

Lents Town Center Business District Transportation Plan**Key Transportation Issues:**

- **Improve the pedestrian environment**
 - High traffic volumes related to freeway speeding
 - Narrow sidewalks, lack of street trees & amenities
 - Lack of protected crossings
- **Outer SE Community Plan**

Lents Town Center Business District Transportation Plan**Alternatives Development**

- **Alternative A- Decouple**
 - Create a main street environment along Foster Rd. and 92nd Ave.
- **Alternative B- Enhanced Couplet**
 - Create a main street environment on 92nd Ave. and commercial street environment along Foster and Woodstock

Lents Town Center Business District Transportation Plan

Alternatives Evaluation

Alternative B- Enhanced Couplet chosen as the preferred alternative

- **Greater ability to accommodate growth in trips**
- **Decouple impacts- barrier effect**
- **More on-street parking**
- **Construction impacts**

Lents Town Center Business District Transportation Plan

Key Features of Preferred Alternative

- **New traffic signals**
more protected pedestrian crossings
better signal progression/speed control
- **Increased on-street parking supply**
- **Wider sidewalks with street trees and lighting**
- **New transit service on 92nd Ave.**
- **Bicycle facilities consistent with the Bicycle Master Plan**

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**LENTS
TOWN CENTER
BUSINESS DISTRICT
TRANSPORTATION
PLAN**

REPORT AND RECOMMENDATIONS

November 1999

Prepared by
City of Portland
Office of Transportation
and
Portland Development Commission

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

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LENTS TOWN CENTER BUSINESS DISTRICT TRANSPORTATION PLAN EXECUTIVE SUMMARY

Background

For many years the Lents community has requested the City's assistance in reversing economic decline in the neighborhood. These efforts have culminated in the adoption of the Lents Urban Renewal Plan by City Council in 1998, which outlines a comprehensive strategy for the revitalization process. The purpose of the Lents Town Center Business District Transportation Plan is to identify transportation system improvements that support the Lents Urban Renewal Plan's goal of revitalizing the Lents community.

The Lents Town Center Business District Transportation Plan is also intended to support the area's designation as a town center in the Metro Region 2040 Framework Plan. Town centers are designed to provide a wide range of locally oriented commercial and housing options that reduce the need for residents to travel out of the area for basic services. A key functional characteristic of town centers is a transportation system that encourages a high level of pedestrian, bicycle and transit access.

A priority issue for both the urban renewal process and the development of a town center in Lents is the revitalization of the traditional business district core. The business district core is centered around the intersection of Foster Road and 92nd Ave, and is anticipated to receive new development and more neighborhood oriented businesses. Transportation issues play an important role in redeveloping this area given its proximity to the Interstate 205 freeway. Large volumes of traffic generated by the freeway ramps are routed through the core of the business district, creating congestion problems and conflicting with the area's need to improve the pedestrian environment and provide access for all modes of travel. The area's lack of on-street parking also impedes commercial development in existing storefront buildings which do not have off-street parking to rely upon.

The Lents Town Center Business District Transportation Plan was designed to comprehensively address these and other transportation issues specifically related to revitalizing the business district core area. Funding for the plan was made possible in part through a grant from the Transportation and Growth Management (TGM) Program, a joint program of the Oregon Department of Transportation and the Oregon Department of Land Conservation and Development. A citizens advisory committee made up of volunteers from the Lents community has helped guide the plan's development and its recommendations. Public input on the plan was also solicited through two open house events during the spring of 1999. The plan's recommendations include the following elements:

- Street system plan for the business district core,
- Streetscape design standards for street frontage improvements in the public right-of-way as redevelopment occurs
- Action items which provide policy guidelines for additional transportation planning in the study area

Plan Objectives

The objectives of the plan were developed from existing policies, previous planning work and discussions with the citizens advisory committee regarding the key issues that need to be addressed to support revitalization of the commercial district core. Previous plans have laid a policy framework for identifying plan objectives. These plans include the Region 2040 Plan, Outer Southeast Community Plan, the Lents Neighborhood Plan, as well as the Lents Urban Renewal Plan. A transportation study completed in 1995, the Lents Transportation Study, also identified a number of issues that need to be addressed through transportation system improvements and management.

The following list of objectives was adopted by the citizens advisory committee to guide the planning process. Most importantly, the objectives were used as criteria during the evaluation phase to help judge the relative merits of alternatives under consideration. The preferred alternative was chosen based on its ability, on balance, to best meet these objectives.

- Pedestrian environment
Enhance pedestrian access and circulation throughout the business district; improve connections into the neighborhood and to transit service.
- Commercial redevelopment
Ensure transportation improvements support local commercial redevelopment opportunities.
- Parking
Develop a strategy for the provision and management of adequate parking (on and off street) to support commercial redevelopment.
- Transit service
Improve service and connections; coordinate with high capacity transit in the I-205 corridor.
- Streetscape
Create a more attractive environment for pedestrians and commercial development through streetscape design and planning.
- Decoupling
Determine feasibility of decoupling Foster/Woodstock.
- Through traffic
Keep through (non-local) traffic off local streets.
- Auto access and circulation
Maintain acceptable traffic levels of service, stabilize traffic speeds.
- Multi-modal safety
Ensure safety for all modes of travel.
- Bicycles
Improve bicycle access and circulation to and through the business district.

Alternatives Development

Using the plan's objectives as a vision for the transportation system, two transportation system alternatives were developed for evaluation. The first alternative, Alternative A, decouples the existing Foster/Woodstock one-way couplet (between 90th and 100th Ave). Decoupling refers to the process of turning one-way streets back to their original two-way

operation. Decoupling was specifically called out for study by the urban renewal plan. The business district core was historically served by two-way traffic flow on both Foster and Woodstock. This was changed with the construction of the I-205 freeway. The existing couplet was built to improve capacity to the new freeway connections. The couplet changed the function of business district core from a locally oriented 'main street' to one which now functions more like a transportation corridor, with an emphasis on regional access to the freeway. Conceptually, Alternative A attempts to return Foster in the core area functionally back to a more locally oriented 'main street' through decoupling.

The second alternative developed was built around the concept of retaining the existing couplet design for capacity reasons, but mitigating the associated negative impacts and improving its ability to serve local access and circulation by all modes. This alternative is referred to in the plan as Alternative B- Enhanced Couplet. The character of 92nd Ave, which currently has many of the transportation attributes of a main street, is identical in both alternatives.

Based on the intended functional design of each alternative, the alternatives development process then designed the appropriate transportation system improvements needed to enhance each one operationally in terms of capacity, safety, and utility for all modes. The basic system design components for each alternative are summarized below.

	Alternative A Decouple	Alternative B Enhanced Couplet
Foster Rd 90 th – 100 th	<ul style="list-style-type: none"> • Two-way traffic flow • 2 travel lanes + center turn lane • Parking both sides 	<ul style="list-style-type: none"> • One-way traffic flow • 3 travel lanes (all westbound) • Parking both sides
Woodstock Blvd 90 th – 100 th	<ul style="list-style-type: none"> • Two-way traffic flow • 5 travel lanes (two in each direction with a center turn lane) 	<ul style="list-style-type: none"> • One-way traffic flow • 3 travel lanes (all eastbound) • Parking both sides, east of 91st Ave
91 st Ave north of Foster	<ul style="list-style-type: none"> • Realign with 91st south of Foster (improved safety) 	<ul style="list-style-type: none"> • Same as Alternative A
92 nd Ave north of Woodstock	<ul style="list-style-type: none"> • Two-way traffic flow • 2 lanes in each direction • Parking both sides 	<ul style="list-style-type: none"> • Same as Alternative A
New traffic signals	<ul style="list-style-type: none"> • 90th & Foster • 100th & Woodstock • Option 88th & Foster 	<ul style="list-style-type: none"> • 90th & Foster • 91st & Foster • 91st & Woodstock • 100th & Foster/Woodstock
Pedestrian facilities	<ul style="list-style-type: none"> • Wider sidewalks (12-14 ft) on all core area streets • Curb extensions 	<ul style="list-style-type: none"> • Same as Alternative A
Bicycle facilities	<ul style="list-style-type: none"> • Bike lanes, both directions, on Woodstock and 92nd Ave 	<ul style="list-style-type: none"> • Eastbound bike lane on Woodstock, westbound bike lane on Foster. Bike lanes on 92nd Ave

The final design element used in developing the plan is streetscape design. Streetscape design refers to the design and relationship of the right-of-way to adjacent land uses, special sidewalk treatments, street trees, street furniture, etc., that help improve the overall look and attractiveness of the business district. Streetscape design guidelines were developed to create a consistent design theme for the area as properties redevelop and improvements in the right-of-way are required.

Alternatives Evaluation

Each alternative was evaluated using the project's objectives as evaluation criteria. The evaluation process and criteria were divided into two categories, transportation and urban design/commercial development. The evaluation findings for each category and the related criteria were based on separate traffic engineering and urban design consultant reports. The evaluation matrix summarizes the findings for each evaluation criteria (see attached). The (✓) indicates when the criteria is supported by the alternative.

**Lents Town Center Business District Transportation Plan
 Alternatives Evaluation Summary Matrix (✓) indicates support of the criteria**

Objective/ Evaluation Criteria	Alternative A Decouple	Alternative B Enhanced Couplet
Transportation Criteria		
<p>Auto access and circulation Maintain acceptable traffic levels of service, stabilize traffic speeds.</p>	<ul style="list-style-type: none"> • Capacity: LOS 'E' or better in 2015. Adequate capacity can be provided (marginal), through requires significant amounts of right-of-way (✓) <i>Speed control</i>: Reduced through traffic volumes on Foster should reduce speeds. Increased congestion, two-way traffic flow should reduce speeds on Woodstock. 	<ul style="list-style-type: none"> (✓) Capacity: LOS 'D' or better in 2015 More capacity provided than Alternative A. (✓) <i>Speed control</i>: Additional traffic signals can be better timed to control speeds and progression on both Foster and Woodstock through business district core.
<p>Through traffic Keep non-local traffic off local streets</p>	<ul style="list-style-type: none"> (✓) Because adequate capacity is provided, diversion should not be an issue. 	<ul style="list-style-type: none"> (✓) Same as Alternative A
<p>Multi-modal safety Ensure safety for all modes of travel.</p>	<ul style="list-style-type: none"> • Traffic: More potential turn movement conflicts with two-way traffic flow. 	<ul style="list-style-type: none"> (✓) Traffic: Fewer turn movement conflicts with one-way traffic flow.
<p>Pedestrian environment Enhance pedestrian access and circulation throughout the business district; improve connections into the neighborhood and to transit service.</p>	<ul style="list-style-type: none"> (✓) Foster: 'Main Street' traffic environment, lower traffic volumes, slower speeds, narrower street, wider sidewalks- improves pedestrian environment • Woodstock: Wider street with higher traffic volumes creates barrier to south, degrade pedestrian environment. • Signalized crossings: Three signals (one new) in business district core. New signal at east end of study area Optional signal at 88th Ave./Foster. • Unsignalized crossings: Two-way streets are more difficult to cross because fewer crossing 	<ul style="list-style-type: none"> • Foster: Higher traffic volumes, more non-local traffic than Alternative A. Wider sidewalks. (✓) Woodstock: Lower traffic volumes compared Alternative A. Wider sidewalks (✓) Signalized crossings: Five signals (three new) in core area. New pedestrian activated signals at east end of couplet (✓) Unsignalized crossings: One-way streets easier to cross- more longer gaps in traffic, one direction of travel to pay attention to.

opportunities.		
Objective/ Evaluation Criteria	Alternative A Decouple	Alternative B Enhanced Couplet
<p>Bicycles Improve bicycle access and circulation to and through the business district</p>	<p>(✓) Foster-Woodstock: Bike lanes on Woodstock, not separated (✓) 92nd Ave.. Bike lanes provided. • Safety: Two-way traffic flow creates more potential turn movement conflicts with vehicles.</p>	<p>(✓) Foster-Woodstock: East and westbound bike lanes divided between streets. (✓) 92nd Ave.. Bike lanes provided. (✓) Safety: One-way traffic flow creates fewer potential conflicts with vehicles</p>
<p>Transit Service Improve service and connections, coordinate with high capacity transit service in the I-205 corridor.</p>	<p>• Service: Does not affect ability to increase service. Increased congestion compared to Alternative B slows travel times. Eastbound and westbound service can be concentrated on Foster. • Connections: New north-south service on 92nd Ave. to link to Gateway and Clackamas Town Center</p>	<p>• Service: Does not affect ability to improve service. • Connections: Same as Alternative A.</p>
<p>Parking Develop a strategy for the provision and management of adequate parking (on and off street) to support commercial redevelopment.</p>	<p>Land Use/Urban Design Criteria (✓) Overall Supply: +47 spaces • Foster: Parking on both sides of street in core, net increase of 61 spaces • Woodstock: No parking provided. Net decrease of 14 spaces. • 92nd Ave.: No change.</p>	<p>(✓) Overall Supply: +82 spaces. • Foster: parking both sides 87th-90th, +26 spaces. 90th-94th +27 spaces • Woodstock: 92nd-94th, +29 spaces • 92nd Ave.: No change.</p>

Objective/ Evaluation Criteria	Alternative A Decouple	Alternative B Enhanced Couplet
<p>Commercial Redevelopment Ensure transportation support improvements support local commercial redevelopment opportunities.</p>	<p>(✓) Land use development. Supports 'main street' type neighborhood oriented retail opportunities on 92nd Ave. and Foster. Speeding, parking and visibility issues addressed. More 'main street' than Alternative B. Woodstock becomes more auto-oriented, barrier to access from south.</p> <ul style="list-style-type: none"> • Right-of-way acquisition: Right-of-way needed for all streets Significant amounts of right-of-way needed on Woodstock. • Minimum estimate sqft. - 142,000 • Estimated # parcels/structures impacted- 81 • Construction implementation: Significantly greater cost than Alternative B. Construction cannot be phased. 	<p>(✓) Land use development: Supports 'main street' type of neighborhood oriented retail opportunities on 92nd Ave Supports more mixed auto/pedestrian oriented commercial development on Foster and Woodstock. Speeding and parking issues addressed.</p> <p>(✓) Right-of-way acquisition: Right-of-way needed for all streets. Less overall needed than Alternative A Minimum estimate sqft.- 95,000 Estimated # parcels/structures impacted- 72</p> <p>(✓) Construction implementation: Less cost than Alternative A, can be phased in over time.</p>
<p>Streetscape Create a more attractive environment for pedestrians and commercial development through streetscape design</p>	<p>(✓) Wider sidewalks with regular pattern of street trees and pedestrian scale lighting on all three streets will significantly improve visual appearance of commercial core.</p> <p>(✓) Foster, 90th-94th, has greater potential to develop as a neighborhood and pedestrian oriented street More overall 'main street' development potential.</p> <ul style="list-style-type: none"> • Less inviting environment for pedestrians, more auto oriented, on Woodstock is the tradeoff. 	<p>(✓) Wider sidewalks with regular pattern of street trees and pedestrian scale lighting on all three streets will significantly improve visual appearance of commercial core.</p> <ul style="list-style-type: none"> • Potential for gateway treatment at west end of couplet

Recommendation

In review of the findings from the alternatives evaluation phase **Alternative B-Enhanced Couplet was chosen as the preferred alternative by the citizens advisory committee** because, on balance, it best addresses the evaluation criteria and adopted policy. Key findings in making this decision include:

- *Traffic capacity:* Future travel demand in the corridors served by Foster and 92nd Ave are projected to increase substantially. Alternative B provides the most overall transportation system capacity to accommodate current and future travel demand.
- *Pedestrian environment:* Alternative B uses an enhanced system of traffic signals to control traffic speeds and provide more protected crossings for pedestrians along Foster and Woodstock. Wider sidewalks, on-street parking and a coordinated streetscape plan for street lighting and street trees will enhance the comfort and convenience of pedestrian circulation within the business district, consistent with its Town Center designation.
- *On-street parking:* Alternative B provides more opportunities for increasing the on-street parking supply than Alternative A.
- *Decouple impacts:* To provide adequate traffic capacity, Alternative A requires significant widening of Woodstock Blvd (to 5 lanes) through the current couplet section. The widening of Woodstock would create a new barrier to pedestrian access between the south and north sides of the neighborhood.
- *Implementation impacts:* Alternative B requires less right-of-way acquisition and impact to adjacent property than Alternative A. Construction of Alternative B can be phased in over time as properties redevelop, unlike Alternative A.

Streetscape Plan:

The streetscape plan calls for the widening of the business district's sidewalks to Pedestrian District standards and a coordinated system of street trees and street lighting. See attached design guidelines.

Action Items:

The plan recommendation also includes a series design and planning directives to help guide implementation of the plan and coordination with other planning activities going on in the urban renewal district.

- 1 Encourage Tri-Met to provide new transit service on 92nd Ave, connecting the Lents Town Center directly to the Gateway Regional Center and the Clackamas Town Center.
- 2 Request the State Speed Control Board reduce the posted speed limit to 30 mph on Foster and Woodstock within the couplet, and on 92nd Ave Reedway to Tolman to 25 mph.

