur and an open area where lumber is stored for loading. Finished lumber products are brought to the facility by truck and loaded onto rail cars by forklift.

Another potential future intermodal facility exists at the Santiam Travel Station, located on 3rd Street between Sherman and Ash. This historic train depot has been renovated with the intention that it serve as a multimodal transportation facility with possible connections to train, bus transit, bicycle and pedestrian transportation.

As indicated above, rail facilities are important to business operations within the City of Lebanon. There are, however, a number of issues that should be considered for improvement:

- High number of at-grade crossings which result in roadway congestion
- Lack of crossing gates to improve safety
- Railroad operations incur irregular  roadway congestion and vehicle delay and blockage

Proximity of railroad reload facility to incompatible uses, such as residences and commercial businesses, which causes noise and traffic congestion impacts.

### Air Transportation Facilities

The Lebanon State Airport (illustrated on Figure 3-1) is located on the west side of the City between Oak Street and Airport Road just west of Airway Road. The airport has a single runway with partial parallel taxiways on both sides of the runway.

The Lebanon State Airport is one of the 31 publicly owned airports in the state. These airports have airfield facilities necessary to accommodate general aviation users flying light single and multi-engine aircraft weighing 12,500 pounds or less. There are no dedicated cargo facilities at the Lebanon airport. Some of the companies located in the Lebanon area utilize the airport for business-related trips. In conjunction with carrying business personnel, the small planes also carry parcel freight.

According to the 1999 Oregon Aviation Plan, the Lebanon State Airport has existing deficiencies which warrant redevelopment or relocation unless the deficiencies can be mitigated. However, Lebanon State Airport has numerous deficiencies that cannot adequately be addressed on site. A new facility plan update for the Lebanon State Airport is currently underway and will address and enhance the existing facility.

The following issues need to be addressed to sustain adequate air transportation services for the City of Lebanon:

- Inadequate primary runway length/width
- Inadequate runway safety area
- Encroachment into runway object free area
- Encroachment into runway protection zones
- Lack of freight handling facility

### Pipeline Transport Facilities

There are no regional pipelines in or near the City of Lebanon.

### Water Transportation Facilities

No water-borne transportation exists within or near the City of Lebanon.

## Summary of Existing Deficiencies

### Roadways

- Geometric deficiencies at intersections with US 20 in the vicinity of Crowfoot Road and at Dewey St. / Walker St.
- Incompatibility with truck traffic and land use along current truck freight routes

Figure 3-9 Railroads, 11x17

Figure 3-9 Railroads, 11x17

- High accident frequencies near intersections along US 20 and other arterials within the City.
- Pockets of lighting deficiencies at crosswalk locations throughout the City.

## Public Transportation

- Expanding commuter services to surrounding communities including Albany and Salem (consider improvements as commuting patterns warrant)
- Increasing transit services for the mobility challenged including the elderly and physically impaired (the need will increase as the population ages).
- Enhancing public transportation services including the identification of future locations for park-and-ride lots, multimodal centers and transit supporting facilities such as sidewalks, shelters and other amenities.

## Pedestrian Facilities

- Certain street segments do not have sidewalks or have sidewalks only one side of the street
- Cascade Elementary School is a pedestrian attraction that is under-served by sidewalks.

## Bicycle Facilities

- The number of collectors and arterials with bike lanes is very limited.
- Available bike lanes do not connect major activity centers.

## Rail Facilities

- High number of at-grade crossings which result in roadway congestion
- Lack of crossing gates to improve safety
- Railroad operations incur irregular roadway congestion and vehicle delay and blockage
- Proximity of railroad reload facility to incompatible uses, such as residences and commercial businesses, which causes noise and traffic congestion impacts.

## Air Transportation

- Inadequate primary runway length/width
- Inadequate runway safety area
- Encroachment into runway object free area
- Encroachment into runway protection zones
- Lack of freight handling facility

SECTION 4

# Future Transportation Conditions, Deficiencies, and Needs

Population growth will play an important role in determining the future needs of the transportation system in Lebanon. This section summarizes the methodology used to determine future travel demand and the results of the operational analysis of future, forecasted (2027) PM peak-hour conditions in Lebanon. The no-build analysis of future, forecasted conditions assumes existing roadway geometry and traffic control, plus projects currently committed and funded in the ODOT State Transportation Improvement Program (STIP) or the City of Lebanon Capital Improvement Program (CIP). This section also summarizes the needs of the transportation system as determined through the analysis of existing and future conditions.

## Growth and Land Use

### Population and Employment

Based on the 2000 census data, the population for the year 2000 within the City of Lebanon was 12,950. Analysis of the 2000 census data concludes the population within the Urban Growth Boundary (UGB) for the year 2000 was 15,971. The Linn County Planning Department projects that the population growth rate for Lebanon will be 1.71 percent per year. With this growth rate, the population within the City Limits in the year 2025 will be 19,786 and the population within the UGB will be 24,173. Table 4-1 presents population and households for the years 2000 and 2025 for the city limits and UGB. Employment is estimated to grow at a quicker rate than the population, based on state employment records. During the 2000 to 2025 time period, the City's employment base is anticpated to grow by over 80 percent from 4,817 to 8,876. Table 4-2 presents employment by sector. Appendix C describes the process, assumptions, and results of translating the 2025 comprehensive plan assumptions into transportation analysis zones (TAZ) totals for use in forecasting with the travel demand model.

### Future Travel Demand

Land-use and demographic data are the primary source of input in generating a travel demand forecasts. Population and future employment (described above) are two key pieces of information critical in the development and application of the model. Household estimates for the model were generated from population estimates using assumptions on average persons per household based on the 1990 Census. A 2025 future year travel demand forecast was developed by ODOT's Transportation Planning Analysis Unit to estimate future conditions and inform street system needs and deficiencies. The travel demand model was implemented using the EMME/2 computer software program following a traditional four-step process (trip generation, trip distribution, trip assignment and mode

split). The model estimates typical weekday P.M. peak hour traffic conditions and was calibrated based on year 2000 conditions.

TABLE 4-1
Population Summary

| Lebanon Comprehensive Plan | City or Urban Growth Area | Population | Total Dwelling Units | Multi-Family | Single-Family |
|---|---|---|---|---|---|
| 2000 | City[1] | 12,950 | 5,466 | 1,169 | 4,297 |
| | UGA[2] | 3,046 | 1,324 | 23 | 1,301 |
| | Total | 15,996 | 7,097 | 1,192 | 5,905 |
| | | | | | |
| 2025 | City | 19,597 | 8,054 | 2,066 | 5,988 |
| | UGA | 4,576 | 1,948 | 34 | 1,915 |
| | Total | 24,173 | 10,002 | 2,100 | 7,903 |

[1] Dwelling units estimated as 2003 dwelling units less building permits for years 2001-2003.

[2] Population is year 2000 and dwelling units are year 2003.

Source: City of Lebanon Comprehensive Plan, December 2004.

TABLE 4-2
Employment Summary

| Year | Commercial | Office | Industrial | Public | Totals |
|---|---|---|---|---|---|
| 2000 | 1,338 | 1,537 | 1,435 | 507 | 4,817 |
| 2025 Comprehensive Plan | 2,172 | 3,119 | 4,496 | 1,306 | 11,093 |
| 2025 Comprehensive Plan Urban Growth Boundary * | 1,738 | 2,495 | 3,597 | 1,045 | 8,874 |

* Employment estimates in the Lebanon Comprehensive Plan are based on estimates for the 97355 zip code, which represents a larger area than the Lebanon urban growth boundary (UGB). Based on geocoding of state employment records, it was determined that approximately 80% of the Comprehensive Plan total resides within the Lebanon UGB.

Source: City of Lebanon Comprehensive Plan, December 2004.

The future conditions presented in this chapter represent a 2027 "No Build" condition in which no street network improvements have been made in the interim to address emerging deficiencies. It serves as the future baseline condition against which alternatives will be evaluated and compared. The 2025 traffic volumes from the model were post-processed to develop the 2027 No Build P.M. peak hour roadway segment and intersection turning movement volumes to support deficiency analysis. The methodology used to develop the

volumes is based on the 1992 Transportation Research Board (TRB) Report 255 Highway Traffic Data for Urbanized Area Project Planning and Design.

# Future Conditions

An analysis of future traffic conditions was performed to identify likely deficiencies in the transportation system during the planning horizon. Traffic operational analysis focused on roadway facilities was used to estimate the severity and relative magnitude of deficiencies within the system.

## Roadway Facilities

Analyses of both roadway and intersection capacity were performed in order to characterize future deficiencies within the City's roadway system. Methodology described in the 2000 Highway Capacity Manual (Transportation Research Board) and 2001 ODOT Transportation System Planning Guidelines were followed in conducting the analysis. 2027 PM peak hour forecasted traffic volumes for key roadways within the City of Lebanon are illustrated on Figure 4-1.

### Roadway Capacity

A v/c ratio is a means to express traffic conditions. Volume-to-capacity is the ratio of the peak hour traffic volume in relation to roadway capacity. Capacity is the maximum volume of vehicles (measured in vehicles per hour) that a highway section can pass. In other words, v/c measures the percentage of the capacity of a highway section that is utilized during the peak hour. A value of 1.0 means that all of the highway capacity is used. This condition cannot be maintained and will spontaneously result in traffic breakdown – stop-and-go conditions.

A segment v/c analysis of Lebanon's roadways was conducted using 2027 travel demand model traffic volumes. The result of this analysis is depicted in Figure 4-2. Roadway sections forecast to operate worse than the OHP v/c standards are illustrated with unique line symbols depending on which direction(s) experience deficiency. Volume-to-capacity standards differ for regional state highways as illustrated in the figure and as presented in Table 3-1 based on travel speed and area designations. Roadway sections where the v/c ratio standard is exceeded indicate a deficiency that may warrant future mitigation.

As can be seen in Figure 4-2, the majority of segments exceeding the v/c standards are on US 20 or Airport Road. All sections of roadway projected to exceed the v/c standards are listed below:

- Denny School Road between Highway 34 and Oak Street (Both northbound and southbound directions) – This section of roadway is outside of the Lebanon UGB.
- Airport Road between west boundary of the airport and Airway Road (both eastbound and westbound directions)
- Airport Road between 12th Street and Stoltz Hill Road (eastbound direction)
- Airport Road between 5th Street and US 20 (both eastbound and westbound directions)

- US 20 between North boundary of Lebanon Community Hospital (north of Twin Oaks Drive) and Wheeler Street. (both northbound and southbound directions)
- US 20 (One-Way South Market Street) between Carolina Street and Oak Street. (Southbound direction)
- US 20 (One-Way South East Park Street) between Oak Street and Grant Street. (Northbound direction)
- US 20 between Oak Street and Market Street. (both northbound and southbound directions)
- US 20 extending approximately 500 feet of the Market Street intersection (Southbound direction)
- Southeast Grant Street between Williams Street and Cleveland Street (Eastbound direction)

In the 2027 No Build condition, v/c ratio exceeds the acceptable levels on primary routes such as Airport Road and Denny School Road.

Although several city-owned roadway sections listed above exceed the ODOT v/c standard, the City of Lebanon is not obligated to use standards set for state routes off of the state highway system. For these routes, an intersection-based LOS standard is typically used to identify capacity deficiencies as intersections are the critical constraint points to traffic capacity in urban areas rather than the roadway segment. Within urban commercial centers, high traffic volumes are expected and desirable because of the visibility and synergism provided to businesses wanting to attract customers and consumers looking for convenient and co-located shopping destinations. As such, maintaining traffic flow and achieving appropriate travel speeds are of greater importance. Intersection level of service is described in the following section.

### Intersection Capacity

The quality of traffic intersection operations is expressed in terms of LOS for intersections with local roadway approaches. The methods for determining LOS are described in Section 3 of this plan. Additional discussion is provided in Appendix A. Intersection operations that involve approaches on state highways are expressed as v/c. The mobility standards for these intersections are based on facility classification, area type, and speed zones, as noted in Table 3-1.

Table 4-3 summarizes the 2027 No Build intersection levels of service, v/c ratio, and delay for the PM Peak Hour where individual movements are nearing or over capacity. For this analysis, data from the 2025 analysis described above were extrapolated using growth rates derived from the model to estimate year 2027 conditions. These results are also presented graphically in Figure 4-3. In the figure, LOS letter grades for intersections with deficient movements from the table below are converted to ratings of *under capacity* (LOS A through C), *near capacity* (LOS D and E), and *over capacity* (LOS F).This analysis provides for the required 20-year planning horizon for transportation system plans in terms of identification and mitigation of deficiencies.

Figure 4-1, 2020 Peak Hour Volumes Forecasts, 11x17

Figure 4-1, 2020 Peak Hour Volumes Forecasts, 11x17

Figure 4-2. 2027 Roadway Capacity Deficiencies 11 x 17

Figure 4-2. 2027 Roadway Capacity Deficiencies 11 x 17

Figure 4-3. 2027 Intersection Level of Service Deficiencies 11 x 17

Figure 4-3. 2027 Intersection Level of Service Deficiencies 11 x 17

The analysis indicates that, by 2027, a number of minor movements at unsignalized (two-way stop-controlled) intersections are degraded to unacceptable levels of service. Deficiencies can be seen along Oak Street, US 20, and Airport Road. Several of the intersections along US 20 are exacerbated by geometric deficiencies, as well. These geometric deficiencies are generally related to intersection angle (skew) and sight distance. In addition to the unsignalized intersection LOS issues, five signalized intersections are anticipated to be at or near unacceptable levels by 2027. All five of these signalized intersections occur on US 20 (at OR 34, Milton Street, Airport Road, Walker Road, and Market Street). These intersections are reaching unacceptable levels within the current lane configuration and may warrant the addition of lanes.

Alternatives will be developed to address the anticipated future roadway deficiencies described above. Improvements to other transportation system elements are assumed to be included with all potential roadway improvement alternatives and are discussed in the sections that follow.

TABLE 4-3
2027 Intersection Level of Service Deficiencies

| | | P.M. Peak Hour | | |
|---|---|---|---|---|
| **Type** | **Location** | **LOS** | **V/C Ratio** | **Delay (sec)** |
| U | **US 20/Reeves Pkwy** | | | >100 |
| | Eastbound Approach | F | 1.37 | >100 |
| | Westbound Approach | F | 0.86 | |
| U | **US 20/Industrial Way** | | | |
| | Westbound Left | F | >2.0 | >100 |
| | Eastbound Approach | F | 1.09 | >100 |
| **S** | **US 20 (Main St)/ OR 34** | | | |
| | Northbound Left | F | 0.88 | 98.6 |
| | Southbound Through-Right | C | 0.94 | 33.9 |
| | Eastbound Approach | E | 0.96 | 74.9 |
| | Overall Intersection | D | 0.91 | 37.9 |
| **S** | **US 20 (Main St)/Milton St** | | | |
| | Northbound Through-Right | C | 0.92 | 30.0 |
| | Southbound Left | F | 1.03 | 98.4 |
| | Southbound Through-Right | C | 0.83 | 24.2 |
| | Eastbound Approach | F | 1.08 | >100 |
| | Overall Intersection | D | 1.08 | 38.3 |
| U | **Oak St/12th St** | | | |
| | Southbound Approach | F | 1.56 | >100 |
| U | **Airport Rd/12th St** | | | |
| | Southbound Approach | F | 1.42 | >100 |

TABLE 4-3
2027 Intersection Level of Service Deficiencies

| Type | Location | P.M. Peak Hour | | |
|---|---|---|---|---|
| | | LOS | V/C Ratio | Delay (sec) |
| U | **Airport Rd/Stoltz Hill Rd** | | | |
| | Northbound Approach | F | 1.01 | >100 |
| U | **Airport Rd/5th St** | | | |
| | Northbound Approach | D | 0.29 | 25.8 |
| | Southbound Approach | F | 0.80 | 54.6 |
| | Eastbound Approach | B | 0.11 | 10.0 |
| | Westbound Approach | A | 0.03 | 8.6 |
| U | **US 20 (Main St)/Russell Dr** | | | |
| | Westbound Left | F | 1.44 | >100 |
| **S** | **US 20/Walker Rd/Dewey St** | | | |
| | Southbound Through-Right | B | 0.80 | 19.5 |
| | Eastbound Left | D | 0.87 | 48.1 |
| | Overall Intersection | C | 0.85 | 20.9 |
| **S** | **US 20/ Market St** | | | |
| | Northbound Left | D | 0.89 | 53.1 |
| | Eastbound Through-Right | D | 0.83 | 43.5 |
| | Overall Intersection | B | 0.88 | 10.7 |
| U | **Vaughn Ln/ Main Rd** | | | |
| | Eastbound Approach | F | 0.99 | 87.4 |
| U | **US 20/Crowfoot Rd** | | 0.91 | >100 |
| | Eastbound Approach | F | | |
| U | **US 20/Weirich Dr** | | | |
| | Eastbound Approach | F | 0.89 | >100 |

Signal Types: S= Signalized; U= Unsignalized

## Summary of Future Roadway Deficiencies

- Roadway capacity along US 20 (both directions), Oak Street (westbound), Airport Road (both directions vicinity of US 20), and South Main Road (vicinity of US 20).
- Unacceptable delay at two-way-stop controlled (unsignalized) intersections along Airport Road, US 20, and Oak St.
- Unacceptable delay at signalized intersections along US 20 (at OR 34, Milton Street, Airport Road, Walker Road, Market Street).

### Bridge Deficiency

Two bridges within the City of Lebanon have sufficiency ratings which classify them as structurally deficient. The first bridge is on US 20 at milepost 11.89, where the highway crosses the Santiam Canal, and has a very low sufficiency rating of 47.80. This bridge is owned by ODOT. The low sufficiency rating does not necessarily mean that a bridge is in need to be replaced. Coordination with ODOT should occur to determine whether this bridge should be scheduled for replacement. In addition, the Grant Street Bridge, which is under City jurisdiction, received a rating of 47.20 during an ODOT inspection in 2002. Typically bridges with a sufficiency rating of 80 or below are scheduled for additional maintenance, rehabilitation or replacement. This project has received funding from the State and is scheduled for construction in 2006-08.

## Public Transportation Facilities

Public transportation within the City of Lebanon is limited to privately owned and operated services. These services are the Lebanon Town Taxi, Lebanon Senior Center Dial-A-Bus, and Linn Shuttle. All of these services have limited hours of operation and, except for the taxi, primarily cater to the elderly and disabled. Oregon Cascade West Council of Governments OCWCOG provides a vanpool service between Lebanon and Salem on a first-come, first-served basis. These services need to be expanded or supplemented as follows:

- Increase hours of operation and capacity of transit services to the mobility challenged, including the elderly and physically impaired.
- Expand commuter services through vanpools and carpools to surrounding communities including Albany, Sweet Home, Corvallis, Eugene, and Salem. The City of Lebanon should investigate developing vanpool and carpool match lists and providing information and referrals to interested candidates. An effective, low-cost method of providing rideshare assistance in lieu of a dedicated staff person is via an online ride-matching tool. This website, www.carpoolmatchnw.org, is provided by the City of Portland as a free service for communities who wish to use it. While the use of the site is free, gaining access to the reporting functions of the site does require a fee. The entire state of Oregon and certain counties in southwest Washington have been mapped, so the site has the capabilities of providing connections within and outside of both subject counties. Portland is currently working on adding a "one-time only" trip feature, which will allow the casual traveler to potentially find a ride.
- Set aside resources to provide enhanced public transportation services in the future, such as acquiring sites for park-and-ride lots and multimodal centers and installing transit-support facilities like sidewalks, shelters, bicycle storage, and other amenities. Potential park-and-ride lot locations could be located at the south end of the City near Highway 20, downtown Lebanon, and the west end of the City near Highway 34. Initially these lots could accommodate 15 to 20 cars and serve vanpools and carpools. As demand grows and funding becomes available, the lots could expand and serve as intercity express bus stops that link Sweet Home, Lebanon, Albany, Corvallis, and potentially Salem and Eugene.
- Investigate establishing fixed route service in the future.

## Pedestrian Facilities

As discussed in the Existing Conditions Chapter, pedestrian system improvements are needed to serve relatively short trips to major pedestrian attractions, recreational trips, and commute trips. These improvements primarily include the establishment of continuous sidewalks connecting neighborhoods with employment centers, pedestrian attractions and community resources.

The recommended projects are based on review of existing pedestrian system conditions, deficiencies and needs, as well as a review of existing state, county, and local pedestrian and bicycle plans. The improvements address gaps in connectivity and lack of crosswalks or other safety considerations. Many local roadways have low traffic volumes (less than 3,000 average daily traffic [ADT]), and, therefore, pedestrians can safely share the roadway with motorists and bicyclists. However, several local roadways warrant improved pedestrian facilities, especially those near schools and parks.

The downtown area is already well served by sidewalks; however, additional pedestrian amenities have been identified[4] to enhance downtown as a pedestrian center consistent with the ODOT Special Transportation Area (STA) designation within the downtown area. An STA is an area on a State highway where mobility standards are less restrictive than they alternatively would be to balance State mobility objectives with other community objectives specifically in downtown areas. The STA designation is also discussed in sections 2 and 6.The proposed pedestrian improvements include curb extensions, crosswalks, drinking fountains, trash receptacles, pedestrian-scale lighting, and landscaping.

Recommended pedestrian system improvements are summarized in Table 4-4 and shown on Figure 4-4.

While not directly included as individual projects, regular maintenance of pedestrian facilities should be a priority to ensure access, safety, and system preservation. This or another program could also be directed at the small sidewalk gaps (one-to-two lots long) that are scattered throughout the city. Street standards should be adopted that incorporate pedestrian facilities.

## Bicycle Facilities

Bicycle routes in Lebanon fall into three major categories:

- Shoulder bikeways/bike lanes—5-foot-wide striped shoulders with signage/markings
- Multi-use paths
- Shared roadways

Other unmarked and unsigned roadways may accommodate bicyclists as shared roadways, but all components of the official Lebanon bicycle system should be signed and/or marked as bicycle routes per OBPP standards.

[4] *Downtown Lebanon Transportation Enhancements* (Crandall Arambulla, 2000).

TABLE 4-4
Recommended Pedestrian System Improvements

| Roadway | Location |
|---|---|
| **State Facilities**[a] | |
| Santiam Highway | Reeve's Parkway to Industrial Way |
| Santiam Highway | Market Street to Sodaville Road |
| Highway 34 (Tangent Street) | Western UGB to city limits (just east of 13th Street) |
| **County Facilities**[a] | |
| Stoltz Hill Road | Airport Road to southern UGB |
| 5th Street | Vaughn Lane to southern UGB |
| South Main Road | Vaughn Lane to southern UGB |
| Cascade Drive | Weldwood Drive to eastern UGB |
| Franklin Street | City limits to Russell Drive |
| Central Avenue/Rock Hill Drive | Crowfoot Road to southwestern UGB |
| Crowfoot Road | 5th Street to Santiam Highway |
| Oak Street | Western UGB to Airway Road on the north side |
| Airport Road | Western UGB to City limits |
| Wagon Wheel Dr. | City Limits to Cascade Drive |
| Russell Drive/River Road | Highway 20 to River View Street |
| **Local Facilities**[a] | |
| Kees Street | Stoltz Hill Road to 6th Street |
| Wassom Street | Stoltz Hill Road to 6th Street |
| 6th Street | Kees Street to Walker Road |
| Airway Road | Oak Street to Airport Road |
| 12th Street | E Street (approx.) to Airport Road |
| Airport Road | City limits to 12th Street |
| F Street | 12th Street to 7th Street |
| J Street | 5th Street to 2nd Street |
| Russell Drive | Santiam Highway to Primrose Avenue |

TABLE 4-4
Recommended Pedestrian System Improvements

| Roadway | Location |
|---|---|
| **Downtown[c]** | |
| Main Street | Rose Street to Maple Street |
| Park Street | Vine Street to Oak Street |
| Vine Street | 2nd Street to Park Street |
| Ash Street | 2nd Street to Park Street |
| Sherman Street | 3rd Street to Park Street |
| Grant Street | 3rd Street to Park Street |
| Maple Street | 2nd Street to Park Street |

[a]Pedestrian improvements proposed for state, county, and local roadways are 5 or 6-foot sidewalks on both sides of the street depending on classification.
[c]Pedestrian improvements proposed for STA are curb extensions, crosswalks with scoring to match sidewalk paving, scored concrete paving for sidewalks, and ornamental pedestrian-scale lighting. Main Street would also have benches, trash receptacles, and water fountains.

Figure 4-4. Pedestrian Improvements 11 x 17

Figure 4-4. Pedestrian Improvements 11 x 17

### Bicycle System Improvements

Ideally, all arterial and collector roadways should have bicycle lanes and the bicycle system should connect residential areas with schools, commercial areas, and employment centers. Designated bicycle lanes should generally be provided on all arterials and streets carrying in excess of 3,000 vehicles per day. As a result, the recommended bicycle facility improvements were derived from a review of relevant existing local, regional, and state plans and policies and an analysis of existing conditions and deficiencies. The local roadways that would provide a cohesive bicycle system are identified in Table 4-5 and Figure 4-5. The proposed bike lanes have been prioritized based on their ability to eliminate gaps in the overall system and serve activity centers.

Shoulder bikeways (paved roadways with striped shoulders wide enough for bicycle travel) or adequate space for a shared roadway should be provided on arterial and collector roadways that do not have or are not proposed to have bicycle lanes. In addition to the roadway facilities, a bicycle path along the Santiam River is also proposed from Grant Street to River Drive. The improvements described above are illustrated on Figure 4-5.

### Bicycle Parking

The City of Lebanon does not currently have explicit requirements for bicycle parking. However, the City's proposed Land Use Regulation Amendments (LURA) do identify bicycle parking space requirements for new residential, commercial, public/civic, and industrial uses, as well as for uses not specifically identified. To complement the proposed bicycle system and encourage bicycle use, bicycle parking should also be provided at the following activity centers:

- Downtown Lebanon (to serve local businesses, offices, and government buildings)
- Lebanon parks, such as River Park and Jaycee Park
- Lebanon schools (upgraded bicycle parking is part of the Lebanon Union High School renovations)

## Rail Facilities

The existing rail system does not adequately serve the freight needs of industrial lands on the west side of Lebanon, specifically west of Airway Road between Highway 34 and Vaughn Lane. The utility and value of these industrial lands could be enhanced significantly if served by rail. A rail spur could be provided by either a north-south spur, which would tie to the mainline north of Highway 34, or an east-west spur, which would tie to the mainline in the vicinity of "A" Street. While possible, each of these alternatives has drawbacks to implementation. The north-south spur would require an at-grade crossing at Highway 34 and possible environmental impacts to several creek crossings and wetlands. An east-west spur also would impact existing residential developments and require multiple at-grade crossings. Further study would be required to evaluate and establish a viable alternative.

TABLE 4-5
Proposed Bicycle Lanes

| Roadway | Location | Priority |
|---|---|---|
| 12th Street | Tangent Street to Oak Street | High |
| 12th Street | F Street to Airport Road | High |
| 7th Street | E Street to Oak Street | High |
| 5th Street | Oak Street to Walker Road | High |
| 2nd Street | U.S. 20/Twin Oaks Drive to H Street | High |
| Grove Street | Wheeler Street to Milton Street | High |
| Franklin Street | Milton Street to Russell Drive | High |
| Sherman Street | 10th Street to Williams Street | High |
| Vaughn Lane | 10th Street to South Main Road | High |
| Crowfoot | South Main to Cascade Dr. | High |
| Cascade Dr. | Hwy 20 to Crowfoot | High |
| Milton Street | 12th Street to Franklin Street | Medium |
| 10th Street | Walker Road to Vaughn Lane | Medium |
| Franklin Street | Grant Street to Milton Street | Medium |
| Park Drive | Milton Street to Mountain River Road/River Street | Medium |
| Oak Street | City limits to Franklin Street | Medium |
| Walker Road | Stoltz Hill Road to 7th Street | Medium |
| Milton Street | Franklin Street to Park Drive | Medium |
| Vaughn Lane | Stoltz Hill Road to 10th Street | Medium |
| Wheeler Street | 2nd Street to Tennessee Road | Medium |

Figure 4-5. Bicycle Improvements, 11x17

Figure 4-5, Bicycle Improvements, 11x17

Currently, the rail system throughout the city has many at-grade crossings, which impede the flow of automobile and rail traffic. The flow of train and vehicle traffic could be improved if at-grade crossings were eliminated on arterial roadways, specifically Tangent Oak, 2nd, Main, and Park Streets. Furthermore, some at-grade crossings do not have gates, which can pose a threat to safety. The City should explore opportunities to eliminate or consolidate rail crossings and consider installing gates at at-grade crossings where gates are not currently provided. Figure 4-6 depicts existing grade crossings without gates and conceptual spur connections to serve industrial land.

## Air Transportation

The Lebanon State Airport does not currently have master plan. Development of a plan could address the following deficiencies identified by the 1999 Oregon Aviation Plan at the airport:

- Inadequate primary runway length/width
- Inadequate runway safety area
- Encroachment into runway object free area
- Encroachment into runway protection zones
- Lack of freight handling facilities

## Pipeline Transportation Needs

There are no regional pipelines in or near Lebanon. The City does not anticipate any need for a pipeline in the next 20 years.

## Water Transportation Needs

The City of Lebanon does not currently have a waterborne transportation system and is not anticipated to need one.

Figure 4-6, Rail Improvements, 11x17

Figure 4-6, Rail Improvements 11x17

SECTION 5

# Transportation System Plan Alternatives

In previous sections of this TSP, system deficiencies have been identified under existing and future forecasted no-build conditions. Under future no-build conditions, the following operational deficiencies are forecasted:

- Results from the travel demand forecasts identified inadequate roadway capacity along US 20 and Airport Road (see Figure 4-2).
- Detailed review of intersection operations identified unacceptable delay at both two-way-stop controlled (unsignalized) and signalized intersections, primarily along Airport Road, US 20, and Oak Street (see Figure 4-3).

Potential roadway improvement projects to meet both the long- and short-term needs of Lebanon have been identified. To address capacity deficiencies and needs of the City's transportation system the transportation model described in Section 4 was used to evaluate effectiveness of four system alternatives. The alternatives were formulated based on current and previous planning efforts undertaken by the City and recommendations from the project management team made up of representatives of City, County, State and consultant staff guiding completion of the plan. In order to identify solutions for persistent problems following the alternatives analysis along the northern portion of US 20 between Reeves Parkway and OR 34 a more detailed subarea analysis was performed.

## Alternatives

Four system alternatives were developed and evaluated as described below and illustrated graphically in Figure 5-1.

### Alternative 1: Baseline Improvements

Alternative 1 provides a modest approach that proposes improvements which relieve traffic congestion primarily through improvements in roadway system continuity and connectivity. This alternative is composed of a series of arterial and collector extensions to improve the balance of traffic across the system and reduce concentration of trips on a few primary routes. The major improvements include upgrading 12th Street to collector standards and extending it to Walker Road/Stoltz Hill Road; improving Airway between Oak and Airport Road and extending it to connect with an extension of Walker Road; extending Airport Road to Russell Drive and constructing a frontage road on the east side of US 20 between Airport Road and Cascade Drive; extending Market Street between US 20 and River Drive; extending Franklin Street between Russell Drive and the Market Street extension; and the connection of Grant Street and Mountain River Drive. Alternative 1 improvement's are displayed in Figure 5-1.

## Alternatives 2 - 4: Baseline + Lebanon Parkway Improvement

Alternatives 2 through 4 consider impacts of different Lebanon Parkway scenario configurations on the westside of Lebanon connecting with OR 34 and US 20. Each alternative includes the baseline improvements. The objective of these alternatives is to alleviate congestion on US 20 and Airport Road and provide a better truck route. Each of the three parkway alternative variation is described below and illustrated in Figure 5-1.

- **Alternative 2). Baseline + Lebanon Parkway**—This scenario extents the west end of the existing Reeves Parkway to the Urban Growth Boundary (UGB) and then travels south (outside the UGB) across OR 34 and continuing south within the UGB to Stolz Hill Road were the alignment begins heading east to connect with the west end of Crowfoot Road to connect with US 20 on the south end of the City.

- **Alternative 3). Baseline + Lebanon Parkway South of OR 34**—This scenario is the same as Alternative with the exception that the parkway facility is only considered beginning south of OR 34 on the west end of town near the UGB.

- **Alternative 4). Baseline + Denny School Road Extension**—The forth scenario considers impacts of adding a southeast extension to Denny School Road connecting with Crowfoot Road. This scenario does not provide additional north-south connectivity on the western edge of the city between OR 34 and Airport Road. However, it does illustrate the regional nature of the Lebanon Parkway demand and how the County road system or Lebanon Parkway facility extending south from Airport could be extended to help serve the demand.

Figure 5-1, 2027 Alternatives (11x17)

Figure 5-1, 2027 Alternatives (11x17)

# Scenario Screening Analysis

To consider benefits of each of the scenarios, traffic results from each scenario were summarized by the distribution of lane miles by volume/capacity (v/c) ration. The v/c comparison portrays system-wide congestion levels across each of the alternative. The ratios are divided into five categories: less than .6, .6-.7, .7-.8, .8-.9 and greater than .9. Depending on facility type and speed ratios above .75 generally indicate a deficiency (see Figure 4-2). The results are intuitive, in that as system capacity is added the system performs better. The capacity improvements also demonstrate benefits to facilities with the most congestion under future No Build conditions (that is, US 20 and Airport road). Table 5-1 presents the V/C ratio distribution by lane miles and Table 5-2 shows the percentage distribution.

The Baseline scenario (Alternative 1) reduces heavily congested road segments (lane miles with a V/C greater than 0.9) from 4.50 miles to 3.33 miles. The Lebanon Parkway (Alternative 2) provides the most benefit to higher congested facilities, reducing the V/C lane miles in this category from 3.33 in the Baseline to 1.40. Alternatives 3 and 4 perform very similarly, both reduce heavily congested V/C segments from 3.33 miles to 1.87 miles. This result demonstrates that each of the alternatives helps achieve the objectives of reducing congestion and achieving State highway mobility standards. The parkway alternatives provide the ability to reduce congestion primarily on Airport Road and US 20 south of Airport Road. Both of these areas where top congestion spots in the No-build analysis. However, none of these alternatives was able to reduce congestion satisfactorily on the north portion of US 20 between OR 34 and Reeves Parkway.

The combination of projects included in each alternative add different amounts of system capacity thus creating more lane miles with the highest (best) LOS (v/c <0.6) compared with the No-build alternative. The No-build network forecasts 151 miles in this category. The Baseline alternative projects without the Lebanon Parkway increase system capacity by 13 miles and add 15 lane miles with a v/c less than .6[5]. Alternative 3, the Lebanon Parkway south of OR34, improves the system performance further adding 20 miles of new capacity and 21 v/c miles less than .6. Both the Lebanon Parkway and the Denny School Road extension scenarios increase lane miles operating with a v/c ratio of less than .6 to 176 miles. However, the Lebanon Parkway scenario adds 23 capacity miles and improves 25 capacity miles operating less than .6 were the Denny School Road scenario adds only 19 capacity miles and still improves 25 capacity miles operating below the .6 ratio. These results indicate that providing additional system capacity south of Airport Road is most helpful to the overall transportation system and provides considerable benefits to Airport Road and US 20 south of Airport Road. It also indicates that the primary benefit of the additional north-south Lebanon Parkway capacity between OR 34 and Airport road is serving local access consistent with collector street access for industrial uses in the area.

[5] Note: Distances reported are based on model assumptions for comparison purposes, not actual or proposed alignments.

TABLE 5-1
Volume-to-Capacity Ratio Distribution by Lane Miles

| V/C Ratio | Total Lane Miles | | | | |
|---|---|---|---|---|---|
| Scenario # | | 1 | 2 | 3 | 4 |
| Scenario | No-Build | Baseline | Preferred Base + Lebanon Parkway | Preferred Base + Lebanon Parkway South of OR34 | Preferred Base + Denny School Extension |
| <0.6 | 151.35 | 166.87 | 176.54 | 172.45 | 176.37 |
| 0.6 - 0.7 | 5.92 | 7.01 | 6.31 | 10.37 | 7.28 |
| 0.7 - 0.8 | 5.13 | 2.97 | 6.53 | 4.89 | 2.89 |
| 0.8 - 0.9 | 5.09 | 4.79 | 4.23 | 2.69 | 2.58 |
| >0.9 | 4.50 | 3.33 | 1.40 | 1.87 | 1.87 |
| Total Lane Miles | 171.99 | 184.97 | 195.01 | 192.27 | 190.99 |

TABLE 5-2
V/C Ratio Distribution by Lane Miles (Percentage of System Lane Miles)

| V/C Ratio | Total Lane Miles | | | | |
|---|---|---|---|---|---|
| Scenario # | | 1 | 2 | 3 | 4 |
| Scenario | No-Build | Baseline | Preferred Base + Lebanon Parkway | Preferred Base + Lebanon Parkway South of OR34 | Preferred Base + Denny School Extension |
| <0.6 | 88.0% | 90.2% | 90.5% | 89.7% | 92.3% |
| 0.6 - 0.7 | 3.4% | 3.8% | 3.2% | 5.4% | 3.8% |
| 0.7 - 0.8 | 3.0% | 1.6% | 3.3% | 2.5% | 1.5% |
| 0.8 - 0.9 | 3.0% | 2.6% | 2.2% | 1.4% | 1.4% |
| >0.9 | 2.6% | 1.8% | 0.7% | 1.0% | 1.0% |
| Total | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

None of the alternatives tested solve all of the congestion problems identified in the No-build analysis on their own. In addition, Lebanon Parkway (Alternative 2) and Denny School Road Extension (Alternative 4) are not considered as TSP recommendations because they both contain elements outside of the UGB. Specific Lebanon Parkway improvement recommendations are discussed in the following section.

# Central and Southern Lebanon Parkway Recommendations

The alternatives analysis screening process served to refine and prioritize the Lebanon Parkway recommendations for inclusion in the TSP described in three segments in this section. Segment 1 (OR 34 to Airport Road) parallels existing City and County roads. The need for this segment of the facility will be based on the development of industrial land west of the City. Segment 2 (Airport Road to 5th Street) will make an important south and east connection to a portion of the city that currently has poor connectivity. The need for this segment will likely occur first, but must be coordinated with improvements on Crowfoot Road. Segment 3 (5th Street to US 20) traverses through the most densely developed area along the proposed parkway route and will require the most expensive right of way along the alignment. The need for this segment will be based on the improvements made to Crowfoot Road and the general pace of development at the south end of town. Each segment is discussed in more detail below. Figure 5-2 displays the general location for the proposed central and southern parkway facility.

## Segment 1: OR 34 to Airport Road

This segment is proposed as a collector facility and would serve mostly industrial parcels located at the west side of the City's UGB. The following considerations have been made in designating this portion of the facility:

- The collector facility should be near the western edge of the UGB to maximize developable land; especially the industrial pieces to avoid cutting valuable parcels in half. The specific alignment will be determined as development occurs in the area.
- Consider accesses locations at OR 34, Oak Street, and Airport Road only to maintain mobility.
- The City should also coordinate with the County to improve alignment and associated geometrics of Denny School Road/Oak Street intersection to better handle freight needs.

## Segment 2: Airport Road to 5th Street

This segment extends from the intersection of Airport Road, at the limits of the UGB and heads generally southeast and across Oak Creek with a new crossing toward an intersection with Stoltz Hill Road. The proposed alignment would then follow Vaughn Road and would continue off of the Vaughn Road alignment near the crossing of Oak Creek. The segment would continue just south and parallel to Oak Creek and would cross Oak Creek at the intersection of 5th Street. This segment of the Lebanon Parkway would be built to City Parkway arterial standards. The following considerations have been made in designating this portion of the facility:

- The use of the western portion of Vaughn Road is compatible with existing grades and the location of Oak Creek.
- A T- intersection with the eastern section of Vaughn Road would need to be constructed, but the location is dependent on the impacts to Oak Creek and existing development in the area.
- Consider accesses at Airport Road, the Extension of Walker Road, Stoltz Hill Road, Vaughn Road, and 5th Street to maintain mobility.

### Additional TSP Segment Area Recommendations

- Cul-de-sac Stoltz Hill Road north of Walker Road (Include as part of 12th Street improvements).
- The extension of Walker Road can be considered, but will only serve local traffic until Parkway segment is built.
- New access to proposed development should be directed to Walker Road, Stoltz Hill Road (North of Walker), 10th Street, 5th Street (Joy Street to Vaughn).
- New access should be discouraged/prohibited along 12th Street Extension, Stoltz Hill Road (South of Walker), Vaughn Road (Stoltz Hill Road to 10th Street), and 5th Street (South of Joy to Oak Creek).
- Improve Stoltz Hill Road/ Vaughn Road intersection to allow left turn pockets, freight movements and increased capacity.
- The City should coordinate with the County and ODOT to initiate a refinement planning effort to verify feasibility of the proposed alignment. This planning effort would include County consideration of a Denny School road extension as an alternative for this segment of the Parkway connecting a Crowfoot road extension west.

## Segment 3: 5th Street to US 20

The third Parkway segment extends from the intersection of 5th Street, near the location of the Crowfoot extension, and heads generally southeast toward a new crossing of South Main Road. The alignment would then require relocations and right of way acquisitions through more urbanized land uses along Crowfoot Road. The alignment would cross Central and Cascade avenues then turn north to connect to US 20 approximately 1 mile south of the City limits. The following considerations have been made in the arterial designation of this portion of the facility:

- The proposed alignment was kept north of Oak Creek to stay inside the UGB, but also will be providing access to developable land south of the proposed alignment in the areas of South Main Road, Central Avenue, and Cascade Avenue.
- Intersections are proposed at 5th Street, South Main Road, Central Avenue, Cascade and US 20.
- Improvements to Crowfoot should be in place before completion of the middle segment.

### Additional TSP Segment Area Recommendations

- Correct congestion, driver confusion, pedestrian and bike mobility at the Crowfoot Road/ Cascade Drive / Central Avenue Intersection. Consider cutoff of either Cascade or Central Avenues (identified as a County TSP project).
- Extension of Crowfoot between South Main and 5th Street to collector standards (City has ROW).

Since the southern segment of the Parkway may be implemented last, improvements to Crowfoot Road should be made to improve the facility to City/County collector street standards (Consistent with functional classification designation):

  - County collector facility
  - Meandering lanes, restricted cross section (slow traffic)
  - Additional right of way acquisition required to get 2/3 lane section.

- Align Crowfoot intersection to improved Weirich intersection at US 20.
- New access to proposed development should be directed to Central Avenue, Cascade Avenue, and South Main Road.
- New access should be prohibited along Crowfoot Road to enhance mobility as a collector facility.

Figure 5-2, Recommended Lebanon Parkway Segments (11x17)

Figure 5-2 (11x17)

# NW Industrial Area Subarea Analysis

As discussed in the previous scenario screening section, all of the identified No-build capacity deficiencies were not eliminated based on Baseline and Lebanon Parkway alternative improvements. The most significant deficiency remaining is located on US 20 between Reeves Parkway and OR 34. As a result, a detailed subarea analysis was conducted on the north end of the City for the area bounded on the north by Reeves Parkway, OR 34 on the south, Hansard to the west and US 20 to the east. The evaluation focused on the performance of ten key intersections within subarea with and without extension of the Reeves Parkway to the west connecting with OR 34 in the vicinity of the western edge of the City's UGB. Figure 5-3 delineates the subarea boundary and intersections evaluated.

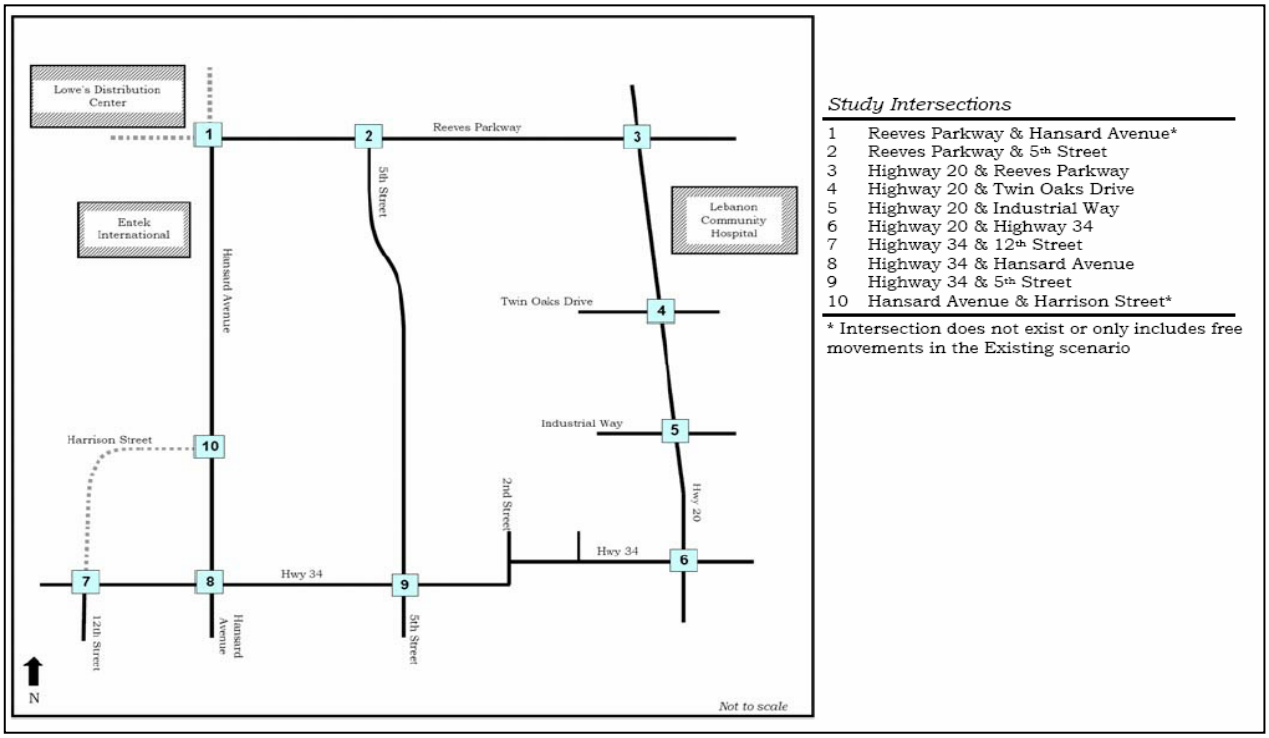



**Figure 5-3 - STUDY AREA FOR LEBANON INDUSTRIAL LAND ACCESS**

Analysis results are compared with mobility standard V/C ratios as designated by the 1999 Oregon Highway Plan. Mobility standards are based on facility classification, area type, and speed zones for roadways intersecting state highways. All of the study intersections are within the UGB, and all roadway approaches have a speed limit of 35 MPH or less. The OHP designates US 20 north of OR 34 as a regional highway. It is not a freight route, is outside of an MPO and is outside of a special transportation area (STA); therefore the mobility standard threshold for the intersections of US 20 and Reeves Parkway, Twin Oaks Drive, and Industrial Way is 0.85. OR 34 is designated by the OHP as a freight route on a regional highway. It is also outside of an MPO. The intersections west of 5th Street are outside of an STA, therefore the mobility standard threshold for OR 34 with 12th Street and Hansard Avenue is 0.85. East of (and including) 5th Street, OR 34 is inside an STA, so the

threshold for the intersections of Highway 34 with 5th Street and Highway 20 is 0.90. The remaining intersections are considered local interest roads therefore the mobility threshold for these locations is 0.90.

Because the Lebanon Parkway Scenario did show some benefits to the State highways on the north end of town this scenario was analyzed further as part of the subarea analysis to get a clear understanding of traffic operations for this alternative. The Lebanon Parkway extension (Alternative #2) does improve operations for two of the five intersections identified to fail on OR 34. However, overall the results of this analysis show similar results as the No-Build analysis. With the exception of the OR 34/US 20 intersection, all intersections on Highway 20 in the study area are not expected to meet the mobility standard. While the V/C ratio at the intersection of OR 34/5th Street would meet the mobility standard of 0.90, the level of service would remain at LOS F since the intersection delay is expected to be over one-minute per signal cycle. This result confirmed recommendations from the alternatives analysis screening in that that the additional capacity provided by the parkway extension does not solve operational problems anticipated at intersections in the subarea on US 20. Furthermore, it demonstrates that improvements to existing facilities will be necessary to mitigate deficiencies thus; extending Reeves Parkway from Hansard Avenue west/south to OR 34 is not included as plan recommendation. Table 5-3 presents the results of the operational analysis for the future No-build and Lebanon Parkway Extension alternatives.

TABLE 5-3 2025 SUBAREA NO-BUILD AND LEBANON PARKWAY EXTENSION INTERSECTION OPERATIONAL ANALYSIS

| *Intersection* | | **Mobility Standard (v/c)** | No-Build | | | Lebanon Parkway Extension Alternative #2 | | |
|---|---|---|---|---|---|---|---|---|
| Major Approach | Minor Approach | | LOS | Delay | V/C | LOS | Delay | V/C |
| **Signalized Intersections** | | | | | | | | |
| Highway 20 | Highway 34 | **0.90** | **D** | **37.9** | **0.91** | C | 27.7 | 0.72 |
| **Unsignalized Intersections** | | | | | | | | |
| Reeves Parkway | Hansard Avenue | **0.90** | A | 8.9 | 0.23 | B | 11.8 | 0.36 |
| Reeves Parkway | 5th Street | **0.90** | B | 10.0 | 0.06 | B | 13.2 | 0.11 |
| Highway 20 | Reeves Parkway | **0.85** | **F** | **>100** | **1.37** | **F** | **>100** | **1.76** |
| Highway 20 | Twin Oaks Drive | **0.85** | **F** | **>100** | **1.92** | **F** | **>100** | **0.96** |
| Highway 20 | Industrial Way | **0.85** | **F** | **>100** | **>2.00** | **F** | **>100** | **1.54** |
| Highway 34 | 12th Street | **0.85** | C | 24.9 | 0.52 | D | 31.4 | 0.57 |
| Highway 34 | Hansard Avenue | **0.85** | C | 17.3 | 0.08 | C | 17.8 | 0.07 |
| Highway 34 | 5th Street | **0.90** | **F** | **>100** | **1.13** | **F** | **65.9** | **0.75** |
| Hansard Avenue | Harrison Street* | **0.90** | A | 9.5 | 0.25 | A | 9.6 | 0.25 |
| | | | | | | | | |

The previous scenario analysis predicted high traffic volumes on US 20 (and to a lesser degree on Highway 34) under future conditions, therefore many of the stop-controlled intersections fail as traffic from the minor approaches cannot find sufficient gaps to access the highways. As a result, traffic signals can be used to improve traffic operations. While use of traffic signals at failing intersections greatly improves operations, signal spacing is not ideal given the proximity between the Industrial Way/US 20 intersection and both Twin

Oaks Drive and OR 34 intersections. As a result, a set of various mitigation options were also tested for their effectiveness to relieve congestion in the Highway 20/ Industrial Way area without the use of a traffic signal. Each of the variation assumes a traffic signal as mitigation at the other locations. The alternative strategies are described below:

- Strategy 1 – Signalization. The signalization strategy improves the level of service dramatically as the traffic signals reduce intersection delay. Left turn pockets at OR 34/US 20 are needed to provide additional capacity to reduce its V/C ratio. All intersections would operate at LOS C or better, and all are expected to meet the OHP mobility standards.
- Strategy 2 – Williams Street Extension. This alternative utilizes a currently unpaved section of Williams Street to circulate traffic away from the US 20/Industrial Way intersection. Results show that not enough traffic is diverted to via Williams Street to make the intersection perform acceptably. The resulting V/C ratio at the intersection improves from greater than 2.00 (unsignalized) to 1.17. This is still greater than the mobility standard (0.85) and well above the 0.71 V/C ratio achieved by Strategy 1.
- Strategy 3 – Right In, Right Out at US 20/Industrial Way. This alternative proposes that access to this intersection be restricted to right-in, right-out movements only. The strategy works best with the William Street Extension. This configuration significantly improves operations at this intersection as most of the delay is attributed to long wait times for vehicles turning left onto US 20 and vehicles moving through the intersection across US 20. Under the new restricted access arrangement, only a small number of vehicles are expected to exit from eastbound and westbound approaches. The conflicts with through movements are virtually eliminated with the new right-in, right-out arrangement. As a result, the Highway 20/Industrial Way intersection would improve dramatically to a V/C of 0.16.
- Strategy 4 – Closure of West Leg Access on Industrial Way. This alternative assumes the west leg of the US 20/Industrial Way intersection would be closed. Traffic will not have access to or from the west side of Industrial Way from Highway 20. This variation produces similar results as found with Strategy 2. The V/C ratio at Highway 20/Industrial Way is expected to improve from greater than 2.00 to 1.32, but it still fails to meet the mobility standard of 0.85. This mitigation strategy performs worse than variation 2 (V/C of 1.17), and far worse than variation 1 (V/C of 0.71).

Table 5-4 presents the results of all mitigation alternatives.

TABLE 5-4 2025 SUBAREA INTERSECTION OPERATIONAL ANALYSIS ALTERNATIVE STRATEGIES MITIGATION

| *Intersection* | | **Mobility Standard (v/c)** | Strategy 1 - Signalization | | | Strategy 2 – Williams Street Extension | | |
|---|---|---|---|---|---|---|---|---|
| Major Approach | Minor Approach | | LOS | Delay | V/C | LOS | Delay | V/C |
| **Signalized Intersections** | | | | | | | | |
| Highway 20 | Highway 34 | **0.90** | C | 21.1 | 0.83 | **C** | **33.7** | **0.91** |
| **Unsignalized Intersections** | | | | | | | | |
| Reeves Parkway | Hansard Avenue | **0.90** | A | 8.9 | 0.23 | A | 8.9 | 0.23 |
| Reeves Parkway | 5th Street | **0.90** | B | 10.0 | 0.06 | B | 10.0 | 0.06 |
| Highway 20 | Reeves Parkway | **0.85** | A | 8.5 | 0.72 | A | 7.9 | 0.74 |
| Highway 20 | Twin Oaks Drive | **0.85** | B | 10.6 | 0.72 | B | 10.5 | 0.74 |
| Highway 20 | Industrial Way | **0.85** | A | 7.0 | 0.71 | **F** | **183.9** | **1.17** |
| Highway 34 | 12th Street | **0.85** | C | 24.9 | 0.52 | C | 24.9 | 0.52 |
| Highway 34 | Hansard Avenue | **0.85** | C | 17.3 | 0.08 | C | 17.3 | 0.08 |
| Highway 34 | 5th Street | **0.90** | C | 24.0 | 0.54 | B | 16.6 | 0.54 |
| Hansard Avenue | Harrison Street* | **0.90** | A | 9.5 | 0.25 | A | 9.5 | 0.25 |
| | | | | | | | | |
| *Intersection* | | **Mobility Standard (v/c)** | Strategy 3 - Right In, Right Out at US 20/Industrial Way | | | Strategy 4 - Closure of West Leg Access on Industrial Way | | |
| Major Approach | Minor Approach | | LOS | Delay | V/C | LOS | Delay | V/C |
| **Signalized Intersections** | | | | | | | | |
| Highway 20 | Highway 34 | **0.90** | **D** | **40.3** | **0.94** | **D** | **43.1** | **0.93** |
| **Unsignalized Intersections** | | | | | | | | |
| Reeves Parkway | Hansard Avenue | **0.90** | A | 8.9 | 0.23 | A | 8.9 | 0.23 |
| Reeves Parkway | 5th Street | **0.90** | B | 10.0 | 0.06 | B | 10.0 | 0.06 |
| Highway 20 | Reeves Parkway | **0.85** | A | 8.0 | 0.74 | A | 10.0 | 0.71 |
| Highway 20 | Twin Oaks Drive | **0.85** | B | 10.6 | 0.74 | B | 12.6 | 0.71 |
| Highway 20 | Industrial Way | **0.85** | D | 29.6 | 0.16 | **F** | **222.8** | **1.32** |
| Highway 34 | 12th Street | **0.85** | C | 24.9 | 0.52 | C | 24.9 | 0.52 |
| Highway 34 | Hansard Avenue | **0.85** | C | 17.3 | 0.08 | C | 17.3 | 0.08 |
| Highway 34 | 5th Street | **0.90** | B | 14.5 | 0.55 | B | 13.2 | 0.55 |
| Hansard Avenue | Harrison Street* | **0.90** | A | 9.5 | 0.25 | A | 9.5 | 0.25 |

The evaluation confirmed that the extension of Reeves Parkway to the west does not alleviate the need for intersection improvements along US 20 to meet designated ODOT mobility standards. Furthermore, the analysis demonstrated that feasible solutions exist for existing facilities inside the existing UGB to satisfy transportation needs for the planning horizon. Most of the deficiencies can be mitigated by signalizing currently unsignalized intersections. Therefore, as previously stated, extension of the Reeves Parkway west is not included as a TSP recommendation. However, because Parkway recommendations are included south of OR 34, the City should preserve right-of-way as possible so that future connectivity is not precluded beyond the 20-year planning horizon and build-out of the area has taken place. The complete analysis is documented in Appendix D, City of Lebanon Transportation System Plan Industrial Land Access Analysis Technical Memorandum. Recommendations from the analysis include:

Intersection Signalization:

- Highway 20 / Reeves Parkway
- Highway 20 / Twin Oaks Drive
- Highway 34 / 5th Street

Intersection Capacity Improvements:

- US 20 Highway / Highway 34 – Add left turn pockets on east and westbound approaches

Other Improvements:

- US 20/Industrial—Right In, Right Out is recommended because Industrial Way is approximately 340 feet from the proposed traffic signal recommended at Twin Oaks Drive. While the State Traffic Engineer can permit signals that do not meet the ODOT preferred signal spacing requirement, it is unlikely that a traffic signal 340 feet away from the next signal would be approved.
- Williams Street Extension—This improvement would utilize a currently unpaved section of Williams Street to circulate traffic away from the Highway 20/Industrial Way intersection. Currently, Williams Street is a gravel access road that crosses the Santiam Canal and connects with Highway 34. The bridge across this canal is an extension of the existing Williams Street (which is only paved south of Highway 34 today). This extension road would need to be improved with pavement and lane striping and possible realigned to better to accommodate re-routed traffic. The bridge structure might also require replacing. This improvement would provide better access to the truck route for industrial properties on the eastside of US 20 in this area.

## Preferred Alternative Recommendations

The preferred alternative roadway recommendations for the Lebanon TSP through the 2027 planning horizon, as described throughout this section, include the following recommendations:

- Arterial and collector extensions and improvements intended to balance traffic across the system as described as part of Alternative 1 - Baseline Improvements as shown in Figure 5-1.
- Lebanon Parkway improvements as described in Central and Southern Parkway Recommendations section to improve access to industrial land and provide adequate arterial capacity for the regional travel shed currently served by Denny School Road, Airport Road and US 20.
- State highway and local system improvements described as part of the **NW Industrial Area Subarea Analysis** section to maintain adequate State highway operations, improve circulation and access from industrial area's to designated freight facilities.
- **Intersection Improvements.** In order to address local congestion points not addressed by improvements above, a number of intersection improvements will be necessary.

Table 5-5 summarizes the remaining poorly performing study intersections with and without mitigation under forecast 2027 conditions.

TABLE 5-5
2027 PM Peak Hour Intersection Operations With and Without Mitigation

| | | Preferred Alternative | | | Preferred Alternative with Mitigation Measures | | |
|---|---|---|---|---|---|---|---|
| **Type*** | **Location** | **LOS** | **V/C Ratio** | **Delay** | **LOS** | **V/C Ratio** | **Delay** |
| U / S | **Oak St/12th St** | | | | | | |
| | Southbound Approach | **F** | **0.80** | **55.6** | A | 0.45 | 6.9 |
| S | **US 20 (Main St)/Milton St** | | | | | | |
| | Westbound Through-Right | **E** | **0.92** | **79.3** | E | 0.67 | 56.3 |
| | Westbound Right | **-** | **-** | **-** | **F** | **0.88** | **95.4** |
| | Northbound Through-Right | **C** | **0.93** | **31.5** | B | 0.79 | 19.5 |
| | Southbound Left | **D** | **0.88** | **52.5** | **D** | **0.89** | **54.4** |
| | Southbound Through-Right | **C** | **0.89** | **27.3** | B | 0.60 | 14.6 |
| | Southbound Right | **-** | **-** | **-** | B | 0.31 | 11.6 |
| | Overall Intersection | **C** | **0.95** | **33.7** | C | 0.83 | 25.0 |
| U / S | **Main Rd/Crowfoot Rd** | | | | | | |
| | Northbound Approach | **F** | **1.41** | **>100** | B | 0.33 | 14.5 |
| | Overall Intersection | **-** | **-** | **-** | B | 0.59 | 16.3 |
| U / S | **US 20/Crowfoot Rd/Weirich Dr** | | | | | | |
| | Eastbound Approach | **D** | **0.85** | **53.4** | - | - | - |
| | Eastbound Left | **-** | **-** | **-** | E | 0.57 | 58.9 |
| | Eastbound Through | **-** | **-** | **-** | D | 0.40 | 46.7 |
| | Eastbound Right | **-** | **-** | **-** | D | 0.60 | 37.3 |
| | Southbound Approach | **C** | **0.92** | **31.1** | - | - | - |
| | Southbound Left | **-** | **-** | **-** | D | 0.35 | 42.1 |
| | Southbound Through | **-** | **-** | **-** | **B** | **0.80** | **16.3** |
| | Southbound Right | **-** | **-** | **-** | A | 0.02 | 5.2 |
| | Overall Intersection | **C** | **0.96** | **27.0** | C | 0.74 | 24.1 |

*Signal Types: S= Signalized; U= Unsignalized

Mitigation associated with each of the intersections presented in Table 5-3 is described below.

*Oak St/12th St* – Adding a traffic signal is recommended to reduce delay for minor approaches.

*US 20 (Main St)/Milton St* – Additional capacity in the form of a westbound and southbound right turn lane/pocket is anticipated for this intersection to meet the State mobility standard. The westbound right turn movement is still forecast to have a high V/C ratio, but the overall intersection delay is reduced from 33.7 to 25.0 seconds so that the overall intersection would meet the .85 State V/C mobility standard.

*Main Rd/Crowfoot Rd* – Adding a traffic signal is recommended to reduce delay for minor approaches due to increased Parkway volumes.

*US 20/Crowfoot Rd – As this intersection forms the southern terminus of the Parkway* northbound left and eastbound right movements are forecast to be high enough to require additional turn lane capacity at the intersection. Capacity improvements to meet mobility standards would include:

- Add one additional northbound left turn pocket (for two left-turn lanes total)
- Add southbound right turn pocket
- Add eastbound left and right turn pockets (currently single shared lane)
- Add westbound left turn pocket (currently single shared lane)

# Transportation Demand Management

Transportation Demand Management (TDM) strategies and programs could be implemented to reduce single occupancy vehicle (SOV) travel within the city, especially for work-related trips. These strategies are central to achieving local and statewide planning goals, including the Transportation Planning Rule.

There are a variety of strategies that the City along with major employers and businesses can implement that advance defined plan goals and objectives in the coming years. Examples of these potential strategies are outlined below.

## Carpool Matching Programs

Employers and/or the City could sponsor carpool matching programs to pair employees who could potentially share rides to and from work. In some cases, ridesharing occurs in personal vehicles; in other cases employers purchase a vehicle for vanpool use. While these types of programs can be administered by individual employers, a centralized database maintained by the City or another organization that matches employees at different employment locations is advantageous because it provides a larger commuter pool. Within the Portland Metro area, Carpool Match Northwest has been established to accomplish this objective. A similar program could be established in Lebanon.

## Carpool Parking Programs

As an incentive to carpooling, employers could provide preferential parking for carpools and vanpools. The City could enhance the use of this program by reducing the number of required parking spaces for new developments if a specific number of spaces were reserved for carpools and/or vanpools. This concept is typically part of an overall employee ridesharing program that includes carpool matching and transit subsidies.

## Flexible Work Hours

An employer providing flexible work hours could reduce the number of employees commuting to/from work during the AM and PM peak hours. These peak hours typically represent the highest vehicular demands experienced on the system. Allowing employees to commute to work outside of the traditional commute periods spreads the demands typically experienced during the peak periods to other hours of the day.

## Telecommuting

In addition to establishing more flexible work schedules, employers could allow employees to telecommute from home or other off-site locations one or more days per week. This also reduces the travel demand during typical commute periods.

## Pedestrian and Transit-Oriented Developments

Providing pedestrian or transit-oriented developments could result in a decreased reliance on the automobile. These developments could take a variety of forms. For example, providing neighborhood retail and services at several key locations throughout the city could allow trips to be made by walking, cycling, or short driving distances from neighborhoods. Transit-oriented developments can include a mixture of employment, housing, and retail uses with direct sidewalk connections, bus stop provisions and proper building orientation that also provide opportunities for trips to be made via walking or cycling or short driving distances.

SECTION 6

# Transportation System Plan

This section summarizes the preferred transportation system for the City of Lebanon to be implemented in the next 20 years. The transportation improvements, strategies and recommendations in this section were included based on the analysis of relevant plans and policies, existing and future forecasted no-build conditions and the alternatives analysis. This section contains the following subsections:

- Roadway system plan
- Transit plan
- Pedestrian facilities plan
- Bicycle facilities plan
- Air facilities plan
- Rail facilities plan

## Roadway System Plan

The street plan reflects the anticipated operational and circulation needs through the year 2027. It provides guidance on how to facilitate travel for all roadway users within the UGB over the next twenty years. The street system plan includes functional classification designations, street standards, recommended capacity and connectivity improvements, and access management strategies.

### Functional Classification Plan

The purpose of classifying streets within the UGB is to create a balanced system that facilitates mobility for vehicles, transit, pedestrians and cyclists. Street functional classification identifies the intended purpose, the amount and character of traffic, the degree to which non-auto traffic is emphasized, and the design standards. It is essential that the street functional classification consider adjacent land uses.

The following functional classifications are recommended as part of the TSP. The primary classification designations are discussed below.

#### General Definitions of Functional Classifications

Arterial Streets. The primary function of these facilities are to serve local and through traffic as it enters and leaves the urban area, connect Lebanon with other urban centers and regions, and provide connections to major activity centers within the UGB. Emphasis should be on traffic flow, pedestrian and bicycle movements. Arterials should serve the majority of truck traffic and all through traffic. Highways serve as arterials within the City.

> *Parkway Arterial*. Typically a 4 lane cross section with a center turn lane at intersections and/or driveways. This type of arterial has drainage ditches and a

median separating travel directions. This type of arterial is proposed for the parkway where right-of-way is not constrained by existing development.

*Major (or Principal) Arterial.* Typically, five-lane cross-section with two-way left-turn lanes and additional turning lanes at intersections. In order to reduce conflicts and promote safety within the transportation system, bike routes should not be located along major arterials, unless adequate parallel minor arterial or collector routes do not exist.

*Minor Arterial.* Usually a three-lane cross section, minor arterials should have a higher degree of access, shorter trip lengths, lesser traffic volumes, and lower travel speeds than major arterials.

Collector Streets. Primary function is to provide connections between neighborhoods/major activity centers and the arterial street system. Some degree of access is provided to adjacent properties, while maintaining circulation and mobility for all users. Service collectors carry lower traffic volumes at slower speeds than major and minor arterials. On-street bike lanes and sidewalks should be provided. Depending on adjacent land use and available right-of-way, parallel parking may be provided along collector streets on either one-side or both depending on parking demand generated by adjacent land uses and the availability of off-street parking. Collector streets within residentially zones areas will be two-lane collectors, whereas collector streets within industrially or commercially zoned properties will be constructed with a center turn lane.

Local Streets. Primary function is to connect residential neighborhoods with collectors or arterials. On-street parking and access to adjacent properties is prevalent. Slower speeds should be provided to ensure community livability and safety for pedestrians and cyclists. In many cases, cyclists can "share the road" with motor vehicles due to low traffic volumes and speeds. Sidewalks should be provided for pedestrians. In residential areas where multifamily housing units are prevalent, parking may be provided.