- 3 Review the relationship between traffic flow and the location of on-street parking on 91st Avenue between Foster and Woodstock when the 91st/Foster and 91st/Woodstock signals are installed to ensure efficient traffic flow along this narrow street
- 4 Develop a transportation and streetscape plan for Foster west of 88th Ave that builds off of and complements the Lents Town Center Business District Transportation Plan This plan should also address safety and cut-through traffic concerns related to the intersection of Foster/Ellis and 84th Ave
- 5 Continue to study traffic issues and implement transportation improvement projects on surrounding local neighborhood streets
- 6 Encourage undergrounding utilities within business district
- 7 Work with the Oregon Department of Transportation to study the feasibility of allowing full southbound access to I-205 from Powell Blvd

Other Issues:

- Study the feasibility and desirability of providing a direct connection between Harold Street and Ellis Street in the vicinity of 92nd Ave
- Continue to work with Metro and Tri-Met on the study and development of a high capacity transit system in the I-205 corridor which includes a station in Lents

Next Steps

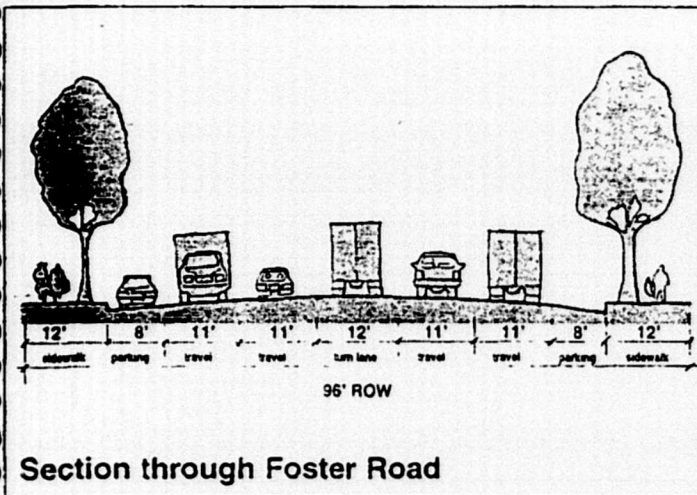
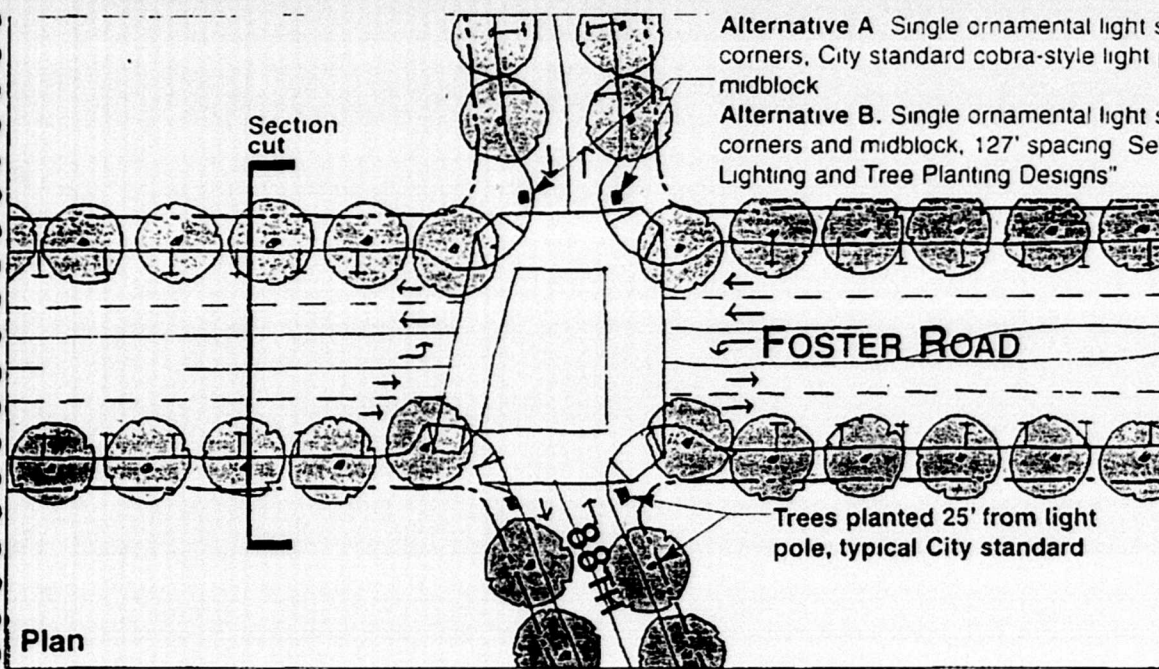
Adoption of the plan

The recommendations proposed by this plan have been approved by the Lents Town Center Business District Transportation Plan Citizens Advisory Committee in September, 1999. The Lents Neighborhood Association has also reviewed and endorsed the preferred alternative. This recommendation will be forwarded to the Lents Town Center Urban Renewal Advisory Committee for approval in October, 1999 and eventually City Council for final adoption by resolution, probably in the late fall of 1999.

Construction

Currently, there are two identified sources of funding for construction of this plan, System Development Charges (SDC) dedicated to expanding transportation system capacity related to growth, and tax increment financing from the Lents Town Center Urban Renewal Project. The SDC fund has earmarked approximately \$1.2 million for construction of transportation improvement projects in Lents, while the urban renewal funds are contingent upon establishing funding priorities within the entire urban renewal plan work plan. Given the total cost estimate for construction of this plan (see Appendix D), implementation of the plan will need to be phased over time. Establishing priorities for implementation for the transportation management plan will be coordinated by the Portland Development Commission through the urban renewal public involvement and planning process.

Before construction of each identified improvement can proceed additional design engineering work is required to ensure final compatibility with City traffic and civil engineering standards



GUIDELINES

Sidewalks. 12' where the sidewalk allows; 4' for furnishing zone; 8' for through pedestrian zone (in conformance with Portland Pedestrian Design Guide).

Curb cuts, driveways. Consolidate driveways and minimize curb cuts.

Curb extensions. At all corners, except on east and west corners of 88th at Foster.

Marked crosswalks At all corners, painted or scored concrete (preferred).

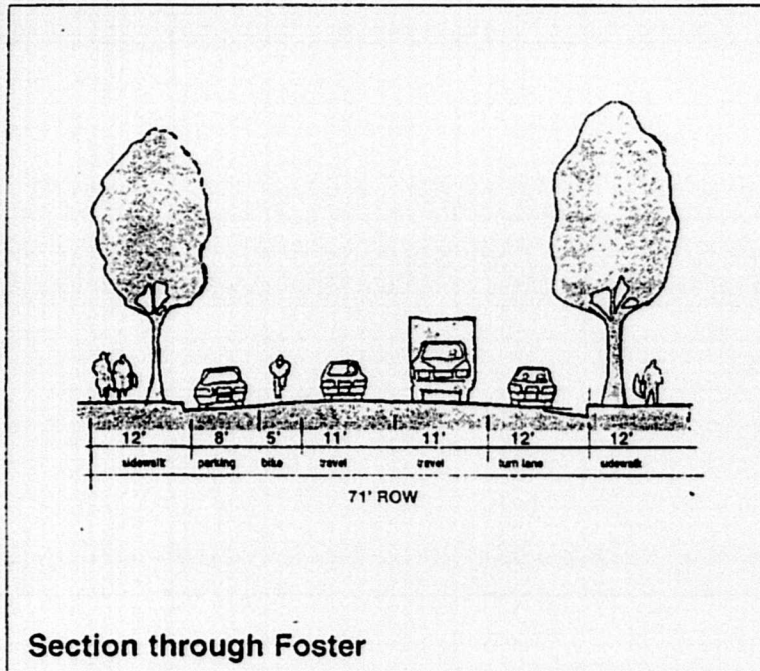
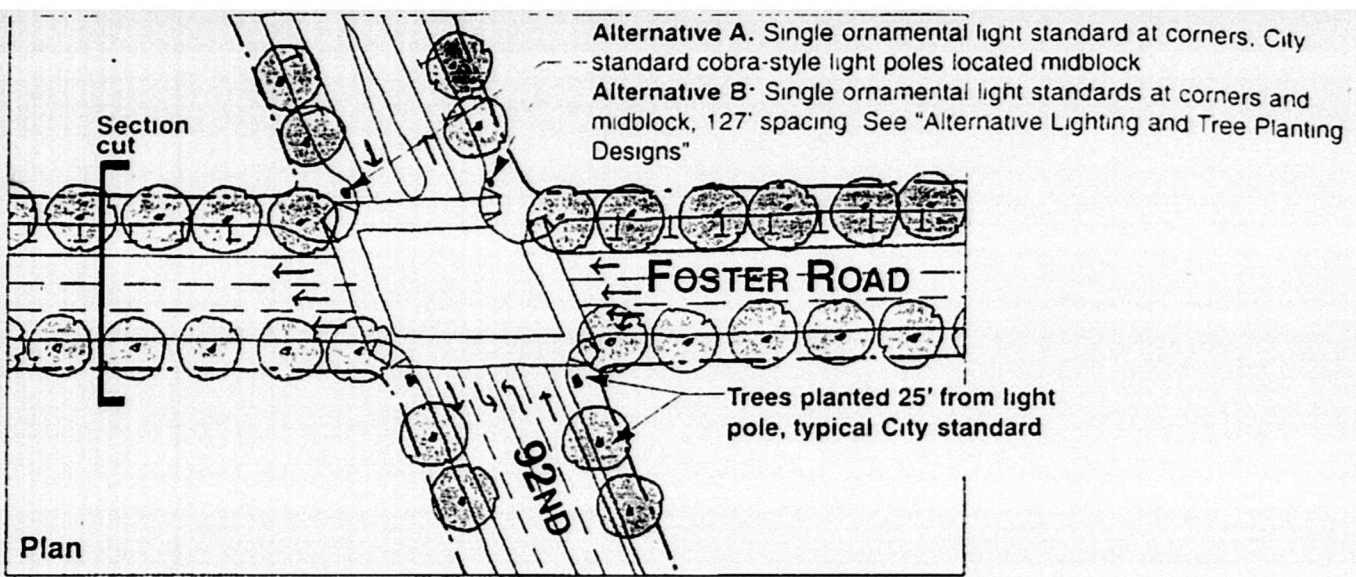
Lighting. Two alternatives are illustrated, see plans. Especially on commercial streets, the white light of a metal halide luminaire is preferred, over the orange light produced by City standard sodium vapor. Pedestrian scale pole-mounted luminaire is preferred. See "Alternative Lighting and Tree Planting Designs" for specifications.

Trees. 20'-30' spacing, depending on the species selected: Trees with a 20' spread, plant 20' o.c., trees with a 30' spread, plant 30' o.c. (in conformance with Portland Urban Forestry Street Tree Planting Guidelines) Canopy type tree preferred See Canopy-type Tree list.

Streetscape Design Guidelines for Commercial Street

Southeast 88th Avenue and Foster Road

Lents Town Center Plan



GUIDELINES

Sidewalks. 12' where the sidewalk allows; 4' for furnishing zone, 8' for through-pedestrian zone (in conformance with Portland Pedestrian Design Guide).

On-street parking. Maximize, where possible.

Curb cuts, driveways. Consolidate driveways and minimize curb cuts.

Curb extensions. At north corners of Foster at 92nd.

Marked crosswalks. At all corners, painted or scored concrete (preferred)

Lighting. Two alternatives are illustrated, see

plans. Especially on commercial streets, the white light of a metal halide luminaire is preferred, over the orange light produced by City standard sodium vapor. Pedestrian scale pole-mounted luminaire is preferred. See "Alternative Lighting and Tree Planting Designs" for specifications.

Trees. 20'-30' spacing, depending on the species selected. Trees with a 20' spread, plant 20' o.c., trees with a 30' spread, plant 30' o.c. (in conformance with Portland Urban Forestry Street Tree Planting Guidelines) canopy type tree preferred. For possible canopy-type street tree species, see Canopy-type Tree list.

Streetscape Design Guidelines for Commercial Street

Southeast 92nd Avenue and Foster Road

Lents Town Center Plan

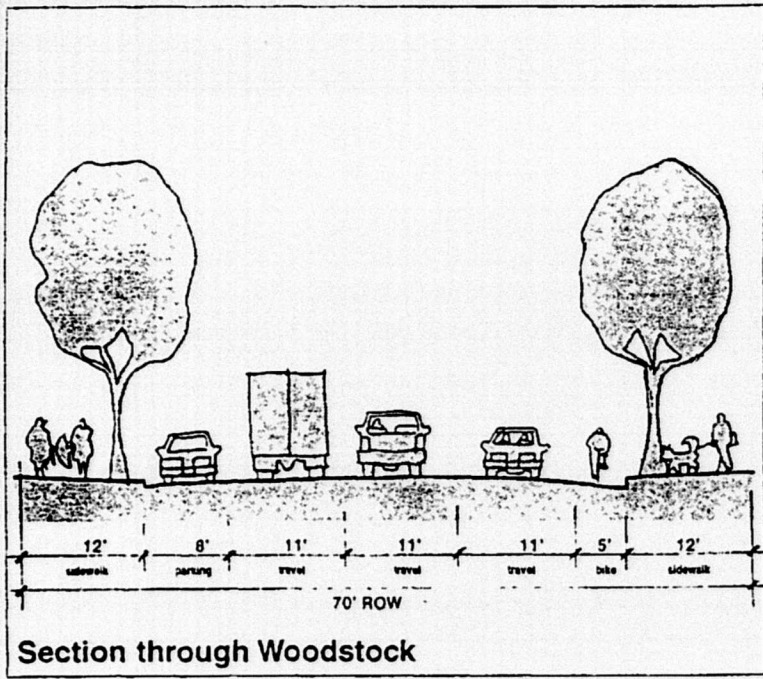
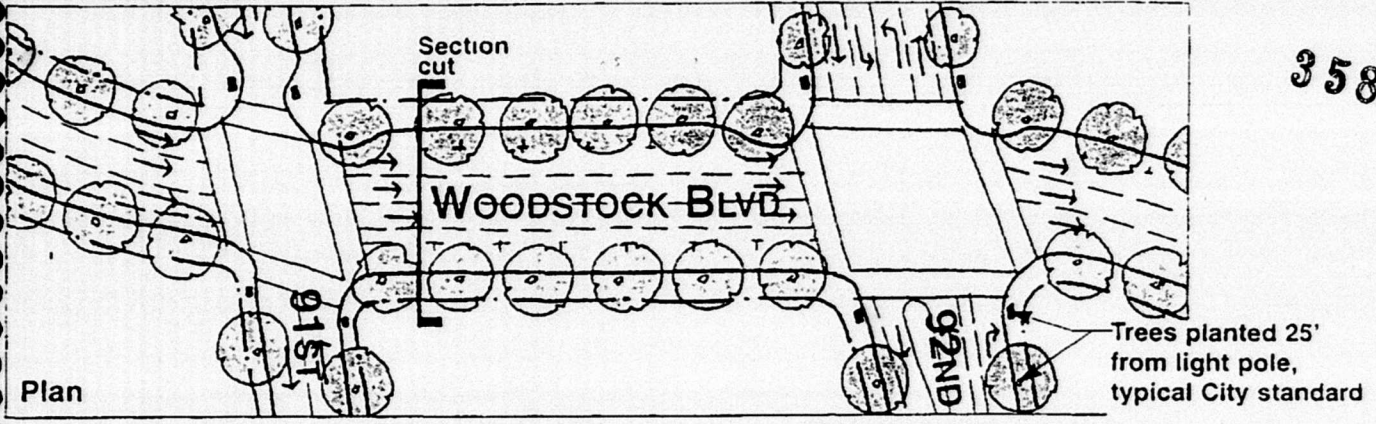
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Alternative A Single ornamental light standard at corners. City standard cobra-style light poles located midblock

Alternative B. Single ornamental light standards at corners and midblock, 127' spacing See "Alternative Lighting and Tree Planting Designs"

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GUIDELINES

Sidewalks. 12' where the sidewalk allows, 4' for furnishing zone, 8' for through-pedestrian zone (in conformance with Portland Pedestrian Design Guide).

On-street parking. Maximize, where possible

Curb cuts, driveways. Consolidate driveways and minimize curb cuts.

Curb extensions. At north corners of Woodstock at 92nd.

Marked crosswalks. At all corners, painted or scored concrete (preferred).

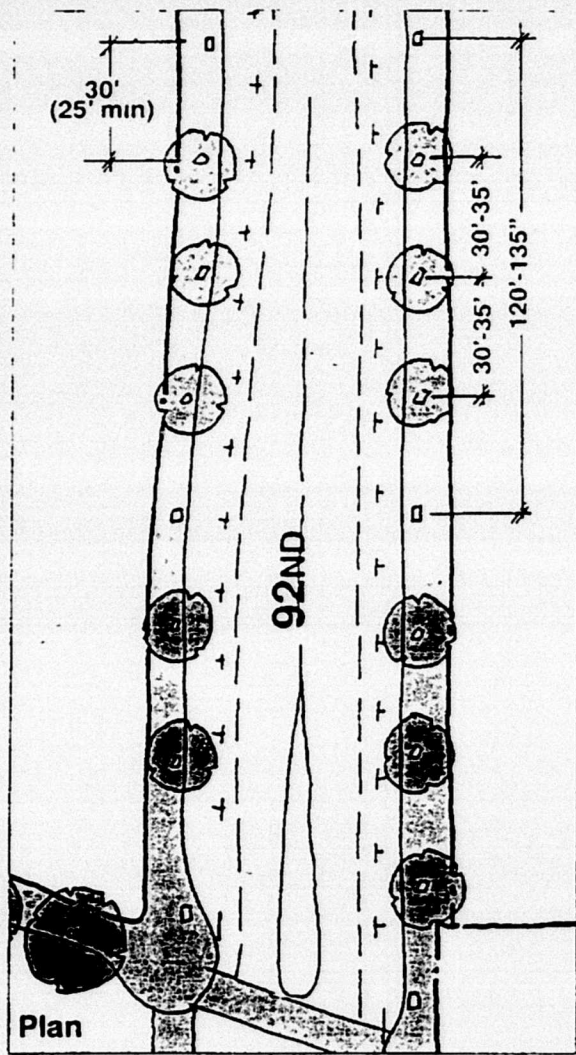
Lighting. Two alternatives are illustrated, see plans. Especially on commercial streets, the white light of a metal halide luminaire is preferred, over the orange light produced by City standard sodium vapor. Pedestrian scale pole-mounted luminaire is preferred. See "Alternative Lighting and Tree Planting Designs" for specifications.

Trees. 20'-30' spacing, depending on the species selected: Trees with a 20' spread, plant 20' o.c.; trees with a 30' spread, plant 30' o.c. (in conformance with Portland Urban Forestry Street Tree Planting Guidelines) canopy type tree preferred. For possible canopy-type street tree species, see Canopy-type Tree list. Plant trees 25' from the curb line of intersections.

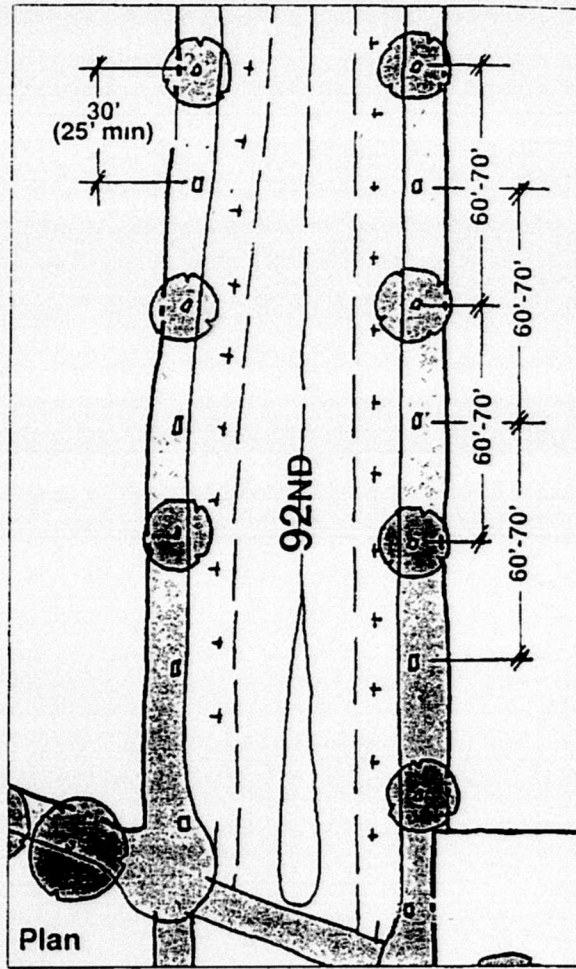
Streetscape Design Guidelines for Transportation Corridor

Southeast 92nd Avenue and Woodstock Boulevard

Lents Town Center Plan



92nd Main Street Alternative A
 Trees spaced 30-35'
 Same pole and luminaire as at 91st.
 Light poles spaced 120-135', or one at each end of block and one at center. Similar to spacing at improved segment of 91st.



92nd Main Street Alternative B
 Trees spaced 60-70'
 Same pole and luminaire as at 91st.
 Light poles spaced 60-70", or at quarter block intervals. Within 200', this spacing is similar to lighting at South Park blocks in downtown Portland.

LIGHTING ON WOODSTOCK AND FOSTER, ALTERNATIVE B SPECIFICATIONS

Single ornamental light standards at corners and midblock, 127' staggered spacing, resulting in a pole every 63.5', at alternate sides of the street.

Pole: Aluminum or fiberglass, 18' high

Luminaire: Acorn type

Average footcandle (9 min required for major arterial per IES) .92

Uniformity (3 1 max, per IES) 2 09 1

Veiling luminance (3 1 per IES) 297 1

Alternative Lighting and Tree Planting Designs

For 92nd Main Street and Foster/Woodstock

Lents Town Center Plan

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GUIDELINES

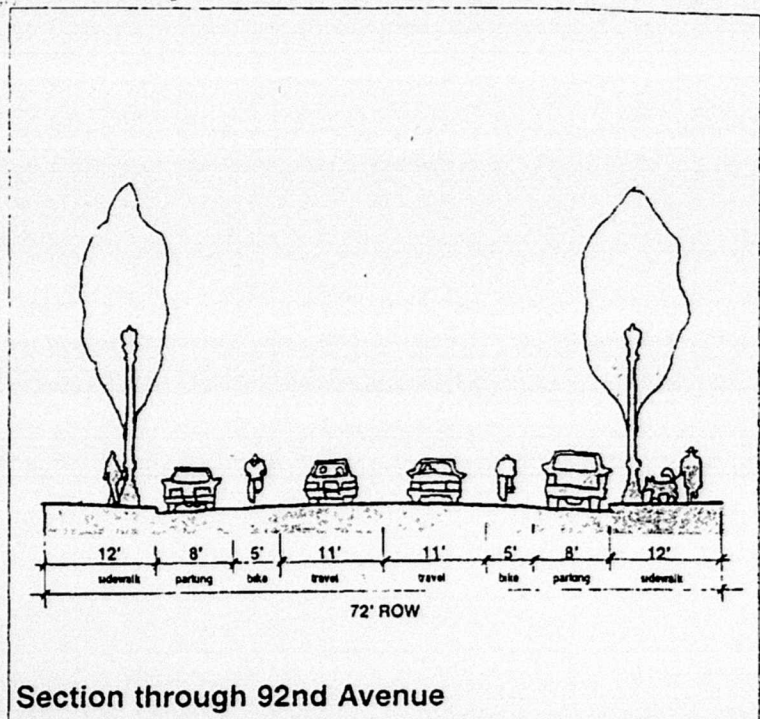
Sidewalks. 12' required 4' for furnishing zone, 8' for through pedestrian zone; 15' preferred 4' for furnishing zone, 8' through-pedestrian zone, 2'6" storefront frontage zone, (in conformance with Portland Pedestrian Design Guide). For additional information, see "Sidewalk Details"

On-street parking. Provide a maximum number of spaces

Curb cuts, driveways. Consolidate driveways and minimize curb cuts.

Lighting. Two alternatives are illustrated, see "Alternative Lighting and Tree Planting Plans" Especially on commercial streets, the white light of a metal halide luminaire is preferred, over the orange light produced by City standard sodium vapor. Pedestrian scale pole-mounted luminaire is preferred.

Trees. Two alternatives are illustrated, see "Alternative Lighting and Tree Planting Plans". Plans show a columnar-type tree. Trees must be located 25' from light poles. Between light poles, plant trees at 10'-20' spacing, depending on the species selected: trees with a 10' spread, plant 10' o.c., trees with a 20' spread, plant 20' o.c. (in conformance with Portland Urban Forestry Street Tree Planting Guidelines). For possible columnar-type street tree species, see Columnar-type Tree list. Plant trees 25' from the curb line of intersections.

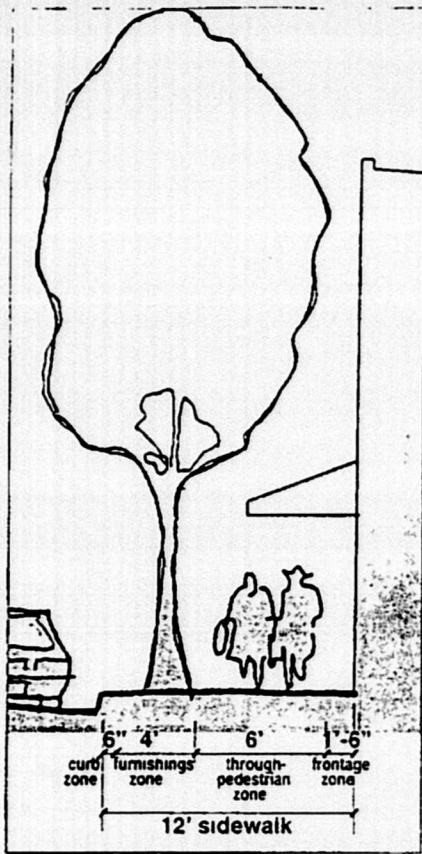


Streetscape Design Guidelines for Main Street

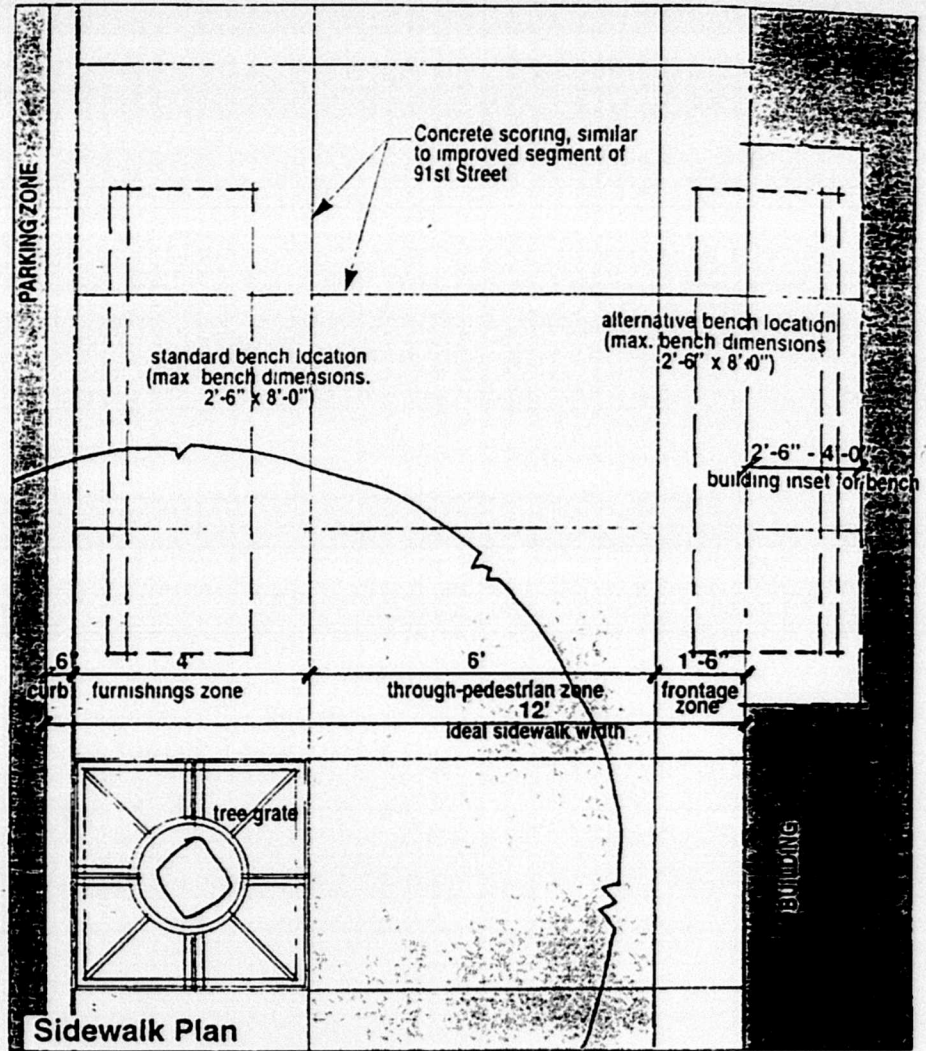
Southeast 92nd Avenue north of Foster Road

Lents Town Center Plan

City of Portland • Lennertz Coyle & Associates • DKS • Urbsworks, Inc



Sidewalk Section Detail



Sidewalk Plan

SIDEWALK DESIGN GUIDELINES

Trees, light poles and street furniture such as benches, drinking fountains, bike racks, planters and garbage receptacles should occupy the 4' space between the curb zone and the through-pedestrian zone. When benches are placed next to the curb, they should face the storefront, not the street. Benches, removable planters and temporary cafe seating can also be located in the frontage zone (next to the building), as long as the through-pedestrian zone remains clear.

Where existing buildings prevent sidewalk from reaching an ideal 12'-0" width, adjustments can be made to the frontage zone and/or the furnishings zone. The through pedestrian zone can be reduced to 4'-6". Furnishings zone can be reduced to 3'-0" Reduction to less than 3'-0" is not recommended but in certain cases may be unavoidable. (Less than 3'-0" generally prohibits tree planting). The frontage zone can be reduced to 0'.

Trees are protected by Portland City standard tree grates, either with 4' x 4' size preferred. Select grates similar in style to those located on the improved portion of 91st street.

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INTRODUCTION

Project Background

The Lents Town Center Business District Transportation Plan is a supporting piece of the Lents Urban Renewal Plan effort dedicated to revitalizing the Lents neighborhood. For many years the Lents community has suffered from protracted economic decline. The heart of the community, the once thriving business district centered at 92nd Avenue and Foster Road, over the years has seen its vitality eroded by commercial development along 82nd Avenue and construction of the I-205 freeway. Today the business district lacks the variety and character of the neighborhood oriented businesses that once defined the neighborhood.

Recently, the City has been working with the neighborhood to develop a strategy to finally get the revitalization process going. In 1995 Lents was designated as a Town Center in Metro's Region 2040 Plan, giving it regional funding priority for improvements. The City's Outer Southeast Community Plan, adopted in 1996, provided community based policy guidance for revitalizing the area. This overall planning effort culminated in the adoption of the Lents Urban Renewal Plan in 1998 by the Portland Development Commission. The urban renewal plan outlines a comprehensive strategy for revitalization as well as establishing a funding source for moving it forward.

Among the key elements recognized by the urban renewal plan is the need to improve the area's transportation system so it supports commercial redevelopment and improves neighborhood access. Currently, the business district core is dominated by non-local, freeway related traffic. The freeway pumps large volumes of traffic through the core area and creates a tremendous barrier between the east and west sides of the neighborhood. As a result, access to local businesses is difficult and uninviting either by car, bus, bike or foot. The sidewalks are narrow and lack basic commercial district amenities, the streets are wide and difficult to cross on foot, on-street parking is limited, and traffic circulation is difficult due to the large traffic volumes and congestion.

Policy G Transportation of the urban renewal plan specifically directs the City to develop a transportation management plan for the business district to answer these and other transportation related problems that hinder commercial redevelopment. This plan is intended to address the above policy and provide a transportation system that supports the area's Town Center designation.

Funding for development of the Lents Town Center Business District Transportation Plan was provided through a Transportation and Growth Management Program grant, a joint program sponsored by the Oregon Department of Transportation and the Oregon Department of Land Conservation and Development.

Propose

The primary purpose of the plan is to identify a comprehensive package of transportation improvement projects that will support neighborhood oriented commercial redevelopment in the Lents business district. The improvements are intended to provide multi-modal access to the business district consistent with the objectives of the 2040 Plan for Town Centers, City policy and neighborhood values. The plan's recommendations include the following elements:

- Street system plan for the business district which identifies the operational design of the street network;
- Streetscape design guidelines for improvements (primarily sidewalks, street trees and street lighting) in the public right-of-way as redevelopment occurs and public funds become available.
- Design and planning directives to help guide implementation of the plan and coordination with other planning activities going on in the urban renewal district.

Study Area

The plan's study area is focused on the historic core of the business district, the intersection of Foster Road and 92nd Avenue. While businesses that serve the Lents neighborhood extend both east and west of 92nd Avenue along Foster Road, this core area has been identified by the community as the starting point for revitalization of the broader neighborhood. The primary emphasis of the plan is the function of the three arterial streets which serve the core area, Foster Road, Woodstock Boulevard and 92nd Avenue. Figure 1 provides a map of the study area boundaries.

Plan Development Process

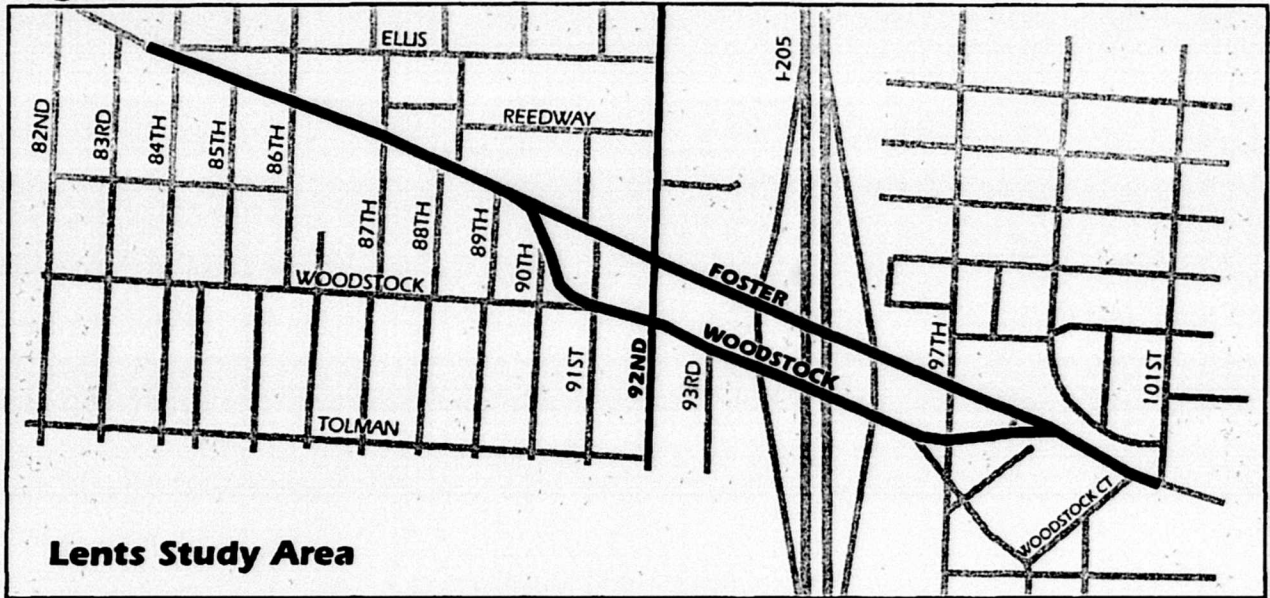
A four phase process was used to develop the recommendations proposed by this plan. The process serves as a framework for understanding how the plan was put together. Each phase of the process culminates in an important decision making milestone, which is used as a building block for subsequent phases. Figure 2 illustrates the relationship of the four phases in the planning process.

To help prepare the products outlined for each phase of the process, a project team was assembled that included a traffic engineering consultant, an urban design consultant, and a retail development consultant. These products were reviewed by a technical advisory committee composed of representatives from various state, regional and local agencies that provide services in the Lents community. Coordination of the process was handled by city staff from the Office of Transportation and the Portland Development Commission.

Public Involvement

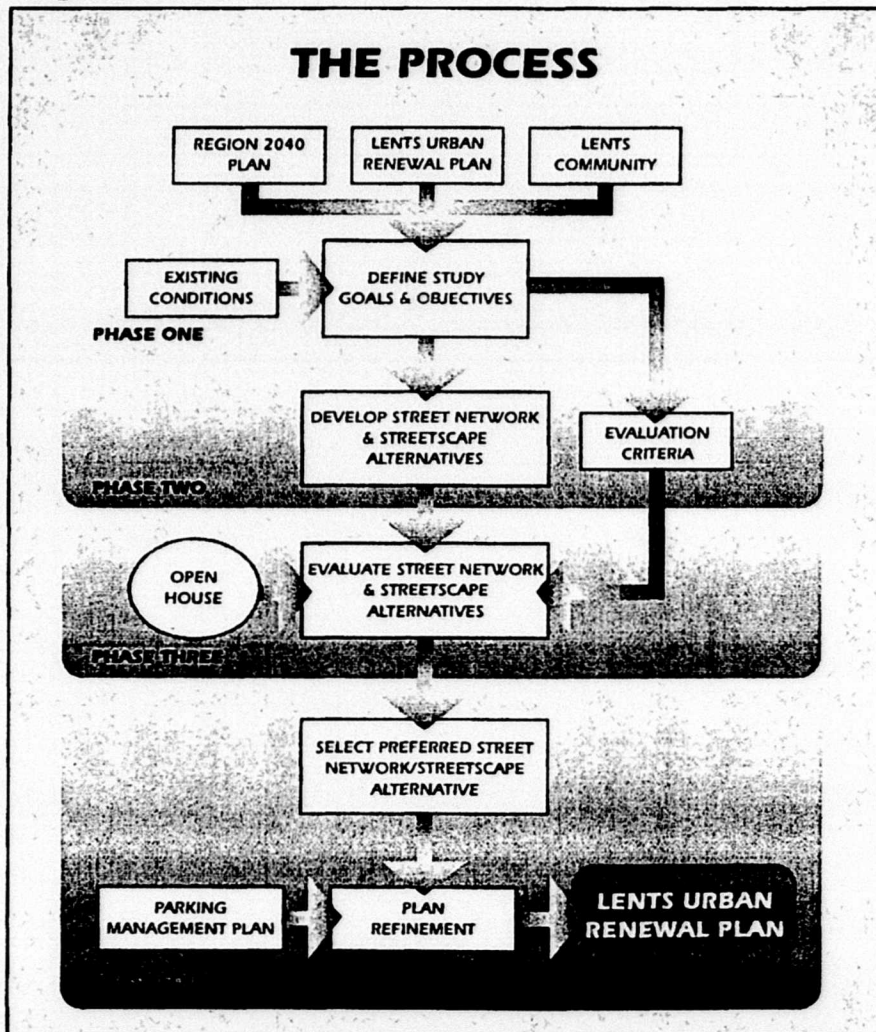
To help guide development of the plan and ensure consistency with local community values and concerns, a citizens advisory committee met regularly with the project's staff to review the planning process and products. The committee consisted of representatives from the

Figure 1



Lents Study Area

Figure 2



Lents Urban Renewal Plan Transportation Sub-Committee and other interested volunteers from the Lents community. The committee provided important input during each decision making phase of the project and was the primary decision making body in drafting the project's recommendations to the Lents Urban Renewal Plan Steering Committee.

Broader public input regarding the plan and process was solicited through two open house events. The first open house was held on April 13 and the second on June 8, 1999. Each of these open house events provided an opportunity for residents, property owners, and business owners to review and comment on the work produced by the project staff. The draft plan recommendations were mailed to all residents, business owners, and property owners adjacent to the streets affected by this plan in late September of 1999. Appendix C provides a list of all public meetings related to the development of this plan.

PHASE I: GOALS & OBJECTIVES

Policy Background

There are many land use and transportation policies which pertain to the Lents business district at the local and regional level and helped guide the development of this plan. The most important policy is the area's designation as a town center in the Region 2040 Plan. Town centers play a key role in the region's growth management strategy. Town centers are intended to function as vibrant commercial hubs for the surrounding neighborhoods. The transportation system serving them is intended to provide high quality multi-modal access to support concentrated development and reduce the need to travel out of the area by car.

Lents is also at the crossroads of two very important regional transportation facilities, Interstate 205 and Foster Road. Immediately east of the business district core is the I-205 freeway, a regional trafficway that divides the neighborhood into two, leaving only two street and one pedestrian/bicycle connection which cross it in close proximity to the study area. While the freeway creates a major barrier to the study area's local access and circulation, the freeway ramps in turn provide significant regional traffic access to the area. The region's long term transportation system plan also calls for development of a high capacity system in the I-205 freeway corridor with a station that serves the Lents Town Center. This service would provide a major linkage to the regional transit system and greatly enhance the study area's multi-modal options.