Local Streets also function to provide access and circulation within industrial areas. In these areas, width of travel and parking lanes should be increased due to the likelihood of higher truck traffic.

Alleys are another type of local street. They will not include planting areas, parking, or sidewalks.

### Functional Classification of City Streets

Figure 6-1 shows the functional classification designations for all existing and future streets within the Lebanon UGB. The alignment of future streets should be considered conceptual; the end points of the streets are often fixed but the alignment between the end points may vary depending on the design requirements and right-of-way constraints at the time in which the street is constructed. The designation for all streets is also listed below.

Figure 6-1, Future Functional Classification, 11x17

Figure 6-1, Future Functional Classification, 11x17

**Arterial Streets—Highways.** Both state highways facilities in the City, OR 34 and US 20 function as arterials and are classified as Regional Highways by ODOT.

ODOT has also designated portions of US 20 and OR 34 as a Special Transportation Area (STA). The US 20 STA couplet boundaries are southbound from mile point (MP) 13.08 (Rose Street) to MP 13.45 (Oak Street) and northbound from MP 13.45 (Oak Street) to MP 13.17 (Rose St). The OR 34 STA boundary is from MP 17.89 (railroad crossing) to MP 18.13 (US 20).

**Arterial Streets—Non-Highway Arterials.** 2nd Street from Tangent Street to Airport Road; Academy Street from 2nd Street to Santiam Highway (US 20); Airport Road; Brewster Road from Berlin Road to UGB; Berlin Road from Grant Street to UGB; Oak Street from Lebanon Parkway to eastern terminus; Lebanon Parkway from Airport road to southern terminus with Santiam Highway (US 20); River Drive; Stoltz Hill Road from UGB to Vaughan Lane; South Main Road; Tennessee Road; Walker Road; Wheeler Street

**Collector Streets.** Hansard Avenue; 5th Street from Walker Road to Reeves Parkway and from southern UGB to Vaughan Lane; 7th Street from Walker Road to Oak Street and from Grant Street to Tangent Street/Corvallis-Lebanon Highway (OR 34); 9th Street from Rose Street to Tangent Street/Corvallis-Lebanon Highway (OR 34); 10th Street from Oak Street to Tangent Street/Corvallis-Lebanon Highway (OR 34), from F Street to E Street, and from Vaughn Lane to Walker Road; 12th Street from Airport Road to Tangent Street/Corvallis-Lebanon Highway (OR 34); Stoltz Hill Road from Vaughan Lane to Airport Road; Airway Road from Airport Road to northern terminus; Grove Street from Milton Street to Wheeler Street; Williams Street from Milton Street to Wheeler Street; Franklin Street; Berlin Road from Brewster Road to Grant Street; Rose Street from 10th Street to 5th Street; Sherman Street from 12th Street to Park Street; Grant Street from 10th Street to Berlin Road; Maple Street from 2nd Street to Park Street; Elmore Street from 2nd Street to Grove Street; Oak Street from western UGB to Airway Road; E Street; Milton Street; F Street from 12th Street to 10th Street; Russell Drive; Vaughan Lane; Crowfoot Road from South Main Road to Santiam Highway (US 20); Weirich Drive; Cascade Drive; Weldwood Drive; Central Avenue; Lebanon Parkway from Tangent Street/Corvallis-Lebanon Highway (OR 34) to Airport Road; and Rock Hill Drive.

**Truck Route.** Although the existing truck route (Figure 3-6) is in conflict with the residential uses along Wheeler/Williams/Milton Streets, it has been in its present alignment since the early 1960s. Therefore, motorists and pedestrians are aware of the safety issues along the existing truck route alignment. Until a better truck route alternative can be provided by Lebanon Parkway, the existing truck route should be enhanced to improve the road structure, surface condition, and turning radii. Projects that provide these improvements are included in the roadway plan and have been programmed into the City of Lebanon Capital Improvement Program.

The City has received an OTIA grant to replace the Grant Street bridge because of seismic deficiencies.

## Street Design Standards

Street design standards are based on the desired functional and operational characteristics, such as vehicular volume, capacity, operating speed, safety, and level of pedestrian and bicycle use. The standards are necessary to ensure that the system of streets, as it continues to develop within Lebanon, can safely and efficiently serve motorists, cyclists, and pedestrians while also accommodating the orderly development of adjacent lands.

The street design standards are represented graphically in typical cross-sections for each of the major functional classifications (see Tables 6-2 through 6-4). These cross-sections are intended for planning and design purposes for new road construction, and where it is physically and economically feasible to improve existing streets. The elements of each typical roadway cross-section include sidewalks, planting areas, parking lanes, bicycle lanes, and travel lanes. The elements that make up each cross-section will depend on a number of factors, in addition to functional classification, including adjacent land use, special district designations, bicycle system route plan and the availability of off street parking. Each of the street design elements are described below. Curb, gutters, storm drainage and underground utilities should be provided on all streets. The standard dimensions of these elements are also summarized in the respective tables.

### Neighborhood Refinement Plans

The standards noted throughout this section may be superseded or expanded by additional or different standards developed specifically for neighborhood subareas in Neighborhood Refinement Plans. The first such Refinement Plan to develop specific standards for a neighborhood was the May *2003 Russell Drive Area Mixed Use Neighborhood Center Plan.* The Russell Drive Neighborhood Refinement Plan and associated documents were presented to the Lebanon Planning Commission and City Council in June of 2003. This Refinement Plan is part of the TSP. Future Neighborhood Refinement Plans, when adopted by the City Council, will be incorporated into the TSP as formal amendments that are part of the adoption resolution or ordinance.

### Sidewalks

Sidewalks are an element of all street types, excluding alleys. Sidewalks will be constructed in compliance with Americans with Disabilities Act (ADA) Requirements which govern width, horizontal (cross)-slope and vertical slope. The standard sidewalk width is 5 or 6 feet depending on the facility type. The effective width of the sidewalk may be extended depending on treatments used in the planting area (described below). Horizontal slope should not exceed 2 percent and vertical slope should not exceed 5 percent. Curb ramps should be provided in line with the continuous direction of travel. Sidewalks should be provided on both sides of the street, unless right-of-way is constrained or where other extenuating factors may exist.

### Planting Areas

Planting areas should be wide enough to accommodate street trees. The minimum width for planting areas is 5.5 feet which includes the 6-inch width of curbing that separates the planting area from the travel lanes. Where additional right-of-way is available and is not required for the construction of traffic lanes and sidewalks, the planting area may be wider.

Decisions to widen the planting area should consider the costs of ongoing maintenance that may be required.

In commercial districts, paving or brickwork may replace the planting area to provide an amenity zone where street furniture (benches, trash receptacles) or utility features (vaults, hand holes) can be located. This will increase the functional pedestrian area and accommodate more pedestrian traffic, expected in areas of commercial land use.

### Parking Lanes

Parking lanes will be 8 feet wide and may be called for on one or both sides of the street depending on available right-of-way and demand. Parking will be restricted near driveways and intersections and where prohibited on certain roadways.

### Bicycle Lanes

Bicycle lanes are 5 or 6 feet wide depending on facility type and are provided on all collector streets and on arterial streets. Bicycle lanes will be separated from travel lanes as called for in the Manual on Uniform Traffic Control Devices (MUTCD).

### Travel (motor vehicle) Lanes

Standard travel lane widths will be 12 feet striped travel lanes for arterials and collectors. Shoulder lanes will be 14 feet and two-way left-turn lanes will be 14 feet. In circumstances where right-of-way is constrained, lane widths may be minimally reduced.

The street cross-section standards are summarized in Table 6-1.

TABLE 6-1
Typical Street Cross-Sections

| Facility | ROW | Travel Lanes (volumes) | Median Type | Bike Lanes | Sidewalks | On-Street Parking | Planting Strip |
|---|---|---|---|---|---|---|---|
| Arterial: | | | TWLTL or Raised Median* | Yes (new construction only unless specified in bikeway plan) | Yes | No | Yes |
| Minor | 75 feet | 3 (14,000 to 18,000 ADT) | | | | | |
| Major | 105 feet | 5 (18,000 ADT and above) | | | | | |
| Parkway | 130 feet | 4 (40,000 ADT) | | Multi-use path | Multi-use Path | | |
| Collector | 60 to 75 feet | 2 to 3 (10,000 to 14,000 ADT) depending on access density & zoning | None or TWLTL or Raised Median* | Yes | Yes | No | Yes |
| Local | 50 to 56 feet | 2 (less than 10,000 ADT) | None | Shared | Yes | One side or two if multi-family residential | Yes |

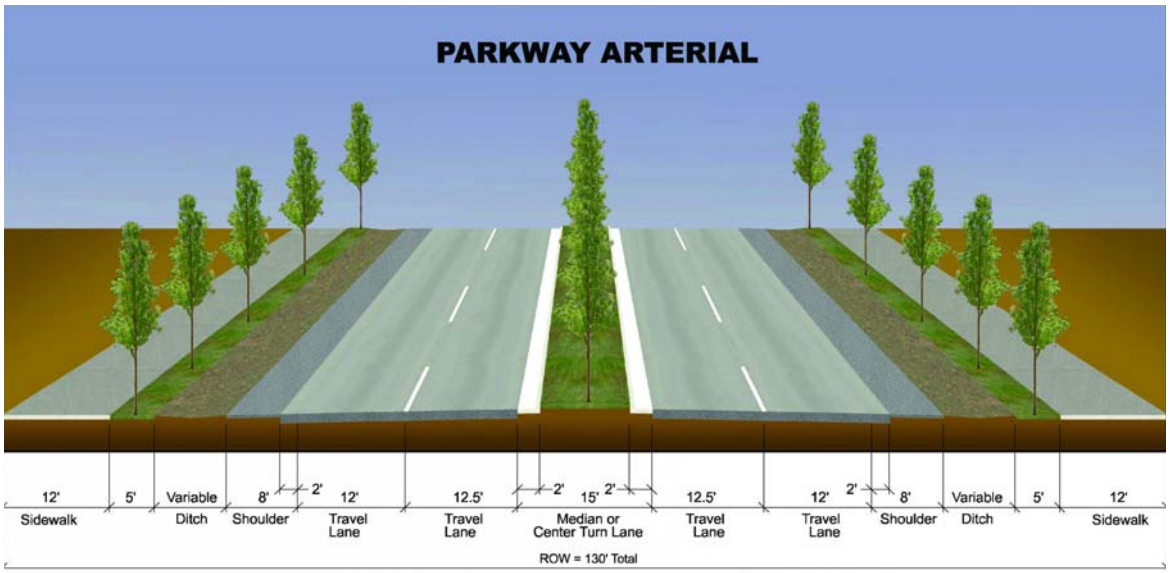
TWLTL = two-way left-turn lane; ADT = Average Daily Traffic.

* Raised median may be constructed in lieu of the center turn lane for access management and safety.

## Typical Cross Sections

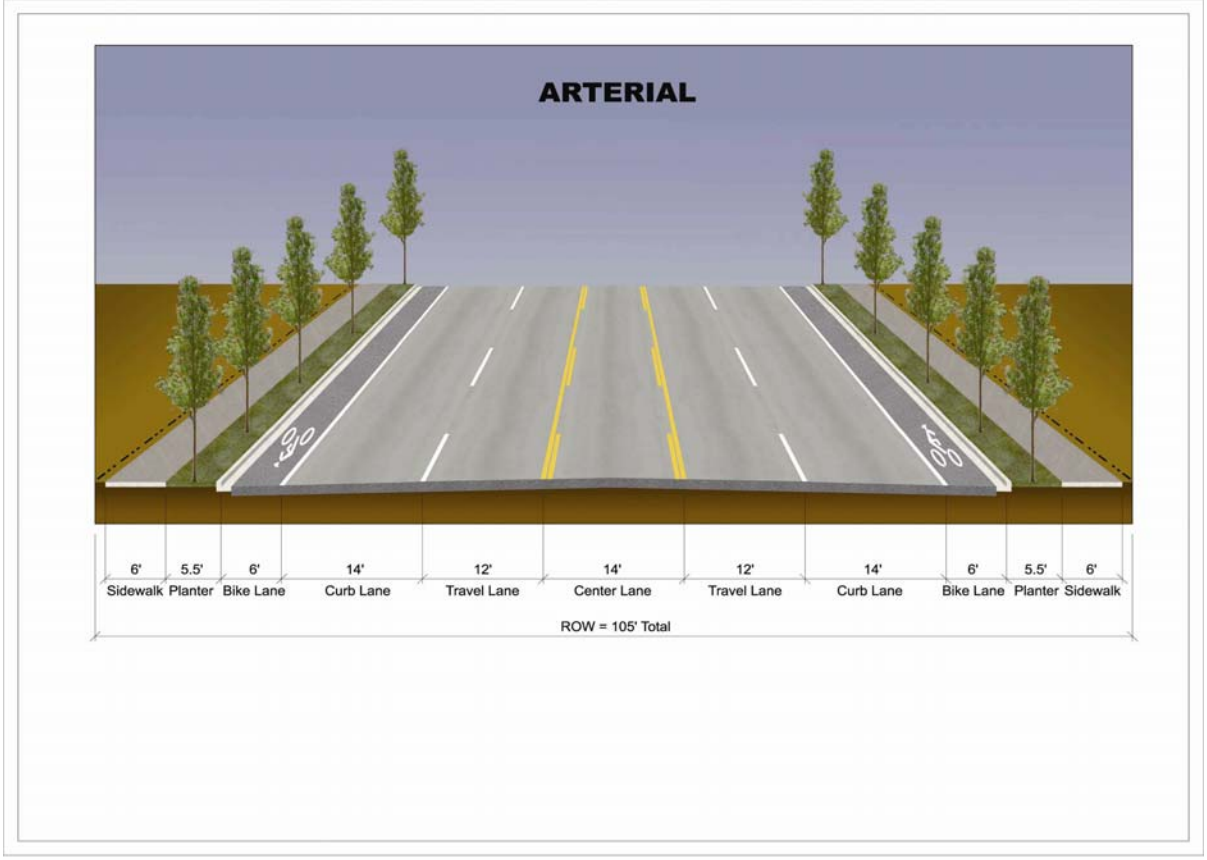
Tables 6-2 through 6-5 illustrate and summarize the typical cross section and design criteria for each of the street classifications.

TABLE 6-2
Parkway Street Design Standard Criteria (Diagram shows 130' ROW, 4-lane configuration)




| Design Criterion | Value |
|---|---|
| ROW (ft) | 130 |
| Lane Width (ft) | 12/12.5/15/12.5/12 |
| Shoulder/Parking (ft) | 8 ft. shoulder with no parking allowed |
| Roadway Width (ft) | 64 |
| Design Speed (mph) | 45 |
| Maximum Grade (%) | 5 |
| Minimum Centerline Radius (ft) | 1,200 |
| Design Volume (ADT) | 40,000 |
| Minimum Driveway Spacing (ft) | N/A |
| Sidewalk/Multi-use Path (ft) | Multi-use Path: 12 ft generally located on side of roadway towards the City Center<br><br>Sidewalk: 6 ft sidewalk should be constructed on opposite side of the roadway where there is no other alternative for pedestrian traffic. |
| Ditch | Variable depending on drainage requirement |
| Planter (includes 6-inch curb) | 5 feet (minimum) |
| Minimum Intersection Curb Radius (ft) | 45 |

TABLE 6-3
Typical Arterial Street Design Standard Criteria (Diagram shows 105' ROW, 5-lane configuration)

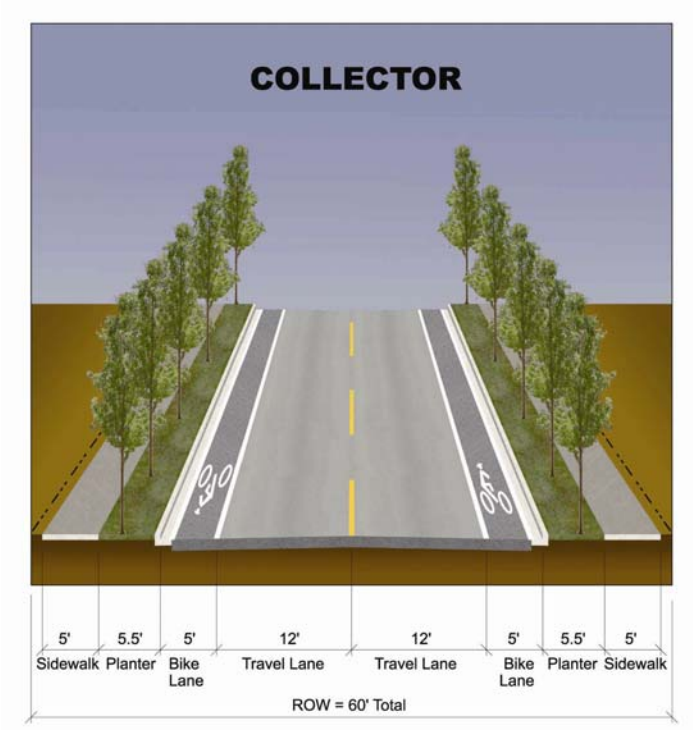



| Design Criterion | Value |
|---|---|
| ROW (ft) | 75 to 105 |
| Lane Width (ft) | 14/12/14/12/14 for 105' ROW for major arterial; 12/14/12 for 75' ROW for minor arterial |
| Shoulder/Parking (ft) | None |
| Roadway Width (ft) | 78 for 5-lane configuration; 50' for 3-lane configuration |
| Design Speed (mph) | 40 |
| Maximum Grade (%) | 6 |
| Minimum Centerline Radius (ft) | 500 |
| Design Volume (ADT) | 18,000 |
| Bike Lane (ft) | 6 feet |
| Sidewalk (ft) | 6 feet |
| Planter (includes 6-inch curb) | 5.5 feet (minimum) |
| Curb and Gutter Required (inches) | 30 |
| Minimum Intersection Curb Radius (ft) | 35 (A) |

Notes:

- A) Larger radius may be required if there is a significant amount of truck traffic.
- Bike lanes provided where specified in Bicycle Plan, or as part of new construction.
- Standards developed specifically for neighborhood subareas may supersede these standards.

TABLE 6-4
Typical Collector Street Design Standard Criteria (Diagram shows 60' ROW, 2-lane configuration)

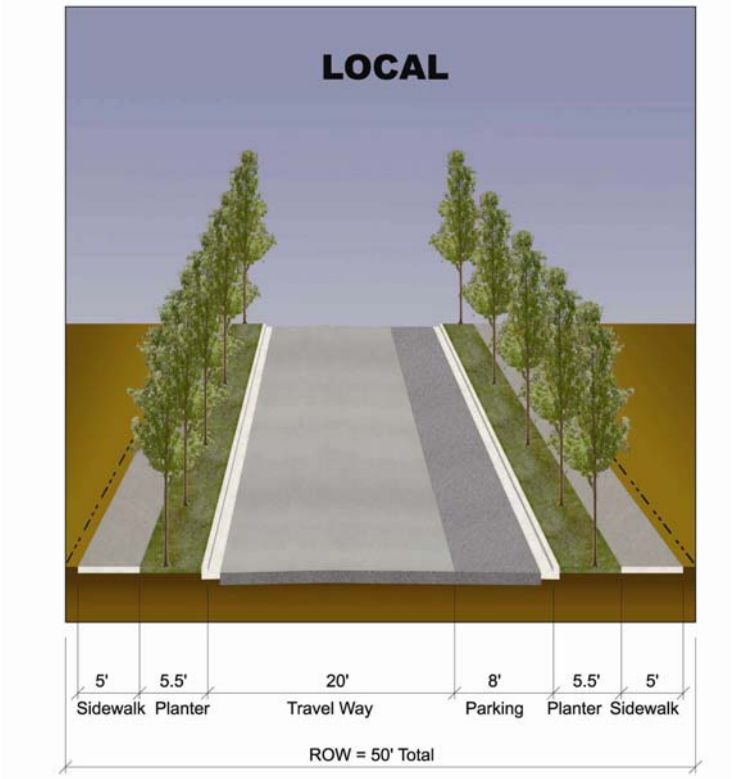



| Design Criterion | Value |
|---|---|
| Minimum ROW (ft) | 60 to 75 |
| Lane Width (ft) | 12/12 for 60' ROW; 12/14/12 for 75' ROW |
| Shoulder/Parking (ft) | 8 ft. for parking permitted in residential neighborhood areas(a) |
| Roadway Width (ft) | 34' for 2-lane configuration; 48' for 3-lane configuration |
| Design Speed (mph) | 35 |
| Maximum Grade (%) | 10 |
| Minimum Centerline Radius (ft) | 300 |
| Design Volume (ADT) | 14,000 |
| Bike Lane (ft) | 5 feet |
| Sidewalk (ft) | 5 feet |
| Planter (includes 6 inch curb) | 5.5 feet (minimum) |
| Curb and Gutter Required (inches) | 30 |
| Minimum Intersection Curb Radius (ft) | 20 (b) |

Notes:

- a) On-Street parking may be permitted in residential neighborhoods
- b) Larger radius may be required if there is a significant amount of truck traffic.5 ft Bicycle lanes provided in each direction.
- 14ft center lane in industrial or commercial areas.
- No parking unless insufficient off-street.
- Standards developed specifically for neighborhood subareas may supersede these standards.

TABLE 6-5
Typical Local Street Design Standard Criteria (Diagram shows 50' ROW for parking on one side of street)




| Design Criterion | Value |
|---|---|
| Minimum ROW (ft) | 50' for parking on one side; 56' for parking on both sides |
| Lane Width (ft) | 20 |
| Shoulder/Parking (ft) | 8 |
| Roadway Width (ft) | 28' for parking on one side; 34' for parking on both sides |
| Design Speed (mph) | 25 |
| Maximum Grade (%) | 15 |
| Minimum Centerline Radius (ft) | 100 |
| Design Volume (ADT) | 3,000 |
| Sidewalk (ft) | 5 feet |
| Planter (includes 6-inch curb) | 5.5 feet (minimum) |
| Curb and Gutter Required (inches) | 30 |
| Minimum Intersection Curb Radius (ft) | 20 |

Notes:

- Exceptions may be granted when connecting to existing substandard local street improvements.
- 5-foot bike lanes provided where specified in Bicycle Plan, otherwise bicycles share travelway
- Standards developed specifically for neighborhood subareas may supersede these standards

## Needed Street Upgrades

Over time, a number of existing streets within the City will be upgraded, and will be improved in compliance with the newly established cross-sections presented above. However, there are streets included in the preferred alternative project list that require improvement to serve their intended/designated function. The upgrades are prioritized as either high, medium, low; high indicates a need within the next 5 years, medium within the next 6 to 10 years, and low within 10 to 20 years. Table 6-6 presents prioritized lists of street upgrades and new street development required over the next 20 years and whether the projects are listed in the City of Lebanon's current (2006-20010) CIP. These projects are also presented in Figure 6-2.

TABLE 6-6
Needed Street Upgrades

| Street Segment / Intersection | Priority | CIP |
|---|---|---|
| Williams Street between Milton Street and Grant Streets | High | Yes |
| Wheeler Street between US 20 and Williams Street | High | Yes |
| Williams Street between Grant and Wheeler St. | High | Yes |
| Milton Street between Main Street and Williams Street, including capacity improvements at US 20 and Milton Street | High | Yes |
| 12th Street between Vine Street and Tangent Street | High | Yes |
| Airway Road Widening between Airport Road and Oak Street | Medium | No |
| Russell Drive Area Improvements:<br>Primrose between Airport Road and Porter Street<br>Park Way between Russell Drive and Center Street<br>Porter between Russell Drive and Gilbert Street | Medium | No |
| 12th Street between F Street and Vine Street | Medium | No |
| Signalize Intersection at Oak / 12th Street | Low | No |
| Reclassification/Realignment of Stoltz Hill Road north of Walker Road | Low | No |
| Signalize Intersection at Reeves Parkway / US 20 | Medium | No |
| Signalize Intersection at Twin Oaks / US 20 and reconfigure Industrial Way / US 20 intersection for right-in, right-out access | Medium | No |
| Signalize Intersection at 5th / OR 34 | Medium | No |
| Modify operations at Intersection of Russell Drive / US 20 | Medium | No |
| Signalize Intersection at Crowfoot Road / South Main Road | Low | No |
| Develop Signalized Intersection @ US 20 /Crowfoot Rd./Strawberry Festival Site Access Road. | High | No |

Figure 6-2, Road Plan (11x17)

Figure 6-2, Road Plan (11x17)

## New Streets

Table 6-7 presents new streets and extensions planned over the next 20 years:

TABLE 6-7
New Streets and Extensions

| Street Segment | Priority | CIP |
|---|---|---|
| Extension of Airport Road to Russell Drive (CLURD Frontage Road) | High | No |
| Construction of Lebanon Parkway (phased development) | | Yes* |
| Tangent Street (OR 34) to Airport Road | Low | |
| Airport Road to 5th Street | Medium | |
| 5th Street to US 20 | Medium | |
| Construct Frontage Road along east side of US 20 from Weldwood Drive to Gilbert Street (Porter Street reconstruction extension) | Medium | No |
| Extension of 12th Street between Airport Road and Stoltz Hill | Medium | No |
| Extension of Market Street between US 20 and River Street | Medium | No |
| Extension of Franklin Street between Russell Drive and Market Street (extension) | Medium | No |
| Weldwood Drive Realignment and Upgrade | High | No |
| Extend Walker Road to 12th Street (extension) | Medium | No |
| Extension of Crowfoot Road to Stoltz Hill Road | Medium | No |
| Extension of Walker Road to Reeves Parkway | Low | No |
| Extension of Airway Road between Airport Road and Walker Road (extension) | Low | No |
| Eastside Connector between Mountain River Drive and Grant Street | Low | No |

* Portions of the Lebanon Parkway appear in the 2006-20010 City of Lebanon CIP. Segments of the Lebanon Parkway are discussed in Section 5.

## Access Management

Managing access to the City's road system is necessary to preserve the capacity of the arterial street system. Access management minimizes the number of points where traffic flow may be disrupted by traffic entering and exiting the roadway. As the potential conflicts are reduced, safety would be enhanced.

Section 7 of the LURAs outlines target strategies for consolidating and managing access along the streets located within the City. The goal of these Access Management regulations is as follows:

*Access shall be managed to maintain an adequate "level of service" and to maintain the "functional classification" of roadways as required by the City's Transportation System Plan. Major roadways, including highways, arterials, and collectors, serve as the primary system for moving people and goods.*

From a policy perspective with regards to Highway facilities (US 20 and OR 34), the City of Lebanon and ODOT should consider the need for conditioning each land use action that is located along a state facility with one or more of the actions listed below. These projects are opportunity-driven based on property conversion or future roadway projects.

- Shared driveways and access easements should be provided on all compatible parcels (topography, access, and land use) to facilitate future access between adjacent parcels.
- Opportunities for alternative access to non-state facilities should be investigated and implemented when reasonable access can occur (consistent with the State's Division 51 access management standards).
- Right-of-way dedications should be provided to facilitate the future planned roadway system in the vicinity of the proposed development.
- Half-street improvements (sidewalks, curb and gutter, bike lanes/paths, and/or travel lanes) should be provided along all site frontages which do not have full buildout improvements in place at the time of development.

On all existing and new arterial, service collector, and access streets within its jurisdiction, the City of Lebanon should manage access to provide safe and efficient vehicular, pedestrian and bicycle operations. Section 7 of the LURA includes access standards for public streets and private accesses and policies related to the establishment of access easements where appropriate and feasible. These standards should be implemented as development and redevelopment occurs along the city facilities.

### Traffic Operations Standards

It is recommended that the City consider using LOS "E" as its minimum standard for signalized intersections. A v/c ratio greater than 1.00 should also be considered to be below the minimum standard, regardless of level of service. At unsignalized intersections, a v/c ratio of less than 0.90 on the critical movement should be maintained, provided the queues on the critical approach can be appropriately accommodated. The evaluation of traffic operations should be conducted using the methodology outlined in the most recent edition of the Highway Capacity Manual.

The projects included in the TSP's Implementation Plan collectively achieve these LOS and mobility standards.

## Transit Plan

The City's transit plan continues existing services and proposes mechanisms to monitor demand to identify when new transit services are warranted. One potential mechanism for monitoring transit demand is an annual or biennial citywide questionnaire (either through direct mail or as an insert to the local paper) that assesses the community's interest and need. This questionnaire could be coupled with a letter to the City's major employers requesting feedback on their employee transportation issues and needs. Future potential transit improvements could include an intercity transit system and expanded use of

paratransit for special needs services. Improvements to public transportation should be pursued in the following areas as warranted:

- Commuter services to surrounding communities including Albany and Salem (consider improvements as commuting patterns warrant)
- Increased need for transit services to the mobility challenged including the elderly and physically impaired as the population ages
- Enhanced public transportation services including the identification of future locations for park-and-ride lots, multimodal centers, and transit supporting facilities such as sidewalks, shelters and other amenities

The details of each of the components of the plan are outlined below.

## Intercity Fixed Route Transit

There is no city-operated fixed-route bus service. An initial fixed-route service could be focused on the commuter market and carry workers between the City and employment centers in the Albany and Salem areas. The City should engage in a partnership with the Oregon Cascade West Council of Governments and Linn County to develop such a service and should only do so when the demand exists and when a sustainable funding program has been established. Improvements to the fixed route transit system should be implemented incrementally over time.

## Taxi Service

The City should encourage continued taxi service in Lebanon by private providers.

## Dial-A-Ride Transportation Service

Demand for paratransit will likely increase in line with aging of the general population and an increase in the number of City residents who do not drive. Dial-A-Bus service like that currently provided by the Lebanon Senior Center should be expanded to meet rising demand. If private provides cannot expand to meet demand, the City should consider initiating Dial-A-Ride Service and seek capital and operating funding through available grant sources including those provided by the State of Oregon and the Federal Transit Administration. If grant funding proves inadequate or unavailable, the City should consider other funding options.

## Transit Supportive Facilities

Successful transit service requires a number of supporting facilities that facilitate access and patronage. These include centers where transfers occur, park-and-ride lots where patrons may leave their vehicles, and sidewalks and shelters that provide access to stops and comfort for patrons as they wait. The City should consider incentives to encourage private park-and–ride lots to support commuter services. Three potential areas for park-and-ride lots have been identified in the south end of the City along US 20, in the downtown center area, and in the west end of the City along Highway 34. Park-and-ride lots in these areas would provide the best opportunity to intercept commuters oriented to Albany, Corvallis and I-5. The City should also discuss siting a transit center in the downtown area which

would support transfers between services, passenger drop-off and pick-up areas, and other amenities. These improvements will serve at a later date as part of a potential fixed-route bus system.

## Pedestrian Plan

It is important for a city's pedestrian system to connect residential areas with commercial centers, schools, and community focal points, which are collectively referred to as pedestrian generators. In addition, a community's pedestrian system also offers recreational opportunities. While some gaps exist, pedestrian facilities in the City of Lebanon are extensive and generally in good condition. The majority of Lebanon's pedestrian generators are accessible by streets with sidewalks.

To meet specific goals and objectives identified in this TSP, the City of Lebanon will encourage walking as a means of transportation by addressing the following:

- **Connectivity.** The City will work to develop a connected network of pedestrian facilities by filling existing gaps and linking new facilities over time. The City's street standards require sidewalks when constructing new streets and reconstructing existing ones.
- **Safety.** The City will work to provide a safe and secure walking environment**.** As traffic volumes increase, it becomes more difficult for pedestrians to cross streets. Two common means of improving pedestrian crossing safety are constructing crosswalks and curb extensions. Crosswalks are provided either at intersections or mid-block, allowing pedestrians to cross in an area of increased visibility to a driver and in locations where pedestrians are expected to be present. Curb extensions extend the sidewalk into the parking lane, shortening the crossing distance for pedestrians and improving their visibility. Adequate crosswalk lighting is very important for the safety and security of pedestrians.
- **Design.** The City can ensure pedestrian-oriented urban design by adopting policies and development standards that integrate pedestrian scale, facilities, access and circulation into the design of residential, commercial, and industrial projects. The City's *Downtown Lebanon Transportation Enhancements* and Russell Drive Area Mixed Use Neighborhood Center plans serve as good examples of this direction.
- **Policy**. To enhance pedestrian safety, circulation, and connectivity, and to comply with the TPR, the City is preparing code amendments for adoption as expressed in the LURA. These changes include new street design standards that require sidewalks along all new streets and include provisions for planter strips to provide a buffer between motorists and pedestrians. Access management provisions are also included.

The recommended pedestrian projects are based on a review of existing pedestrian system conditions, deficiencies and needs, as well as a review of existing state, county, and local pedestrian and bicycle plans. The improvements address gaps in connectivity and lack of crosswalks or other safety considerations. Several local roadways warrant improved pedestrian facilities, especially those near schools and parks.

The downtown area is already well served by sidewalks; however, additional pedestrian amenities have been identified[6] to enhance downtown as a pedestrian center.

Pedestrian system improvements have been prioritized on the basis of proximity to pedestrian destinations such as parks, schools and other public facilities. Improvements should first be made in the proximity of what is considered a "walkable distance" from the destination, generally considered one-half mile for most people.

Recommended pedestrian system improvements are summarized in Table 6-8 and shown graphically in Figure 4-4.

TABLE 6-8
Recommended Pedestrian System Improvements

| Roadway | Location |
|---|---|
| **Local Facilities*** | |
| Kees Street | Stoltz Hill Road to 6th Street |
| Wassom Street | Stoltz Hill Road to 6th Street |
| 6th Street | Kees Street to Walker Road |
| Airway Road | Oak Street to Airport Road |
| 12th Street | E Street (approx.) to Airport Road |
| Airport Road | City limits to 12th Street |
| F Street | 12th Street to 7th Street |
| J Street | 5th Street to 2nd Street |
| Russell Drive | Santiam Highway to Primrose Avenue |
| **Downtown**** | |
| Main Street | Rose Street to Maple Street |
| Park Street | Vine Street to Oak Street |
| Vine Street | 2nd Street to Park Street |
| Ash Street | 2nd Street to Park Street |
| Sherman Street | 3rd Street to Park Street |
| Grant Street | 3rd Street to Park Street |
| Maple Street | 2nd Street to Park Street |
| **State Facilities*** | |
| Santiam Highway | Reeve's Parkway to Industrial Street |
| Santiam Highway | Market Street to Sodaville Road |
| Highway 34 (Tangent Street) | Western UGB to city limits (just east of 13th Street) |

*Downtown Lebanon Transportation Enhancements* (Crandall Arambulla, 2000).