With its connections to the I-205 freeway, Foster Road serves as a major arterial for SE Portland traffic south of Powell Boulevard. However, Foster Road is also intended to serve many other transportation functions. The road is designated as a Major City Traffic Street, Major City Transit Street, Minor Truck Route, and City Walkway. Through the couplet portion, the road is designated as a City Bikeway. Foster Road and the area surrounding the core of the business district is also designated as a Pedestrian District, where priority is supposed to be given to pedestrian access and activities.

Plan Objectives

Defining the plan's objectives was a key first step of the plan development process. The list of objectives represents a set of community values that was used to guide the entire plan development process. From the identification of issues to be addressed, through the development of alternatives and selection of recommended improvements, the process was built upon these objectives. The list of objectives serves its most important role in the evaluation phase of the process where the objectives are used as criteria in which to help judge the relative merits of each alternative under consideration.

In addition to the comprehensive plan policies noted above, there are a variety of recent planning efforts specific to the Lents area which have further helped lay the groundwork for developing the project's objectives. The Outer Southeast Community Plan, the Lents

Neighborhood Plan and the Lents Urban Renewal plan all contain policies which specifically pertain to how the study area's transportation system should function. The 1995 Lents Transportation Study also identified issues the community wanted to see addressed through transportation system improvements.

The citizens advisory committee reviewed these policies and issues and developed the following comprehensive list of objectives for the plan and planning process:

- Pedestrian environment
Enhance pedestrian access and circulation throughout the business district; improve connections into the neighborhood and to transit service.
- Commercial redevelopment
Ensure transportation improvements support local commercial redevelopment opportunities.
- Parking
Develop a strategy for the provision and management of adequate parking (on and off street) to support commercial redevelopment.
- Transit service
Improve service and connections; coordinate with high capacity transit in the I-205 corridor.
- Streetscape
Create a more attractive environment for pedestrians and commercial development through streetscape design and planning.
- Decoupling
Determine feasibility of decoupling Foster/Woodstock.
- Through traffic
Keep through (non-local) traffic off local streets.
- Auto access and circulation
Maintain acceptable traffic levels of service, stabilize traffic speeds
- Multi-modal safety
Ensure safety for all modes of travel.
- Bicycles
Improve bicycle access and circulation to and through the business district.

Existing Conditions

To help understand and define the transportation issues to be addressed by the plan, current transportation data from the study area was gathered and analyzed. The findings of the existing conditions analysis are contained in Appendix A. A summary of the key findings is listed below:

- Traffic Operations:
Currently, all of the study area's signalized intersections operate at acceptable levels of service. However, congestion is a concern along 92nd Avenue during the PM peak hour due to inadequate storage for southbound vehicles between Foster Road and Woodstock Boulevard. Future growth in the study area's traffic volumes is expected to be significant. Land use development east I-205 should substantially increase traffic.

volumes on Foster Road, while increased congestion on I-205 is likely to increase volumes on 92nd Avenue as well.

- **Speed**
Surveys show most traffic is not exceeding the posted speed limit of 35 mph on Foster Road and Woodstock Boulevard. Nonetheless, due to the narrow width of the sidewalks and lack of an on-street parking buffer, the traffic speeds are considered detrimental to the pedestrian and retail environment
- **Pedestrian Environment :**
Access and circulation through the business district core is poor for pedestrians due to the narrow width of most sidewalks, lack of sufficient signalized crossings along Foster Road and Woodstock Boulevard, and the speed and volume of traffic moving through the core area. The lack of pedestrian amenities, such as street trees and landscaping makes the area uninviting for pedestrians.
- **Transit service**
Generally good levels of service are provided to downtown Portland relative to the rest of the region. Connections north and south to the Gateway Regional Center and Clackamas Town Center are indirect and inconvenient
- **Parking:**
On-street parking is limited along Foster Road and Woodstock Boulevard. Peak hour restrictions further reduce the supply at key demand times. Current utilization of the supply is low.
- **Bicycles:**
Bike lanes are provided for east-west connections along Foster Road and Woodstock Boulevard. North-south connections along 92nd Avenue are incomplete due to the lack of bike lanes north of Woodstock Boulevard

PHASE II ALTERNATIVES DEVELOPMENT

The alternatives development design process was divided into three separate elements. The first design element establishes a basic functional relationship between land use and transportation. The street function design types help define how a street needs to be designed and function in order to support certain general types of commercial development.

Given the functional street design defined in the first element, the second element, street network design, goes into greater detail regarding how to design and build a street that matches its intended function. Street network design goes into the basic multi-modal operational details of street design- the general geometry, capacity and connectivity of the street system. Basic design issues include the number of travel lanes, turn lanes, placement of signals.

The third design component is streetscape. Streetscape goes beyond merely how the street functions in terms of transportation into how it looks, feels, and relates back to the buildings, businesses, and surrounding community. Basic issues related to streetscape design include the design of pedestrian environment (sidewalk width, street trees, amenities) and its integration with land use development through design guidelines.

Street Function Design

While the Lents Town Center desires a more local, neighborhood oriented transportation environment to serve the business district, the reality is that the connections to the freeway and land use growth east of the freeway create the need to accommodate large volumes of non-local traffic. These two competing elements need to be balanced in the functional design of the transportation system.

Three business district street design types were identified as applicable to the Lents business district. Each design type functions differently in terms of transportation access and circulation, and tends to support different types of commercial development. These design types become useful in understanding how different street network alternatives relate to the commercial redevelopment and multi-modal access. They can be used in combination to build a transportation system that serves the two competing needs in the area, local access and regional through capacity. The three basic street design types are 'Main Street', 'Commercial Street' and 'Transportation Corridor'.

A. Main Street

The 'main street' is the classic design type in terms of supporting neighborhood oriented commercial development in urban areas. Most of the Lents business district during the early 1900's, as was true of many older Portland area neighborhoods, developed in the mold of the 'main street' design type. The most important transportation feature of the main street is its narrow width and pedestrian orientation. Traffic volumes are relatively low and speeds

are slow compared to the other two design types. Commercial development is characterized by one to three story buildings, which are built directly adjacent to the sidewalk area and exhibit a strong orientation to pedestrian access.

The pedestrian environment tends to be comfortable because the street design does not emphasize traffic capacity. The adjacent buildings and the commercial activity they generate, such as sidewalk cafes and retail window displays dominate the sidewalk area. The street is narrow so pedestrian crossings at unsignalized intersections are comfortable and traffic speeds are slow. Because of the narrow, slow feel of the street bicyclists can more comfortably and safely mix with traffic. Transit access is encouraged because of the good pedestrian environment and compact nature of the commercial development.

This type of street environment tends to support compact, more neighborhood oriented storefront commercial development and uses. Buildings are built up to the street and form a nearly continuous storefront that extends approximately 1,000 ft. The businesses predominantly retail and rely primarily on on-street as opposed to off-street parking. Examples in Portland include NW 23rd Avenue, SE Belmont St. near 33rd Avenue and SE Hawthorne Blvd.

Basic design features generally include

- Two travel lanes (up to maximum of four)
- Two-way traffic flow
- On-street parking on both sides of the street
- 10-12 ft. sidewalks with street trees
- Pedestrian scale lighting

B. Commercial Street

Compared to the 'main street', the 'commercial street' design type tends to balance traffic capacity with multi-modal access and circulation. The main transportation characteristic that sets it apart from the 'main street' is the larger volume of traffic. The 'commercial street' also tends to carry more through traffic, and thus tend to be located along major regional connections. The major land use characteristic of the 'commercial street' compared to the 'main street' is that development tends to be more of a mix of auto and pedestrian oriented.

A broader range of commercial businesses are permitted by the 'commercial street' compared to the 'main street' because the market area it serves is generally larger. Smaller, locally oriented businesses can be found next to larger national chains, which serve a regional market. Buildings typically are more set back from the street, are spaced apart more from each other, and rely on a mix of on and off-street parking.

Because the traffic volumes are greater, a major street design issue is how to safely and comfortably allow pedestrians to circulate through the business district. The street width and traffic speeds make crossings at unsignalized intersections more difficult for both pedestrians and bicyclists. This can be addressed through curb extensions to narrow the crossing distance and additional signals for protected crossings and speed control. Wider sidewalks and management of driveway location and design can improve the comfort and

safety of walking along the street which reduce the potential for conflicts between cars, bicyclists and pedestrians

A good functional example of a commercial street in Portland is SW Capitol Highway through Hillsdale. The street currently carries about 26,000 cars a day. Though the volumes are high, the area has developed in a relatively compact manner that has made it comfortable and convenient for pedestrians as well as cars.

Basic design features generally include:

- Four travel lanes with or without a center turn lane
- Two-way or one-way traffic flow
- Greater use of traffic signals and turn lanes to control traffic flow and improve pedestrian crossings
- On-street parking, except at turn lanes
- Bicycle lanes
- A minimum of 12 ft sidewalks

C. Transportation Corridor

The 'transportation corridor' design type places the most emphasis on traffic capacity of the three design types. The traffic volumes, traffic speeds and percentage of through traffic are all generally higher than the other design types. As a result, the kind of businesses this street type supports are less retail in nature, serve a broad regional market, and are almost exclusively auto-oriented. 82nd Avenue and Powell Boulevard are currently examples of the 'transportation corridor' design type.

Basic design features generally include:

- Four or more travel lanes with or without a center turn lane
- Two-way or one-way traffic flow
- No on-street parking
- Traffic scale lighting

The above three functional design types help to clarify in general what kind of commercial street environment the community could develop in Lents. While Lents historically has most closely resembled the 'main street' design type, and community policy tends to encourage it as well, this needs to be balanced against the need to plan and accommodate connections to the regional transportation system.

Transportation System Design

The transportation system design process then takes the functional concepts discussed above and figures out how to make them operational. The transportation system is based on three primary design elements, design of the street network, management of the system, and transit service

A. Street Network

The street network is the backbone of an area's transportation system, defining the basic circulation system for all modes of travel. A key street network issue is connectivity. Connectivity refers to how well the street network is interconnected. Good connectivity supports access and circulation to and through the study area for all modes of travel by making it easier to move through the system, especially without a car.

The current local street network is primarily based on the traditional grid system that generally provides good street connectivity. The area's major east-west arterial, Foster Road, cuts diagonally across the grid system. The blocks are regularly spaced and for the most part do not require excessive out-of-direction travel for all modes to get around. A major barrier to the grid network and connectivity between the area east of 94th Avenue and the business district is the I-205 freeway.

Another key street network issue is capacity. Capacity refers to the ability of the street network to carry existing and projected travel demand so that the impacts of congestion and traffic diversion are minimized. Capacity is an important issue in the Lents business district because of its proximity to I-205 freeway ramps and projected growth related to land use development east of I-205.

B. Transportation System Management

Transportation system management refers to how the transportation system is controlled to permit safe and efficient access and circulation through the study area for all modes of travel. Management design issues generally focus on the use of signals, turn lanes, bike lanes, pedestrian crossing locations and on-street parking.

Management of the study area's traffic flow was changed dramatically with the construction of the Interstate 205 freeway. Prior to construction, Foster Road was a two-way street, similar to existing conditions west of 90th Avenue. In order to provide additional capacity for freeway access, the current Foster-Woodstock one-way couplet between 90th and 100th Avenue was constructed. In addition to providing more capacity, the one-way couplet changed the basic operational characteristics of the transportation system and how it relates to the surrounding business district.

The couplet now divides traffic access to the core of the business district between Foster Road and Woodstock Boulevard, making access and circulation more indirect. Businesses can orient themselves to only one direction of travel, reducing visibility to passing customers. The additional capacity provided by couplets also tends to encourage speeding.

'Decoupling', the changing of a one-way couplet back to two-way traffic operation along both streets, is a major design issue studied by this plan. The feasibility of decoupling Foster-Woodstock Boulevard between 90th and 100th Avenue has been a long standing issue in the neighborhood, and policy contained in the Lents Urban Renewal Plan specifically requests that the issue be studied through the transportation planning process.

Traffic signals are the primary means of traffic control within a transportation system. Signals allow for controlled, safe access between streets and circulation within the business

district for vehicles. Traffic signals can also be used to control the flow and speed of traffic through an area by synchronizing the timing of a series of signals.

Pedestrian crossings are another issue related to transportation system management design. Traffic signals benefit pedestrians as well as traffic circulation by providing protected crossings. Protected crossings are particularly important along wide streets with heavy traffic volumes. At unsignalized intersections the ease and safety of crossing the street can be improved through curb extensions and median refuges, which reduce the crossing distance and improve sight distances. The use of curb extensions is limited to only areas where there is on-street parking. For traffic safety reasons, medians are recommended only for streets with two-way traffic flow.

On-street parking serves many purposes within a commercial area's transportation system. The availability of parking has been identified as a very important access issue for commercial development and viability in Lents. On-street parking is especially important for many businesses, which do not have direct access to off-street parking, which is typically the case in older neighborhood commercial districts around the city. On-street parking also plays an important role in creating a safe and comfortable pedestrian environment by buffering pedestrians from traffic.

Bicycle access and circulation within areas that experience high traffic volumes, such as Lents, is difficult and unsafe without bike lanes. The city's Bicycle Master Plan designates Foster-Woodstock Boulevard as the east-west bicycle corridor serving the study area and 92nd Avenue as the north-south corridor. Currently, bike lanes are provided on Foster Road and Woodstock Boulevard through the couplet area, with connections to the Springwater Corridor, the I-205 bike path and Woodstock Boulevard westbound. 92nd Avenue is striped with bike lanes south of Woodstock Boulevard, but lacks bike lanes to the north.

C. Transit Service

To address growth in travel demand, city, state and regional policy all require transit to play an increasingly important role in the development and management of a multi-modal transportation system. This is particularly true in areas designated as town centers, such as Lents. Currently, three transit lines serve the Lents business district with service that is 15 minutes or better during the peak hours. Service connections remain an important issue. While transit connections are good to downtown, they are more indirect to other important destinations in the area, such as the Gateway Regional Center and Clackamas Town Center. Improved north-south (cross-town) transit service through the business district would provide a stronger multi-modal linkage between the development centers consistent with the 2040 growth concept.

Street improvements within the right-of-way are another important component in transit service enhancement. The efficiency of service can be improved through stop improvements such as curb extensions, which reduce the dwell time at stops. Amenities at stops, such as shelters, and the regular, close spacing improve the quality of service.

In the longer term, high capacity transit service, such as light rail, is envisioned for the I-205 corridor, with a station that serves the Lents neighborhood. Many of the design details

associated with a high capacity transit system have not yet been planned. An objective for this plan is to ensure that transportation system improvements proposed by this plan will complement and not preclude strong multi-modal connections to development of high capacity transit service along I-205 in the future. Station areas that could serve the Lents area include a station within the I-205 right-of-way centered on Foster Road or closer to the Boys and Girls Club site off of 92nd Avenue.

Streetscape Design

The final layer of developing a comprehensive street system plan is the streetscape element. Streetscape refers primarily to the design of the sidewalk area and how it relates to adjacent land use development. Design guidelines for the streetscape are important because as redevelopment occurs over time, where improvements to the adjacent right-of-way are required, a consistent design theme can be developed.

Issues that the design guidelines address include the width of the sidewalks, special sidewalk design treatments, street trees, street lighting, street furniture, gateways, and pedestrian plazas. Streetscape design also can mean special design guidelines for buildings unique to the Lents business district that help building design relate better to the design theme and improve the overall design relationship between land uses and the transportation system.

Transportation System Alternatives

Using the above design elements, the project staff developed and refined two transportation system alternatives to forward to the evaluation phase of the process. The two alternatives were chosen because they reflect *conceptually* the best alternatives for meeting all of the project’s objectives through transportation system design. The basic difference between the two is that Alternative A is designed to return the original ‘main street’ environment to Foster Road through decoupling, while the second alternative, Alternative B, emphasizes mitigation of the negative impacts associated with the couplet to improve local access and circulation.

Street Function Design	
Alternative A Decouple	Alternative B Enhanced Couplet
<ul style="list-style-type: none"> • The major element of this alternative is the development of Foster Rd. between 90th Ave. and 94th Ave. as a ‘main street’ through decoupling. • 92nd Ave. would also be designed to function as a ‘main street’. • The areas of Foster and Woodstock near the freeway, east of 94th and west of 97th Ave, would be designed as ‘transportation corridors’ 	<ul style="list-style-type: none"> • This alternative is designed to create a ‘commercial street’ environment along both Foster and Woodstock west of 94th Ave • 92nd Ave would also be designed to function as a ‘main street’. • The areas of Foster and Woodstock near the freeway, east of 94th and west of 97th Ave, would be designed as ‘transportation corridors’

Transportation System Management Design	
Alternative A Decouple	Alternative B Enhanced Couplet
<p>Traffic Flow:</p> <ul style="list-style-type: none"> The major network design change associated with Alternative A is the 'decoupling' of Foster and Woodstock between 90th Ave. and 100th Ave. Decoupling refers to returning two-way traffic flow to both streets which are currently one-way through the core of the business district. <p>Street Network:</p> <ul style="list-style-type: none"> Foster between 90th and 100th Ave. would become a two-way street with one travel lane in each direction and a center left turn lane. Woodstock would be two-way as well, but widened to five lanes, with two lanes in each direction and a center turn lane, to provide adequate capacity. 92nd Ave would remain a two lane, two-way street with the option of providing left turn pockets where needed. 91st Ave. would be realigned north of Foster to create a new signalized intersection at 91st and Foster, providing better access and circulation north of Foster. <p>Traffic Signals:</p> <ul style="list-style-type: none"> A new signal at Foster-Woodstock and 90th Ave is needed to connect Foster to Woodstock, the new through route connection to the freeway and Foster east of I-205. An option is to signalize Foster at 88th Ave., with realignment of 88th Ave. north of Foster, to improve circulation to areas north of Foster and connections to 92nd Ave. via Reedway St. 	<p>Traffic Flow:</p> <ul style="list-style-type: none"> The current Foster/Woodstock one-way couplet between 90th and 100th Ave would be retained. <p>Street Network:</p> <ul style="list-style-type: none"> Three travel lanes in each direction would be provided on Foster-Woodstock through the couplet area. 92nd Ave would remain a two lane, two-way street with the options of providing left turn pockets where needed. A new access point north of Foster is proposed at 90th Ave to provide signalized access into the PDC redevelopment site. 91st Ave would be realigned north of Foster to create a new signalized intersection at 91st and Foster to also provide better access and circulation north of Foster. <p>Traffic Signals:</p> <ul style="list-style-type: none"> Access and circulation issues associated with the couplet would be mitigated through new signalized intersections at Foster and 90th Ave, Foster and 91st Ave. (which would be realigned north of Foster), and Woodstock and 91st Ave. The existing 'U' turn lanes at each end of the couplet are removed to improve pedestrian circulation. At the west end of the couplet the new 90th Ave signal will permit left turns from Foster to Woodstock.

Transportation System Management Design continued	
Alternative A Decouple	Alternative B Enhanced Couplet
<p><i>On-Street Parking</i></p> <ul style="list-style-type: none"> • Foster, west of 94th Ave - both sides • Woodstock, west of 94th Ave - no parking • 92nd Ave , between Foster and Woodstock- no parking 92nd Ave , north of Foster- both sides • Foster and Woodstock, east of 94th Ave - no parking <p><i>Pedestrian Crossings</i></p> <ul style="list-style-type: none"> • New signal at Foster/90th Ave and 100th Ave provide protected crossing at west and east end of business district • Curb extensions along both sides of Foster between 90th and 94th Ave <p><i>Bicycle Facilities</i></p> <ul style="list-style-type: none"> • East-west travel- bike lanes on both sides of Woodstock. • 92nd Ave. design option- bike lanes on both sides of 92nd Ave north of Woodstock <p><i>Transit Service</i></p> <ul style="list-style-type: none"> • Policy- request Tri-Met to provide new service on 92nd Ave which connects Lents to Gateway and Clackamas Town Center. • Stops- two block spacing; design transit stops to include full bus curb extensions, where possible, with shelters 	<p><i>On-Street Parking</i></p> <ul style="list-style-type: none"> • Foster, west of 94th Ave Option 1: north side of Foster only Option 2 both sides • Woodstock, west of 94th Ave - Option 1: north side only, east of 91st Ave. Option 2 both sides, east of 91st Ave • 92nd Ave , between Foster and Woodstock- no parking 92nd Ave , north of Foster- both sides • Foster and Woodstock, east of 94th Ave - no parking. <p><i>Pedestrian Crossings</i></p> <ul style="list-style-type: none"> • New signals at Foster/90th Ave , Foster/91st Ave , Woodstock/91st Ave provide protected crossings in core of business district. Pedestrian activated signals at east end of couplet • Curb extensions along Foster and Woodstock where parking is provided <p><i>Bicycle Facilities</i></p> <ul style="list-style-type: none"> • East-west travel- bike lane eastbound on Woodstock, westbound bike lane on Foster. • 92nd Ave. design option- bike lanes on both sides of 92nd Ave north of Woodstock <p><i>Transit Service</i></p> <ul style="list-style-type: none"> • Same as Alternative A

Streetscape Design	
Alternative A Decouple	Alternative B Enhanced Couplet
<p>Foster</p> <ul style="list-style-type: none"> Widen sidewalks to 12 ft with street trees spaced at 20 ft. Street lighting, similar to 91st Ave between Foster and Woodstock, at corners minimum. Consolidated driveways where possible. <p>Woodstock</p> <ul style="list-style-type: none"> Widen sidewalks to 12 ft. with street trees spaced at 20 ft. Street lighting, similar to 91st Ave. between Foster and Woodstock, at corners minimum. Consolidated driveways where possible <p>92nd Ave., north of Foster</p> <ul style="list-style-type: none"> Widen sidewalks to 14 ft. with street trees spaced at 20 ft. Street lighting, similar to 91st Ave. between Foster and Woodstock, at corners and mid-block. 	<p>Foster</p> <ul style="list-style-type: none"> Same as Alternative A <p>Woodstock</p> <ul style="list-style-type: none"> Same as Alternative A <p>92nd Ave.</p> <ul style="list-style-type: none"> Same as Alternative A

Design Options

Both alternatives contain a series of design options, one which is common to both and the others which pertain only to individual alternatives

1. Alternative B- On-Street Parking/ Foster

Alternative B provides on-street parking along the north side of Foster Road west of 94th Avenue (currently restricted parking during the AM peak hour). An option, which would increase the need for additional right-of-way acquisition, is to have on-street parking along both sides of Foster Road between 90th and 94th Avenue

2. Alternative B- On-Street Parking/ Woodstock

Alternative B provides on-street parking along the north side of Woodstock Boulevard between 91st and 94th Avenue. An option, which would increase the need for additional right-of-way acquisition, is to have on-street parking along both sides of Woodstock Boulevard between 91st and 94th Avenue

3. Alternative A- 88th Avenue Signal

This signal provides an additional protected crossing for pedestrians at the west end of the business district core and could improve auto circulation between Foster Road and 92nd Avenue north of Foster Road

PHASE III ALTERNATIVES EVALUATION

The two alternatives developed in the previous phase were evaluated using the objectives established in phase I as evaluation criteria. The evaluation findings are based primarily on the analyses contained in Appendix A Transportation System Analysis and Appendix B Urban Design and Retail Development Analysis. The findings for each objective/evaluation criteria are divided into these two general categories and summarized below.

Summary of Findings

A. Transportation System Analysis

Four of the project's objectives are directly related to transportation system operations. Many of these objectives can be quantified and compared between the two alternatives, others are more qualitative in nature and require evaluation based on the professional judgment of the project staff. Appendix A provides a detailed discussion of the methodology and evaluation findings. The seven objectives which pertain most directly to transportation system analysis are:

- Auto access and circulation
Maintain acceptable levels of service for traffic, stabilize traffic speeds.
- Multi-modal safety
Ensure safety for all modes of travel.
- Through traffic
Keep through traffic off of local streets
- Decoupling
Determine the feasibility of decoupling the Foster-Woodstock one-way couplet
- Pedestrian Environment
Enhance pedestrian access and circulation throughout the business district, improve connections into the neighborhood and transit service.
- Bicycles
Improve bicycle access and circulation to and through the business district
- Transit Service
Improve service and connections, coordinate with high capacity transit in the I-205 corridor

Auto Access and Circulation

Objective: Maintain acceptable levels of service for traffic, stabilize traffic speeds.

The primary issue in regards to the auto access and circulation objective is the ability of each alternative to provide adequate capacity within the street network to accommodate projected vehicular traffic volumes. Future traffic volumes within the study area were determined by evaluating data from the Metro regional travel demand forecast model which is based on projected travel demand for the year 2015 during the PM peak hour.

Currently, a large percentage of the traffic volumes moving through the study area are related to trips originating or destined for the I-205 freeway. For instance, the model indicates that the freeway accounts for nearly 50% of the traffic volume on Foster Road between 82nd Avenue and 90th Avenue (during the PM peak hour). The model projects traffic volumes on Foster Road east of 82nd Avenue in the year 2015 to increase by 30%, from 26,750 to 34,700 vehicles a day. While the freeway ramps remain a major origin or destination of this traffic, development growth in the area around Happy Valley will significantly increase travel demand on Foster Road east of I-205. Looking again at vehicle trips on Foster Road between 82nd Avenue and 90th Avenue, the model projects the percentage of vehicles with origins or destinations east of I-205 increasing from 26 to 40% by the year 2015 (during the PM peak hour).

A key measure of the study area's capacity to handle the projected growth in traffic volumes is intersection level-of-service, or LOS. LOS measures an intersection's volume to capacity ratio and vehicle delay. Without mitigation, eight of the nine study area signalized intersections fail to perform at acceptable LOS with Alternative A, and three of the seven intersections fail with Alternative B.

Since it is possible to mitigate poor levels-of-service at study area intersections, the greatest difference between the alternatives is the extent of mitigation needed to provide acceptable LOS. Mitigation for unacceptable LOS is primarily addressed through adding additional lane capacity for critical turn movements at the intersections. The traffic operations analysis found that the main difference between the two alternatives is that Alternative A requires much more extensive mitigation to bring the study area intersections to acceptable levels of service than Alternative B.

The design of 92nd Avenue remains consistent between the two alternatives, with two-way traffic flow, one lane in each direction. Despite the difference in traffic flow at 92nd Ave's intersection with Foster Road and Woodstock Boulevard between the two alternatives, there is little difference in level-of-service at these intersections. Concerns about providing adequate capacity on 92nd Avenue north of Foster Road led to the consideration of an option that included a center left turn lane. The analysis however indicates that this lane would not significantly improve capacity. The capacity constraint on 92nd Avenue is at its intersection with Woodstock Boulevard. This issue is addressed in both alternatives through improved signal timing which allows more 'green time' for the left turn and a right turn lane on Woodstock Boulevard. The year 2015 LOS for 92nd Avenue at Foster Road and Woodstock Boulevard was found to be consistent with city standards under both alternatives.

Speeding is another important traffic operations issue identified by the project CAC. Speeding can be controlled through either active techniques, such as signal timing or speed bumps, or passively through congestion. Alternative A controls speeds primarily through increased congestion, which would occur only during peak periods. Alternative B in comparison has the ability to control traffic speeds through improved signal timing. The alternative includes three new signals in the couplet area that allows the system of signals on each leg of the couplet to better control the progression of traffic through the couplet area. Two-way streets do not have the same ability to control traffic progression with signals. Travel times through the corridor are predicted to increase by 53% with Alternative A,

compared to 25% for Alternative B. Speed bumps are not an option with either alternative because of both Foster and Woodstock's designation as Emergency Response routes.

Multi-modal safety

Objective: Ensure safety for all modes of travel.

The main traffic safety difference between the two alternatives is based on the difference between one-way and two-way traffic flow. Two-way traffic flow creates more potential turning movement conflicts at intersections or driveways compared to one-way flow. Thus, Alternative B is considered a safer environment for vehicular traffic compared to Alternative A. Safety issues related to the bicycle and pedestrian modes are discussed separately under the 'Bicycle' and 'Pedestrian Environment' evaluation criteria.

Through traffic

Objective: Keep through traffic off local streets.

The key issue here is diversion. If an inadequate amount of capacity is placed on the intended through routes of the transportation system, then traffic will seek out, or be diverted to, alternative routes on streets not intended to handle those trips.

Both alternatives are designed to accommodate the projected travel demand on each of the three study area arterials, Foster Road, Woodstock Boulevard between 90th and 100th Avenue, and 92nd Avenue. In order to avoid unacceptable amounts of congestion, and therefore diversion, Alternative A- Decouple needs to be designed with a five lane cross section on Woodstock Boulevard and additional turn lanes as proposed. Three travel lanes are required on Foster Road and Woodstock Boulevard through the couplet section in order to make Alternative B function adequately, and avoid diversion. Maintaining the proposed cross-sections for each alternative, diversion is not expected with either alternative.

The design of 92nd Avenue contains options similar to both alternatives. Analysis indicates that one travel lane in each direction is sufficient to accommodate projected vehicle volumes on 92nd Avenue. Left turn pockets can be provided as warranted when large parcels, such as the Boys and Girls Club site, redevelop.

Decoupling

Objective: Determine the feasibility of decoupling the Foster-Woodstock one-way couplet.

This objective has been addressed through the inclusion of Alternative A- Decouple as part of the alternatives development and evaluation phases of the plan process. Alternative A was chosen over other decouple design options, such as a three lane Woodstock Boulevard and a five lane Foster Road, that were considered because it most closely addressed the project's objective of restoring a 'main street' environment to Foster Road.

Pedestrian Environment

Objective Enhance pedestrian access and circulation throughout the business district; improve connections to the neighborhood and transit service.

With Alternative A-Decouple the reduced volume and speed of traffic along Foster Road between 90th and 94th Avenue are significant enhancements for the pedestrian environment in the core of the business district. Along with on-street parking on both sides of the street, Foster Road would become much more of a traditional main street with a strong pedestrian orientation.

However, there are also significant tradeoffs to the pedestrian environment along Woodstock Boulevard associated with decoupling. The most serious issue for pedestrians with Alternative A-Decouple is the widening of Woodstock Boulevard from three to five lanes. This, along with the additional volume of traffic that is shifted from Foster Road to Woodstock Boulevard, will create a substantial barrier for pedestrian access to the business district from the south. Wide streets with high traffic volumes are inconvenient, uncomfortable, and potentially unsafe for pedestrian circulation.

Another impact associated with Alternative A and decoupling is the effect of two-way traffic on the availability of pedestrian crossing gaps compared to one-way traffic flow. Two-way traffic flow creates fewer gaps in traffic which pedestrians can use to cross the street at unsignalized intersections. This is because pedestrian must pay attention to both directions of traffic, whereas with one-way, there is only one direction of traffic to gauge for adequate gaps.

Both alternatives significantly improve the pedestrian circulation along all three primary streets through proposed widening of the sidewalks. The current width would on average be widened from 6-8 ft to 12-14 ft, consistent with design standards for Pedestrian Districts. Crossing facilities are improved for both alternatives over existing conditions. Alternative A provides for one new protected crossing in the core area, while Alternative B provides for three new protected crossings through signalization. Both alternatives also provide curb extensions to reduce pedestrian crossings distances at signalized and unsignalized intersections on Foster Road. Alternative B includes curb extensions on Woodstock Boulevard between 91st and 92nd Avenue.

The supply of on-street parking should also be taken into account when assessing the pedestrian environment. On-street parking helps create a safe and comfortable environment for pedestrians by buffering the sidewalk area and pedestrians from traffic. Both alternatives provide on-street parking along Foster Road which is beneficial to pedestrians. Design option 2 for Alternative B, which provides parking on both sides of Foster Road, provides additional support in regard to meeting the objective. Alternative A does not provide parking along Woodstock Boulevard, in the interest of minimizing right-of-way acquisition impacts, while Alternative B provides parking along the north side of the street, with the option of placing parking along the south side.

Bicycles

Objective Improve bicycle access and circulation to and through the business district

Both alternatives provide bicycle facilities to serve the study area that are consistent with the city's Bicycle Master Plan. The main difference between the two alternatives for east-west bicycle travel is that Alternative B separates eastbound and westbound bike lanes between the two streets, whereas Alternative A provides bike lanes for east and westbound access on Woodstock Boulevard only. Foster Road between 90th and 94th Avenue is likely to be a slower, lower volume traffic environment with Alternative A where bicycle can mix reasonably with traffic. Circulation via bike lanes through the business district, because of the separation of travel directions, is less direct with the couplet under Alternative B.

The two-way traffic flow on Foster Road and Woodstock Boulevard proposed by Alternative A is considered a less safe environment for bicycles than Alternative B. Because there are more turning movements at intersections and driveways, there is greater potential for conflicts between bicycles and motorists with the decouple alternative.

Bicycle operations on 92nd Avenue are identical between the two alternatives. Bike lanes are proposed for 92nd Avenue north of Woodstock Boulevard to continue the existing lanes south of Woodstock Boulevard. Again, this is consistent with the development of 92nd Ave as north-south bicycle corridor for Outer SE Portland, as designated in the City's Bicycle Master Plan. While the main street traffic environment designed for 92nd Avenue would permit safer and more comfortable mixing of bicycles with traffic, bike lanes provide better overall safety and support of the objective.

Transit Service

Objective Improve service and connections; coordinate with high capacity transit in the I-205 corridor

Transit is intended to play a significant role providing regional and local access to Town Centers. Current transit service levels in the study are good relative to other areas within the region. The frequency of service along Foster Road is better than 15 minutes in the AM and PM peak hours. Because Alternative B provides more system capacity, the efficiency of transit service is less likely to be affected by congestion than Alternative A.

Of greater concern are the current connections the transit system provides. Existing connections to downtown and the hub of the regional system are good, but connections to the two adjacent centers, Gateway and Clackamas Town Center are indirect. These north-south connections would reinforce the link between the Lents Town Center and other centers within the Region 2040 growth management concept.

Neither alternative affects the ability to provide new north-south connections through Lents. 92nd Avenue is the most appropriate location for such service to serve the Lents Town Center and business district core. The 'main street' design proposed for 92nd Avenue is identical to both alternatives, and complements and supports transit service. The plan requests the City work with Tri-Met to provide new service on 92nd Ave as a supporting action item within the recommendations.

Similarly, neither alternative affects the ability to make strong connections to high capacity transit service in the I-205 corridor in the future. Station area planning is not precluded at

either a site within the I-205 right-of-way or at the Boys and Girls Club under either alternative. However, strong pedestrian connections to a station at either location from the south are reduced under Alternative A because of the width and traffic volumes on Woodstock Boulevard.

B. Urban Design/Commercial Development Analysis

The following three objectives pertain most directly to the urban design commercial development analysis findings contained within Appendix B. These objectives are

- **Parking**
Develop a strategy for the provision and management of adequate parking (on and off street) to support commercial redevelopment.
- **Commercial Redevelopment**
Ensure transportation improvements support local commercial redevelopment opportunities.
- **Streetscape**
Create a more attractive environment for pedestrians and commercial development through streetscape design and planning.

Parking

Objective. Develop a strategy for the provision and management of adequate parking (on and off street) to support commercial redevelopment.

On-street parking is considered a critical component in revitalizing the business district core. Currently, many of the existing buildings in the core are older storefront style commercial buildings which for the most part do not have associated off-street parking. However, many of the block faces in the core area also do not have on-street parking, which these buildings rely upon. This situation is compounded by peak hour restrictions for on-street parking along the north side of Foster Road, which limit use and confuse people as to their availability. As the business district redevelops, parking will become increasingly important in supporting the redevelopment process. Adequate on-street parking provides readily identifiable access to shopping for drive-by customers, and also benefits pedestrians by buffering the sidewalk area from traffic.

Both alternatives were designed to increase the study area's parking supply. The net result is that the increase in spaces is roughly the same amount. The difference is in the location of the supply. Alternative A-Decouple provides on-street parking along both sides of the street on Foster Road through the core area and 92nd Avenue, north of Foster Road. However, no on-street parking is provided on Woodstock Boulevard due to right-of-way constraints. Alternative B- Enhanced Couplet provides on-street parking along the north sides of both Foster Road and Woodstock Boulevard, with the option to provide parking along the south sides.

The overall net increase in on-street parking supply for Alternative A is approximately 47 spaces. There is an increase of 61 spaces on Foster Road and a decrease of 14 spaces on

Woodstock Boulevard The supply along 92nd Avenue north of Foster Road remains unchanged Alternative B- Enhanced Couplet increases the overall supply by approximately 35 spaces 26 additional spaces are provided on Foster Road between 87th Avenue and 90th Avenue by adding parking to the south side of the street Through the core of the business district, 90th – 94th Avenue, there is no change in the supply, though the current peak hour restriction (7-9 AM) is removed The south side option adds 27 spaces in this section Woodstock Boulevard retains parking along the north side of the street between 91st and 92nd Avenue, with additional 9 spaces east of 92nd Avenue The south side of the street has the option to develop parking between 92nd and 94th Avenue to add another 29 spaces

The parking demand analysis indicates that while utilization of both on and off street parking is currently low, as redevelopment occurs these spaces will increasingly become short in supply The Parking Management Plan (Appendix A, Chapter 3) indicates that at near full buildout there will be an excess peak period demand for parking that additional off-street spaces provided by redevelopment are not likely to fully satisfy This indicates the importance of on-street parking supply in the long run in terms of supporting redevelopment The parking management plan, which is consistent between the two alternatives, outlines strategies for making sure there is an adequate supply of on and off-street parking as redevelopment occurs over time

Commercial Redevelopment

Objective: Ensure transportation improvements support local commercial redevelopment opportunities

The ability of each alternative to support neighborhood oriented commercial redevelopment is perhaps the most important evaluation criteria for the plan Improving the area's transportation infrastructure is considered a key factor in stimulating and supporting redevelopment activity The most commonly cited deficiency in the business district core is the lack of a clearly defined 'main street' environment, where more local and pedestrian oriented businesses tend to thrive Currently, 92nd Avenue north of Foster Road has many of the transportation elements of a main street- relatively slow and low traffic volumes, narrow street width, and two-way traffic, though currently does not support much retail activity Because of the volume and speed of freeway related traffic, Foster Road clearly no longer functions as a main street like it once did

Alternative A-Decouple is designed around the concept of maximizing the amount of main street environment in the business district core by recreating a main street environment on Foster Road between 90th and 94th Avenue through decoupling This can be achieved, but at the expense of Woodstock Boulevard east of 90th Avenue, which must be widened to five lanes in order to adequately accommodate the projected traffic volumes This type of street environment on Woodstock Boulevard created by decoupling is not likely to support main street type land uses Furthermore, a significantly widening Woodstock Boulevard with higher traffic volumes will act as a barrier to multi-modal access between the north and south sides of the business district Alternative B-Enhanced Couplet focuses main street development along 92nd Avenue, while encouraging more a mixed main street/commercial street environment along Foster Road and Woodstock Boulevard, acknowledging the need to balance traffic capacity with land use development goals

The retail development analysis identified three transportation issues as critical for supporting retail development in the study area: reduce traffic speeds, increase on-street parking, improve the pedestrian environment and business visibility. As discussed under the Auto Access and Circulation criteria findings, both alternatives can reduce traffic speeds through the business district core. Alternative A-Decouple slows traffic on Foster Road by changing to two-way traffic flow and increasing the percentage of local trips by shifting freeway related traffic to Woodstock Boulevard. Traffic speeds on Woodstock Boulevard are in turn slowed on Woodstock Boulevard primarily through increased congestion. Alternative B-Enhanced Couplet slows traffic speeds primarily through improved traffic progression made possible by retaining the one-way couplet and adding signals on both Foster Road and Woodstock Boulevard.