TABLE 6-8
Recommended Pedestrian System Improvements

| Roadway | Location |
|---|---|
| **County Facilities*** | |
| Stoltz Hill Road | Airport Road to southern UGB |
| 5th Street | Vaughn Lane to southern UGB |
| South Main Road | Vaughn Lane to southern UGB |
| Cascade Drive | Santiam Highway to eastern UGB |
| Franklin Street | City limits to Russell Drive |
| Central Avenue/Rock Hill Drive | Crowfoot Road to southwestern UGB |
| Crowfoot Road | 5th Street to Santiam Highway |
| Oak Street | Western UGB to Airway Road |
| Airport Road | Western UGB to City limits |
| Wagon Wheel Dr. | City Limits to Cascade Drive |
| Russell Drive/River Road | Highway 20 to River View Street |

*Pedestrian improvements proposed for state, county, and local roadways are 6-foot sidewalks on both sides of the street.

**Pedestrian improvements proposed for STA are curb extensions, crosswalks with scoring to match sidewalk paving, scored concrete paving for sidewalks, and ornamental pedestrian-scale lighting. Main Street would also have benches, trash receptacles, and water fountains.

While not directly included as individual projects, regular maintenance of pedestrian facilities should be a priority to ensure access, safety, and system preservation.

# Bicycle Plan

The bicycle plan establishes a network of bicycle lanes and routes to connect the City's bicycle trip generators and to provide a safe, interconnected bicycle system. Bicycle lanes are designated on arterial and collector street segments to provide the same level of continuity and connectivity provided in the road network. On local streets, it is typically appropriate for bicyclists to share a lane with other vehicles. This on-street system would be supplemented by an off-street trail system along the future Reeves Parkway corridor (on the west side of the city), as well as along the Santiam River on the east side.

The City's existing bikeway plan identifies a standard width of 5 feet for bike lanes along arterial and collector streets. The current recommended standards include 6 feet for bike lanes in each direction as they are constructed as part of new facilities.

The TPR (OAR 660-012-0045) requires that on-street bicycle facilities be provided on all new arterials and collectors. Since the current bike system in the City does not currently connect community focal points well, the City should seek to retrofit bike lanes along streets that provide connections to parks, schools, and other public places. Because arterial streets serve higher traffic volumes and truck traffic, it is important that bicycle facilities be carefully designed to adequate standards to avoid conflicts with traffic and unsafe conditions. For

this reason, it is recommended that adding bicycle lanes to existing roadways be focused on collector streets unless an arterial street is required to provide necessary connectivity.

Recommended bicycle system improvements are summarized in Table 6-9 and shown graphically in Figure 4-5.

TABLE 6-9
Recommended Bicycle Lanes

| Roadway | Location | Priority |
|---|---|---|
| 12th Street | Tangent Street to Oak Street | High |
| 12th Street | F Street to Airport Road | High |
| 7th Street | E Street to Oak Street | High |
| 5th Street | Oak Street to Walker Road | High |
| 2nd Street | U.S. 20/Twin Oaks Drive to H Street | High |
| Grove Street | Wheeler Street to Milton Street | High |
| Franklin Street | Milton Street to Russell Drive | High |
| Sherman Street | Main Street to Williams Street | High |
| Vaughn Lane | 10th Street to South Main Road | High |
| Cascade Dr | Hwy 20 to Crowfoot | High |
| Crowfoot | South Main to Cascade Dr. | High |
| Milton Street | 12th Street to Franklin Street | Medium |
| 10th Street | Walker Road to Vaughn Lane | Medium |
| Franklin Street | Grant Street to Milton Street | Medium |
| Park Drive | Milton Street to Mountain River Road/River Street | Medium |
| Oak Street | City limits to Franklin Street | Medium |
| Walker Road | Stoltz Hill Road to 7th Street | Medium |
| Milton Street | Franklin Street to Park Drive | Medium |
| Vaughn Lane | Stoltz Hill Road to 10th Street | Medium |
| Wheeler Street | 2nd Street to Tennessee Road | Medium |

The City is preparing code amendments in the LURA that include provisions for establishing bicycle parking for residential and commercial land use designations. To complement the proposed bicycle system and encourage bicycle use, bicycle parking should be provided at the following activity centers:

- Downtown Lebanon (to serve local businesses, offices, and government buildings)
- Lebanon parks, such as River Park and Jaycee Park
- Lebanon schools, particularly Lebanon Union High School

# Rail Plan

Railroad service will remain important to commerce in the Lebanon area. The City should continue to ensure that a rail system and the train movements along the system are operated in a safe and efficient manner. The system should provide the required rail service while minimizing impacts to other modes. In support of this effort, the City should focus on managing points where the roadway system and rail system intersect. As industrial development opportunities arise in the northwest industrial area, the city should work with developer to identify the best rail alignment to suit the needs of incoming businesses. Any potential rail line should be located to minimize potential impacts to non-industrial uses and the environment.

The number of rail crossings should be kept to a minimum to avoid conflicts that may result in unsafe conditions and vehicle delay. To that end, the City should strive to maintain no net increase in rail crossings and when one is required, opportunities for closure of other existing crossing locations should be explored. In addition the City should work with other rail owners to improve all rail crossings so that they are signed and gated. For example, the city should continue to work with Weyerhaeuser to realign Weirich Road around its facility in order to eliminate rail and truck freight conflicts at Weirich Road and US 20. The City should also continue to work with ODOT Rail Division to close two unprotected railroad crossings near Weirich Road in exchange for one protected crossing at the realigned Weirich Road.

# Air Facilities Plan

The Lebanon State Airport, located within the City of Lebanon, is one of several general aviation airports in the southern Willamette Valley. Several courses of actions should be pursued to maintain the airport's viability and competitiveness with other local airports, such as adopting land use regulations to protect the facility, preparing an airport master plan, and exploring opportunities and funding for physical improvements.

As part of the Transportation Planning Rule Revisions to City of Lebanon's Land Use Regulations, the City has proposed airport overlay zones to encourage compatible development around the airport and to promote aviation safety by prohibiting structures, trees, and other objects from comprising takeoffs and landings at the airport.

An airport master plan could address deficiencies identified by the 1999 Oregon Aviation Plan, such as:

- Inadequate primary runway length/width
- Inadequate runway safety area
- Encroachment into runway object free area
- Encroachment into runway protection zones
- Lack of freight handling facilities

Global positioning system (GPS) instrument approach technology would make the airport more competitive with other municipal airports and would enhance business opportunities.

The construction of a small terminal building with restrooms and an area shielded from the weather would also make the airport a more attractive facility.

## Water and Pipeline Transport Facilities Plans

There are no significant water or pipeline transportation facilities in Lebanon and none are anticipated to be needed in the future.

SECTION 7

# Transportation Funding

This section summarizes the funding and financing required to implement the TSP. It considers federal, state, regional, and local sources that can be directly applied to transportation-related projects and services in the City of Lebanon. In this financing plan, the terms funding and financing are distinguished and defined separately as follows:

- Funding describes any mechanism that generates revenue.
- Financing refers to ways to spread the impact of collecting funds through the issuance of debt obligation to be repaid over time with interest.

This plan contains a review of existing mechanisms that can serve as the basis for identifying additional sources and options for funding and financing.

## Introduction

The Transportation Planning Rule (OAR 660-12-040) requires that a financing plan be included in transportation system plans for cities with populations over 2,500. This financing plan is developed in response to the list of proposed improvement projects presented in this TSP. It also includes an analysis of the ability of existing and potential funding mechanisms to fund the proposed improvements.

The City of Lebanon may need to establish new funding mechanisms to finance its transportation system improvement needs over the next 20 years, both in preservation and new construction. Selection of additional funding mechanisms must consider a number of criteria to ensure that they are appropriate for the City of Lebanon. Evaluation criteria to select additional mechanisms should consider the following:

- Legal authority
- Financial capacity
- Administrative cost
- Equity
- Political acceptability
- Stability

## Existing Transportation Funding

The current Lebanon Capital Improvement Program (CIP) projects $19,139,550 in project costs between the years 2006 to 2010. This translates to an average of slightly more than $3.82 million annually. The 2006–2010 CIP draws funding from six funding sources, each with its own purpose and restrictions. Projected revenues total $13,989,300 versus total planned project cost of $19,139,550.

## Road-Related Funding

Table 7-1 presents road-related revenue accounts and a description of how the funding for each source is intended to be used.

TABLE 7-1
Road-Related Funding Accounts in Lebanon

| Acc. No. | Title | Description |
|---|---|---|
| 550 | State Foot and Bike Path | The City uses this fund for all budgeted projects relating to pedestrian and bikeway improvements. This fund is without revenue due to cuts in the General Fund. |
| 571 | Surface Transportation Program (STP) | The STP operates like a block grant program. The State of Oregon currently offers an exchange program to allow a broad range of uses and releases the city from the administrative burden by exchanging state funds for federal STP funds. The City currently receives approximately $65,000 per year, which is used to help fund the Street Preservation Program.<br><br>It is not clear how ISTEA reauthorization will affect this program. |
| 750 | Special Assessment Funds | This fund is for Local Improvement District administration on projects for which reimbursement is expected. |
| 805 | Grant Street Bridge | This project received funds from an OTIA grant and is restricted to fund the replacement of the Grant Street Bridge. |
| 840 | Street Capital Improvement Fund | This fund receives monies designated for street improvements intended to preserve the existing City street system. |
| 841 | Capital Improvement Projects (Restricted) Fund | This fund receives Linn County timber funds into an interest-bearing account for street improvements. The fund is to be used for improvements exclusively, no engineering or administration expenditures are allowed. |
| 882 | Systems Development Charges Street Improvements | This fund receives development charges paid by new development within the City. The fund may be used for a variety of system capacity projects throughout the City. |
| 920 | Lebanon Urban Renewal District (URD) | This fund receives property tax set-asides from an urban renewal district which includes South Main Road, 2nd Street, Airport Road, and Walker Road. Funding for the projects comes from property tax revenues and a bond sale not to exceed $3.3 million. |
| 924 | Lebanon Urban Renewal District 1999 Construction Bonds | This is an accounting fund used for debt service on bonds issued for improvements in the URD. |

TABLE 7-1
Road-Related Funding Accounts in Lebanon

| Acc. No. | Title | Description |
|---|---|---|
| 925 | Northwest Lebanon Urban Renewal District | Fund provides for development of infrastructure to serve the industrial area located west of Highway 20 and north of Highway 34. |
| 931 | Northwest Lebanon URD 2000 Construction Bonds | This fund provides $5.0 million for construction costs related to projects in the Northwest Lebanon URD. |
| 937 | Cheadle Lake URD | This is an accounting fund used for bonds issued for improvements in the Cheadle Lake URD. |

Source: City of Lebanon 2006-2010 Capital Improvement Program

# Summary of Outlook for Existing Transportation Funding Sources

The Street Capital Improvement Fund should be a relatively stable source of revenue for Lebanon. Because these funds are limited to preservation projects, these funds can only be applied to a subset of projects needed over the next 20 years. Lebanon's share of what eventually replaces the Surface Transportation Program (STP) could increase or decrease depending on how it grows relative to the state average. Nonetheless, Lebanon's share of state funds will probably not increase as fast as its street maintenance requirements, especially as the system expands to serve current and future demands. Table 7-2 summarizes the projected Roads related funding for the 2006-2010 CIP cycle.

As is noted in the CIP, revenue from the Capital Improvement Projects Fund could increase over time. However, restrictions on this fund, which do not allow engineering or administration, will not help the majority of projects that have not been developed beyond a conceptual level.

Revenues from development and impact fees (Fund 750) will remain important sources of revenue for Lebanon, but have not been forecast beyond the Local Improvement District (LID) revenue anticipated for the Airway Road improvement project. Bonds financed by LIDs and fees from a Systems Development Charge (SDC) will be largely dependent on the willingness of property owners to form LIDs and to initiate development projects that trigger SDC fees. Both may be dependent on population growth to increase property values and the general economic outlook. To the extent that these revenues are accurately set to the full cost of transportation improvements, they should allow Lebanon to construct basic capital improvements to serve commercial and residential development.

TABLE 7-2
Projected Road-Related Funding in Lebanon 2006-10

| Acc. No. | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | Total |
|---|---|---|---|---|---|---|
| 550 | 0 | 0 | 0 | 50,000 | 0 | 50,000 |
| 571 | 65,000 | 65,000 | 65,000 | 65,000 | 65,000 | 325,000 |
| 805 | 3,325,000 | 3,325,000 | | | | 6,650,000 |
| 840 | 392,600 | 1,367,600 | 1,784,600 | 325,000 | 392,600 | 4,262,400 |
| 882 | 73,700 | 73,700 | 73,700 | 73,700 | 73,700 | 368,850 |
| 929 | 5,883,300 | | 1,600,000 | | | 7,483,300 |
| | | | | | | 19,139,550 |

Source: City of Lebanon 2006-2010 Capital Improvement Program

The Oregon Transportation Investment Act (OTIA) was passed by the 2001 Oregon Legislative Assembly and is funded through bond proceeds derived from increased Department of Motor Vehicle (DMV) fees. OTIA currently provides $650 million (including $150 million of local matching funds) for 173 construction projects throughout Oregon that will improve pavement conditions, increase lane capacity, and improve bridges. Projects were selected with extensive input from local communities and other stakeholders. In 2002, the Oregon Transportation Commission allocated these funds for modernization, preservation, and bridge projects throughout the state. This signals a willingness by the state government to address transportation needs.

The 2004 federal budget lays the groundwork for a $247 billion, six-year reauthorization proposal, as compared to TEA-21's current level of $218 billion. Of the proposed total, $195 billion would fund the highway program (up from $168 billion) over six years, and $45 billion would fund the transit program (up from $41 billion). Federal funding is typically distributed through the state.

In summary, it is expected that sources of transportation revenue will remain relatively stable. Population growth should help support LID-financed improvements and SDCs assessed to new development will allow the City to put some resources toward future improvements. In addition, population growth may continue to give the City a slightly bigger share of funds available from the state.

# Cost Estimates for Transportation System Improvements

Transportation improvements needed in the City of Lebanon were presented in Section 6. Estimated cost opinions for these improvements to meet system needs over the next 20 years were developed and are presented in Table 7-3. In all, about $75 million dollars of road and transit service improvements for the City of Lebanon have been identified for the next 20 years.

TABLE 7-3
Proposed Transportation Improvements – 2027 Preferred Alternative

| Num. | Project Description | Planning Level Opinion of Cost |
|---|---|---|
| 1 | Extend 12th St btwn Airport Rd and Stoltz Hill Rd | $2,400,000 |
| 2 | Extend Walker Rd to new 12th St extension | $200,000 |
| 3 | Repave and repair 12th St btwn Vine St and Airport Rd | $2,640,000 |
| 4 | Pave 12th St btwn OR 34 and Vine St | $1,600,000 |
| 5 | Russell Drive Area Improvements | $7,400,000 |
| 6 | Extend Crowfoot Rd to Stoltz Hill Rd/Vaughan Ln intersection | $4,800,000 |
| 7 | Airway Road improvements (Widen Between Oak and Airport) | $1,760,000 |
| 8 | Extend Walker Rd westward | $2,280,000 |
| 9 | Extend Airway Rd btwn Airport Rd and new Walker Rd extension | $1,920,000 |
| 10 | Reconstruct Williams St. and Wheeler St between Hwy 20 and Milton St | $4,663,000 |
| 11 | Reconstruct Milton St between US 20 and Williams St, including capacity improvements at US 20 and Milton Street. | $1,500,000 |
| 12 | Extend Airport Rd to Russell Dr | $1,760,000 |
| 13 | Extend Franklin St btwn Russell Dr and Market St extension | $1,880,000 |
| 14 | Extend Market St btwn US 20 and River St | $2,080,000 |
| 15 | Construct Lebanon Parkway | $23,905,000 |
| 16 | Signalize intersection at US 20/ Reeves Pkwy/Cemetery Rd. | $400,000 |
| 17 | Reconfigure intersection at Russell Dr and US 20 for right-in/right-out operation | $400,000 |
| 18 | Reclassify/Realign Stoltz Hill Rd north of Walker Rd | $2,000,000 |
| 19 | Develop signalized intersection at US 20/Crowfoot Rd/Strawberry Fest Site Access Rd | $750,000 |
| 20 | Develop Eastside Connector btwn Mountain River Dr and Oak St | $7,420,000 |
| 21 | Develop Weldwood Drive Realignment | $2,500,000 |
| 22 | Signalize intersection at OR 34 and 5th Street | $250,000 |
| 23 | Signalize intersection and US 20 and Industrial and reconfigure US 20 and Industrial Way intersection to right-in and right-out operations | $500,000 |
| 24 | Signalize intersection at Oak Street and 12th Street | $250,000 |
| 25 | Signalize intersection at Crowfoot Road and 12th Street | $250,000 |
| | | $75,508,000 |

# Financing Needs and Sources for Transportation System Improvements

The projects identified represent an ambitious program of roadway improvements for the City of Lebanon. Constructing these improvements will require a significantly higher level of transportation expenditures than Lebanon has spent in the past. Depending on how the projects are eventually sequenced and staged, the improvements identified may require Lebanon to roughly double the amount (annually) they have planned over the next 6 years.

It is expected that Lebanon will want to pursue additional funding for transportation from the following sources:

- **State or Linn County Funds**—Obtain more projects or funds from the state for improvements to the state highway. Explore cost sharing with the County for mutually beneficial projects.
- **Local Improvement Districts**—For projects that are needed as a result of proposed development, property owners should pay all or a portion of the project cost.
- **Transportation Impact Fees**—For projects that do not tie directly to new development or directly benefit property owners, the cost should be spread and provided from existing transportation funding sources such as TIF fees.
- **General Obligation Bonds**—Backed by property tax revenue where this source is determined by City staff and the governing body to be fair and viable.

The likely funding sources for transportation improvements in Lebanon are presented below. Lebanon should pursue funding sources at the federal, state, and local level and develop strategies to maximize the potential for each of these sources to implement its transportation improvements.

## Federal and State Sources

Lebanon should access federal funds by working with ODOT. A key action will be to get improvement projects listed as part of the State Transportation Improvement Plan (STIP) in order to qualify those projects for funding in the adopted plan every two years. The City of Lebanon should also work with ODOT to determine the potential for project funding under the upcoming highway reauthorization bill.

The state has a number of programs that can be tapped for improvements that address a variety of specific projects including congestion relief, footpaths and bikeways, and other special projects.

## County Sources

Lebanon may be able to secure an occasional cost-sharing arrangement with Linn County and should seek to coordinate with the County on transportation improvements within the county to partner on projects wherever possible.

## Local Sources

Lebanon should continue to seek funds from property owners that directly benefit from transportation improvements that enable new development.

**SECTION 8**

# Implementing Ordinances

This section of the TSP presents recommended changes to the City of Lebanon's land use regulations in order to comply with implementation provisions of the Oregon Transportation Planning Rule (TPR) as codified in OAR 660-012-045. Many of the recommended changes have already been addressed by the City's Transportation Planning Rule Revisions to City of Lebanon's Land Use Regulations, commonly referred as the LURA, which was prepared in June 2001. Table 2-1 of this TSP identifies the sections of LURA which meet requirements of OAR 660-012-045. The following section addresses the changes proposed by the LURA to the City's land use regulations that are specifically required by OAR 660–012-045 and are incomplete pending information from this TSP. This section also proposes changes to address one requirement of the TPR not addressed by the LURA—OAR 660-012-0045(1)(c).

The discussion of recommended changes is generally organized by referencing the applicable section(s) of the TPR that prompt a change in the LURA, followed by the recommended revisions. Revisions are presented with deletions shown ~~strikethrough~~ and additions shown <u>underlined</u>.

## OAR 660-12-0045(1)(c)

> *In the event that a transportation facility, service or improvement is determined to have a significant impact on land use or to concern the application of a comprehensive plan or land use regulation and to be subject to standards that require interpretation or the exercise of factual, policy or legal judgment, the local government shall provide a review and approval process that is consistent with 660-012-0050. To facilitate implementation of the TSP, each local government shall amend its land use regulations to provide for consolidated review of land use decisions required to permit a transportation project.*

To comply with the above TPR requirement, the following additions are proposed to "LURA 6.0: Standards for Transportation Improvements:"

3) If review under this Section indicates that the use or activity is inconsistent with the Transportation System Plan, Comprehensive Plan, Zoning Ordinance, or any combination of the preceding, the procedures for plan and zoning amendments, as applicable, shall be undertaken prior to or in conjunction with the conditional permit review.

## OAR 660-12-0045(3)(b)

> *Provide "safe and convenient" (per subsection 660-012-0045.3(d)) pedestrian and bicycle connections from new subdivisions/multifamily development to neighborhood activity centers; bikeways are required along arterials and major collectors; sidewalks are required along arterials, collectors, and most local streets in urban areas except controlled access roadways.*

The following sections of the LURA, 7.024(a) and 7.025(a) have been revised based on information developed during preparation of the TSP.

## SECTION 7.024 BICYCLE ACCESS AND MANAGEMENT REQUIREMENTS:

**(1) Pedestrian/Bicycle Facility Paving Standards:** Adequate widths for pedestrian/bicycle facilities shall be provided in accordance with the standards summarized below.

**(a) Paving Standards:** Table 7.024 – 1 shows paving and width standards for each classification category.

### Table 7.024 – 1: Pedestrian/Bicycle Facility Paving Width Standards

**~~(All figures are place holders pending completion of TSP.)~~**

| Type of Bikeway/Multi-Use Path | | Paved Area (Width in Feet) | Minimum ROW or Easement (Width in Feet) |
|---|---|---|---|
| Bike Lane | (On-Street)* | 5-6 | NA – In Street ROW |
| Bike Path | (Off-Street) | 5-6 | 10 |
| Multi-Use Path or Two-Way Bike Path | (Off-Street) | 12 | 15 |
| Special High Volume Multi-Use Path or Two-Way Bike Path | (Off-Street) | 15 | 18 |
| Multi-Use Path or Two-Way Bike Path Built for Use by Emergency Vehicles | (Off-Street) | Up to 20 | 20 |

*Notes:*

** Bike lanes provided only where specified in Bicycle Plan.*

- Multi-Use Paths and Bike Paths must be paved.
- The ROW that is not paved should be graveled.
- "Recreational Trails" are not regulated by the standards of this chapter (nor Chapter 14), and as noted in the TPR do not have to be paved. See Parks Master Plan and related documents.

## SECTION 7.025 PEDESTRIAN ACCESS AND MANAGEMENT REQUIREMENTS:

**(a) Paving Width Standards for Pedestrian Facilities (e.g., Pathways, Sidewalks):** The following paving width standards shall apply to all new development and redevelopment. (See LURA Tables 7.024–1, and 8.090–1.)

### Table 7.025 – 1: Pedestrian Facility Paving Width Standards

**~~(All figures are place holders pending completion of TSP.)~~**

| Type of Pedestrian Facility | Minimum Paved Area (Width in Feet) | | |
|---|---|---|---|
| | Local Streets | Collectors | Arterials |
| Sidewalk – retrofit on existing street | 5 | 5 | 5 |
| Curbside Sidewalk - reconstruction on existing street, or new development | 5 | 5 | 6 |
| Setback Sidewalk – reconstruction on existing street, or new development | 5 | 5 | 6 |
| Sidewalk on bridge | 5 | 5 | 6 |
| Sidewalk in Pedestrian District or STA | 8-10 | 8-10 | 8-10 |
| Multi-Use Path | 12 | 12 | 12 |

# OAR 660-12-0045(7)

*Local governments shall establish standards for local streets and accessways that minimize pavement width and total ROW consistent with the operational needs of the facility.*

Section 8.02 of the LURA has been revised based on information developed during preparation of the TSP.

**8.02 THE DESIGN STANDARDS FOR IMPROVEMENTS -- STREETS, ALLEYS, AND PATHWAYS**

**(6) Minimum Rights-of-Way and Street Sections:** Street rights-of-way and improvements shall be the widths in **Tables 8.02-1, 8.02-2, and 8.02-3**. Standards for expressways will be established when such roadways are located in the City of Lebanon. A variance shall be required in conformance with Subsection "2" above to vary the standards in **Tables 8.02-1, 8.02-2, 8.02-2, and 8.02-4**. The factors that determine the width of a street shall include the following factors:

**(a)** Street classification in the *Transportation System Plan* and *Comprehensive Plan;*

(b) Anticipated traffic generation;

(c) On-street parking needs;

(d) Sidewalk and bikeway requirements based on anticipated level of use;

(e) Requirements for placement of utilities;

(f) Street lighting;

(g) Minimize drainage, slope, and sensitive lands impacts, as identified by [Section # - TBD and the Comprehensive Plan];

(h) Street tree location, as provided for in Section # - TBD;

(i) Protection of significant vegetation, as provided for in Section # - TBD;

(j) Safety and comfort for motorists, bicyclists, and pedestrians;

(k) Street furnishings (e.g., benches, lighting, bus shelters, etc.), when provided;

(l) Access needs for emergency vehicles; and

(m) Transition between different street widths (i.e., existing streets and new streets), as applicable.

Table 8.02-1: City of Lebanon Right-of-Way and Street Design Standards

These cells are blank pending completion of TSP.

| CLASSIFICATION | AVE. DAILY TRIPS (ADT) | RIGHT OF WAY WIDTH | CURB-TO-CURB PAVEMENT WIDTH | WITHIN CURB-TO-CURB AREA | | | | CURB on both sides | PLANT-ING STRIP On both sides | SIDE-WALKS On both sides |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MOTOR VEHICLE TRAVEL LANES | MEDIAN AND/OR CENTER TURN LANE | BIKE LANE On both sides | ON-STREET PARK-ING | | | |
| **ARTERIAL STREETS**<br>**Boulevards:**<br>2-Lane Boulevard<br>3-Lane Boulevard<br>5-Lane Boulevard<br>**Avenues:**<br>2-Lane Avenue<br>3-Lane Avenue | | | | | | | | | | |
| **COLLECTOR STREETS**<br>**Residential:**<br>No Parking<br>Parking One Side<br>Parking Both Sides<br>**Commercial**<br>Parallel Parking One Side<br>Parallel Parking Both Sides<br>Diagonal Parking One Side<br>Diagonal Parking Both Sides | | | | | | | | | | |
| **LOCAL RESIDENTIAL STREETS** [4]<br>Parking One Side<br>Parking Both Sides | | | | | | | | | | |
| **ALLEYS** | | | | | | | | | | |
| **ACCESSWAYS & MULTI-USE PATHS** | | | | | | | | | | |
| NOTES: | | | | | | | | | | |

The contents of his table will need to be illustrated with appropriate drawings.

Table 8.02-1: Typical Arterial Street Design Standard Criteria

| Design Criterion | Value |
|---|---|
| ROW (ft) | 75 to 105 |
| Lane Width (ft) | 14/12/14/12/14 for 105' ROW for major arterial; 12/14/12 for 75' ROW for minor arterial |
| Shoulder/Parking (ft) | None |
| Roadway Width (ft) | 78 for 5-lane configuration; 50' for 3-lane configuration |
| Design Speed (mph) | 40 |
| Maximum Grade (%) | 6 |
| Minimum Centerline Radius (ft) | 500 |
| Design Volume (ADT) | 18,000 |
| Bike Lane (ft) | 6 feet |
| Sidewalk (ft) | 6 feet |
| Planter (includes 6-inch curb) | 5.5 feet (minimum) |
| Curb and Gutter Required (inches) | 30 |
| Minimum Intersection Curb Radius (ft) | 35 (A) |

Notes:

- A. Forty-five foot radius may be required if there is a significant amount of truck traffic.
- Bike lanes provided where specified in Bicycle Plan, or as part of new construction.
- Standards developed specifically for neighborhood subareas may supersede these standards.

**Figure 8.02-1: Typical Arterial Street**

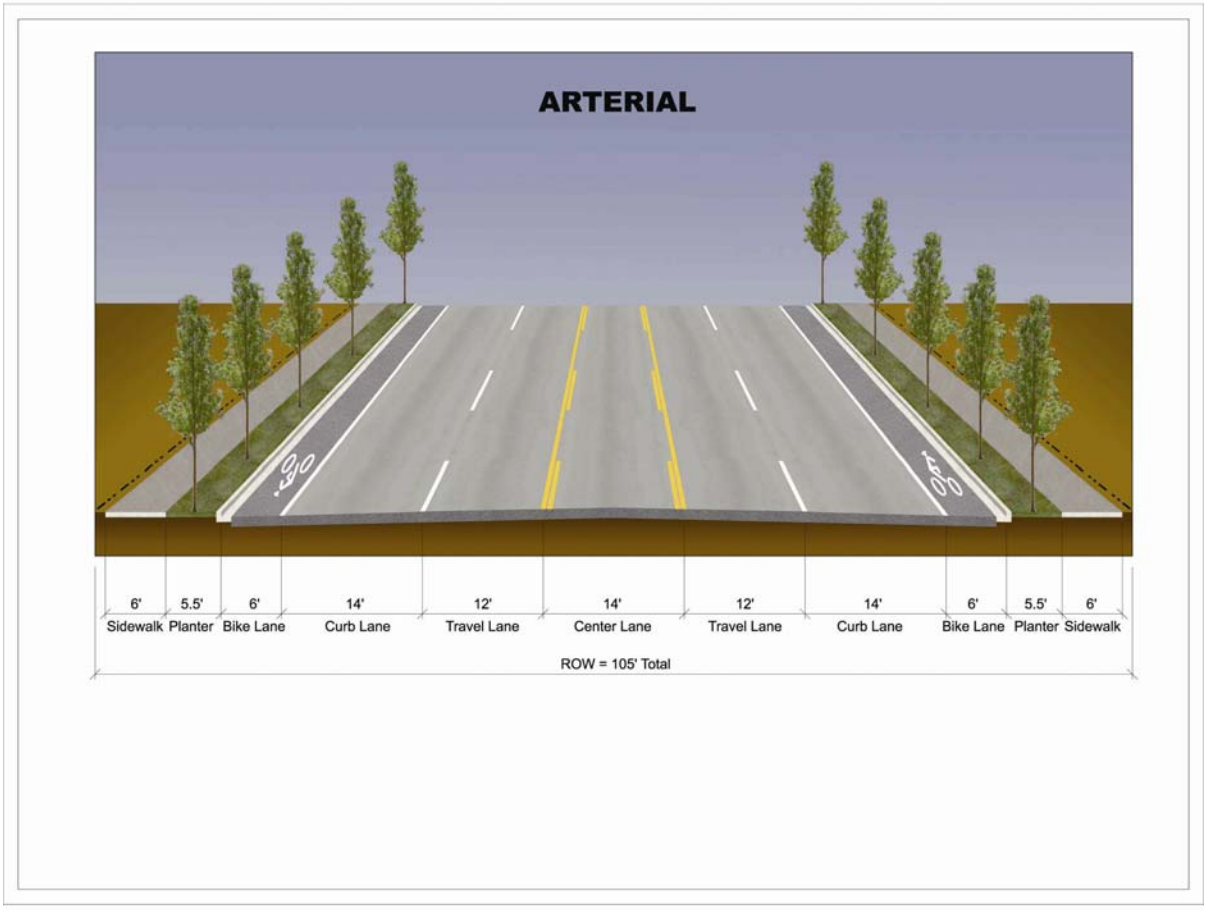


Table 8.02-2: Typical Parkway Arterial Street Design Standard Criteria

| Design Criterion | Value |
|---|---|
| ROW (ft) | 130 |
| Lane Width (ft) | 12/12.5/15/12.5/12 |
| Shoulder/Parking (ft) | 8 ft. shoulder with no parking allowed |
| Roadway Width (ft) | 64 |
| Design Speed (mph) | 45 |
| Maximum Grade (%) | 5 |
| Minimum Centerline Radius (ft) | 1,200 |
| Design Volume (ADT) | 40,000 |
| Minimum Driveway Spacing (ft) | N/A |
| Sidewalk/Multi-use Path (ft) | Multi-use Path: 12 ft generally located on side of roadway towards the City Center<br>Sidewalk: 6 ft sidewalk should be constructed on opposite side of the roadway where there is no other alternative for pedestrian traffic. |
| Ditch | Variable depending on drainage requirement |
| Planter (includes 6-inch curb) | 5 feet (minimum) |
| Minimum Intersection Curb Radius (ft) | 45 |

Figure 8.02-2: Typical Parkway Arterial Street

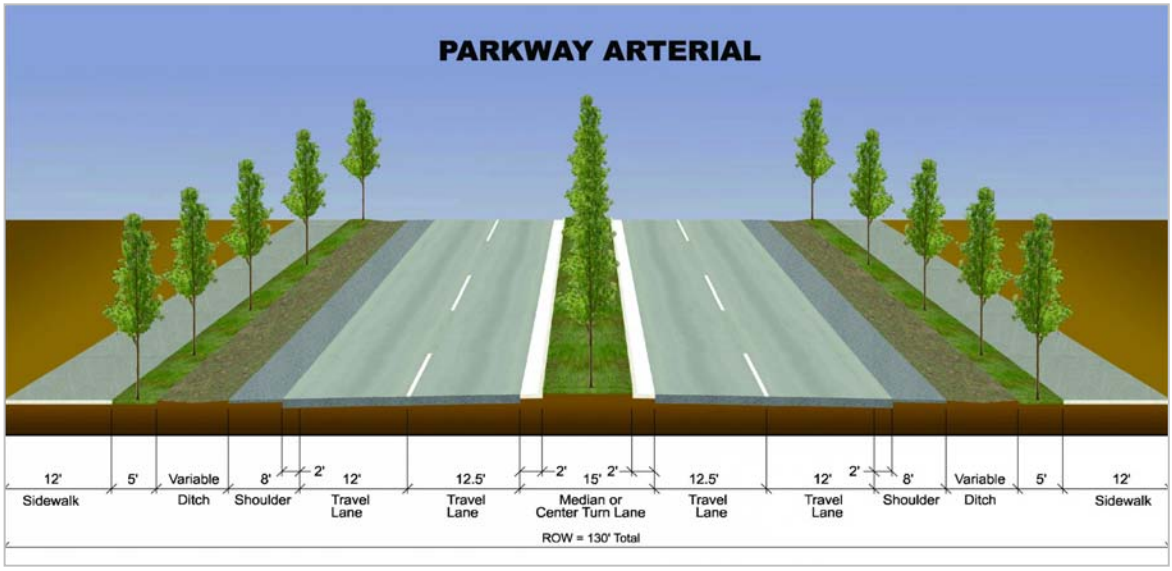


Table 8.02-3: Typical Collector Street Design Standard Criteria

| Design Criterion | Value |
|---|---|
| Minimum ROW (ft) | 60 |
| Lane Width (ft) | 12/12 for 60' ROW; 12/14/12 for 75' ROW |
| Shoulder/Parking (ft) | 8 ft. for parking permitted in residential neighborhood areas(a) |
| Roadway Width (ft) | 34' for 2-lane configuration; 48' for 3-lane configuration |
| Design Speed (mph) | 35 |
| Maximum Grade (%) | 10 |
| Minimum Centerline Radius (ft) | 300 |
| Design Volume (ADT) | 14,000 |
| Bike Lane (ft) | 5 feet |
| Sidewalk (ft) | 5 feet |
| Planter (includes 6 inch curb) | 5.5 feet (minimum) |
| Curb and Gutter Required (inches) | 30 |
| Minimum Intersection Curb Radius (ft) | 20 (b) |

Notes:

- a.On-Street parking may be permitted in residential neighborhoods
- b. Forty-five foot radius may be required if there is a significant amount of truck traffic.5 ft Bicycle lanes provided in each direction.
- 14ft center lane in industrial or commercial areas.
- No parking unless insufficient off-street.
- Standards developed specifically for neighborhood subareas may supersede these standards.

*Figure 8.02-3: Typical Collector Street Design*

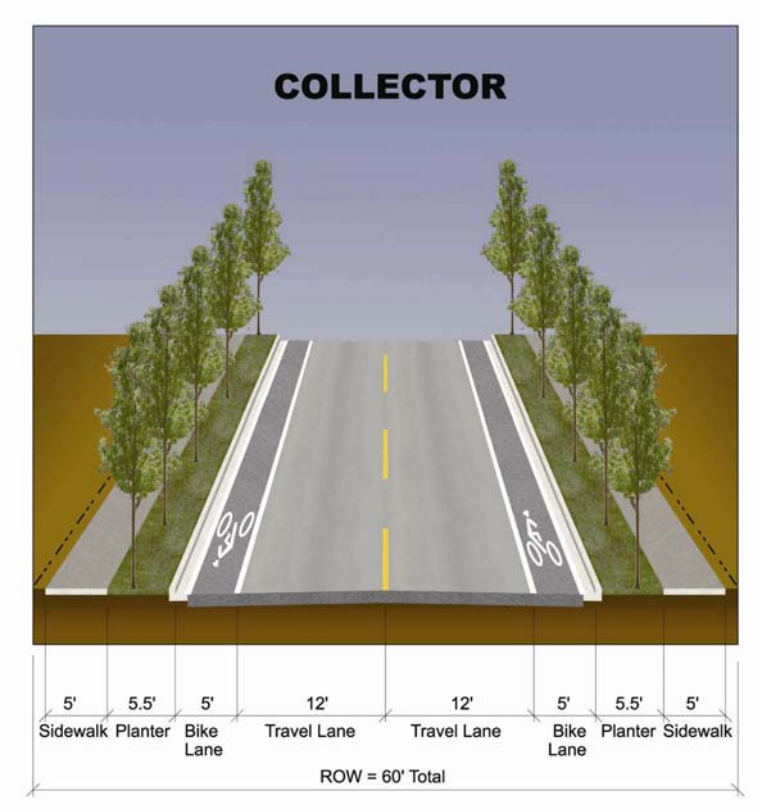


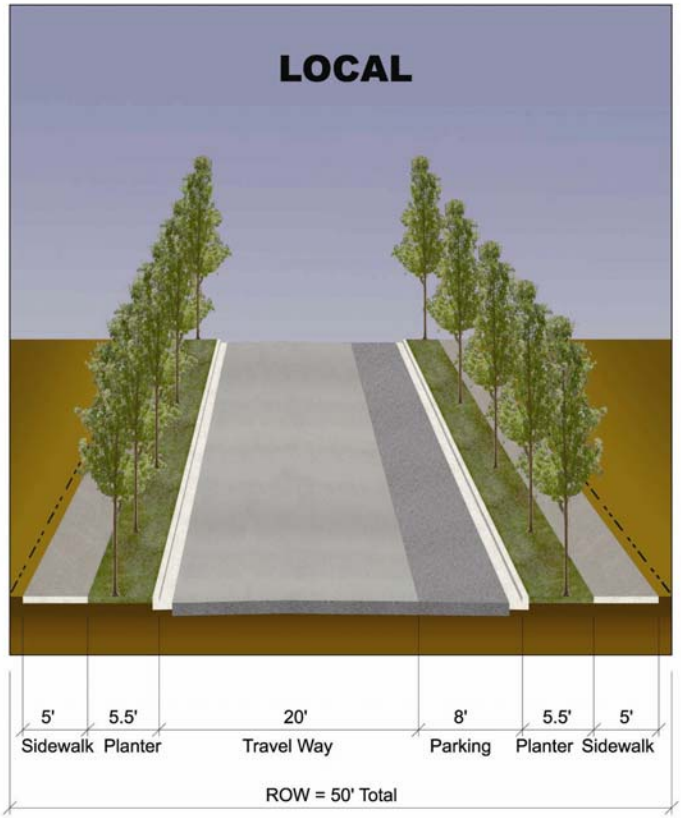
Table 8.02-4: Typical Local Street Design Standard Criteria

| Design Criterion | Value |
|---|---|
| Minimum ROW (ft) | 50 for parking on one side; 56' for parking on both sides |
| Lane Width (ft) | 20 |
| Shoulder/Parking (ft) | 8 |
| Roadway Width (ft) | 28' for parking on one side; 34' for parking on both sides |
| Design Speed (mph) | 25 |
| Maximum Grade (%) | 15 |
| Minimum Centerline Radius (ft) | 100 |
| Design Volume (ADT) | 3,000 |
| Sidewalk (ft) | 5 feet |
| Planter (includes 6-inch curb) | 5.5 feet (minimum) |
| Curb and Gutter Required (inches) | 30 |
| Minimum Intersection Curb Radius (ft) | 20 |

Notes:

- Exceptions may be granted when connecting to existing substandard local street improvements.
- 5-foot bike lanes provided where specified in Bicycle Plan, otherwise bicycles share travelway
- Standards developed specifically for neighborhood subareas may supersede these standards

*Figure 8.02-4: Typical Local Street Design*



**APPENDIX A**

# Detailed Level of Service Description

The quality of traffic intersection operations is expressed in terms of Level of Service (LOS). LOS is defined using different methods depending on whether the subject of traffic operations is a roadway segment or an intersection. Traffic operations for intersections (both signalized and unsignalized) is calculated based on average vehicle delay and expressed in terms of LOS grade ranging from "A" to "F." "A" represents the least congestion and delay, and "F" represents the highest level of congestion. The methods for calculating delay differ between signalized and unsignalized conditions. Stopped time for a signalized intersection refers to the time spent waiting until a green light is given. For unsignalized intersection, stopped time refers to the amount of time stopped waiting for an acceptable gap in traffic (or their "turn" for right-of-way) that allows the driver to enter the intersection. These methods are described in the Highway Capacity Manual (HCM), published by the Transportation Research Board. Levels of service grades are described in Table A-1, below.

TABLE A-1
Level of Service Descriptions

| Level of Service | Traffic Flow Characteristics |
|---|---|
| A | Level of service A describes operations with very low delay, i.e., less than or equal to 10.0 seconds per vehicle for both signalized or unsignalized intersections. For signalized intersections, most vehicles arrive during a green phase and do not stop at all. For unsignalized intersections, most vehicles find a gap in traffic to turn into or cross the intersection immediately after stopping. |
| B | Level of service B describes operations with delay in the range of 10.1 to 20 seconds per vehicle for signalized intersections or a range of 10.1 to 15 seconds for unsignalized intersections. More vehicles stop and wait for either a green light or a gap in traffic than for LOS A, causing higher levels of average delay. |
| C | Level of service C describes operations with delay in the range of 20.1 to 35.0 seconds per vehicle in signalized situations and 15.1 to 25 in unsignalized . For signalized intersections, the number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping. At unsignalized intersections, stopped vehicles must wait longer for sufficient gaps in traffic. |
| D | Level of service D describes operations with delay in the range of 35.1 to 55.0 seconds per vehicle for signalized intersections and 25.1 to 35 seconds for unsignalized. At level D, the influence of congestion becomes more noticeable. Many vehicles stop, and the proportion of vehicles not stopping declines. Unsignalized intersection stopped time continues to increase. |

TABLE A-1
Level of Service Descriptions

| Level of Service | Traffic Flow Characteristics |
|---|---|
| E | Level of service E describes operations with delay in the range of 55.1 to 80.0 seconds per vehicle for signalized intersections and 35.1 to 50 seconds for unsignalized intersections. This is considered to be the limit of acceptable delay. |
| F | Level of service F describes operations with delay in excess of 80.0 seconds per vehicle or 50 seconds per vehicle for signalized and unsignalized intersections respectively. This is considered to be unacceptable to most drivers. |

Source: Transportation Research Board, *Highway Capacity Manual*, 2000

**APPENDIX B**

# Pedestrian System Gaps - 2003

TABLE B-1
**2003** Pedestrian System Gaps[a]

| Street Section | Gaps in Sidewalk Coverage | Street Section | Gaps in Sidewalk Coverage |
|---|---|---|---|
| • **2nd Street/South Main Road** | | • **River Drive** | |
| – "H" Street to "J" Street | Both Sides | – Franklin Street to Russell Drive | Both Sides |
| – Vaughn Lane to Crowfoot Road | Both Sides | – Russell Drive to Moss Street | Both Sides |
| – Crowfoot Road to Southern UGB | Both Sides | – Moss Street to Urban Growth Boundary | Both Sides |
| • **Berlin Road** | | • **Tennessee Road** | |
| – Brewster Road to UGB | Both Sides | – Northern UGB to Wheeler Street | Both Sides |
| • **Grant Street/Brewster Road** | | • **US 20 (Main Street)** | |
| – River Park[b] and Santiam River Bridge | South | – Gore Drive to Industrial Way | Both Sides |
| – East side of Santiam River Bridge to East City Limits | Both Sides | – Industrial Way to Highway 34 | West |
| | | – Market Street to Sodaville Road | Both Sides |
| • **Highway 34 (Tangent Street)** | | • **Walker Road** | |
| – Western UGB to Burkhart Creek | Both Sides | – Stoltz Hill Road to 7th Street | North |
| – Burhart Creek to 12th Street | North | | |
| • **Oak Street** | | • **Wheeler Street** | |
| – Western UGB to Guard Armory | Both Sides | – Williams Street to Hiatt Street | South |
| – Guard Armory to Airway Road | North | – Hiatt Street to Tennessee Road | Both Sides |
| • **5th Street** | | • **Central Avenue** | |
| – Reeves Parkway to Mary Street | East | – Crowfoot Road to Oregon Street | Both Sides |
| – Vaughn Lane to Southern UGB | Both Sides | – Oregon Street to Rock Hill Drive | Both Sides |

TABLE B-1
**2003** Pedestrian System Gaps[a]

| Street Section | Gaps in Sidewalk Coverage | Street Section | Gaps in Sidewalk Coverage |
|---|---|---|---|
| • **7th Street**[c] | | • **Crowfoot Road** | |
| – Ash Street to Grant Street | Both Sides | – South Main Road to US 20 | Both Sides |
| – "E" Street to Airport Road | West | | |
| – Airport Road to Walker Road | West | | |
| • **10th Street** | | • **Cascade Drive** | |
| – Highway 34 to Academy Street | Both Sides | – US 20 to Eastern UGB | Both Sides |
| – Academy Street to Ash Street | West | | |
| – Mazama Avenue to Vaughn Lane | West | | |
| • **12th Street** | | | |
| – Highway 34 to Vine Street | Both Sides | | |
| – "D" Street to "F" Street | West | | |
| – "F" Street to Airport Road | Both Sides | | |
| • **Airway Road** | | • **Hansard Avenue** | |
| – Oak Street to south of Airport Road | Both Sides | – Reeves Parkway to Highway 34 | Both Sides |
| • **Gore Drive** | | • **Russell Drive** | |
| – Western UGB to Highway 20 | Both Sides | – US 20 to River Street | None |
| • **Weirich Drive** | | • **Sherman Street** | |
| – US 20 to Urban Growth Boundary | Both Sides | – 10th Street to 8th Street | South |

[a] As shown on Figure 3-7, other small street segments lack sidewalks.

[b] Pedestrian access on the north side of Grant Street along River Park is provided by a multi-use path.

[c] Pedestrian access on the east side of 7th Street from "E" Street to Walker Road is provided by a multi-use path.

**APPENDIX C**

# Transportation Model Update Summary

## CITY OF LEBANON

## MEMORANDUM

**TO:** John deTar, Sam Ayash, Steve Perone **DATE:** 11/21/2005

**FROM:** Rob Emmons

**CC:** Jim Ruef, Doug Parker, Malcolm Bowie, Darrin Lane

**SUBJECT:** TSP ~ 2025 Transportation Model Update Summary

Background:

The City of Lebanon originally undertook the process to complete a Transportation System Plan (TSP) in 1999. Oregon Department of Transportation (ODOT) together with Hann Lee and Associates created an EMME 2 Transportation Model as part of this original work effort. The model had a base year of 2000 and a 20 year planning horizon resulting in a future year of 2020. The original TSP work effort was not completed and was temporarily put on hold.

Work resumed on the TSP in 2002 with the technical and financial assistance of ODOT. This work effort consisted of completing the TSP which was partially completed by the original consultant Hann Lee and Associates. The scope of this work did not include updating the EMME 2 Transportation Model; rather it focused on wrapping up the technical work previously started and completing the recommended alternatives analysis. During the public hearing process, issues were raised as to the feasibility and/or legality of the recommended preferred alternative. (Reeve's Parkway traversing outside of Lebanon's Urban Growth Boundary.) Hence, the TSP was not adopted by the City of Lebanon.

In 2005 work resumed on the TSP with the continued assistance and funding of ODOT. The scope of work included, among other things, updating the EMME 2 Transportation Model

to future year 2025 allowing the evaluation of various alternatives to mitigate future transportation system demands.

Model Update:

The scope of work in the current contract (2005) calls for using historic growth rates to extrapolate the EMME 2 2020 land use data to represent a 2025 planning horizon. This process was completed and compared to the 2004 Lebanon Comprehensive Plan. It was discovered that the Comp Plan used the ES-202 employment data which encompasses the entire Lebanon 97355 zip code which extends well beyond the Lebanon UGB. The TSP transportation analysis zones (TAZ) were created to analyze employment, population, and land use only within the Lebanon UGB. Hence, there is a difference in perspective between the TSP and the Comp Plan in what constitutes an impact to the Lebanon transportation system.

During the Technical Review Committee (TRC) meeting held on August 18, 2005, it was decided 1) that the EMME 2 Transportation Model future year 2020 would be updated to match Lebanon's Comp Plan future year 2025 for employment and total households, and 2) that the EMME 2 base year 2000 would not be adjusted.

The following table presents totals used for the EMME 2 model for 2000, 2020, the extrapolated totals for 2025 and the 2025 Comp Plan totals.

TABLE 1
Summary of TAZ Land Use Totals

| Year | Population | Households | Employment |
|---|---|---|---|
| 2000 | 17,076 | 6,830 | 4,817 |
| 2020 | 22,994 | 9,118 | 6,772 |
| 2025 | 25,982 | 10,269 | 7,640 |
| 2025 Comprehensive Plan | 24,173 | 10,002 | 8,874* |

* 80% of Comprehensive Plan Total based on ODOT covered employment geocode estimate.

Employment:
ODOT, for comparison with the EMME 2 Transportation Model, geo-coded the ES-202 employment data used by the Lebanon 2004 Comp Plan. It was discovered that approximately 80% of the jobs within the 97355 zip code (4976 of the 6258 jobs) fall within the Lebanon UGB.

According to the Lebanon Comp Plan, the 2025 total employment is estimated at 11,093 jobs within the 97355 zip code. Assuming the rate of employment growth between the Lebanon

97355 zip code and the Lebanon UGB remains similar to the relationship determined by the ODOT geo-code results (80%), the employment in the UGB is approximately 8,875 (11,093 x 0.8) jobs.

CH2M HILL updated the employment totals by calculating adjustment factors between the 2020 TAZ totals and the 2025 Comprehensive Plan totals. The factors were calculated by dividing the 2025 Comprehensive Plan total by the 2020 model total. The adjustment factors take into account socio-economic market segmentation utilized by the travel demand model. The factors were then applied to the individual 2020 TAZ totals.

The employment categories used in the Lebanon 2004 Comprehensive Plan are similar but not identical to the categories used in the EMME 2 2020 model. Table 2 displays categories for the Comprehensive Plan, corresponding TAZ totals and the calculated adjustment factors for the employment categories.

After applying the adjustment factors, the individual TAZ allocations were reviewed by City staff and manual adjustments were made to reflect more recent information and local expertise on development. The adjustments made by City staff did not result in a net increase or decrease to each employment category. *For a list of changes, please see attachment A*.

**TABLE 2 – EMPLOYMENT COMPARISON**

| **LEBANON COMP. PLAN** | **COMMERCIAL** | **OFFICE** | **INDUSTRIAL** | **PUBLIC** | **TOTALS** |
|---|---|---|---|---|---|
| **MODEL CATEGORY** | **RETAIL** | **SERVICE** | **INDUSTRIAL, AGRICULTURE, OTHER** | **EDUCATION, GOVERNMENT** | **ALL** |
| | | | | | |
| 2025 COMP. TOTAL | 2,172 | 3,119 | 4,496 | 1,306 | 11,093 |
| 2025 COMP. W/I UGB | 1,738 | 2,495 | 3,597 | 1,045 | 8,874 |
| | | | | | |
| 2020 MODEL UGB | 1,808 | 2,077 | 2,107 | 780 | 6,772 |
| ***ADJUSTMENT FACTOR*** | ***0.96*** | ***1.2013*** | ***1.7071*** | ***1.3397*** | - |
| 2025 MODEL UGB | 1,739 | 2,495 | 3,597 | 1,045 | 8,876 |

Households:
The housing adjustments factors were calculated in similar fashion to employment adjustment factors. Adjustment factors were calculated for single and multi-family households inside and outside of the City limits. Table 3 presents a comparison of

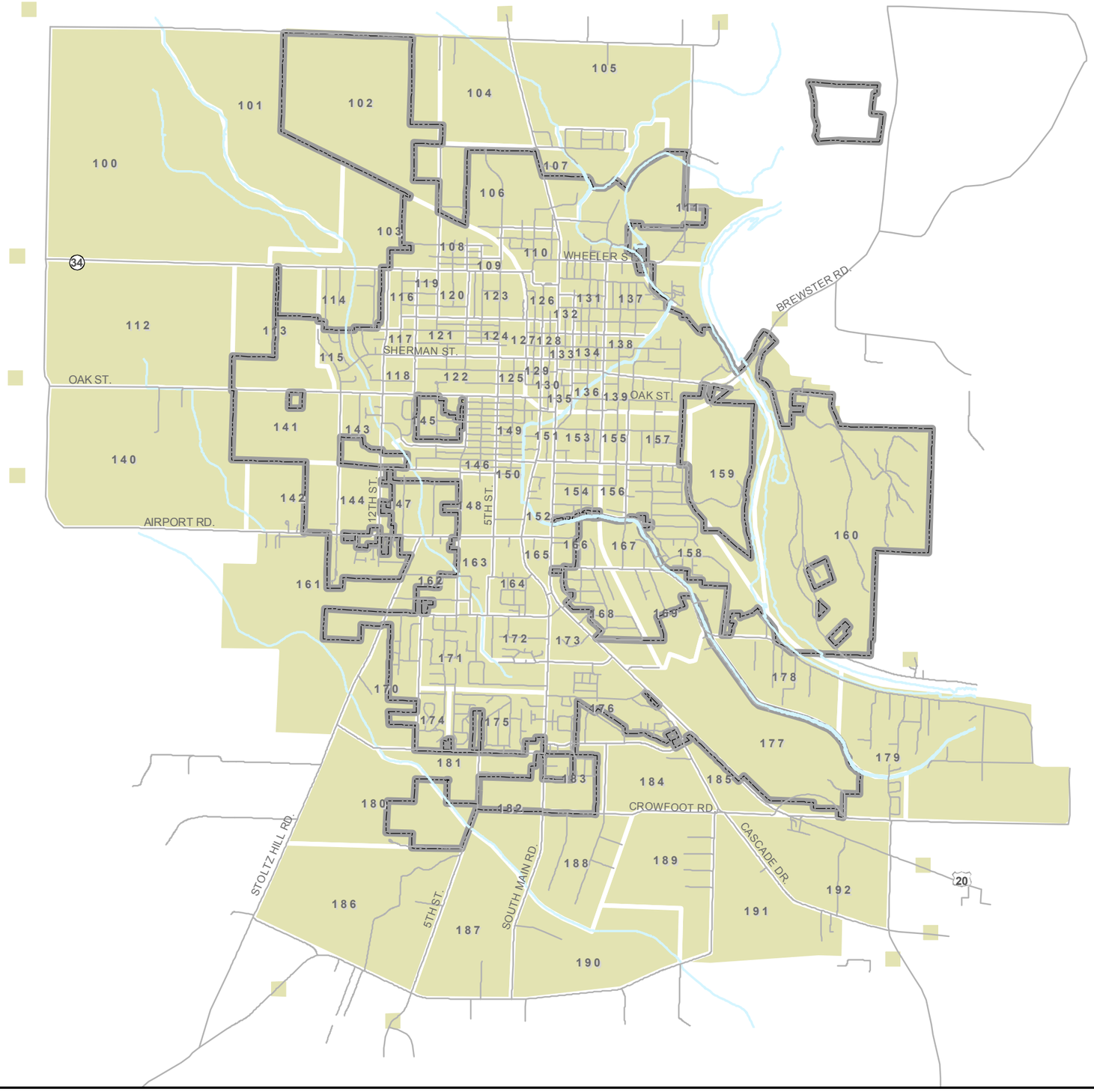
population and households for the Comprehensive Plan and the TAZ system and the associated adjustment factors applied to the 2020 forecast.

After applying the adjustment factors to the 2020 TAZ totals, the 2025 totals matched the Lebanon Comp Plan totals for total households inside and outside the City limits. However, much of the large vacant/developable land within the UGB is not currently within the City limits. The City expects annexations over the planning period to accommodate growth. This initial allocation overstated the amount of growth expected within the current city limits. City staff reviewed the initial 2025 TAZ allocations and made manual adjustments to finalize the forecast. The final 2025 TAZ totals are summarized at the end of Table 3. *A detailed summary of changes made to each individual TAZ is summarized in attached B.*

**Table 3 – Population and Household Comparison**

| | | Population | Total Dwelling Units | Multi-Family | Single-Family |
|---|---|---|---|---|---|
| **Lebanon Comp. Plan** | | | | | |
| 2000 | City ** | 12,950 | 5,466 | 1,169 | 4,297 |
| | UGA *** | 3,046 | 1,324 | 23 | 1,301 |
| | Total | 15,996 | 7,097 | 1,192 | 5,905 |
| | | | | | |
| Growth | City | 6,647 | 2,588 | 897 | 1,691 |
| | UGA | 1,530 | 624 | 11 | 614 |
| | | | | | |
| 2025 | City | 19,597 | 8,054 | 2,066 | 5,988 |
| | UGA | 4,576 | 1,948 | 34 | 1,915 |
| | Total | 24,173 | 10,002 | 2,100 | 7,903 |
| | | | | | |
| **TAZ**** | | | | | |
| 2020 | Inside City | 15,918 | 6,504 | 1,771 | 4,733 |
| | Outside City | 7,076 | 2,614 | 431 | 2,183 |
| | Total | 22,994 | 9,118 | 2,202 | 6,916 |
| | | | | | |
| ***Adjustment Factors*** | ***Inside City*** | **-** | **-** | ***1.1666*** | ***1.2652*** |
| | ***Outside City*** | **-** | **-** | ***0.0789*** | ***0.8772*** |
| | | | | | |
| 2025 | Inside City | 17,417 | 7,262 | 1,712 | 5,550 |
| | Outside City | 7,142 | 2,741 | 388 | 2,353 |
| | Total | 24,560 | 10,003 | 2,100 | 7,903 |

** Dwelling units estimated as 2003 dwelling units less building permits for years 2001-2003
*** Population is year 2000 and dwelling units are year 2003.
**** Comparisons on inside and outside city are approximates only because there is not a one to one relationship between the TAZ and City Boundary




TAZ Boundary

City Limits

0 0.25 0.5 Miles

CH2MHILL

**Lebanon TSP: TAZ and City Boundary**

# Attachment A

## Lebanon 2025 Employment

| Factors: | Commercial (R | 0.96106 | Office (Service) | 1.2013 |
|---|---|---|---|---|
| | Public (Ed, Gov | 1.3397 | Industrial (Ind, Ag, O | 1.7071 |

| Within City Boundary? | Totals | 10003 | 4850 | 0 | 131 | 809 | 236 | 2265 | 1200 | 1739 | 2495 | 7137 | 8876 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TAZ | Total_HH | K-12 | COLLEGE | Agri | Edu | Gov | Industrial | Other_Emp | Retail | Service | Non-Retail | Total Emp | Notes |
| no | 100 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| no | 101 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| yes | 102 | 11 | 0 | 0 | 0 | 0 | 0 | 643 | 139 | 5 | 12 | 793 | 798 | Added 600 Industrial and 130 other jobs to account for Lowe's and related development |
| no | 103 | 50 | 0 | 0 | 0 | 0 | 0 | 638 | 60 | 24 | 12 | 711 | 735 | Removed 30 Other jobs. Entek has developed most of the land into Industrial jobs. |
| no | 104 | 178 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 5 | 7 | 29 | 34 | |
| no | 105 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 8 | 0 | 2 | 9 | |
| yes | 106 | 70 | 500 | 0 | 0 | 78 | 13 | 85 | 26 | 57 | 117 | 319 | 375 | |
| no | 107 | 17 | 0 | 0 | 0 | 47 | 0 | 0 | 26 | 0 | 657 | 730 | 730 | Added 47 Education jobs to account for LBCC. Removed 80 Industrial jobs - only 2 small tax lots are zone for industrial development within TAZ |
| yes | 108 | 78 | 0 | 0 | 0 | 0 | 0 | 57 | 0 | 0 | 0 | 57 | 57 | Removed 250 Industrial jobs. Only about 6 acres available industrial land which is unlikely to support an addition 250 jobs. |
| yes | 109 | 48 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 4 | 12 | 12 | |
| yes | 110 | 99 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 12 | 64 | 72 | 85 | |
| yes | 111 | 95 | 0 | 0 | 19 | 0 | 13 | 80 | 29 | 12 | 16 | 157 | 168 | TAZ is located within an industrial park which will experience growth - added 80 Industrial jobs. |
| no | 112 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 20 | 20 | |
| yes | 113 | 4 | 0 | 0 | 0 | 0 | 0 | 128 | 0 | 5 | 0 | 128 | 133 | |
| no | 114 | 48 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 12 | 12 | 22 | |
| yes | 115 | 200 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 4 | |
| yes | 116 | 66 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 8 | 24 | 24 | |
| yes | 117 | 92 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| yes | 118 | 24 | 500 | 0 | 0 | 88 | 0 | 0 | 0 | 0 | 0 | 88 | 88 | |
| yes | 119 | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 5 | |
| yes | 120 | 141 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111 | 111 | 111 | |
| yes | 121 | 130 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 3 | 3 | |
| yes | 122 | 304 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 90 | 99 | 99 | |
| yes | 123 | 121 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 2 | 26 | 30 | 32 | |
| yes | 124 | 104 | 450 | 0 | 0 | 100 | 5 | 80 | 0 | 0 | 8 | 194 | 194 | Removed 47 Education jobs. TAZ contains LCSD district office and only expected to support approx. 100 education jobs |
| yes | 125 | 39 | 0 | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 28 | 28 | |
| yes | 126 | 101 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 19 | 19 | |
| yes | 127 | 16 | 0 | 0 | 0 | 0 | 8 | 0 | 5 | 0 | 23 | 36 | 36 | |
| yes | 128 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 31 | 114 | 140 | 170 | |
| yes | 129 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 12 | 12 | 20 | |
| yes | 130 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 82 | 38 | 62 | 144 | |
| yes | 131 | 151 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 74 | 74 | 84 | |
| yes | 132 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 36 | 20 | 29 | 65 | |
| yes | 133 | 3 | 0 | 0 | 0 | 0 | 0 | 14 | 7 | 58 | 88 | 108 | 166 | |
| yes | 134 | 60 | 0 | 0 | 0 | 0 | 5 | 0 | 19 | 15 | 29 | 53 | 68 | |
| yes | 135 | 7 | 0 | 0 | 0 | 0 | 92 | 12 | 15 | 32 | 68 | 188 | 220 | |
| yes | 136 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 20 | |
| yes | 137 | 176 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 2 | 0 | 12 | 14 | |
| yes | 138 | 327 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 5 | 2 | 11 | 16 | |
| yes | 139 | 133 | 0 | 0 | 0 | 0 | 0 | 56 | 19 | 0 | 4 | 79 | 79 | TAZ contains only a small amount of industrial land. Removed 100 Other jobs to show a total of 79 which is more appropriate. |
| no | 140 | 14 | 0 | 0 | 17 | 0 | 0 | 0 | 5 | 0 | 0 | 22 | 22 | |
| yes | 141 | 0 | 0 | 0 | 0 | 0 | 0 | 85 | 24 | 0 | 0 | 109 | 109 | |
| no | 142 | 2 | 0 | 0 | 0 | 0 | 0 | 85 | 65 | 26 | 6 | 156 | 182 | |
| yes | 143 | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 34 | 0 | 12 | 46 | 46 | |
| yes | 144 | 23 | 0 | 0 | 0 | 0 | 0 | 43 | 94 | 0 | 36 | 173 | 173 | |
| no | 145 | 130 | 0 | 0 | 0 | 0 | 50 | 0 | 2 | 0 | 53 | 104 | 104 | |
| yes | 146 | 210 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | |
| no | 147 | 155 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 7 | 7 | |
| yes | 148 | 6 | 1700 | 0 | 0 | 208 | 7 | 3 | 0 | 0 | 1 | 219 | 219 | |
| yes | 149 | 117 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 36 | 36 | |
| yes | 150 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| yes | 151 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 10 | 10 | 26 | |
| yes | 152 | 76 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 166 | 62 | 80 | 246 | |
| yes | 153 | 78 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 26 | 52 | 60 | 86 | |
| yes | 154 | 175 | 0 | 0 | 0 | 0 | 0 | 0 | 101 | 61 | 43 | 144 | 205 | |
| yes | 155 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

| Within City Boundary? | Totals / TAZ | 10003 / Total_HH | 4850 / K-12 | 0 / COLLEGE | 131 / Agri | 809 / Edu | 236 / Gov | 2265 / Industrial | 1200 / Other_Emp | 1739 / Retail | 2495 / Service | 7137 / Non-Retail | 8876 / Total Emp | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| yes | 156 | 75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| yes | 157 | 136 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| yes | 158 | 640 | 500 | 0 | 9 | 99 | 0 | 0 | 17 | 0 | 1 | 126 | 126 | |
| no | 159 | 200 | 0 | 0 | 0 | 0 | 0 | 22 | 67 | 0 | 0 | 89 | 89 | |
| yes | 160 | 290 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| no | 161 | 420 | 0 | 0 | 0 | 0 | 0 | 34 | 9 | 1 | 24 | 67 | 68 | |
| no | 162 | 64 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| yes | 163 | 71 | 500 | 0 | 0 | 72 | 0 | 0 | 7 | 0 | 0 | 79 | 79 | |
| yes | 164 | 180 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 77 | 99 | 119 | 196 | |
| yes | 165 | 41 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 73 | 40 | 53 | 126 | |
| no | 166 | 13 | 0 | 0 | 0 | 0 | 0 | 43 | 17 | 209 | 36 | 96 | 304 | |
| no | 167 | 66 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| no | 168 | 139 | 0 | 0 | 29 | 0 | 0 | 50 | 38 | 88 | 48 | 164 | 253 | |
| no | 169 | 42 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 0 | 24 | 24 | TAZ only contains small amount of industrial land. Removed 200 Industrial jobs. |
| no | 170 | 365 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| yes | 171 | 405 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| yes | 172 | 200 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 6 | 6 | |
| yes | 173 | 47 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 209 | 79 | 93 | 301 | Removed 258 Retail jobs to account for Wal-Mart relocation |
| yes | 174 | 44 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | |
| yes | 175 | 374 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 8 | 22 | 22 | |
| yes | 176 | 409 | 0 | 0 | 0 | 0 | 0 | 0 | 43 | 303 | 67 | 110 | 413 | Added 238 Retail jobs to account for Wal-Mart relocation |
| yes | 177 | 106 | 0 | 0 | 0 | 0 | 0 | 43 | 26 | 35 | 48 | 117 | 152 | Removed 150 Industrial jobs. TAZ is within Cheadle Lake URD and is expected to experience redevelopment into other uses. |
| no | 178 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| no | 179 | 81 | 0 | 0 | 58 | 0 | 0 | 5 | 7 | 0 | 0 | 70 | 70 | |
| no | 180 | 167 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| no | 181 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| yes | 182 | 242 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 10 | |
| yes | 183 | 342 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| no | 184 | 55 | 700 | 0 | 0 | 117 | 13 | 0 | 3 | 0 | 0 | 133 | 133 | |
| no | 185 | 50 | 0 | 0 | 0 | 0 | 0 | 7 | 32 | 5 | 26 | 66 | 70 | |
| no | 186 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 2 | |
| no | 187 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 5 | |
| no | 188 | 68 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 0 | 0 | 10 | 10 | |
| no | 189 | 112 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| no | 190 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| no | 191 | 61 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| no | 192 | 118 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 49 | 65 | 65 | |
| | | 7262 | 4150 | 0 | 27 | 646 | 173 | 1352 | 798 | 1364 | 1557 | 4553 | 5917 | |
| | | 2741 | 700 | 0 | 104 | 164 | 63 | 913 | 402 | 375 | 938 | 2584 | 2959 | |
| | | **10003** | **4850** | **0** | **131** | **809** | **236** | **2265** | **1200** | **1739** | **2495** | **7137** | **8876** | |