There are many reasons on-street parking is important in neighborhood shopping districts. For many retailers in older storefront buildings on-street parking is crucial because they do not have off-street parking to rely upon. With old and new retail development, on-street parking provides readily identifiable parking for drive-by customers. On-street parking also enhances the pedestrian access to retail by buffering the sidewalk area from vehicular traffic.

Both alternatives increase the supply of on-street parking in the business district core area. Alternative A provides approximately 57 additional spaces, while Alternative B provides 56 additional spaces with the design option to provide approximately 57 more spaces on the south sides of Foster Road and Woodstock Boulevard.

Business visibility refers to the ability of traffic passing through the area to identify shopping opportunities. Currently, much of the traffic moving through the area is moving too fast to recognize individual businesses. The couplet also separates visibility by direction, where businesses on Foster Road are exposed to only westbound vehicles and Woodstock Boulevard only to eastbound vehicles. This limits the types of businesses that can locate on the street because certain businesses rely on catching either the morning or evening commute (such as coffee shops in the morning and video rentals in the evening).

Alternative A addresses the directional visibility problem through decoupling. Businesses need not worry about which direction to orient to on either Foster Road or Woodstock Boulevard. The tradeoff for Foster Road though is that the overall future volume of traffic is reduced from 24,000 vehicles a day to 13,500. The lower volume of traffic means fewer potential drive by customers. Retaining the couplet in Alternative B means the directional problem remains, but traffic volumes are balanced between Foster Road and Woodstock Boulevard.

Streetscape

Objective: Create a more attractive environment for pedestrians and commercial development through streetscape design and planning.

In addition to improvements, which make the pedestrian access in the business district safer and more convenient, there is the need to enhance the overall appearance of the area to encourage pedestrian access and support commercial redevelopment. Currently there is no consistent design treatment in the right-of-way that defines the business district. The

proposed streetscape plan is identical to the two street network alternatives. The plan addresses the four major deficiencies in the study area, narrow sidewalk widths, lack of street trees, lack of pedestrian scale lighting, and the lack of an overall consistent design theme.

The proposed design guideline for all sidewalks in the core area along Foster Road, Woodstock Boulevard is 12 feet. 92nd Avenue, where more intense sidewalk activity is expected, such as cafes with sidewalk seating, 14 ft wide sidewalks are recommended. These dimensions are consistent with the City's design guidelines for a Pedestrian District and allows for a comfortable pedestrian through zone with room for street trees, utilities and street furniture next to the curb. In most cases, this will require additional right-of-way to implement under both alternatives.

Reconstruction and widening of the sidewalk area allows for two important elements of streetscape design to be implemented, street trees and street lighting. Through these elements a consistent design theme throughout the business district can be developed which helps define the character of the business district. A regular street tree pattern is important in terms of making the business district more inviting to pedestrians and gives it more of a neighborhood oriented character. Pedestrian scale lighting is proposed as another element of the streetscape plan because of the need to emphasize the pedestrian nature of the business district. Similar to the street tree design, the proposed pedestrian scale ornamental lighting pattern creates a consistent design theme which identifies with the desired neighborhood orientation of the business district and its historical character.

The matrix on the following three pages summarizes the results of alternatives evaluation findings.

**Lents Town Center Business District Transportation Plan
 Alternatives Evaluation Summary Matrix (✓) indicates support of the criteria**

Objective/ Evaluation Criteria	Alternative A Decouple	Alternative B Enhanced Couplet
Transportation Criteria		
<p>Auto access and circulation <i>Maintain acceptable traffic levels of service, stabilize traffic speeds.</i></p>	<ul style="list-style-type: none"> Capacity: LOS 'E' or better in 2015. Adequate capacity can be provided (marginal), through requires significant amounts of right-of-way. Speed control: Reduced through traffic volumes on Foster should reduce speeds. Increased congestion, two-way traffic flow should reduce speeds on Woodstock. 	<ul style="list-style-type: none"> Capacity: LOS 'D' or better in 2015. More capacity provided than Alternative A. Speed control: Additional traffic signals can be better timed to control speeds and progression on both Foster and Woodstock through business district core.
<p>Through traffic <i>Keep non-local traffic off local streets.</i></p>	<ul style="list-style-type: none"> Because adequate capacity is provided, diversion should not be an issue. 	<ul style="list-style-type: none"> Same as Alternative A.
<p>Multi-modal safety <i>Ensure safety for all modes of travel.</i></p>	<ul style="list-style-type: none"> Traffic: More potential turn movement conflicts with two-way traffic flow. 	<ul style="list-style-type: none"> Traffic: Fewer turn movement conflicts with one-way traffic flow.
<p>Pedestrian environment <i>Enhance pedestrian access and circulation throughout the business district; improve connections into the neighborhood and to transit service.</i></p>	<ul style="list-style-type: none"> Foster: 'Main Street' traffic environment, lower traffic volumes, slower speeds, narrower street, wider sidewalks- improves pedestrian environment. Woodstock: Wider street with higher traffic volumes creates barrier to south, degrade pedestrian environment. Signalized crossings: Three signals (one new) in business district core. New signal at east end of study area. Optional signal at 88th Ave./Foster. Unsignalized crossings: Two-way streets are more difficult to cross because fewer crossing opportunities. 	<ul style="list-style-type: none"> Foster: Higher traffic volumes, more non-local traffic than Alternative A. Wider sidewalks. Woodstock: Lower traffic volumes compared Alternative A. Wider sidewalks. Signalized crossings: Five signals (three new) in core area. New pedestrian activated signals at east end of couplet. Unsignalized crossings: One-way streets easier to cross- more longer gaps in traffic, one direction of travel to pay attention to.

Objective/ Evaluation Criteria	Alternative A Decouple	Alternative B Enhanced Couplet
Bicycles Improve bicycle access and circulation to and through the business district.	(✓) Foster-Woodstock: Bike lanes on Woodstock, not separated. (✓) 92 nd Ave.: Bike lanes provided. • Safety: Two-way traffic flow creates more potential turn movement conflicts with vehicles	(✓) Foster-Woodstock: East and westbound bike lanes divided between streets. (✓) 92 nd Ave.: Bike lanes provided. (✓) Safety: One-way traffic flow creates fewer potential conflicts with vehicles.
Transit Service Improve service and connections; coordinate with high capacity transit service in the I-205 corridor.	• Service: Does not affect ability to increase service. Increased congestion compared to Alternative B slows travel times. Eastbound and westbound service can be concentrated on Foster. • Connections: New north-south service on 92 nd Ave. to link to Gateway and Clackamas Town Center	• Service: Does not affect ability to improve service. • Connections: Same as Alternative A.
Land Use/Urban Design Criteria		
Parking Develop a strategy for the provision and management of adequate parking (on and off street) to support commercial redevelopment.	(✓) Overall Supply: +47 spaces • Foster: Parking on both sides of street in core, net increase of 61 spaces • Woodstock: No parking provided. Net decrease of 14 spaces. • 92 nd Ave.: No change.	(✓) Overall Supply: +82 spaces. • Foster: parking both sides 87 th -90 th , +26 spaces. 90 th -94 th +27 spaces. • Woodstock: 92 nd -94 th , +29 spaces • 92 nd Ave.: No change.

Objective/ Evaluation Criteria	Alternative A Decouple	Alternative B Enhanced Couplet
<p>Commercial Redevelopment Ensure transportation improvements support local commercial redevelopment opportunities.</p>	<p>(✓) Land use development: Supports 'main street' type neighborhood oriented retail opportunities on 92nd Ave. and Foster. Speeding, parking and visibility issues addressed. More 'main street' than Alternative B. Woodstock becomes more auto-oriented, barrier to access from south.</p> <ul style="list-style-type: none"> • Right-of-way acquisition: Right-of-way needed for all streets. Significant amounts of right-of-way needed on Woodstock. • Minimum estimate sqft.- 142,000 • Estimated # parcels/structures impacted- 81 • Construction implementation: Significantly greater cost than Alternative B. Construction cannot be phased. 	<p>(✓) Land use development: Supports 'main street' type of neighborhood oriented retail opportunities on 92nd Ave. Supports more mixed auto/pedestrian oriented commercial development on Foster and Woodstock. Speeding and parking issues addressed.</p> <p>(✓) Right-of-way acquisition: Right-of-way needed for all streets. Less overall needed than Alternative A. Minimum estimate sqft.- 95,000</p> <p>(✓) Estimated # parcels/structures impacted- 72</p> <p>(✓) Construction implementation: Less cost than Alternative A, can be phased in over time.</p>
<p>Streetscape Create a more attractive environment for pedestrians and commercial development through streetscape design.</p>	<p>(✓) Wider sidewalks with regular pattern of street trees and pedestrian scale lighting on all three streets will significantly improve visual appearance of commercial core.</p> <p>(✓) Foster, 90th-94th, has greater potential to develop as a neighborhood and pedestrian oriented street. More overall 'main street' development potential.</p> <ul style="list-style-type: none"> • Less inviting environment for pedestrians, more auto oriented, on Woodstock is the tradeoff. 	<p>(✓) Wider sidewalks with regular pattern of street trees and pedestrian scale lighting on all three streets will significantly improve visual appearance of commercial core.</p> <ul style="list-style-type: none"> • Potential for gateway treatment at west end of couplet.

PHASE IV. PLAN RECOMMENDATIONS

Preferred Alternative

In review of the findings from the alternatives evaluation phase **Alternative B-Enhanced Couplet** was chosen as the preferred alternative by the citizens advisory committee. The key reasons for selecting Alternative B include.

- *Traffic capacity*: Future travel demand in the corridors served by Foster Road and 92nd Avenue are projected to increase substantially. Alternative B provides the most overall transportation system capacity to accommodate current and future travel demand.
- *Pedestrian environment*: Alternative B uses an enhanced system of traffic signals to control traffic speeds and provide more protected crossings for pedestrians along Foster Road and Woodstock Boulevard. Slowing traffic speeds and improving pedestrian access and circulation are considered essential ingredients to revitalizing commercial activity within the business district.
- *On-street parking*: Alternative B provides more opportunities for increasing the on-street parking supply than Alternative A. On-street parking is considered as another key ingredient to the revitalization of the business district.
- *Decouple impacts*: To provide adequate traffic capacity, Alternative A- Decouple requires significant widening of Woodstock Boulevard through the current couplet section (to 5 lanes). This widening would create a new barrier between the south and north sides of the neighborhood.
- *Implementation impacts*: Alternative B requires less right-of-acquisition and impact to adjacent property than Alternative A. Construction of Alternative B can be phased in over time as properties redevelop, unlike Alternative A.

Streetscape Plan

The streetscape plan was developed in conjunction with the street network alternatives to provide a consistent streetscape design theme throughout the business district. The plan specifies design guidelines for sidewalks, street trees and street lighting that make the business district a more attractive, safe and convenient place to shop. See Appendix B.

Action Items

The plan recommendation also includes a series design and planning directives to help guide implementation of the plan and coordination with other planning activities going on in the urban renewal district.

- 1 Encourage Tri-Met to provide new transit service on 92nd Avenue, connecting the Lents Town Center directly to the Gateway Regional Center and the Clackamas Town Center
- 2 Request the State Speed Control Board reduce the posted speed limit to 30 mph on Foster Road and Woodstock Boulevard within the couplet, and 92nd Avenue Reedway to Tolman to 25 mph.
- 3 Review the relationship between traffic flow and the location of on-street parking on 91st Avenue between Foster Road and Woodstock Boulevard when the 91st/Foster Road and 91st/Woodstock Boulevard signals are installed to ensure efficient traffic flow along this narrow street.
- 4 Develop a transportation and streetscape plan for Foster Road west of 88th Avenue that builds off of and complements the Lents Town Center Business District Transportation Plan This plan should also address safety and cut-through traffic concerns related to the intersection of Foster Road/Ellis and 84th Avenue
- 5 Continue to study traffic issues and implement transportation improvement projects on surrounding local neighborhood streets
- 6 Encourage of undergrounding utilities within business district
- 7 Work with the Oregon Department of Transportation to study the feasibility of allowing full southbound access to I-205 from Powell Boulevard

Other Issues

- Study the feasibility and desirability of providing a direct connection between Harold Street and Ellis Street in the vicinity of 92nd Avenue
- Continue to work with Metro and Tri-Met on the study and development of a high capacity transit system in the I-205 corridor which includes a station in Lents

Next Steps

Formal adoption of the plan

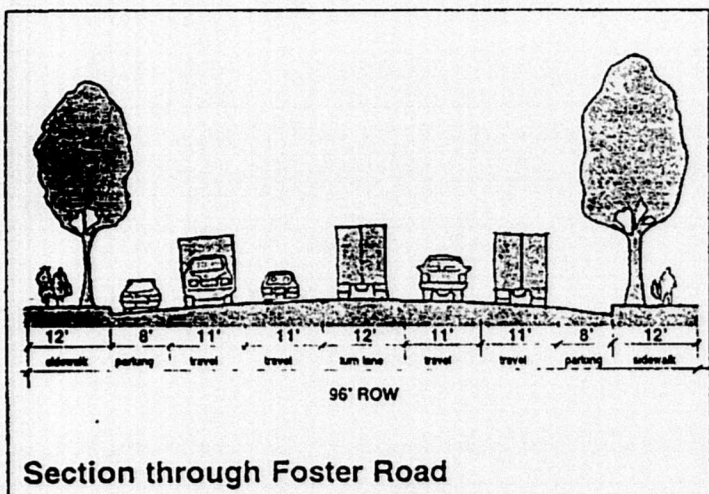
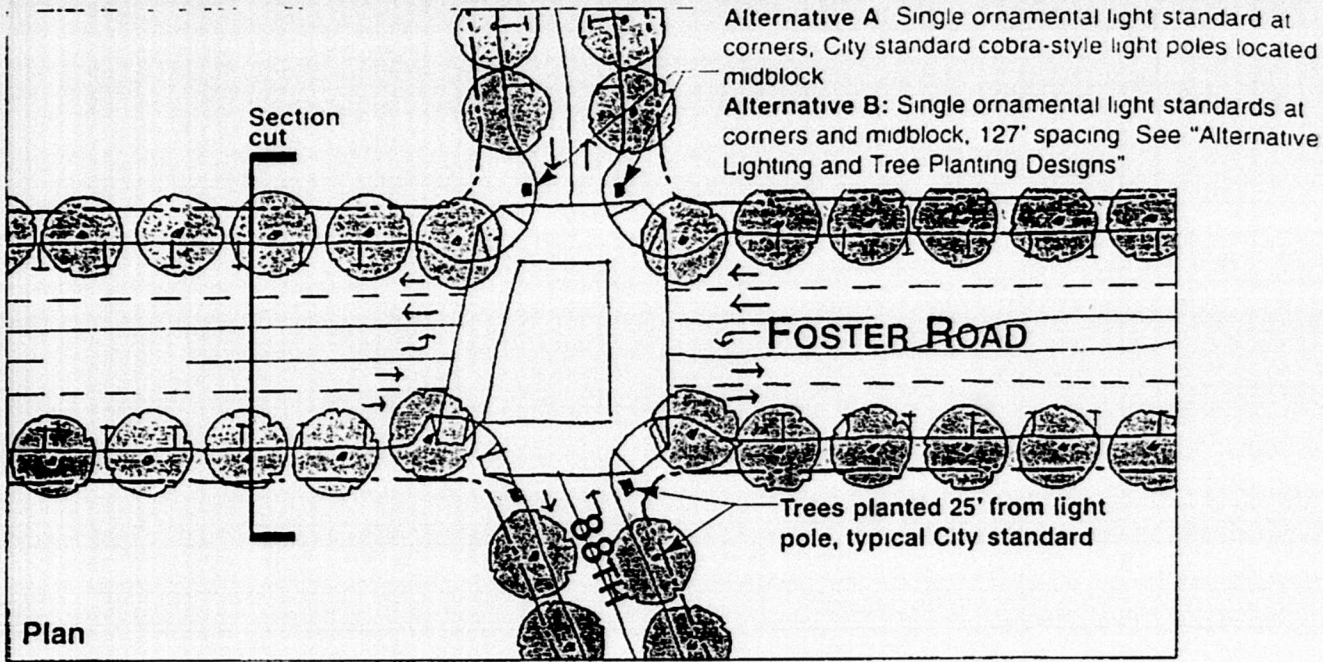
The recommendations proposed by this plan have been approved by the Lents Town Center Business District Transportation Plan Citizens Advisory Committee in September, 1999. The Lents Neighborhood Association has also reviewed and endorsed the preferred alternative. This recommendation will be forwarded to the Lents Town Center Urban Renewal Advisory Committee for approval in October, 1999 and eventually City Council for final adoption by resolution, probably in the late fall of 1999.

Construction

Currently, there are two identified sources of funding for construction of this plan, System Development Charges (SDC) dedicated to expanding transportation system capacity related to growth, and tax increment financing from the Lents Town Center Urban Renewal Project. The SDC fund has earmarked approximately \$1.2 million for construction of

transportation improvement projects in Lents, while the urban renewal funds are contingent upon establishing funding priorities within the entire urban renewal plan work plan. Given the total cost estimate for construction of this plan (see Appendix D), implementation of the plan will need to be phased over time. Establishing priorities for implementation for the transportation management plan will be coordinated by the Portland Development Commission through the urban renewal public involvement and planning process.

Before construction of each identified improvement can proceed additional design engineering work is required to ensure final compatibility with City traffic and civil engineering standards.



GUIDELINES

Sidewalks. 12' where the sidewalk allows; 4' for furnishing zone; 8' for through pedestrian zone (in conformance with Portland Pedestrian Design Guide).

Curb cuts, driveways. Consolidate driveways and minimize curb cuts.

Curb extensions. At all corners, except on east and west corners of 88th at Foster.

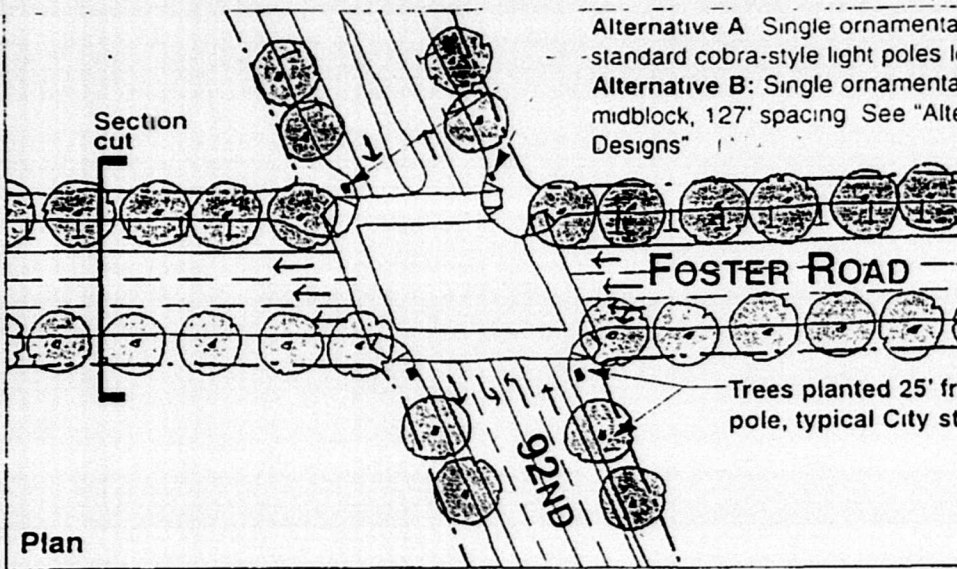
Marked crosswalks At all corners, painted or scored concrete (preferred).