Jobs were removed from TAZ

Jobs were added to TAZ

| Sums: | | | | |
|---|---|---|---|---|
| | Commercial (Retail) | 1739 | Office (Service) | 2495 |
| | Public (Ed, Gov) | 1045 | Industrial (Ind, Ag, Otl | 3597 |

# Attachment B

## Lebanon Forecast ~ Household Adjustments

| | | 2000 | | | 2020 | 2025 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Within City Boundary? | TAZ | Single Fam | Multi Fam | Total HH | Total HH | Match Comp Plan Total HH | Allocation Adjustment | Adjusted Total HH | Multi Fam Adjust | Single Fam Adjusted Total | Multi Fam Adjusted Total | Notes |
| no | 100 | 1 | 0 | 1 | 1 | 1 | | 1 | | 1 | 0 | |
| no | 101 | 1 | 0 | 1 | 1 | 1 | | 1 | | 1 | 0 | |
| yes | 102 | 9 | 0 | 9 | 9 | 11 | | 11 | | 11 | 0 | |
| no | 103 | 4 | 46 | 50 | 50 | 7 | 43 | 50 | | 4 | 46 | Adjustment factors understated the amount of housing for 2025. Adjusted to match 2020. |
| no | 104 | 29 | 3 | 32 | 132 | 113 | 65 | 178 | 35 | 140 | 38 | Adjustment factors understated the amount of housing for 2025. Adjusted to reflect anticipated growth. |
| no | 105 | 33 | 0 | 33 | 33 | 29 | | 29 | | 29 | 0 | |
| yes | 106 | 36 | 7 | 43 | 84 | 104 | -34 | 70 | 4 | 59 | 11 | Reduced housing to reflect recent hospital development proposal within TAZ. |
| no | 107 | 6 | 0 | 6 | 19 | 17 | | 17 | 1 | 16 | 1 | |
| yes | 108 | 50 | 13 | 63 | 63 | 78 | | 78 | 3 | 62 | 16 | |
| yes | 109 | 36 | 2 | 38 | 38 | 48 | | 48 | 1 | 45 | 3 | |
| yes | 110 | 58 | 22 | 80 | 80 | 99 | | 99 | 2 | 75 | 24 | |
| yes | 111 | 48 | 29 | 77 | 77 | 95 | | 95 | 10 | 56 | 39 | |
| no | 112 | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | |
| yes | 113 | 3 | 0 | 3 | 3 | 4 | | 4 | | 4 | 0 | |
| no | 114 | 44 | 0 | 44 | 55 | 48 | | 48 | | 48 | 0 | |
| yes | 115 | 157 | 32 | 189 | 189 | 236 | -36 | 200 | 2 | 166 | 34 | TAZ is close to build out. Reduced housing to reflect realistic growth potential. |
| yes | 116 | 39 | 14 | 53 | 53 | 66 | | 66 | 2 | 50 | 16 | |
| yes | 117 | 12 | 80 | 92 | 92 | 109 | -17 | 92 | | 12 | 80 | Reduced housing to reflect recent hospital development proposal within TAZ. |
| yes | 118 | 19 | 0 | 19 | 19 | 24 | | 24 | | 24 | 0 | |
| yes | 119 | 31 | 10 | 41 | 41 | 51 | | 51 | 2 | 39 | 12 | |
| yes | 120 | 29 | 112 | 141 | 141 | 167 | -26 | 141 | | 29 | 112 | TAZ is currently at build out. Reduced housing to match 2020. |
| yes | 121 | 104 | 13 | 117 | 117 | 147 | -17 | 130 | 2 | 115 | 15 | TAZ is close to build out. Reduced housing to reflect realistic growth potential. |
| yes | 122 | 115 | 182 | 297 | 310 | 373 | -69 | 304 | | 122 | 182 | TAZ is currently at or close to build out. Reduced housing to reflect realistic growth potential. |
| yes | 123 | 62 | 13 | 75 | 198 | 237 | -116 | 121 | 7 | 101 | 20 | TAZ is currently close build out conditions. Reduced housing to reflect realistic growth potential. |
| yes | 124 | 51 | 34 | 85 | 85 | 104 | | 104 | 6 | 64 | 40 | |
| yes | 125 | 27 | 4 | 31 | 31 | 39 | | 39 | 2 | 33 | 6 | |
| yes | 126 | 41 | 42 | 83 | 83 | 101 | | 101 | 9 | 50 | 51 | |
| yes | 127 | 13 | 0 | 13 | 13 | 16 | | 16 | | 16 | 0 | |
| yes | 128 | 15 | 0 | 15 | 15 | 19 | | 19 | | 19 | 0 | |
| yes | 129 | 7 | 0 | 7 | 7 | 9 | | 9 | | 9 | 0 | |
| yes | 130 | 5 | 0 | 5 | 5 | 6 | | 6 | | 6 | 0 | |
| yes | 131 | 102 | 49 | 151 | 151 | 186 | -35 | 151 | | 102 | 49 | TAZ is currently at build out. Reduced housing to match 2020. |
| yes | 132 | 25 | 0 | 25 | 25 | 32 | | 32 | | 32 | 0 | |
| yes | 133 | 2 | 0 | 2 | 2 | 3 | | 3 | | 3 | 0 | |
| yes | 134 | 32 | 23 | 55 | 55 | 67 | -7 | 60 | | 37 | 23 | TAZ is close to build out. Reduced housing to reflect realistic growth potential. |
| yes | 135 | 1 | 5 | 6 | 6 | 7 | | 7 | | 2 | 5 | |
| yes | 136 | 25 | 8 | 33 | 33 | 41 | -6 | 35 | | 27 | 8 | TAZ is close to build out. Reduced housing to reflect realistic growth potential. |
| yes | 137 | 166 | 10 | 176 | 176 | 222 | -46 | 176 | | 166 | 10 | TAZ is currently at build out. Reduced housing to match 2020. |
| yes | 138 | 216 | 46 | 239 | 323 | 401 | -74 | 327 | 20 | 261 | 66 | TAZ is close to build out. Reduced housing to reflect realistic growth potential. |
| yes | 139 | 110 | 12 | 122 | 122 | 153 | -20 | 133 | 2 | 119 | 14 | TAZ is close to build out. Reduced housing to reflect realistic growth potential. |
| no | 140 | 16 | 0 | 16 | 16 | 14 | | 14 | | 14 | 0 | |
| yes | 141 | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | |
| no | 142 | 2 | 0 | 2 | 2 | 2 | | 2 | | 2 | 0 | |
| yes | 143 | 31 | 0 | 31 | 61 | 75 | -25 | 50 | | 50 | 0 | TAZ is partially zone SPD with a mix of comm/indust/housing. Reduced housing to reflect realistic development potential. |
| yes | 144 | 0 | 0 | 23 | 0 | 0 | 23 | 23 | | 23 | 0 | 2020 model eliminated current housing development. Added current housing back into TAZ. |
| no | 145 | 92 | 11 | 103 | 252 | 164 | -34 | 130 | 4 | 115 | 15 | TAZ is close to build out. Reduced housing to reflect realistic growth potential. |

| Within City Boundary? | | 2000 | | | 2020 | 2025 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TAZ | Single Fam | Multi Fam | Total HH | Total HH | Match Comp Plan Total HH | Allocation Adjustment | Adjusted Total HH | Multi Fam Adjust | Single Fam Adjusted Total | Multi Fam Adjusted Total | Notes |
| yes | 146 | 154 | 42 | 196 | 196 | 244 | -34 | 210 | 4 | 164 | 46 | Adjustment factors overstated growth potential. Reduced housing to reflect realistic growth within TAZ. |
| no | 147 | 68 | 41 | 109 | 177 | 107 | 48 | 155 | 15 | 99 | 56 | Adjustment factors understated growth potential. Added housing to reflect current growth potential. |
| yes | 148 | 5 | 0 | 5 | 5 | 6 | | 6 | | 6 | 0 | |
| yes | 149 | 90 | 24 | 114 | 114 | 142 | -25 | 117 | | 93 | 24 | Adjustment factors overstated growth potential. Reduced housing to reflect realistic growth within TAZ. |
| yes | 150 | 33 | 6 | 39 | 39 | 49 | | 49 | 2 | 41 | 8 | |
| yes | 151 | 11 | 8 | 19 | 19 | 23 | | 23 | | 15 | 8 | |
| yes | 152 | 35 | 31 | 66 | 92 | 111 | -35 | 76 | 2 | 43 | 33 | TAZ is close to build out. Growth potential was overstated. Housing reduced to reflect realistic growth. |
| yes | 153 | 45 | 18 | 63 | 63 | 78 | | 78 | 3 | 57 | 21 | |
| yes | 154 | 130 | 30 | 160 | 160 | 199 | -24 | 175 | 3 | 142 | 33 | Adjustment factors overstated growth potential. Reduced housing to reflect realistic growth within TAZ. |
| yes | 155 | 39 | 43 | 82 | 100 | 121 | -21 | 100 | 9 | 48 | 52 | Adjustment factors overstated growth potential. Reduced housing to reflect realistic growth within TAZ. |
| yes | 156 | 48 | 2 | 50 | 103 | 128 | -53 | 75 | 2 | 71 | 4 | TAZ is close to build out. Growth potential was overstated. Housing reduced to reflect realistic growth. |
| yes | 157 | 105 | 6 | 111 | 123 | 154 | -18 | 136 | 3 | 127 | 9 | Adjustment factors overstated growth potential. Reduced housing to reflect realistic growth within TAZ. |
| yes | 158 | 282 | 12 | 294 | 512 | 640 | | 640 | 125 | 503 | 137 | |
| no | 159 | 0 | 0 | 0 | 0 | 0 | 200 | 200 | 50 | 150 | 50 | TAZ is zoned Industrial. City expects this area to redevelop into a mix out residential/retail/commercial uses. |
| yes | 160 | 13 | 0 | 13 | 113 | 143 | 147 | 290 | 20 | 270 | 20 | City has had development proposals for this area. Added housing to reflect recent proposals. |
| no | 161 | 109 | 0 | 109 | 466 | 313 | 107 | 420 | 75 | 345 | 75 | Large TAZ which has sustained growth within the last 3 years. Growth potential is very high in this area. |
| no | 162 | 55 | 11 | 66 | 101 | 64 | | 64 | | 53 | 11 | |
| yes | 163 | 36 | 22 | 58 | 58 | 71 | | 71 | | 49 | 22 | |
| yes | 164 | 94 | 62 | 156 | 183 | 223 | -43 | 180 | | 118 | 62 | Adjustment factors overstated growth potential. Reduced housing to reflect realistic growth within TAZ. |
| yes | 165 | 11 | 23 | 34 | 34 | 41 | | 41 | | 18 | 23 | |
| no | 166 | 15 | 0 | 15 | 15 | 13 | | 13 | | 13 | 0 | |
| no | 167 | 27 | 0 | 27 | 93 | 66 | | 66 | | 66 | 0 | |
| no | 168 | 131 | 4 | 135 | 180 | 139 | | 139 | | 135 | 4 | |
| no | 169 | 28 | 2 | 30 | 50 | 42 | | 42 | | 40 | 2 | |
| no | 170 | 153 | 4 | 157 | 339 | 265 | 100 | 365 | 20 | 341 | 24 | TAZ which has sustained growth within the last 3-5 years. Growth potential is very high in this area. |
| yes | 171 | 252 | 74 | 326 | 326 | 405 | | 405 | | 331 | 74 | |
| yes | 172 | 183 | 8 | 191 | 191 | 241 | -41 | 200 | | 192 | 8 | Adjustment factors overstated growth potential. Reduced housing to reflect realistic growth within TAZ. |
| yes | 173 | 1 | 39 | 40 | 40 | 47 | | 47 | | 8 | 39 | |
| yes | 174 | 35 | 0 | 35 | 35 | 44 | | 44 | | 44 | 0 | |
| yes | 175 | 272 | 42 | 314 | 339 | 424 | -50 | 374 | 18 | 314 | 60 | Adjustment factors overstated growth potential. Reduced housing to reflect realistic growth within TAZ. |
| yes | 176 | 306 | 53 | 359 | 359 | 449 | -40 | 409 | 15 | 341 | 68 | Adjustment factors overstated growth potential. Reduced housing to reflect realistic growth within TAZ. |
| yes | 177 | 84 | 0 | 84 | 84 | 106 | | 106 | | 106 | 0 | |
| no | 178 | 46 | 0 | 46 | 46 | 40 | | 40 | | 40 | 0 | |
| no | 179 | 92 | 4 | 96 | 96 | 81 | | 81 | | 77 | 4 | |
| no | 180 | 5 | 0 | 5 | 10 | 9 | 158 | 167 | 30 | 137 | 30 | City has had development proposals for this area. Added housing to reflect recent proposals. |
| no | 181 | 5 | 0 | 5 | 25 | 22 | | 22 | | 22 | 0 | |
| yes | 182 | 10 | 0 | 10 | 196 | 242 | | 242 | 50 | 192 | 50 | |
| yes | 183 | 109 | 0 | 109 | 313 | 392 | -50 | 342 | 75 | 267 | 75 | Adjustment factors overstated growth potential. Reduced housing to reflect realistic growth within TAZ. |
| no | 184 | 42 | 0 | 42 | 46 | 40 | 15 | 55 | 2 | 53 | 2 | Adjustment factors understated growth potential. Added housing to reflect current growth potential. |
| no | 185 | 29 | 4 | 33 | 44 | 35 | 15 | 50 | 3 | 43 | 7 | Adjustment factors understated growth potential. Added housing to reflect current growth potential. |
| no | 186 | 14 | 0 | 14 | 14 | 12 | | 12 | | 12 | 0 | |
| no | 187 | 19 | 0 | 19 | 19 | 17 | | 17 | | 17 | 0 | |
| no | 188 | 58 | 2 | 60 | 79 | 68 | | 68 | | 66 | 2 | |
| no | 189 | 60 | 0 | 60 | 71 | 62 | 50 | 112 | 10 | 102 | 10 | Adjustment factors understated growth potential. Added housing to reflect current growth potential. |
| no | 190 | 5 | 0 | 5 | 5 | 4 | | 4 | | 4 | 0 | |
| no | 191 | 54 | 0 | 54 | 69 | 61 | | 61 | | 61 | 0 | |
| no | 192 | 86 | 2 | 88 | 108 | 93 | 25 | 118 | 9 | 107 | 11 | Adjustment factors understated growth potential. Added housing to reflect current growth potential. |
| | City Limits | 4060 | 1307 | 5367 | 6504 | 8054 | | 7262 | | 5550 | 1712 | |
| | UGA | 1329 | 134 | 1463 | 2614 | 1949 | | 2741 | | 2353 | 388 | |
| | UGB | **5389** | **1441** | **6830** | **9118** | **10003** | **0** | **10003** | | **7903** | **2100** | |

**APPENDIX D**

# City of Lebanon Transportation System Plan Industrial Land Access Analysis Technical Memorandum

# City of Lebanon Transportation System Plan - Industrial Land Access Analysis Technical Memorandum

PREPARED FOR: Lebanon TSP Project Management Team

PREPARED BY: Steve Perone/CH2M HILL
Jimmy Wong/CH2M HILL
Terry Yuen/CH2M HILL

DATE: March 17, 2006

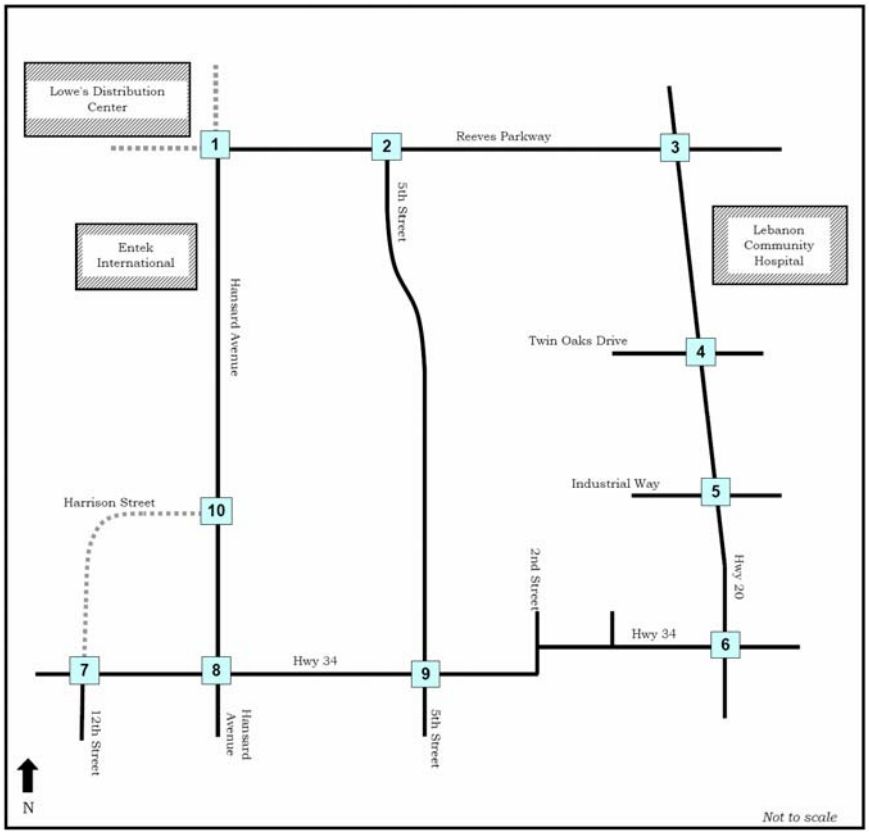
*This memorandum addresses Task 1 of the Lebanon Transportation System Plan update and subsequent intersection operational analysis results of existing traffic conditions, future baseline and mitigation alternatives for the Industrial Land Access Study Area.*

The memorandum describes the purpose and need for the analysis, focusing on the property access to the industrial lands in the City of Lebanon's northwest quadrant. Forecasting and analysis has been conducted to determine the access options and the performance of these options. The results of this analysis will be used to establish whether the north leg of the proposed Lebanon Parkway is warranted within the planning horizon for inclusion in the TSP. Alternative scenarios were developed, analyzed and evaluated. A preferred strategy is recommended based on a set of criteria which includes traffic level of service, cost, and operational feasibility.

## Background

Property access to the industrial lands in the City's northwest quadrant need further analysis in order to determine if appropriate access can be provided within the City's current urban growth boundary (UGB), or whether this property access requires a new facility that is located, at least in part, outside the UGB based on expected growth through the year 2025. The study area for this analysis is located north of Highway 34 and south of Reeves Parkway between Hansard Avenue/Harrison Street on the west and Highway 20 on the east as indicated in Figure A. The ODOT developed travel demand model updated with City supplied land use for the year 2025 was used as the basis to support the subsequent operational analysis.

FIGURE A: STUDY AREA FOR LEBANON INDUSTRIAL LAND ACCESS




*Study Intersections*

| | |
|---|---|
| 1 | Reeves Parkway & Hansard Avenue* |
| 2 | Reeves Parkway & 5th Street |
| 3 | Highway 20 & Reeves Parkway |
| 4 | Highway 20 & Twin Oaks Drive |
| 5 | Highway 20 & Industrial Way |
| 6 | Highway 20 & Highway 34 |
| 7 | Highway 34 & 12th Street |
| 8 | Highway 34 & Hansard Avenue |
| 9 | Highway 34 & 5th Street |
| 10 | Hansard Avenue & Harrison Street* |

* Intersection does not exist or only includes free movements in the Existing scenario

Analysis results are compared with mobility standard V/C ratios as designated by the 1999 Oregon Highway Plan. Mobility standards are based on facility classification, area type, and speed zones for roadways intersecting state highways. All of the study intersections are within the UGB, and all roadway approaches have a speed limit of 35 MPH or less. The OHP designates Highway 20 north of Highway 34 as a regional highway. It is not a freight route, is outside of an MPO and is outside of a special transportation area (STA); therefore the mobility standard threshold for the intersections of Highway 20 and Reeves Parkway, Twin Oaks Drive, and Industrial Way is 0.85. Highway 34 is designated by the OHP as a freight route on a regional highway. It is also outside of an MPO. The intersections west of 5th Street are outside of an STA, therefore the mobility standard threshold for Highway 34 with 12th Street and Hansard Avenue is 0.85. East of (and including) 5th Street, Highway 34 is inside an STA, so the threshold for the intersections of Highway 34 with 5th Street and Highway 20 is 0.90. The remaining intersections are considered local interest roads therefore the mobility threshold for these locations is 0.90.

Mobility standard thresholds by facility type for study intersections are listed in Table 1.

TABLE 1. OREGON HIGHWAY PLAN MOBILITY STANDARDS – EXISTING CONDITIONS

| Highway | Classification Categories | | Mobility Standard (v/c ratio) |
|---|---|---|---|
| Highway 20 (north of Highway 34) | Regional Highway - Non-Freight Route | Within UGB, non-MPO, outside of STA, non freeway speed <=35 mph | 0.85 |
| Highway 34 (west of 5th Street) | Freight Route on a Regional Highway | Within UGB, non-MPO, outside of STA, non freeway speed <=35 mph | 0.85 |
| Highway 34 (east of and including 5th Street) | Freight Route on a Regional Highway | Within UGB, non-MPO, inside of STA, non freeway speed <=35 mph | 0.90 |
| Reeves Parkway, Hansard Avenue | District / Local Interest Roads | Within UGB, non-MPO, outside of STA, non freeway speed <=35 mph | 0.90 |

Source: 1999 Oregon Highway Plan, Table 6, amended August 17, 2005.

# Future 2025 Baseline (No-Build)

Traffic operations analysis was conducted for two signalized intersections and eight unsignalized intersections within the study area. Table 2 presents the results of the existing 2005 and future 2025 baseline traffic operation analysis. In 2005, traffic currently operates at an acceptable level of service under the OHP mobility standards for State highways. In 2025, the baseline traffic operations are expected to worsen, with five intersections failing to meet the mobility standard. All four intersections along Highway 20 in the study area (Reeves Pkwy, Twin Oaks Dr, Industrial Way, and Highway 34) are expected to fail. With the exception of the Highway 20/Highway 34 intersection, all failing intersections would have a V/C ratio greater than 1, indicating the projected volumes would far exceed the intersection capacity. Expected delays would be in excess of 100 seconds. On Highway 34, the intersection of Highway 34/5th Street would also fail. Appendix figures 1 and 2 compare the existing and future baseline traffic operational analysis results, lane channelization and turning movements.

TABLE 2 LEBANON INDUSTRIAL LAND ACCESS 2005 AND 2025 INTERSECTION OPERATIONAL ANALYSIS

| *Intersection* | | **Mobility Standard (v/c)** | Existing 2005 | | | Future 2025 Baseline | | |
|---|---|---|---|---|---|---|---|---|
| Major Approach | Minor Approach | | LOS | Delay | V/C | LOS | Delay | V/C |
| **Signalized Intersections** | | | | | | | | |
| Highway 20 | Highway 34 | **0.90** | C | 20.2 | 0.66 | **D** | **37.9** | **0.91** |
| **Unsignalized Intersections** | | | | | | | | |
| Reeves Parkway | Hansard Avenue* | **0.90** | - | - | - | A | 8.9 | 0.23 |
| Reeves Parkway | 5th Street | **0.90** | A | 9.5 | 0.04 | B | 10.0 | 0.06 |
| Highway 20 | Reeves Parkway | **0.85** | D | 32.3 | 0.35 | **F** | **>100** | **1.37** |
| Highway 20 | Twin Oaks Drive | **0.85** | D | 30.7 | 0.28 | **F** | **>100** | **1.92** |
| Highway 20 | Industrial Way | **0.85** | E | 57.9 | 0.58 | **F** | **>100** | **>2.00** |
| Highway 34 | 12th Street | **0.85** | B | 12.9 | 0.02 | C | 24.9 | 0.52 |
| Highway 34 | Hansard Avenue | **0.85** | B | 13.5 | 0.25 | C | 17.3 | 0.08 |
| Highway 34 | 5th Street | **0.90** | C | 23.5 | 0.39 | **F** | **>100** | **1.13** |
| Hansard Avenue | Harrison Street* | **0.90** | - | - | - | A | 9.5 | 0.25 |

* Intersection does not exist or only includes free movements in the Existing 2005 scenario

# Reeves Parkway Extension Scenario

The Draft Lebanon Transportation System Plan identified Reeves Parkway as a potential new roadway project. To better understand the needs and impacts several EMME/2 scenarios were created to examine overall citywide impacts and impacts by segment[1]. One scenario examined benefits of extending the proposed parkway north from Highway 34 to connect with the existing Reeves Parkway. This would link Highway 34 to Highway 20 on the north side of the City. A detailed traffic operation analysis was conducted for this North Reeves Parkway Extension option in year 2025. In terms of traffic operations on Highway 20 and Highway 34, this alternative shows similar results as the 2025 baseline analysis. With the exception of the Highway 34/Highway 20 intersection, all intersections on Highway 20 in the study area are not expected to meet the mobility standard. While the V/C ratio at the intersection of Highway 34/5th Street would meet the mobility standard of 0.90, the level of service would remain at LOS F since the intersection delay is expected to be over one-minute per signal cycle. This result demonstrates that the additional capacity provided by the parkway extension does not solve operational problems anticipated at intersections in the study area. While the construction cost is large, the marginal benefit is relatively minimal: three of the intersections still fail to meet their mobility standards and four intersections would operate at LOS F. Because the facility only provides marginal system benefits in the planning horizon and further mitigation will be required on existing facilities, the Reeves Parkway Extension is not included as a TSP project. However, the City will preserve right-of-way within the existing UGB so that a future connection could be made when necessary. Table 3 compares the operational analysis results of the 2025 North Parkway Extension option and 2025 baseline.

TABLE 3 LEBANON INDUSTRIAL LAND ACCESS 2025 INTERSECTION OPERATIONAL ANALYSIS: BASELINE VS PARKWAY

| *Intersection* | | **Mobility Standard (v/c)** | Future 2025 Baseline | | | Future 2025 Parkway | | |
|---|---|---|---|---|---|---|---|---|
| Major Approach | Minor Approach | | LOS | Delay | V/C | LOS | Delay | V/C |
| **Signalized Intersections** | | | | | | | | |
| Highway 20 | Highway 34 | **0.90** | **D** | **37.9** | **0.91** | C | 27.7 | 0.72 |
| **Unsignalized Intersections** | | | | | | | | |
| Reeves Parkway | Hansard Avenue | **0.90** | A | 8.9 | 0.23 | B | 11.8 | 0.36 |
| Reeves Parkway | 5th Street | **0.90** | B | 10.0 | 0.06 | B | 13.2 | 0.11 |
| Highway 20 | Reeves Parkway | **0.85** | **F** | **>100** | **1.37** | **F** | **>100** | **1.76** |
| Highway 20 | Twin Oaks Drive | **0.85** | **F** | **>100** | **1.92** | **F** | **>100** | **0.96** |
| Highway 20 | Industrial Way | **0.85** | **F** | **>100** | **>2.00** | **F** | **>100** | **1.54** |
| Highway 34 | 12th Street | **0.85** | C | 24.9 | 0.52 | D | 31.4 | 0.57 |
| Highway 34 | Hansard Avenue | **0.85** | C | 17.3 | 0.08 | C | 17.8 | 0.07 |
| Highway 34 | 5th Street | **0.90** | **F** | **>100** | **1.13** | **F** | **65.9** | **0.75** |
| Hansard Avenue | Harrison Street | **0.90** | A | 9.5 | 0.25 | A | 9.6 | 0.25 |

The remaining scenarios discussed below evaluate less costly intersection improvement options and improvements to existing roadways to eliminate 2025 baseline deficiencies.

[1] The EMME/2 scenario screening results are documented in the February 6th technical memorandum City of Lebanon Transportation System Plan - Travel Demand Model Scenario Screening and Analysis – With Revised Forecasts

# Future 2025 with Mitigation

**Mitigation Variation 1: Signalization**

Based on the future 2025 traffic operational analysis results, a set of strategies were developed to mitigate the intersection deficiencies in the study area. High traffic volumes are predicted on Highway 20 (and to a lesser degree on Highway 34) under 2025 conditions, therefore many of the stop-controlled intersections fail as traffic from the minor approaches cannot find sufficient gaps to access the highways. Signalizing the failing intersections greatly improves operations in the study area. This mitigation alternative calls for signalization of the following intersections:

- Highway 34 / 5th Street
- Highway 20 / Reeves Parkway
- Highway 20 / Twin Oaks Drive
- Highway 20 / Industrial Way

*The intersection of Highway 20 and Reeves Parkway* provides access to James Cemetery (to the east) and to Pioneer School and industrial employment (to the west). The intersection is currently stop-controlled on Reeves Parkway with free movements on Highway 20. East and westbound vehicles making left turns or through movements experience high delay times due to few gaps in traffic on Highway 20. Adding a signal at this intersection would improve operations because east and westbound traffic would be given a signal phase, therefore reducing delay on Reeves Parkway.

*Highway 20 and Twin Oaks* is the main access point to the Lebanon Community Hospital. It is currently stop-controlled on Twin Oaks and experiences delays similar to those at Highway 20 and Reeves Parkway. Vehicles making left turns or through movements from Twin Oaks experience long delays because of continuous traffic on Highway 20. Signalizing this intersection would improve operations by controlling all movements and reducing overall delay.

*Highway 20 and Industrial Way* provides alternative access to the hospital and associated professional buildings to the east of Highway 20. Industrial way also provides access to industrial land and trucking facilities. On the west side, the street provides access to older residential development. Like the previous Highway 20 intersections, this intersection fails because traffic cannot access the highway from the minor street approaches, which causes excessive delay. Signalizing the intersection improves operations and satisfies the mobility standard. ODOT's preferred signal spacing standard is ½ mile between signals. Industrial Way is less than ½ mile from the signalized Highway 20/Highway 34 intersection and the proposed Highway 20/Twin Oaks signal. However, the State Traffic Engineer can permit signals that do not meet this standard when considering the built environment and the coordination and progression included in this analysis indicates that a signal may be a feasible solution in the future.

*Highway 34 at 5th Avenue* is currently stop controlled on the north and southbound approaches. East and westbound traffic on Highway 34 is uncontrolled. Signalizing this intersection as part of mitigation would improve operations by reducing overall delay.

The intersection of Highway 34/Highway 20 would still fail to meet the V/C mobility standard of 0.90, even with signalization at the previously mentioned intersections. In order to meet this standard, additional capacity is needed. Separate left turn pockets are needed on the eastbound and westbound Highway 34 approaches. Having separated left turn pockets would increase capacity and reduce overall delay at the intersection. Vehicles moving through the intersection would not be blocked by vehicles waiting to turn left onto Highway 20.

*Results*: The signalization strategy is expected to improve the level of service dramatically. Traffic signals would reduce intersection delay. Left turn pockets at Highway 34/Highway 20 would provide additional capacity therefore reducing its V/C ratio. All intersections would operate at LOS C or better, and all are expected to meet the OHP mobility standards. Table 4 presents the results of the signalization mitigation strategy and the 2025 baseline traffic operations. Appendix figures 3 and 4 compare the future 2025 baseline, Parkway Extension option, and Mitigation Variation 1 operational analysis results, lane channelization and turning movements.

TABLE 4 LEBANON INDUSTRIAL LAND ACCESS 2025 INTERSECTION OPERATIONAL ANALYSIS: BASELINE VS MITIGATION VARIATION 1

| *Intersection* | | **Mobility Standard (v/c)** | Future 2025 Baseline | | | Future 2025 w/ Mitigation1 | | |
|---|---|---|---|---|---|---|---|---|
| Major Approach | Minor Approach | | LOS | Delay | V/C | LOS | Delay | V/C |
| **Signalized Intersections** | | | | | | | | |
| Highway 20 | Highway 34 | **0.90** | **D** | **37.9** | **0.91** | C | 21.1 | 0.83 |
| **Unsignalized Intersections** | | | | | | | | |
| Reeves Parkway | Hansard Avenue | **0.90** | A | 8.9 | 0.23 | A | 8.9 | 0.23 |
| Reeves Parkway | 5th Street | **0.90** | B | 10.0 | 0.06 | B | 10.0 | 0.06 |
| Highway 20 | Reeves Parkway | **0.85** | **F** | **>100** | **1.37** | A | 8.5 | 0.72 |
| Highway 20 | Twin Oaks Drive | **0.85** | **F** | **>100** | **1.92** | B | 10.6 | 0.72 |
| Highway 20 | Industrial Way | **0.85** | **F** | **>100** | **>2.00** | A | 7.0 | 0.71 |
| Highway 34 | 12th Street | **0.85** | C | 24.9 | 0.52 | C | 24.9 | 0.52 |
| Highway 34 | Hansard Avenue | **0.85** | C | 17.3 | 0.08 | C | 17.3 | 0.08 |
| Highway 34 | 5th Street | **0.90** | **F** | **>100** | **1.13** | C | 24.0 | 0.54 |
| Hansard Avenue | Harrison Street | **0.90** | A | 9.5 | 0.25 | A | 9.5 | 0.25 |

# Additional Improvement Analysis Recommendations

In addition to the signalization mitigation strategy, a set of various mitigation options were tested for their effectiveness to relieve congestion in the Highway 20/ Industrial Way area. These additional strategies were examined due to the signal spacing standard issues identified above. The following mitigation options are slight variations from the above signalization strategy. All traffic signals mentioned in Mitigation Variation 1 are assumed here, except for the Highway 20/Industrial Way signal.

**Mitigation Variation 2: Williams Street Extension**

This alternative would utilize a currently unpaved section of Williams Street to circulate traffic away from the Highway 20/Industrial Way intersection. Currently, Williams Street is a gravel access road that crosses the Santiam Canal and connects with Wheeler Street.

The bridge across this canal is an extension of the existing Williams Street (which is only paved south of Highway 34 today). This extension road would need to be improved with pavement and lane striping to accommodate re-routed traffic and the bridge structure might also require replacing.

From eastbound Industrial Way, vehicles would turn right onto Williams Street, and then turn right onto Wheeler Street, connecting to Highway 34 at the Highway 20/Highway 34 intersection. Vehicles would be able to make left turns and through movements at the signalized intersection at Highway 20.

This mitigation variation assumes Highway 20/Industrial Way is stop controlled. It is assumed that approximately half of the traffic entering/exiting Industrial Way from Highway 20 would now use the Williams Street route to and from this area.

*Results*: Variation 1 and 2 would have similar results at the Highway 20/Twin Oaks Drive intersection. However, the Highway 20/Industrial Way intersection would still fail to meet mobility standard. The V/C ratio is expected to improve from greater than 2.00 to 1.17. This is still greater than the mobility standard (0.85) and well above the 0.71 V/C ratio achieved by variation 1 (signalization).

**Mitigation Variation 3: Right In, Right Out at Highway 20/Industrial Way**

Instead of signalizing the intersection of Highway 20 and Industrial Way, this mitigation strategy proposes that access to this intersection be restricted to right-in, right-out movements only. This strategy will work best with the William Street Extension. This configuration significantly improves operations at this intersection as most of the delay is attributed to long wait times for vehicles turning left onto Highway 20 and vehicles moving through the intersection across Highway 20.

Westbound approach volumes on Industrial Way wishing to turn left (to southbound Highway 20) would be rerouted through the local system, most likely Williams Street, and would access Highway 20 from the signalized intersection at Highway 34. A low number of volumes on westbound Industrial Way originate from the hospital parking lot. These volumes would access Highway 20 from Twin Oaks. Since this volume is anticipated to remain low, this reroute would not adversely affect traffic patterns. Eastbound approach volumes on Industrial Way destined for northbound Highway 20 would also need to change their circulation patterns. These vehicles would mostly likely be rerouted to Highway 34. Since the intersection of Highway 20 and Highway 34 is signalized, operations would not likely be adversely affected by additional traffic from Industrial Way.

*Results*: Variation 1 and 3 would have similar results at the intersection of Highway 20/Twin Oaks Drive. Under the new restricted access arrangement, only 35 vehicles are expected to exit (right-out) of Industrial Way westbound and 25 vehicles are expected to exit

(right-out) eastbound. The conflicts with through movements are virtually eliminated with the new right-in, right-out arrangement. As a result, the Highway 20/Industrial Way intersection would improve dramatically to a V/C of 0.16.

**Mitigation Variation 4: Closure of West Leg Access on Industrial Way**

Variation 4 assumes the west leg of the Highway 20/Industrial Way intersection would be closed. Traffic will not have access to or from the west side of Industrial Way from Highway 20. In essence, it would operate as a "T" intersection. Traffic is assumed to be rerouted to the Highway 20/Twin Oaks Drive or Highway 20/Highway 34 intersections.

*Results*: Variation 4 has very similar results to variation 2. The V/C ratio at Highway 20/Industrial Way is expected to improve from greater than 2.00 to 1.32, but it still fails to meet the mobility standard of 0.85. This mitigation strategy performs worse than variation 2 (V/C of 1.17), and far worse than variation 1 (V/C of 0.71).

Table 5 presents the results of all mitigation variations. Table 6 summarizes the improvements by each variation option. Appendix Figure 5 compares the operational analysis results, lane channelization and turning movements of each variation of the mitigation strategies.

# Conclusion

Future year 2025 forecasted operational deficiencies to the existing City transportation network can be accommodated without new facilities extending beyond the City's UGB. In fact, a facility such as the north parkway extension without local mitigation would not relieve the forecasted congestion problems in 2025. However, because the TSP will include recommendations that include a Parkway facility south of Highway 34, the City should also make it a policy to protect the right-of-way within the existing UGB.

Among the mitigation strategy scenarios evaluated, variation 1 (signalization) provides the most cost effective solution to solve the operational deficiencies identified.

However, if a deviation to the signal spacing standards at Industrial Way is not determined to be feasible, a right-in/right out configuration at Industrial Way and the Williams Street extension could provide alternative circulation (variation 3). This strategy would help Highway 20/Industrial Way meet mobility standards but would be more expensive.

Either of these mitigation strategies is within the Urban Growth Boundary (UGB) and is expected to meet projected future demand. Therefore, a facility outside of the UGB is not necessary. In fact, a facility such as North Parkway Extension without local mitigation would not relieve the congestion problem in 2025. The insignificant benefits in improving access and circulation in the study area do not justify as the sole reason for the construction of the north parkway extension and therefore this option is not recommended. However, the City of Lebanon could consider preserving right-of-way that would facilitate a future north-link connection with the southern parkway beyond the 20-year planning horizon.

TABLE 5 ALTERNATIVE COMPARISONS - LEBANON INDUSTRIAL LAND ACCESS 2025 INTERSECTION OPERATIONAL ANALYSIS

| *Intersection* | | Mobility Standard (v/c) | Future 2025 w/ Mitigation1 | | | Future 2025 w/ Mitigation2 | | | Future 2025 w/ Mitigation3 | | | Future 2025 w/ Mitigation4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Major Approach | Minor Approach | | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C |
| **Signalized Intersections** | | | | | | | | | | | | | | |
| Highway 20 | Highway 34 | **0.90** | C | 21.1 | 0.83 | **C** | **33.7** | **0.91** | **D** | **40.3** | **0.94** | **D** | **43.1** | **0.93** |
| **Unsignalized Intersections** | | | | | | | | | | | | | | |
| Reeves Parkway | Hansard Avenue | **0.90** | A | 8.9 | 0.23 | A | 8.9 | 0.23 | A | 8.9 | 0.23 | A | 8.9 | 0.23 |
| Reeves Parkway | 5th Street | **0.90** | B | 10.0 | 0.06 | B | 10.0 | 0.06 | B | 10.0 | 0.06 | B | 10.0 | 0.06 |
| Highway 20 | Reeves Parkway | **0.85** | A | 8.5 | 0.72 | A | 7.9 | 0.74 | A | 8.0 | 0.74 | A | 10.0 | 0.71 |
| Highway 20 | Twin Oaks Drive | **0.85** | B | 10.6 | 0.72 | B | 10.5 | 0.74 | B | 10.6 | 0.74 | B | 12.6 | 0.71 |
| Highway 20 | Industrial Way | **0.85** | A | 7.0 | 0.71 | **F** | **183.9** | **1.17** | D | 29.6 | 0.16 | **F** | **222.8** | **1.32** |
| Highway 34 | 12th Street | **0.85** | C | 24.9 | 0.52 | C | 24.9 | 0.52 | C | 24.9 | 0.52 | C | 24.9 | 0.52 |
| Highway 34 | Hansard Avenue | **0.85** | C | 17.3 | 0.08 | C | 17.3 | 0.08 | C | 17.3 | 0.08 | C | 17.3 | 0.08 |
| Highway 34 | 5th Street | **0.90** | C | 24.0 | 0.54 | B | 16.6 | 0.54 | B | 14.5 | 0.55 | B | 13.2 | 0.55 |
| Hansard Avenue | Harrison Street | **0.90** | A | 9.5 | 0.25 | A | 9.5 | 0.25 | A | 9.5 | 0.25 | A | 9.5 | 0.25 |

Mitigation 1 includes signals at Hwy 34/5th, Hwy 20/Twin Oaks, Hwy 20/Industrial, Hwy 20/Reeves Parkway as well as capacity improvements at Hwy 20/Hwy 34.

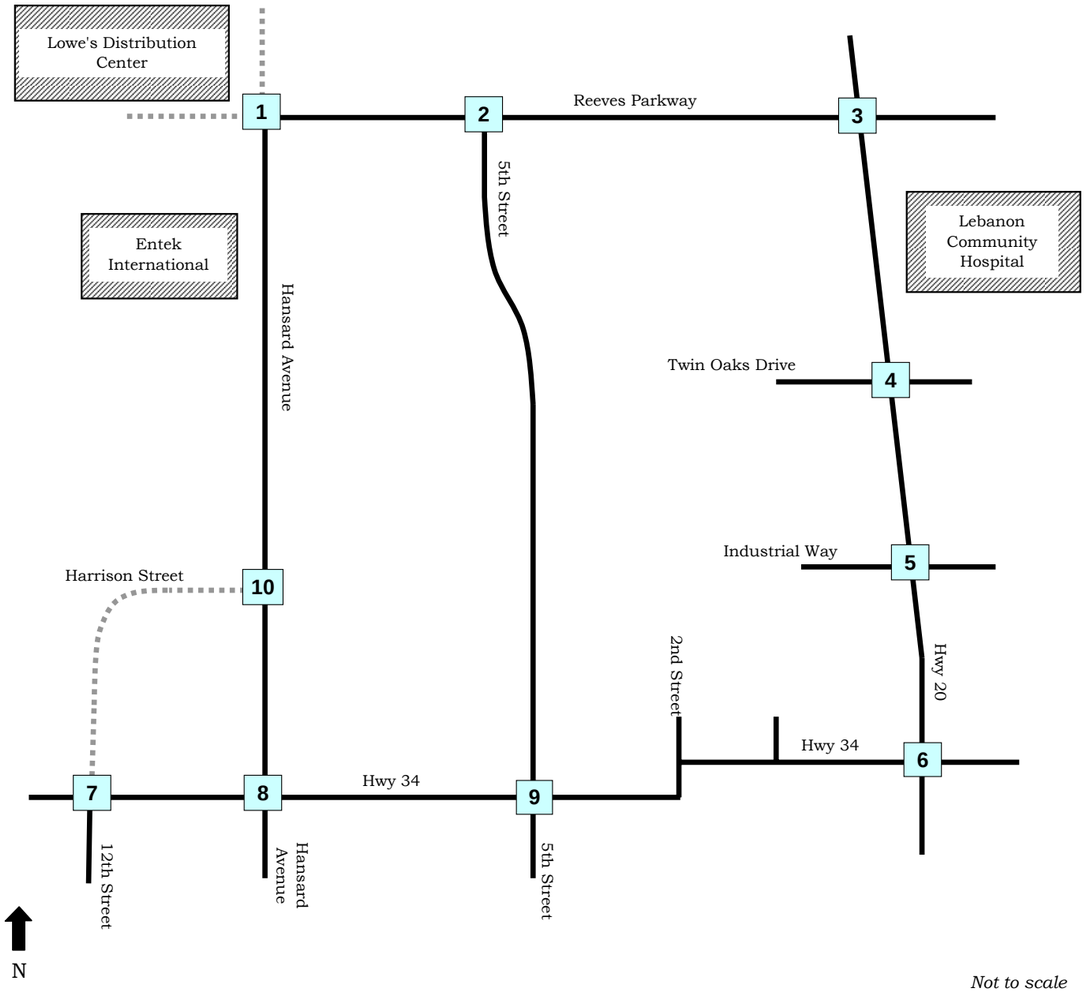
Mitigation 2 includes signals at Hwy 34/5th, Hwy 20/Twin Oaks, Hwy 20/Reeves Parkway and Williams Street extension.

Mitigation 3 includes signals at Hwy 34/5th, Hwy 20/Twin Oaks, Hwy 20/Reeves Parkway and right-in, right-out access at Hwy 20/Industrial.

Mitigation 4 includes signals at Hwy 34/5th, Hwy 20/Twin Oaks, Hwy 20/Reeves Parkway and closing west access at Hwy 20/Industrial.

**Table 6: Summary of Improvements by Options**

| Types | Descriptions | | | | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| | | Existing 2000 | 2025 No Build | 2025 North Parkway | 2025 Mitigations, Local | Williams St. Extension | RI/RO @ Industrial Way | Close Ind. on West Side |
| | Existing Network, (incl Hwy20/Hwy34 signal) | Y | Y | Y | Y | Y | Y | Y |
| New Road | Extension of Parkway to North | | | Y | | | | |
| Signalized | Highway 20 / Reeves Parkway | | | | Y | Y | Y | Y |
| Signalized | Highway 20 / Twin Oaks Drive | | | | Y | Y | Y | Y |
| Signalized | Highway 20 / Industrial Way | | | | Y | | | |
| Signalized | Highway 34 / 12th Street | | | | Y | Y | Y | Y |
| Signalized | Highway 34 / 5th Street | | | | Y | Y | Y | Y |
| Extension | Add Williams street and redistribute some traffic | | | | | Y | | |
| Turn Restriction | Add RI/RO @ industrial and redistribute all traffic | | | | | | Y | |
| Access Closed | Close Industrial on the west side and redistribute traffic | | | | | | | Y |




*Not to scale*

## Legend

**Roadway Geometry**
- Existing (2005)
- Future No Build (2025)

**Signal Control**
- Stop controlled intersection
- Signalized intersection

**LOS**
Level of Service of intersection (based on delay)

**Delay**
Approach delay in seconds

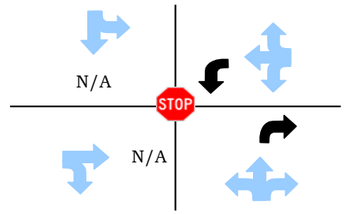
**V/C**
Volume to capacity ratio (for worst approach at unsignalized intersections)

**N/A**
Movement not applicable

**Channelization**
Channelization remains the same between the Existing and No Build options, except where noted

**Turning Movement Direction**
- Existing (2005)
- Future No Build (2025) (If different from the Existing channelization)

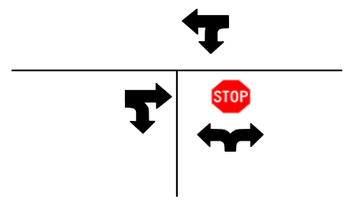
### 1 Reeves Parkway & Hansard Ave




**EX movements are free, NB is all way stop controlled*

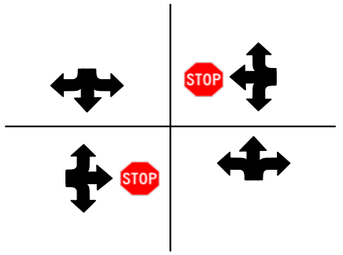
| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2005 EX | - | - | - |
| 2025 NB | A | 8.9 | 0.23 |

### 2 Reeves Parkway & 5th Street



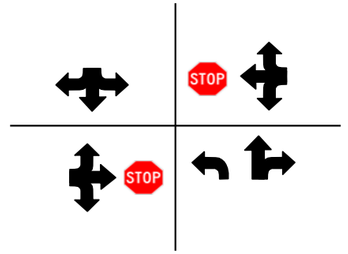

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2005 EX | A | 9.5 | 0.04 |
| 2025 NB | B | 10.0 | 0.06 |

### 3 Highway 20 & Reeves Pkwy



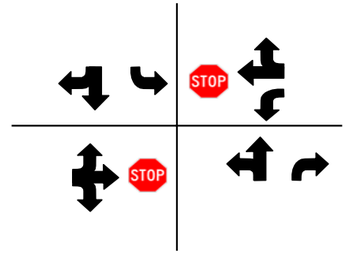

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2005 EX | D | 32.3 | 0.35 |
| **2025 NB** | **F** | **>100** | **1.37** |

### 4 Highway 20 & Twin Oaks Drive



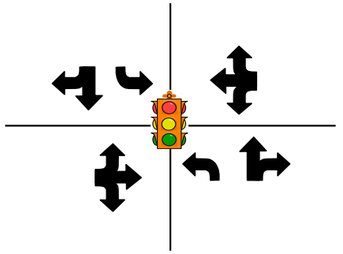

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2005 EX | D | 30.7 | 0.28 |
| **2025 NB** | **F** | **>100** | **1.92** |

### 5 Highway 20 & Industrial Way



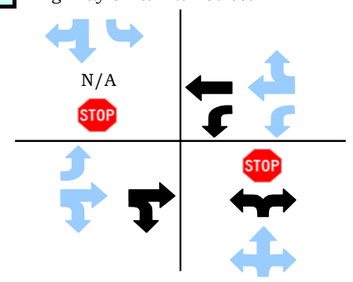

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2005 EX | E | 57.9 | 0.58 |
| **2025 NB** | **F** | **>100** | **>2.00** |

### 6 Highway 20 & Highway 34



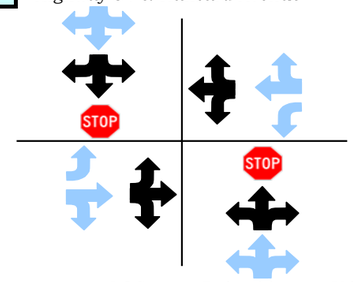
| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2005 EX | C | 20.2 | 0.66 |
| **2025 NB** | **D** | **37.9** | **0.91** |

### 7 Highway 34 & 12th Street



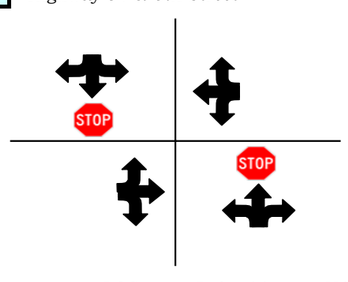

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2005 EX | B | 12.9 | 0.02 |
| 2025 NB | C | 24.9 | 0.52 |

### 8 Highway 34 & Hansard Avenue



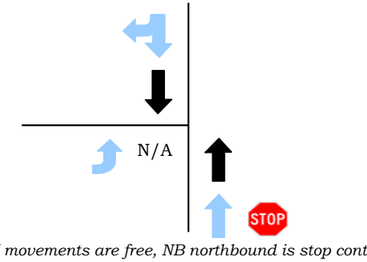

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2005 EX | B | 13.5 | 0.25 |
| 2025 NB | C | 17.3 | 0.08 |

### 9 Highway 34 & 5th Street




| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2005 EX | C | 23.5 | 0.39 |
| **2025 NB** | **F** | **>100** | **1.13** |

### 10 Hansard Avenue & Harrison Street




**EX movements are free, NB northbound is stop controlled*

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2005 EX | - | - | - |
| 2025 NB | A | 9.5 | 0.25 |

## Notes

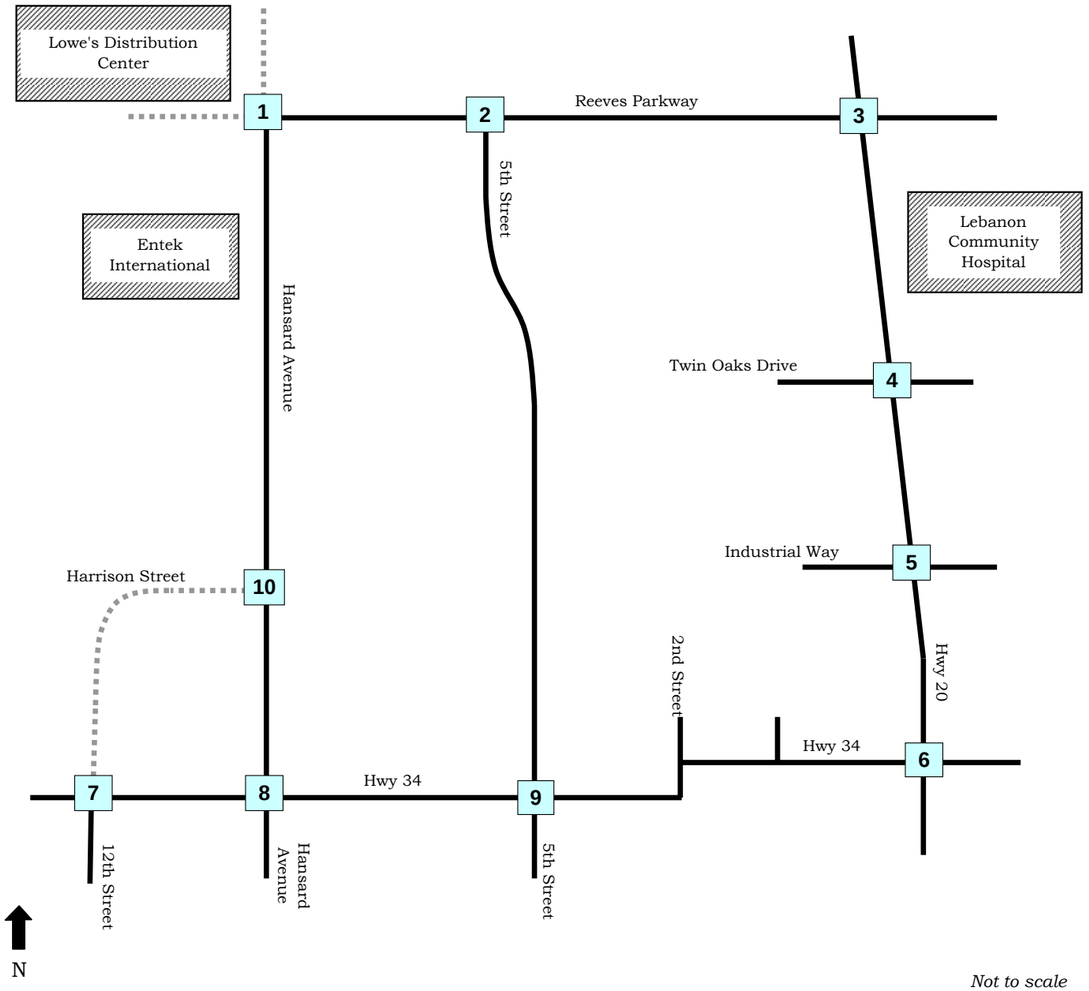
**1.13** Indicates V/C ratios that exceed mobility standards under the No Build condition

Figure 1

PM Peak Hour

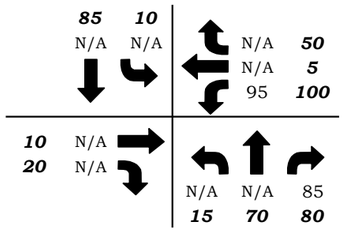
Existing vs. No Build Lane Channelization

**Lebanon Industrial Lands Traffic Analysis**



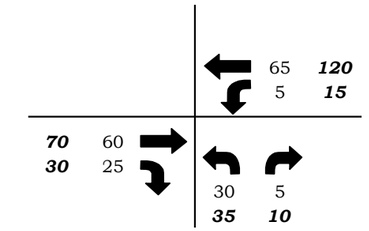

*Not to scale*

## 1 Reeves Parkway & Hansard Ave



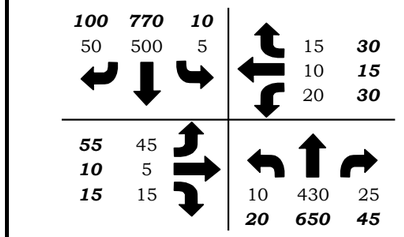

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2005 EX | - | - | - |
| 2025 NB | A | 8.9 | 0.23 |

## 2 Reeves Parkway & 5th Street



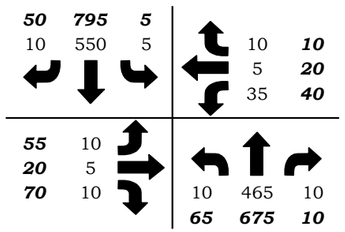

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2005 EX | A | 9.5 | 0.04 |
| 2025 NB | B | 10.0 | 0.06 |

## 3 Highway 20 & Reeves Pkwy



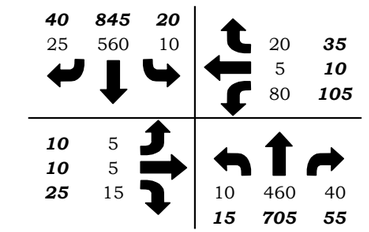

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2005 EX | D | 32.3 | 0.35 |
| **2025 NB** | **F** | **>100** | **1.37** |

## 4 Highway 20 & Twin Oaks Drive



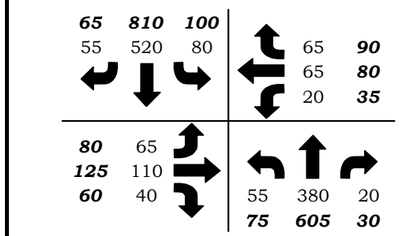

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2005 EX | D | 30.7 | 0.28 |
| **2025 NB** | **F** | **>100** | **1.92** |

## 5 Highway 20 & Industrial Way



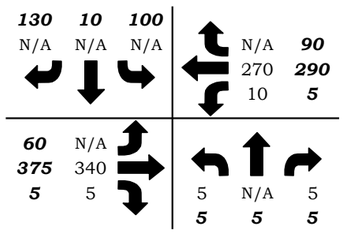

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2005 EX | E | 57.9 | 0.58 |
| **2025 NB** | **F** | **>100** | **>2.00** |

## 6 Highway 20 & Highway 34



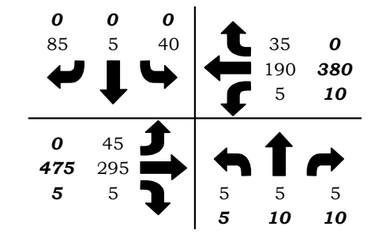

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2005 EX | C | 20.2 | 0.66 |
| **2025 NB** | **D** | **37.9** | **0.91** |

## 7 Highway 34 & 12th Street



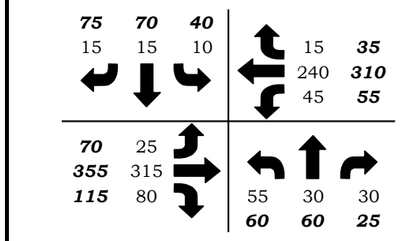

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2005 EX | B | 12.9 | 0.02 |
| 2025 NB | C | 24.9 | 0.52 |

## 8 Highway 34 & Hansard Avenue



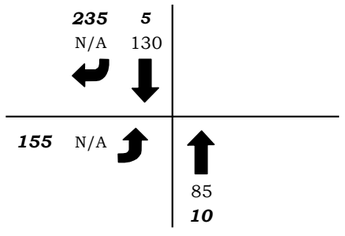

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2005 EX | B | 13.5 | 0.25 |
| 2025 NB | C | 17.3 | 0.08 |

## 9 Highway 34 & 5th Street




| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2005 EX | C | 23.5 | 0.39 |
| **2025 NB** | **F** | **>100** | **1.13** |

## 10 Hansard Avenue & Harrison Street




| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2005 EX | - | - | - |
| 2025 NB | A | 9.5 | 0.25 |

## Legend

**Roadway Geometry**
- Existing (2005)
- Future No Build (2025)

**Turning Movement**
- Direction
- 450 Existing (2005) Volume
- ***495*** Future No Build (2025) Volume

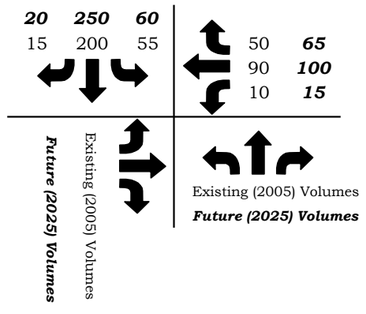
**LOS**
Level of Service of intersection (based on delay)

**Delay**
Approach delay in seconds

**V/C**
Volume to capacity ratio (for worst approach at unsignalized intersections)

**N/A**
Movement not applicable

**Example**




## Notes

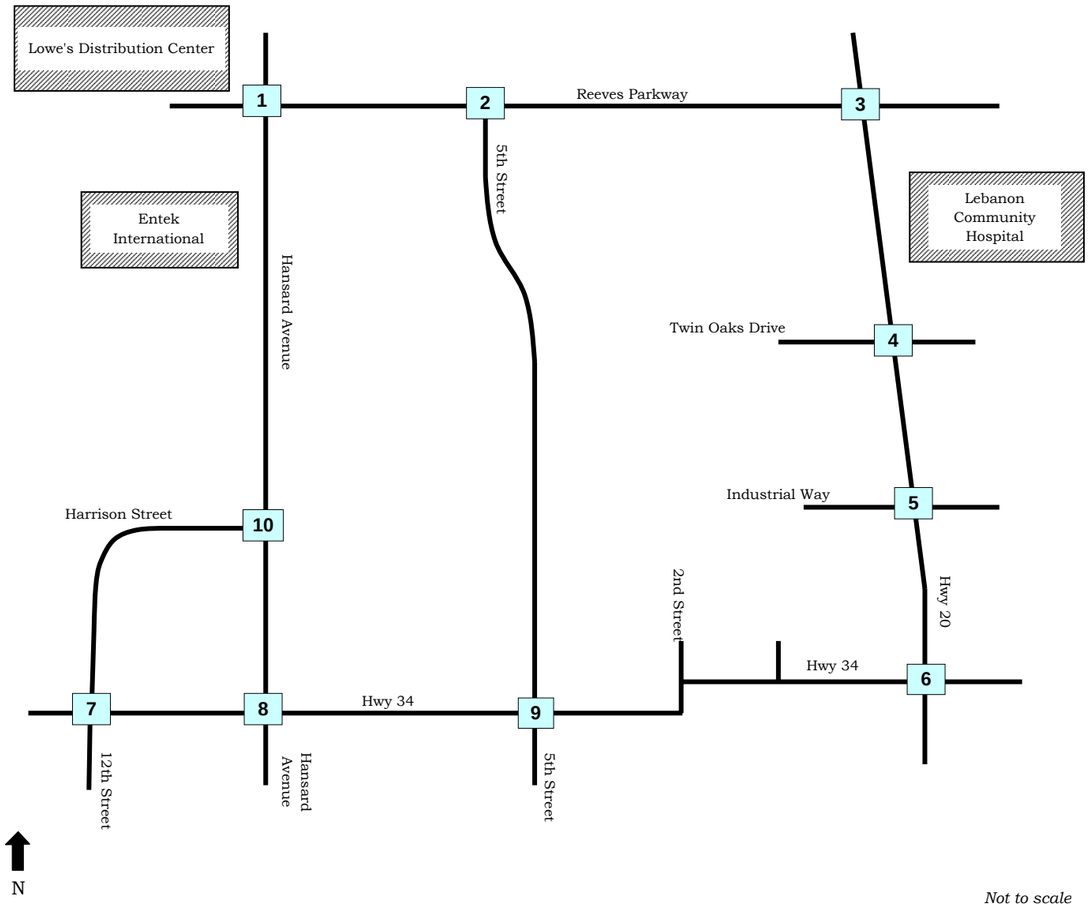
**1.13** Indicates V/C ratios that exceed mobility standards under the No Build condition

Figure 2

PM Peak Hour

Existing vs. No Build Turning Movement Volumes

**Lebanon Industrial Lands Traffic Analysis**




*Not to scale*

## Legend

**Roadway Geometry**
Future No Build and Mitigated geometry (2025)

**Signal Control**
- Stop controlled intersection
- Signalized intersection
- Signalization as part of Mitigation
- * Approach is stop controlled in No Build & Parkway option

**LOS**
Level of Service of intersection (based on delay)

**Delay**
Approach delay in seconds

**V/C**
Volume to capacity ratio (for worst approach at unsignalized intersections)

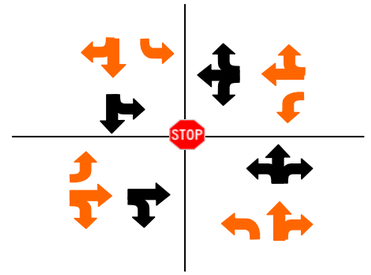
**N/A**
Movement not applicable

**Channelization**
Channelization remains the same between the No Build and Mitigated options, except where noted

**Turning Movement Direction**
- Future No Build (2025)
- Future Mitigated (2025) (If different from the No Build channelization)
- Future Parkway (2025) (If different from the No Build channelization)

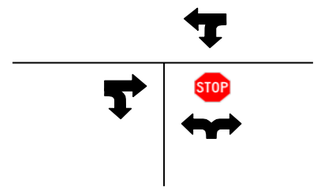
0.77 LOS under the Mitigated option **improves** by at least one grade from the No Build

### 1 Reeves Parkway & Hansard Ave



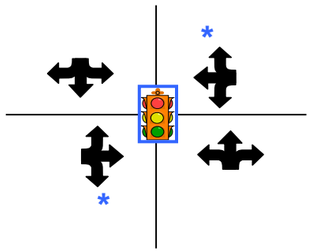

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | A | 8.9 | 0.23 |
| 2025 Mit | A | 8.9 | 0.23 |
| 2025 Pkwy | B | 11.8 | 0.36 |

### 2 Reeves Parkway & 5th Street



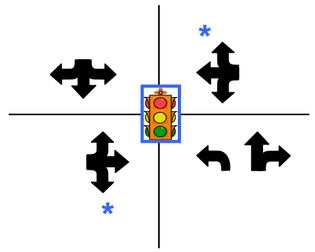

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | B | 10.0 | 0.06 |
| 2025 Mit | B | 10.0 | 0.06 |
| 2025 Pkwy | B | 13.2 | 0.11 |

### 3 Highway 20 & Reeves Pkwy



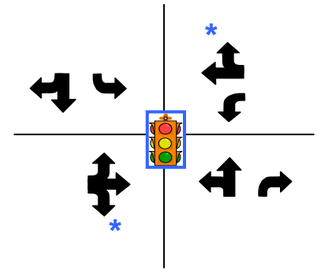

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | F | >100 | 1.37 |
| **2025 Mit** | **A** | **8.5** | **0.72** |
| 2025 Pkwy | F | >100 | 1.76 |