Lighting. Two alternatives are illustrated, see plans. Especially on commercial streets, the white light of a metal halide luminaire is preferred, over the orange light produced by City standard sodium vapor. Pedestrian scale pole-mounted luminaire is preferred. See "Alternative Lighting and Tree Planting Designs" for specifications.

Trees. 20'-30' spacing, depending on the species selected: Trees with a 20' spread, plant 20' o.c.; trees with a 30' spread, plant 30' o.c. (in conformance with Portland Urban Forestry Street Tree Planting Guidelines). Canopy type tree preferred. See Canopy-type Tree list.

Streetscape Design Guidelines for Commercial Street
Southeast 88th Avenue and Foster Road

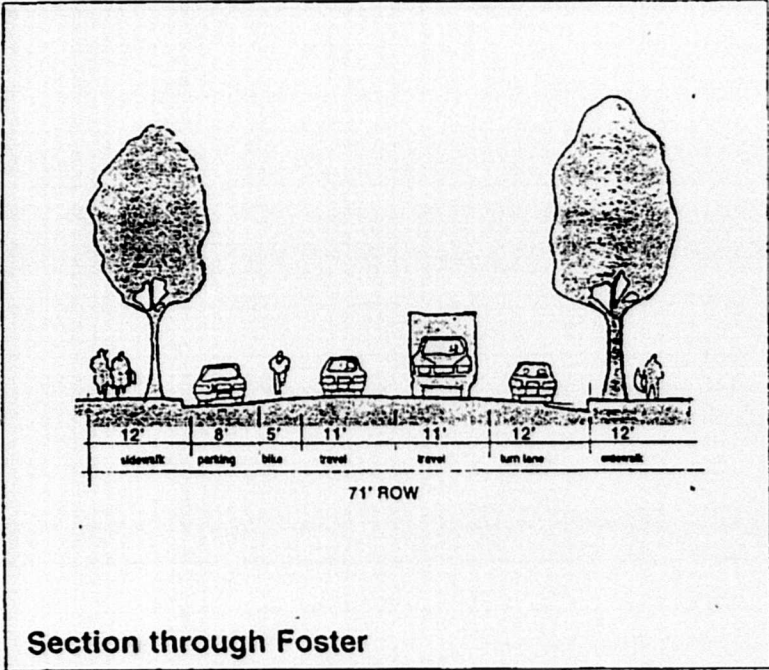
Lents Town Center Plan



Alternative A Single ornamental light standard at corners, cobra-style light poles located midblock
Alternative B: Single ornamental light standards at corners and midblock, 127' spacing See "Alternative Lighting and Tree Planting Designs"

Trees planted 25' from light pole, typical City standard

Plan



Section through Foster

GUIDELINES

Sidewalks. 12' where the sidewalk allows, 4' for furnishing zone, 8' for through-pedestrian zone (in conformance with Portland Pedestrian Design Guide)

On-street parking. Maximize, where possible.

Curb cuts, driveways. Consolidate driveways and minimize curb cuts.

Curb extensions. At north corners of Foster at 92nd.

Marked crosswalks. At all corners, painted or scored concrete (preferred).

Lighting. Two alternatives are illustrated, see

plans. Especially on commercial streets, the white light of a metal halide luminaire is preferred, over the orange light produced by City standard sodium vapor. Pedestrian scale pole-mounted luminaire is preferred. See "Alternative Lighting and Tree Planting Designs" for specifications.

Trees. 20'-30' spacing, depending on the species selected. Trees with a 20' spread, plant 20' o.c., trees with a 30' spread, plant 30' o.c. (in conformance with Portland Urban Forestry Street Tree Planting Guidelines) canopy type tree preferred. For possible canopy-type street tree species, see Canopy-type Tree list.

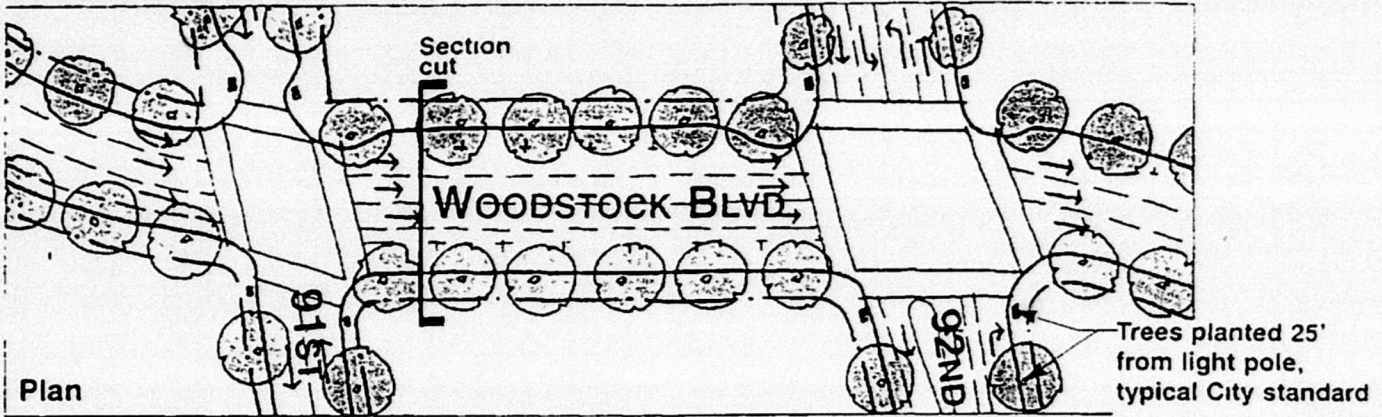
Streetscape Design Guidelines for Commercial Street
 Southeast 92nd Avenue and Foster Road

Lents Town Center Plan

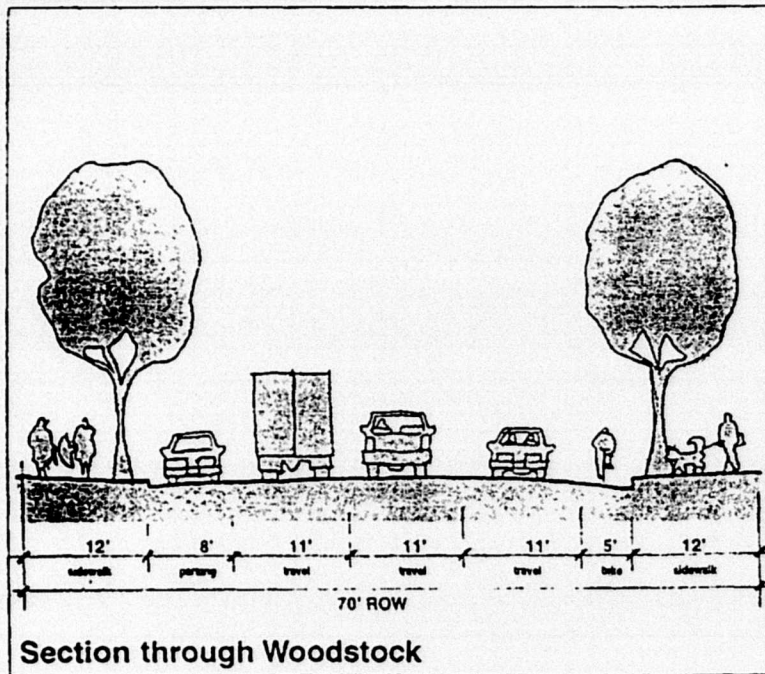
City of Portland • Lennertz Coyle & Associates • DKS • Urbsworks, Inc



Alternative A Single ornamental light standard at corners. City standard cobra-style light poles located midblock
Alternative B Single ornamental light standards at corners and midblock 127' spacing See *Alternative Lighting and Tree Planting Designs*"



Plan



Section through Woodstock

GUIDELINES

Sidewalks. 12' where the sidewalk allows; 4' for furnishing zone, 8' for through-pedestrian zone (in conformance with Portland Pedestrian Design Guide).

On-street parking. Maximize, where possible.

Curb cuts, driveways. Consolidate driveways and minimize curb cuts.

Curb extensions. At north corners of Woodstock at 92nd.

Marked crosswalks. At all corners, painted or scored concrete (preferred).

Lighting. Two alternatives are illustrated,

see plans. Especially on commercial streets, the white light of a metal halide luminaire is preferred, over the orange light produced by City standard sodium vapor. Pedestrian scale pole-mounted luminaire is preferred. See *"Alternative Lighting and Tree Planting Designs"* for specifications.

Trees. 20'-30' spacing, depending on the species selected: Trees with a 20' spread, plant 20' o.c.; trees with a 30' spread, plant 30' o.c. (in conformance with Portland Urban Forestry Street Tree Planting Guidelines) canopy type tree preferred. For possible canopy-type street tree species, see Canopy-type Tree list. Plant trees 25' from the curb line of intersections

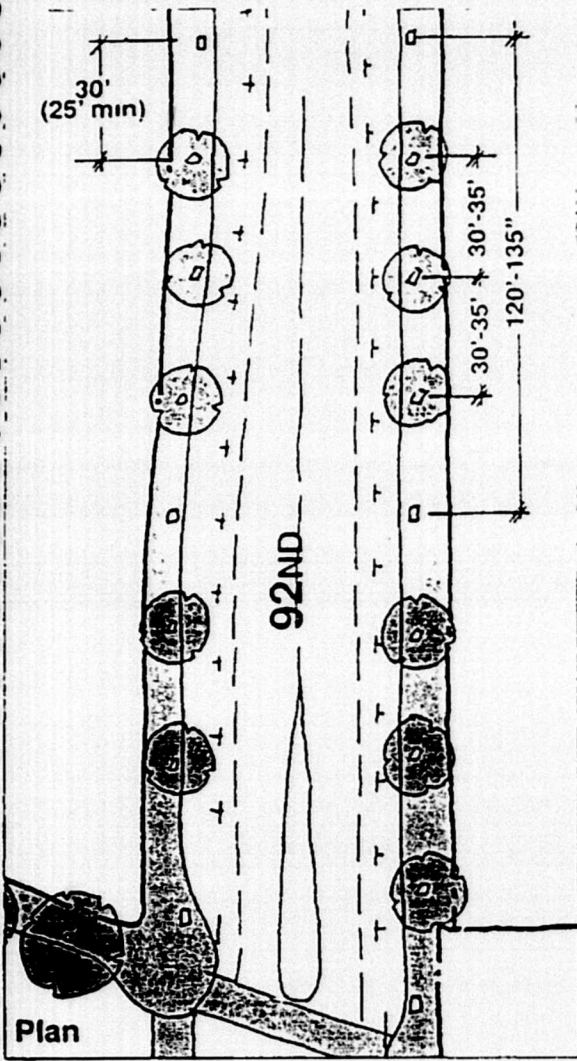
Streetscape Design Guidelines for Transportation Corridor

Southeast 92nd Avenue and Woodstock Boulevard

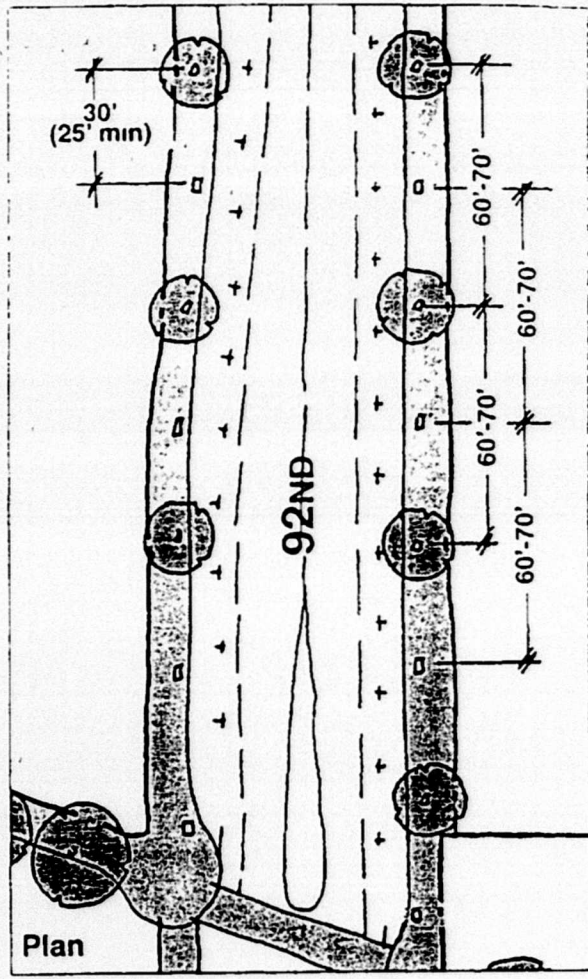
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92nd Main Street Alternative A
 Trees spaced 30-35'
 Same pole and luminaire as at 91st.
 Light poles spaced 120-135', or one at each end of block and one at center. Similar to spacing at improved segment of 91st.



92nd Main Street Alternative B
 Trees spaced 60-70'
 Same pole and luminaire as at 91st.
 Light poles spaced 60-70", or at quarter block intervals. Within 200', this spacing is similar to lighting at South Park blocks in downtown Portland.

LIGHTING ON WOODSTOCK AND FOSTER, ALTERNATIVE B SPECIFICATIONS

- Single ornamental light standards at corners and midblock, 127' staggered spacing, resulting in a pole every 63.5', at alternate sides of the street
- Pole: Aluminum or fiberglass, 18' high
- Luminaire: Acorn type
- Average footcandle (9 min required for major arterial per IES): .92
- Uniformity (3 1 max, per IES): 2 09 1
- Veiling luminance (3 1 per IES): 297.1

Alternative Lighting and Tree Planting Designs

For 92nd Main Street and Foster/Woodstock

Lents Town Center Plan

GUIDELINES

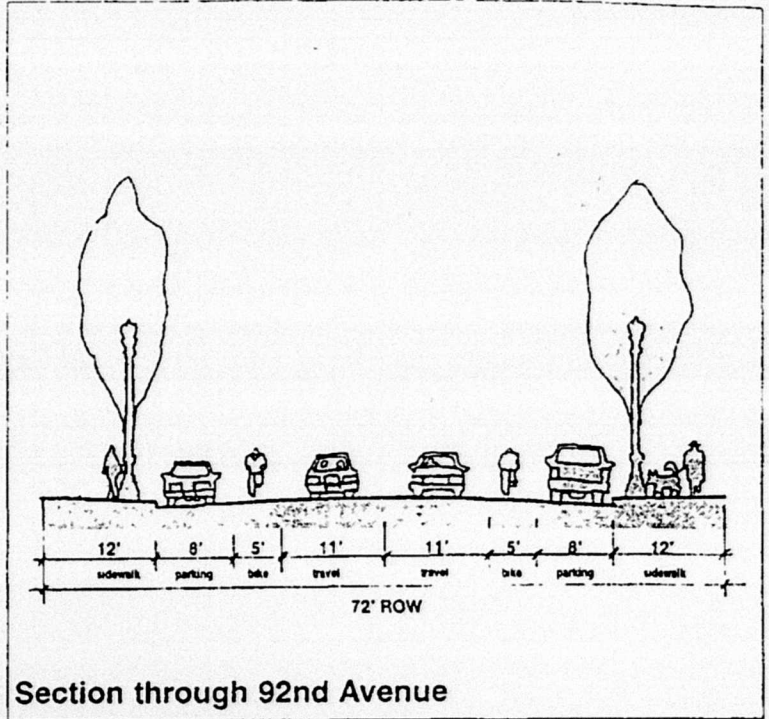
Sidewalks. 12' required 4' for furnishing zone, 8' for through pedestrian zone, 15' preferred 4' for furnishing zone, 8' through-pedestrian zone, 2'6" storefront frontage zone, (in conformance with Portland Pedestrian Design Guide) For additional information, see "Sidewalk Details"

On-street parking. Provide a maximum number of spaces

Curb cuts, driveways. Consolidate driveways and minimize curb cuts

Lighting. Two alternatives are illustrated, see "Alternative Lighting and Tree Planting Plans" Especially on commercial streets, the white light of a metal halide luminaire is preferred, over the orange light produced by City standard sodium vapor. Pedestrian scale pole-mounted luminaire is preferred.

Trees. Two alternatives are illustrated, see "Alternative Lighting and Tree Planting Plans". Plans show a columnar-type tree. Trees must be located 25' from light poles. Between light poles, plant trees at 10'-20' spacing, depending on the species selected: trees with a 10' spread, plant 10' o.c.; trees with a 20' spread, plant 20' o.c. (in conformance with Portland Urban Forestry Street Tree Planting Guidelines). For possible columnar-type street tree species, see Columnar-type Tree list. Plant trees 25' from the curb line of intersections.