### 4 Highway 20 & Twin Oaks Drive



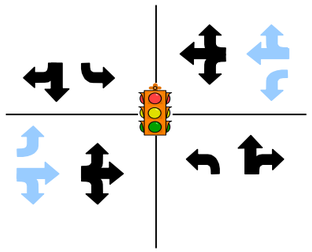

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | F | >100 | 1.92 |
| **2025 Mit** | **B** | **10.6** | **0.72** |
| 2025 Pkwy | F | >100 | 0.96 |

### 5 Highway 20 & Industrial Way



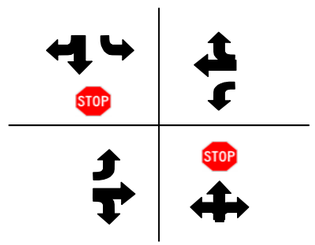

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | F | >100 | >2.00 |
| **2025 Mit** | **A** | **7.0** | **0.71** |
| 2025 Pkwy | F | >100 | 1.54 |

### 6 Highway 20 & Highway 34



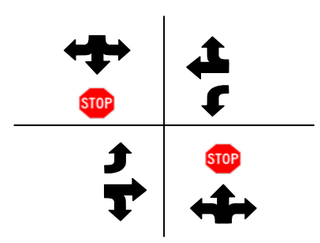
| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | D | 37.9 | 0.91 |
| **2025 Mit** | **C** | **21.1** | **0.83** |
| 2025 Pkwy | C | 27.7 | 0.72 |

### 7 Highway 34 & 12th Street



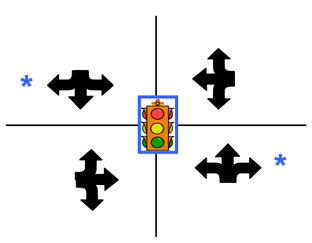

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | C | 24.9 | 0.52 |
| 2025 Mit | C | 24.9 | 0.52 |
| 2025 Pkwy | D | 31.4 | 0.57 |

### 8 Highway 34 & Hansard Avenue



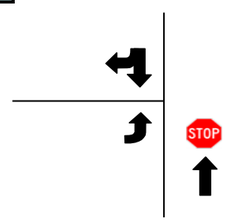

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | C | 17.3 | 0.08 |
| 2025 Mit | C | 17.3 | 0.08 |
| 2025 Pkwy | C | 17.8 | 0.07 |

### 9 Highway 34 & 5th Street




| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | F | >100 | 1.13 |
| **2025 Mit** | **C** | **24.0** | **0.54** |
| 2025 Pkwy | F | 65.9 | 0.75 |

### 10 Hansard Avenue & Harrison Street




*Southbound through movement must yield*

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | A | 9.5 | 0.25 |
| 2025 Mit | A | 9.5 | 0.25 |
| 2025 Pkwy | A | 9.6 | 0.25 |

## Notes

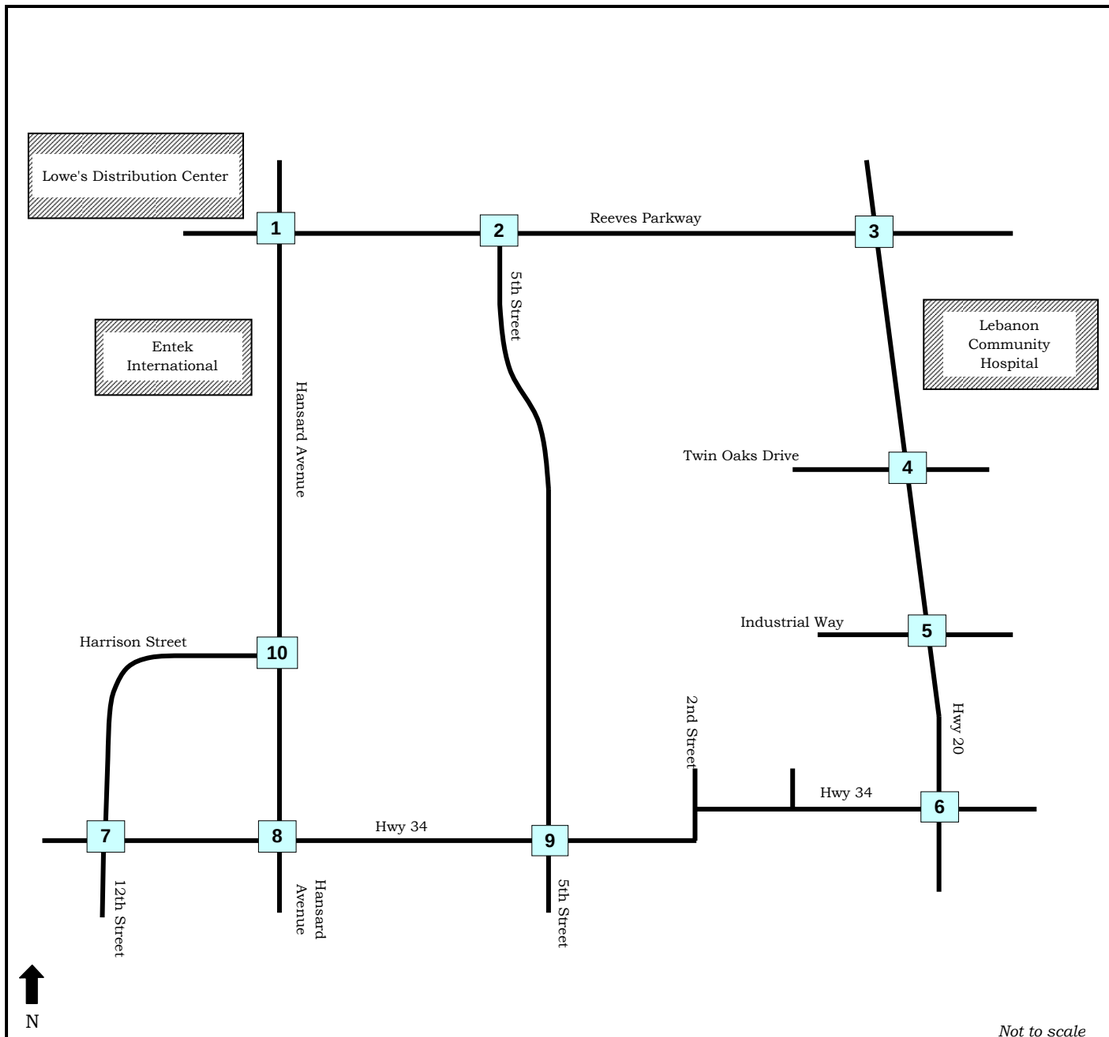
Mitigated option includes signalization at Hwy 20/Reeves Pkwy, Hwy 20/Twin Oaks Dr., Hwy 20/Industrial Way, Hwy 34/12th St, and Hwy 34/5th St
Parkway option includes extension of Reeves Pkwy to the west

Figure 3

PM Peak Hour

No Build, Mitigated, and Parkway Lane Channelization

**Lebanon Industrial Lands Traffic Analysis**




*Not to scale*

## Legend

**Roadway Geometry**

Future No Build and Mitigated geometry (2025)

**Turning Movement**

Direction

450 Future No Build (2025) Volume

***495*** Future Mitigated (2025) Volume

**LOS**

Level of Service of intersection (based on delay)

**Delay**

Approach delay in seconds

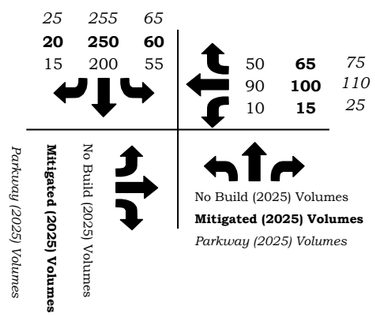
**V/C**

Volume to capacity ratio (for worst approach at unsignalized intersections)

**N/A**

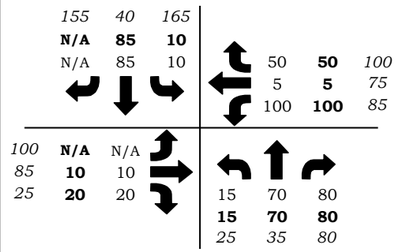
Movement not applicable

**Example**



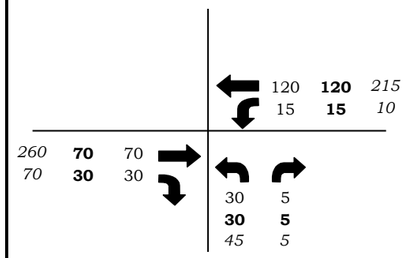

**0.77** LOS under the Mitigated option **improves** by at least one grade from the No Build

### 1 Reeves Parkway & Hansard Ave



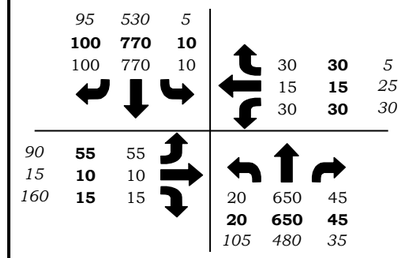

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | A | 8.9 | 0.23 |
| 2025 Mit | A | 8.9 | 0.23 |
| 2025 Pkwy | B | 11.8 | 0.36 |

### 2 Reeves Parkway & 5th Street



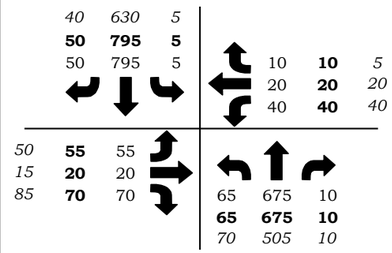

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | B | 10.0 | 0.06 |
| 2025 Mit | B | 10.0 | 0.06 |
| 2025 Pkwy | B | 13.2 | 0.11 |

### 3 Highway 20 & Reeves Pkwy



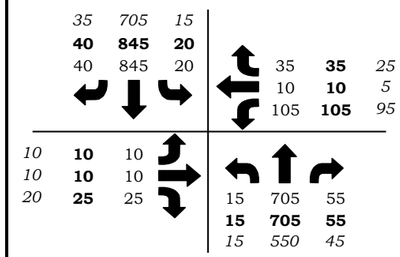

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | F | >100 | 1.37 |
| **2025 Mit** | **A** | **8.5** | **0.72** |
| 2025 Pkwy | F | >100 | 1.76 |

### 4 Highway 20 & Twin Oaks Drive



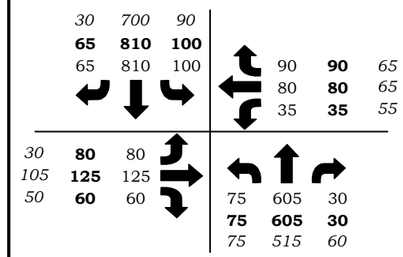

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | F | >100 | 1.92 |
| **2025 Mit** | **B** | **10.6** | **0.72** |
| 2025 Pkwy | F | >100 | 0.96 |

### 5 Highway 20 & Industrial Way



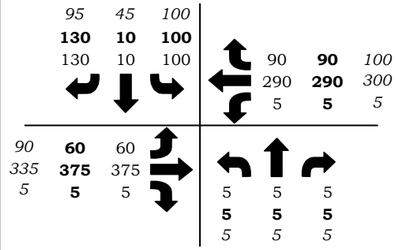

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | F | >100 | >2.00 |
| **2025 Mit** | **A** | **7.0** | **0.71** |
| 2025 Pkwy | F | >100 | 1.54 |

### 6 Highway 20 & Highway 34



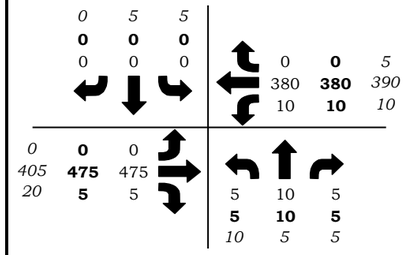

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | D | 37.9 | 0.91 |
| **2025 Mit** | **C** | **21.1** | **0.83** |
| 2025 Pkwy | C | 27.7 | 0.72 |

### 7 Highway 34 & 12th Street



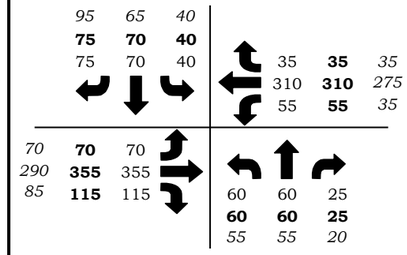

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | C | 24.9 | 0.52 |
| 2025 Mit | C | 24.9 | 0.52 |
| 2025 Pkwy | D | 31.4 | 0.57 |

### 8 Highway 34 & Hansard Avenue



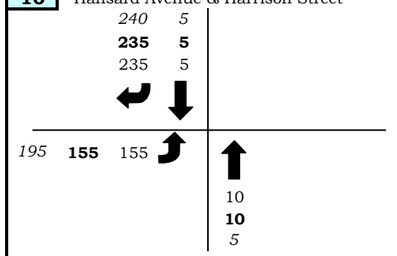

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | C | 17.3 | 0.08 |
| 2025 Mit | C | 17.3 | 0.08 |
| 2025 Pkwy | C | 17.8 | 0.07 |

### 9 Highway 34 & 5th Street




| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | F | >100 | 1.13 |
| **2025 Mit** | **C** | **24.0** | **0.54** |
| 2025 Pkwy | F | 65.9 | 0.75 |

### 10 Hansard Avenue & Harrison Street




| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | A | 9.5 | 0.25 |
| 2025 Mit | A | 9.5 | 0.25 |
| 2025 Pkwy | A | 9.6 | 0.25 |

## Notes

Mitigated option includes signalization at Hwy 20/Reeves Pkwy, Hwy 20/Twin Oaks Dr., Hwy 20/Industrial Way, Hwy 34/12th St, and Hwy 34/5th St

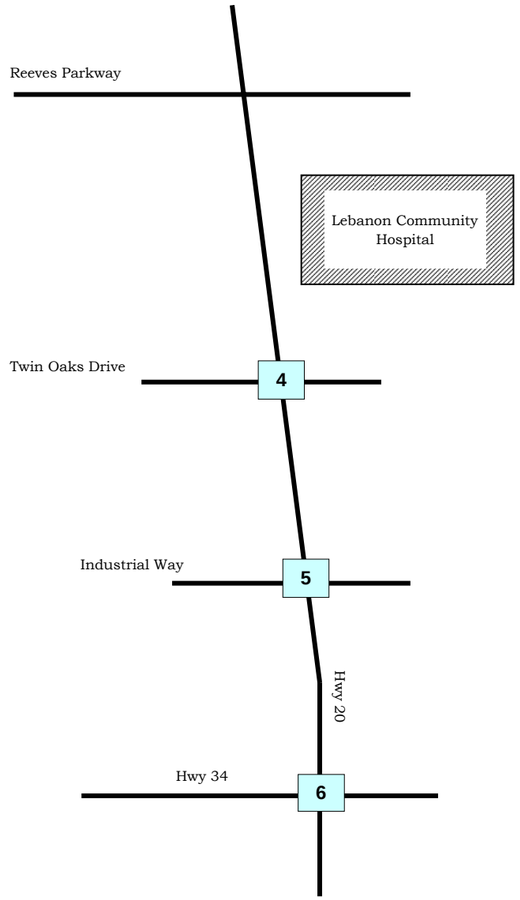
Parkway option includes extension of Reeves Pkwy to the west

Figure 4

PM Peak Hour

No Build, Mitigated, and Parkway Turning Movement Volumes

**Lebanon Industrial Lands Traffic Analysis**




*Not to scale*

## Notes

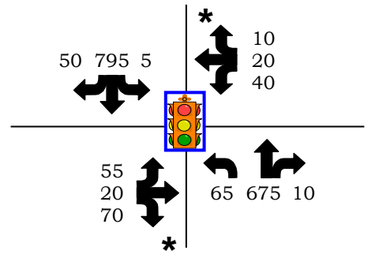
Mitigated options for the entire network are presented in Figures 3 and 4. Those options include a traffic signal at Hwy 20/Reeves Pkwy, Hwy 20/Twin Oaks Dr., Hwy 20/Industrial Way, Hwy 34/12th St, and Hwy 34/5th St.
Variations of mitigation measures at Hwy 20 / Industrial Way are presented here.

**0.77** LOS under the Mitigated option **improves** by at least one grade from the No Build

## Mitigation Variation 1 - Traffic Signal

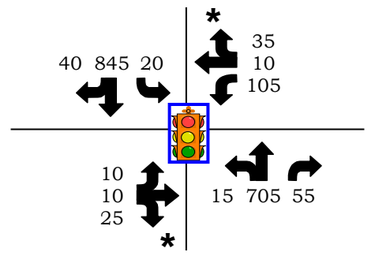
Variation 1 assumes a traffic signal at Hwy 20 / Industrial Way, and added capacity at Hwy 20 / Hwy 34.

**4** Highway 20 & Twin Oaks Drive



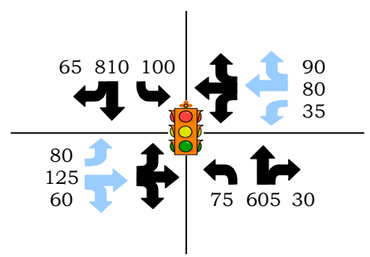

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | F | >100 | 1.92 |
| Mitigation 1 | **B** | **10.6** | **0.72** |

**5** Highway 20 & Industrial Way




| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | F | >100 | >2.00 |
| Mitigation 1 | **A** | **7.0** | **0.71** |

**6** Highway 20 & Highway 34

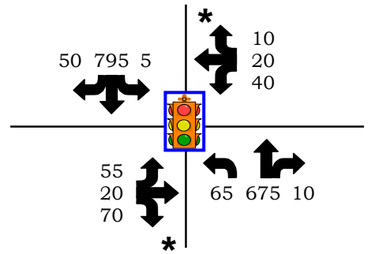



| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | D | 37.9 | 0.91 |
| Mitigation 1 | **C** | **21.1** | **0.83** |

## Mitigation Variation 2 - Extend Williams St.

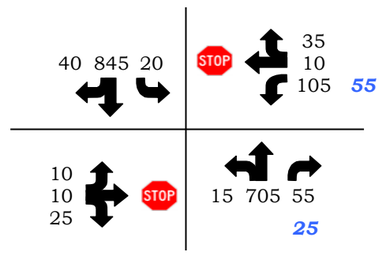
Variation 2 assumes Hwy 20 / Industrial Way is stop controlled (same as No Build). This variation also assumes the Williams Street extension is in place. Assume approximately half the traffic entering/exiting Industrial Way from Hwy 20 will now use this extension.

**4** Highway 20 & Twin Oaks Drive



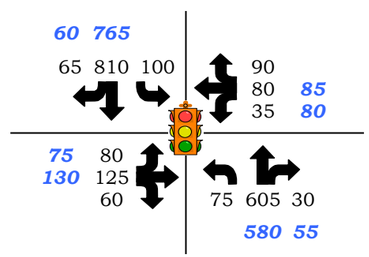

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | F | >100 | 1.92 |
| Mitigation 2 | **B** | **10.5** | **0.74** |

**5** Highway 20 & Industrial Way




| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | F | >100 | >2.00 |
| Mitigation 2 | F | 183.9 | 1.17 |

**6** Highway 20 & Highway 34

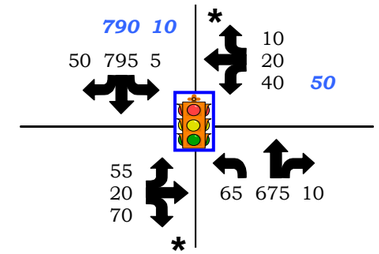



| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | D | 37.9 | 0.91 |
| Mitigation 2 | **C** | **33.7** | **0.91** |

## Mitigation Variation 3 - Right In / Right Out

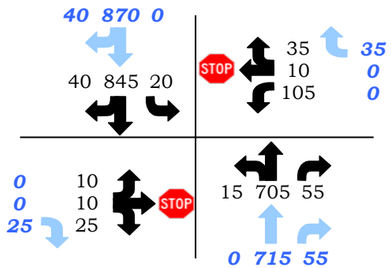
Variation 3 assumes Hwy 20 / Industrial Way has right-in / right-out access only. Left and through movements will be restricted. Assume traffic is rerouted to either Hwy 20/ Oaks or Hwy 20 / Hwy 34.

**4** Highway 20 & Twin Oaks Drive



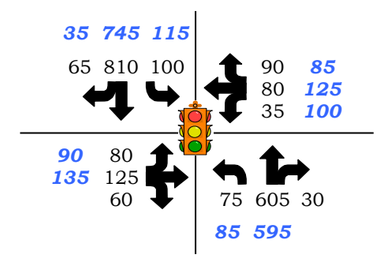

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | F | >100 | 1.92 |
| Mitigation 3 | **B** | **10.6** | **0.74** |

**5** Highway 20 & Industrial Way




| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | F | >100 | >2.00 |
| Mitigation 3 | **D** | **29.6** | **0.16** |

**6** Highway 20 & Highway 34

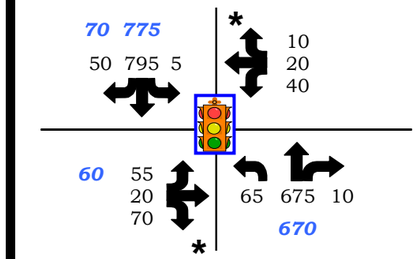



| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | D | 37.9 | 0.91 |
| Mitigation 3 | D | 40.3 | 0.94 |

## Mitigation Variation 4 - Close West Leg Access

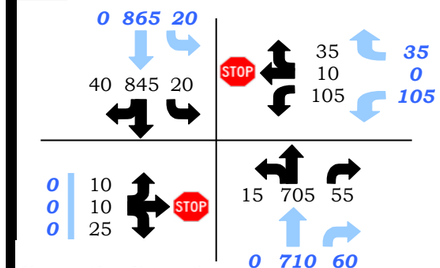
Variation 4 assumes the west leg of Hwy 20/ Industrial Way is closed. Traffic will not have access to or from the west side of Industrial from Hwy 20. Assume traffic is rerouted to Hwy 20 / Twin Oaks or Hwy 20 / Hwy 34.

**4** Highway 20 & Twin Oaks Drive




| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | F | >100 | 1.92 |
| Mitigation 4 | **B** | **12.6** | **0.71** |

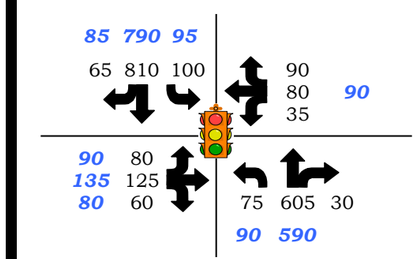
**5** Highway 20 & Industrial Way




*Close west leg of intersection*

| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | F | >100 | >2.00 |
| Mitigation 4 | F | 222.8 | 1.32 |

**6** Highway 20 & Highway 34




| | LOS | Delay (s) | V/C |
|---|---|---|---|
| 2025 NB | D | 37.9 | 0.91 |
| Mitigation 4 | D | 43.1 | 0.93 |

## Legend

LOS
Level of Service of intersection (based on delay)

Delay
Approach delay in seconds

N/A
Movement not applicable

V/C
Volume to capacity ratio (for worst approach at stop controlled intersections)

* Approach is stop controlled in No Build

Signal Control

STOP Stop controlled approach

Signalized intersection (as part of No Build)

Signalized intersection (as part of Mitigation)

Turning Movement Direction & Volume

Future No Build (2025) Turning Direction
250 Volume

Future Mitigated Variation (2025) Turning Direction
250 Volume (If different from the No Build channelization)

Figure 5

PM Peak Hour

Mitigation Variations at Industrial Way

**Lebanon Industrial Lands Traffic Analysis**

**APPENDIX E**

# Truck Route Authorization

FORM E-123X 50M 7-66



STATE OF OREGON
STATE HIGHWAY DEPARTMENT
SALEM 97310

October 24, 1966

Mr. Karel Hyer
Chief of Police
City Hall
Lebanon, Oregon

Dear Mr. Hyer:

Acknowledgment is made of your October 12 letter to Division Traffic Engineer Roger Trygstad regarding the truck route ordinance enacted by the Lebanon City Council.

Please be advised that the Oregon State Highway Commission has no objection to Lebanon City Ordinance No. 1222 and consent is given effective September 20, 1966.

We will install a new sign at Main and Milton Streets which will have the legend "TRUCK ROUTE" rather than the existing "LOG TRUCK ROUTE" sign.

Very truly yours,

Forrest Cooper
State Highway Engineer

By ORIGINAL SIGNED
TOM EDWARDS

Tom Edwards
Assistant State Highway Engineer

bc Forrest Cooper
R. L. Porter
Victor D. Wolfe
F. B. Crandall
R. D. Asburry
H. C. Johnson (enc.) - Please have the sign changed

NOTED
R. L. SCHROEDER

RDT:nn/LEG:njc ja

NOTED
TRAFFIC CONTROL

NOTED
L. E. GEORGE

RECEIVED
OCT 25 1966
TRAFFIC ENGINEERING

A BILL FOR AN ORDINANCE DEFINING TRUCKS) ORDINANCE BILL NO. 22
AND PROVIDING A TRUCK ROUTE THROUGH THE) for 1966
CITY OF LEBANON, AND DECLARING AN )
EMERGENCY. ) ORDINANCE NO. 1222

THE PEOPLE OF THE CITY OF LEBANON DO ORDAIN AS FOLLOWS:

Section 1. All trucks over 35 feet in length, and all trucks towing trailers and/or semi-trailers, loaded or empty, shall proceed through the City of Lebanon on the truck routes herein below established, and by no other routes or streets.

Section 2. The truck routes are as follows:

1. For trucks coming from the North and proceeding to the East:

   South on Santiam Highway to Wheeler Street;
   East on Wheeler Street to Williams Street;
   South on Williams Street to E. Grant Street;
   East on E. Grant Street to City Limits

2. For trucks coming from the North and proceeding to the South:

   South on Santiam Highway to Wheeler Street;
   East on Wheeler Street to Williams Street;
   South on Williams Street to E. Milton Street;
   West on E. Milton Street to South Main Street;
   South on South Main Street to City Limits

3. For trucks coming from the North and proceeding to the West:

   South on Santiam Highway to Morton Street;
   West on Morton Street to Second Street;
   South on Second Street to Tangent Street;
   West on Tangent Street to City Limits

4. For trucks coming from the East and proceeding to the South:

   West on E. Grant Street to Williams Street;
   South on Williams Street to E. Milton Street;
   West on E. Milton Street to South Main Street;
   South on South Main Street to City Limits

5. For trucks coming from the East and proceeding to the West:

   West on E. Grant Street to Williams Street;
   North on Williams Street to Wheeler Street;
   West on Wheeler Street to Morton Street;
   West on Morton Street to Second Street;
   South on Second Street to Tangent Street;
   West on Tangent Street to City Limits

6. For trucks coming from the East and proceeding to the North:

West on E. Grant Street to Williams Street;
North on Williams Street to Wheeler Street;
West on Wheeler Street to Santiam Highway;
North on Santiam Highway to City Limits

7. For trucks coming from the South and proceeding to the West:

North on South Main Street to Park Street;
North on Park Street to Oak Street;
West on Oak Street to Fifth Street;
North on Fifth Street to Tangent Street;
West on Tangent Street to City Limits

8. For trucks coming from the South and proceeding to the North:

North on South Main Street to E. Milton Street;
East on E. Milton Street to Williams Street;
North on Williams Street to Wheeler Street;
West on Wheeler Street to Santiam Highway;
North on Santiam Highway to City Limits

9. For trucks coming from the South and proceeding to the East:

North on South Main Street to E. Milton Street;
East on E. Milton Street to Santiam Lumber Company OR
East on E. Milton Street to Williams Street;
North on Williams Street to E. Grant Street;
East on E. Grant Street to City Limits

10. For trucks coming from the West and proceeding to the North:

East on Tangent Street to Second Street;
North on Second Street to Morton Street;
East on Morton Street to Santiam Highway;
North on Santiam Highway to City Limits

11. For trucks coming from the West and proceeding to the East:

East on Tangent Street to Second Street;
North on Second Street to Morton Street;
East on Morton Street to Wheeler Street;
East on Wheeler Street to Williams Street;
South on Williams Street to E. Grant Street;
East on E. Grant Street to City Limits

12. For trucks coming from the West and proceeding to the South:

East on Tangent Street to Fifth Street;
South on Fifth Street to Oak Street;
East on Oak Street to Main Street;
South on Main Street to City Limits

Section 3. Inasmuch as the provisions of this Ordinance are necessary for the immediate preservation of the peace, health and safety of the people of the City of Lebanon, an emergency is hereby declared to exist, and this Ordinance shall be in full force and effect immediately upon its passage by the Council and approval by the Mayor.

Passed by the Council and approved by the Mayor this 20th day of September, 1966.

Mayor

ATTEST:

City Recorder

File No.
Rd. No. M.P.
City of
Streets
Rural Urban

TRA 7-4

February 28, 1980

City of Lebanon
City Recorder
City Hall
Lebanon, OR 97355

Gentlemen:

The process of changing designated truck routes requires Oregon Transportation Commission approval in writing according to ORS 483.542.

The Oregon Transportation Commission at its meeting on February 19, 1980, approved the establishment of a revised truck route in the City of Lebanon and Linn County.

The approved revision concurs with City of Lebanon Ordinance No. 1769 which became effective February 11, 1980.

Sincerely,

ORIGINAL SIGNED BY L. E. GEORGE
L. E. George
Traffic Engineer

JB:rh
Attachment
bc: H. S. Coulter
C. O. Fredrickson

NOTED
VERNON L. TABERY

NOTED
DWAYNE HOFSTETTER

February 19, 1980
Salem, Oregon

The Oregon Transportation Commission met in the Conference Room 122, Transportation Building, at 10 a.m. Notice of the meeting was made by press release to the newspapers of general and local circulation throughout the State. Present were:

Anthony Yturri, Chairman
Tom Walsh, Vice Chairman
Peter J. Brix, Member
B. Gordon Coleman, Member
Michael P. Hollern, Member
F. B. Klaboe, Director of Transportation
Jack Sollis, Chief Counsel
Fred Miller, Assistant Director for Administration
George Bell, Assistant Director for Intergovernmental and Public Affairs
Robert Royer, Assistant Director for Policy and Program Development
Larry Rulien, Executive Assistant to the State Highway Engineer
David Talbot, Administrator of Parks and Recreation Division
Paul Burket, Administrator of Aeronautics Division
Dennis Moore, Administrator of Public Transit Division
David Moomaw, Administrator of Motor Vehicles Division
Robert Bothman, Administrator, Metropolitan Branch
E. S. Hunter, Assistant State Highway Engineer, Technical Services Branch
David Moehring, Assistant State Highway Engineer, Project Management Branch
E. J. Valach, Federal Highway Administration
Robert W. Gormsen, Manager, Commission Services

There were others present including representatives of the news media.

The Commission unanimously approved the following items on the consent calendar:

1) Minutes of the meetings of January 15 and 28, 1980.

2) Adopted resolution declaring necessity of certain real property for public purposes and authorized condemnation. ("Real Property Condemnation Resolution No. 2695" on file in the Commission's files, Salem.)

3) Authorized payment of $10,313 as membership dues in the American Association of State Highway and Transportation Officials (AASHTO) for the year 1980.

4) Replacing the structure over the Hudson Slough on Smith River Road in Douglas County. Federal Funds estimated at $762,400 with Local Government Funds providing approximately $190,600.

5) Adopted surveys on the following two bridge projects:

   a. Hood River Bridge Section, Mt. Hood Highway, Hood River County. This portion of the Mt. Hood Highway has been relocated to eliminate sharp curvature at approaches of existing structure. ("Highway Corridor & Design Resolution No. 431" on file in the Commission's files, Salem.)

   b. Nehalem River Bridge Section, Oregon Coast Highway, Tillamook County. Improved alignment and local road access provided in relocation of this portion of the Oregon Coast Highway. ("Highway Corridor & Design Resolution No. 432" on file in the Commission's files, Salem.)

6) Adopted resolution abandoning from the State Highway System 0.05 mile of old alignment in the Hendricks Bridge Section of the McKenzie Highway in Lane County. ("Abandonment Resolution No. 463A" on file in the Commission's files, Salem.)

7) Cooperative agreement with the Corps of Engineers to do the Dixon Creek Revetment Extension located along the Albany-Corvallis Highway near the northerly city limits of Corvallis in Benton County and authorized the programming of State Funds of $8,500 to acquire the necessary right of way.

8) Established a revised truck route in Lebanon, Linn County, and authorized the State Highway Engineer to sign necessary documents. This involves rerouting of truck traffic on the Corvallis-Lebanon Highway. (Map of truck route on file in the Commission's files, Salem.)

A BILL FOR AN ORDINANCE REPEALING ORDINANCE NO. 1584 AND AMENDING ORDINANCE NO. 1222 RELATING TRUCK TRAFFIC THROUGH THE CITY OF LEBANON.

ORDINANCE BILL NO. 2 for 1980

ORDINANCE NO. 1769

THE PEOPLE OF THE CITY OF LEBANON DO ORDAIN AS FOLLOWS:

Section 1. Section 2, subsection 7, of Ordinance No. 1222 (compiled as 6-3.2(7) is amended to read as follows, to-wit:

"7. For trucks coming from the South and proceeding to the West:
North on South Main Street to Park Street;
North on Park Street to Oak Street;
West on Oak Street to city limits."

Section 2. Section 2, subsection 12, of Ordinance No. 1222 (compiled as 6-3.2(12) is amended to read as follows, to-wit:

"12. For trucks coming from the West and proceeding to the South:
East on Oak Street to Main Street;
South on Main Street to city limits."

Section 3. Ordinance No. 1584 passed January 27, 1976 is hereby repealed.

Section 4. The amendment contained in this Ordinance shall become effective February 11, 1980.

Passed by the Council of the City of Lebanon by a vote of 4 for and 0 against this 9th day of January, 1980.

David A Clark
Mayor

ATTEST:

Edwin L. Ivey
City Recorder