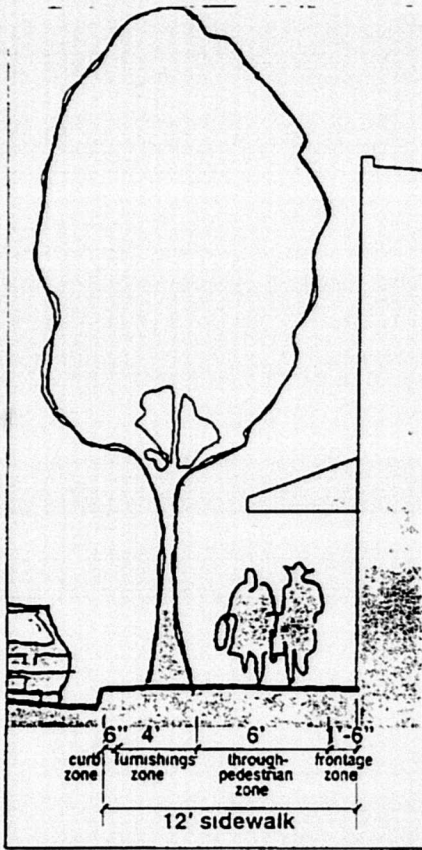
Streetscape Design Guidelines for Main Street

Southeast 92nd Avenue north of Foster Road

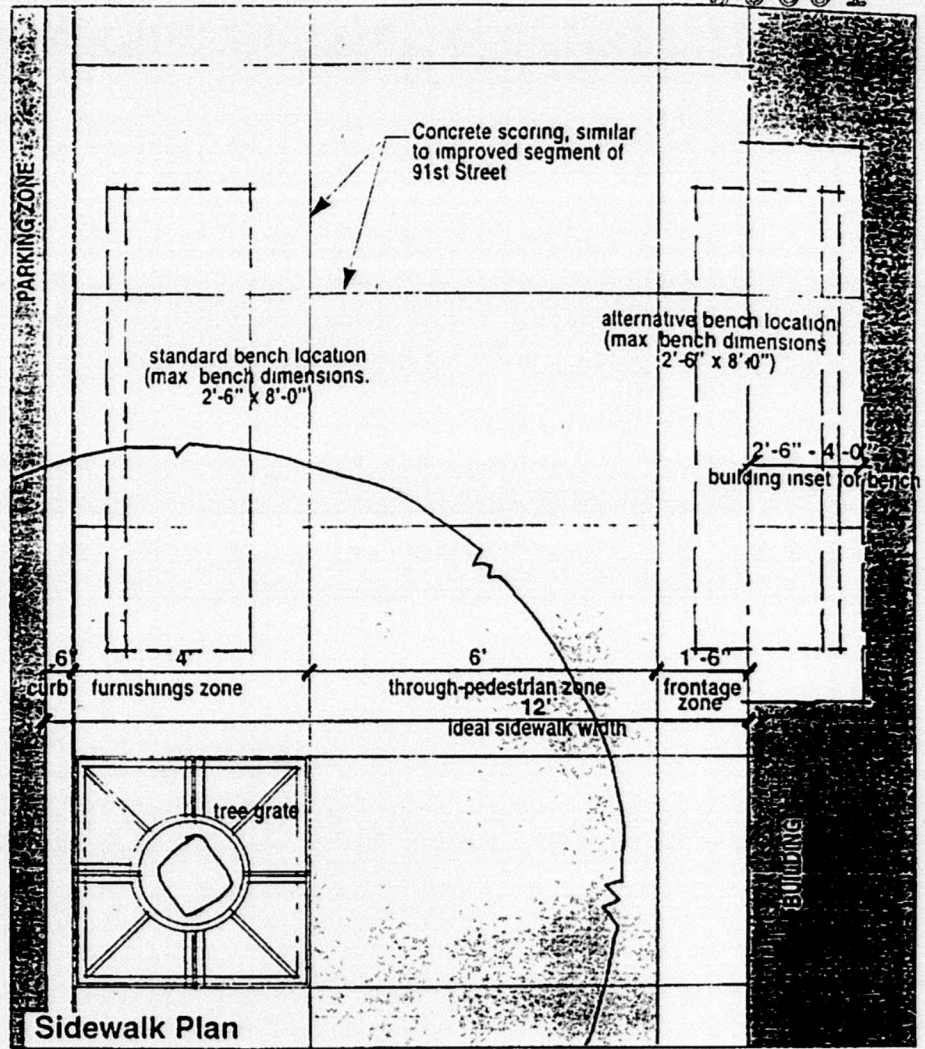
Lents Town Center Plan

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urbsworks



Sidewalk Section Detail



Sidewalk Plan

SIDEWALK DESIGN GUIDELINES

Trees, light poles and street furniture such as benches, drinking fountains, bike racks, planters and garbage receptacles should occupy the 4' space between the curb zone and the through-pedestrian zone. When benches are placed next to the curb, they should face the storefront, not the street. Benches, removable planters and temporary cafe seating can also be located in the frontage zone (next to the building), as long as the through-pedestrian zone remains clear.

Where existing buildings prevent sidewalk from reaching an ideal 12'-0" width, adjustments can be made to the frontage zone and/or the furnishings zone. The through pedestrian zone can be reduced to 4'-6". Furnishings zone can be reduced to 3'-0". Reduction to less than 3'-0" is not recommended but in certain cases may be unavoidable. (Less than 3'-0" generally prohibits tree planting). The frontage zone can be reduced to 0'.

Trees are protected by Portland City standard tree grates, either with 4' x 4' size preferred. Select grates similar in style to those located on the improved portion of 91st street.

Sidewalk Details

Lents Town Center Plan

APPENDIX A
TRANSPORTATION ANALYSIS

Chapter 1: Existing Conditions

Chapter 2: Transportation Street Network Analysis

Chapter 3: Parking Management Plan

CHAPTER 1

EXISTING CONDITIONS

This section of the report discusses the existing transportation conditions in the project study area, including roadway geometries and classifications, traffic and pedestrian volumes, operating conditions, transit, bicycles, parking and other related information. The project study area is generally bounded by SE Harold Street to the north, SE Tolman Street to the south, SE 101st Avenue to the east and SE 84th Avenue to the west. Figure 1 shows the project study area.

This project area focuses on the downtown Lents Business District, which is generally located between Foster Road and Woodstock Boulevard, from just west of the I-205 ramps to about SE 90th Avenue. The following sections summarize current traffic and transportation conditions in the study area, with supporting detail (traffic counts and level of service calculations) provided in the appendix.

ROADWAY NETWORK

Regional access to the study area is provided via the I-205 freeway. The I-205 freeway intersects Foster Road and Woodstock Boulevard in a split diamond interchange configuration. Frontage roads connect Foster Road and Woodstock Boulevard at both the west (southbound only) and east (northbound only) sides of the freeway. This type of configuration of Foster Road and Woodstock Boulevard creates a couplet that exists from approximately 90th Avenue eastward to SE 99th Avenue.

The following section describes the general roadway characteristics for each key roadway in the study area, and is followed by Table 1 which summarizes the functional classifications for each roadway (i.e. street, transit, bike, pedestrian and freight) by Metro and the City of Portland.

Interstate 205 is the regional north/south freeway that provides access to and from the study area. Generally, I-205 is six lanes wide (three northbound lanes and three southbound lanes) and intersects the couplet of Foster Road and Woodstock Boulevard. The posted speed along Interstate 205 is 55 miles per hour. Refer to Table 1 for roadway classifications within the study area.

Foster Road is the northern portion of the couplet (with Woodstock Boulevard) within the study area. It generally consists of three westbound through travel lanes, with left turn lanes at the I-205 south bound ramps and 90th Avenue (west end of the couplet). A right turn lane is provided

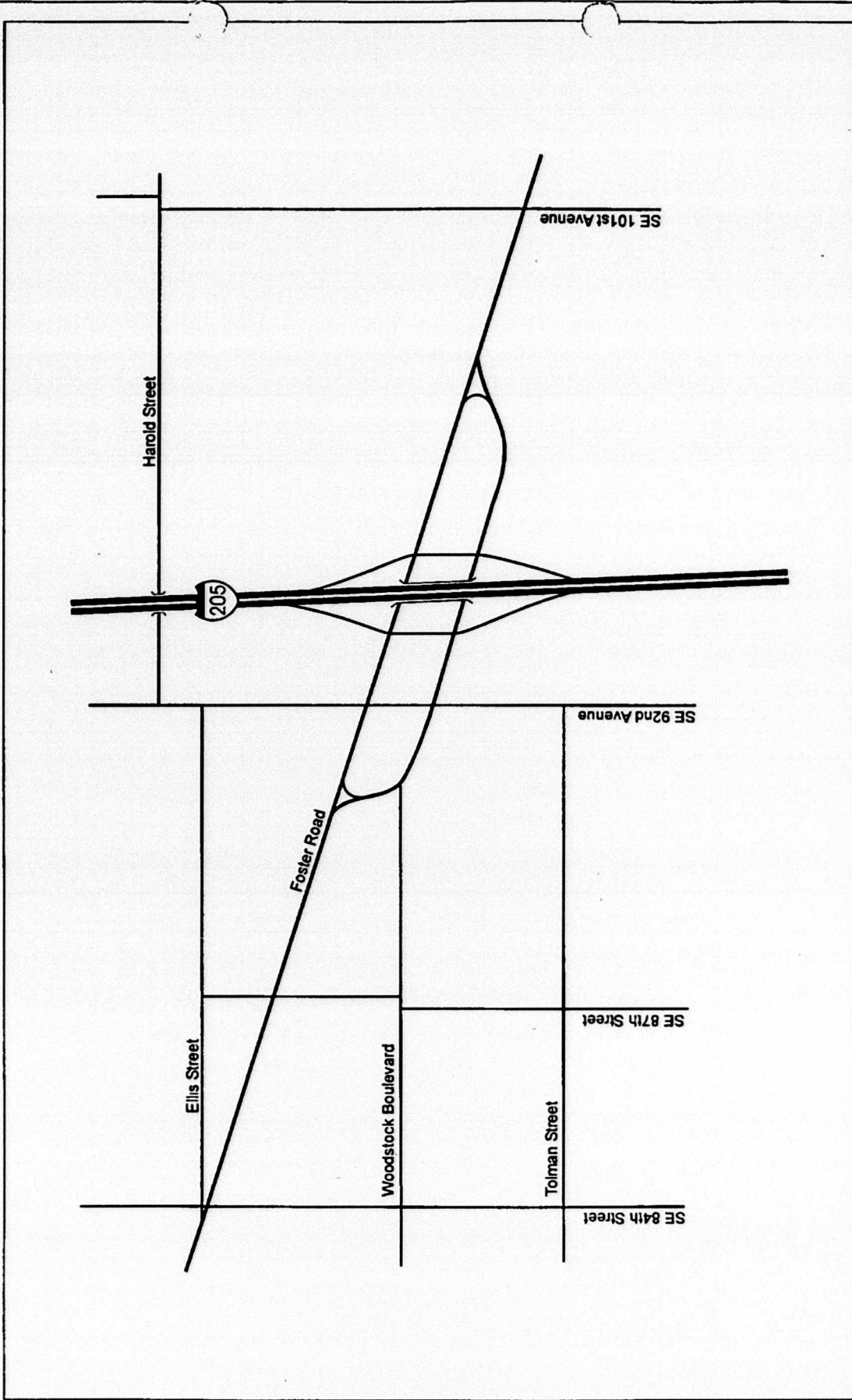
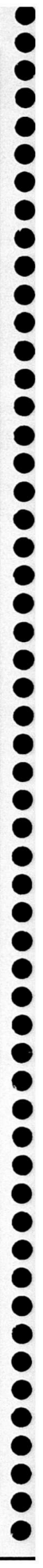


Figure 1
STUDY AREA



at the I-205 northbound ramps. Foster Road is controlled by fixed-time traffic signals at the I-205 southbound and northbound ramps with a semi-actuated signal at 92nd Avenue that is activated by the northbound left turn lane from 92nd Avenue. The posted speed zone along Foster Road within the study area is 35 mph. Figure 2 shows the existing lane geometry for the study area intersections.

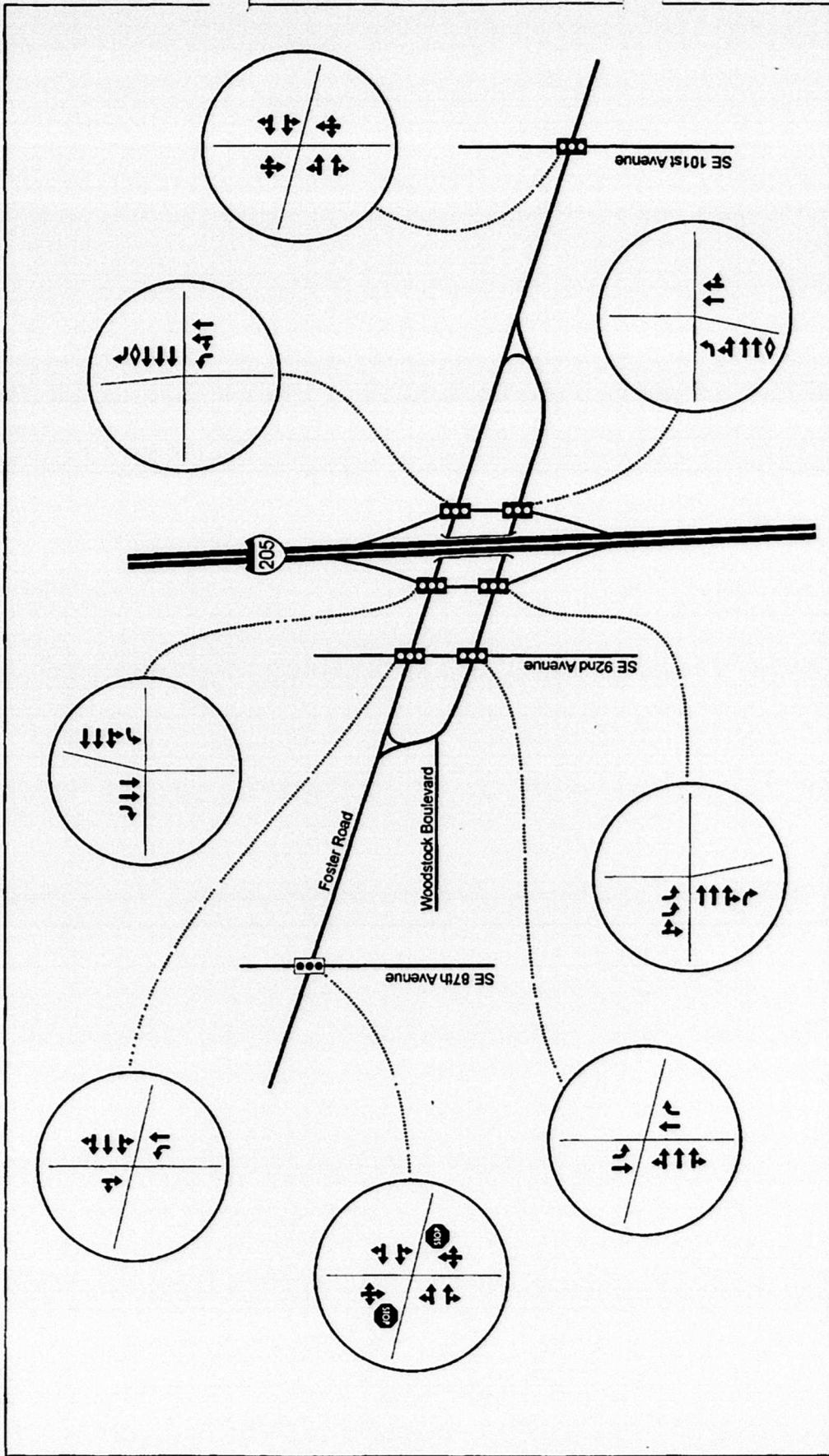
Table 1 summarizes the functional classifications for each roadway within the study area.

Table 1
Summary of Functional Classifications for Roadways Within the Study Area

	Roadway	Transit	Bike	Pedestrian	Freight
<i>Metro¹</i>					
Interstate 205	Principal Arterial (Freeway)	High Capacity Transit Corridor	Off-street multi-use path	Multi-use path	Main Roadway Route
Foster Road	Major Arterial	Frequent Bus	Regional Access Bikeway	Pedestrian District	n/a
Woodstock Boulevard	Major Arterial	Primary Bus (west of couplet) Frequent Bus (within couplet)	Regional Corridor Bikeway (west of couplet) Regional Access Bikeway (within couplet)	Pedestrian District	n/a
92 nd Avenue	Collector of Regional Significance (south of Foster)	n/a	n/a	Pedestrian District	n/a
<i>City of Portland²</i>					
Interstate 205	Regional Trafficway	Regional Transitway	Off-street path	Off-street path	Regional Truck Route
Foster Road	Major City Traffic Street	Major City Transit Street	City Bikeway	Pedestrian District	Minor Truck Street
Woodstock Boulevard	Major City Traffic Street	Major City Transit Street	City Bikeway	Pedestrian District	Minor Truck Street
92 nd Avenue	Neighborhood Collector	Minor Transit Street	City Bikeway	Pedestrian District	n/a

¹ *Regional Transportation Plan, Metro, 1997 version 4.0, Figures 2.1-2.6*

² *Transportation Element City of Portland Comprehensive Plan, Effective June 21, 1996, pp 96-100.*



LEGEND

- Existing Signal
- Existing Pedestrian Signal
- Existing Lane Geometry
- Bicycle Lane

Figure 2
EXISTING SIGNALS AND LANE GEOMETRY

A signalized pedestrian crossing is provided at the intersection of Foster Road/87th Avenue (87th Avenue traffic is stop sign controlled at this location). There is an unsignalized five leg intersection at Foster Road/Ellis Street/84th Avenue with the uncontrolled movement along Foster Road, and stop signs along Ellis Street and 84th Avenue. To the east of the couplet, the nearest traffic signal along Foster Road is located at 101st Avenue and has protected left turn lanes in the east/west direction with permitted left turns along 101st Avenue. Table 1 summarizes the functional classifications of Foster Road.

There are sidewalks along both sides of Foster Road with adequate widths ranging from 6 to 12 feet. However, only three foot wide sidewalks are provided along the south side of the street between the I-205 southbound frontage road and the I-205 northbound frontage road.

Within the couplet area, no parking is allowed on the south side of the street, but parking (1 hour maximum) is allowed on the north side of the street. The exception is on the north side of Foster Road between the two I-205 frontage roads, where a bus zone replaces parking. Although Foster Road is designated as a bike route, limited bicycle facilities exist on the roadway. Bicycle striping along Foster Road is found just east of the I-205 northbound on ramp to the I-205 southbound off ramp. Refer to Table 1 for roadway classifications within the study area.



Foster Road within the couplet in bus zone looking west

Woodstock Boulevard has three eastbound through travel lanes with left turn lanes at the I-205 northbound ramps and at the east end of the couplet. A right turn only lane is provided at the I-205 southbound ramp. Woodstock Boulevard is controlled by fixed-time traffic signals at the I-205 southbound and northbound ramps with a semi-actuated signal at 92nd Avenue that is activated by the southbound left turn lane from 92nd Avenue.

Figure 2 shows the lane geometries and signal locations along Woodstock Boulevard. There is no posted speed along Woodstock Boulevard within the couplet, however previous speeds along Foster Roads are 35 miles per hour.

There are generally sidewalks along both sides of Woodstock Boulevard in the study area, with adequate widths ranging from 5 feet to 10 feet. Minimal sidewalks are provided along the north side of Woodstock Boulevard between the freeway frontage roads and just east of the I-205 northbound frontage road on the south side. A bus zone is located on the south side of the

roadway between the two I-205 frontage roads. There are limited bicycle facilities along Woodstock within the couplet area, however west of the couplet (from outside the study area to the couplet) along Woodstock Boulevard there are designated bicycle facilities on both sides of the roadway.

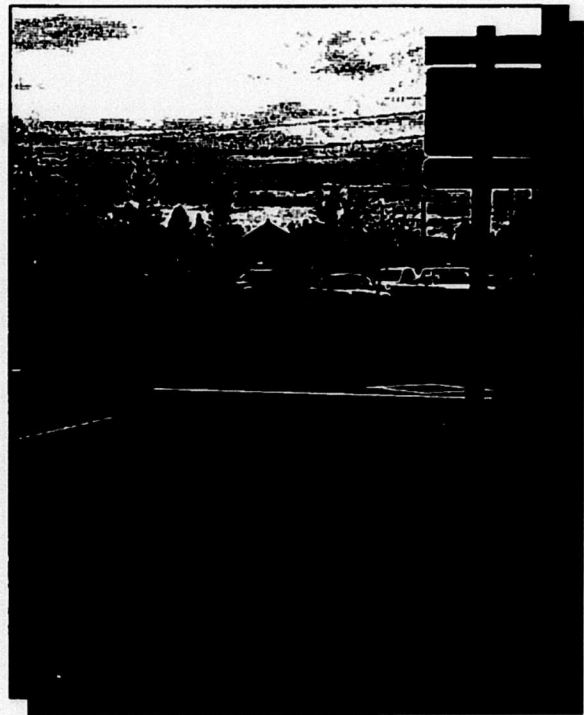
92nd Avenue consists of one through lane in each direction north and south of the couplet. Left turn lanes are provided at Foster Road and Woodstock Boulevard for the north and southbound moving traffic. A right turn lane is also provided for northbound traffic at Woodstock Boulevard. As previously mentioned, 92nd Avenue (at Foster Road and Woodstock Boulevard) is controlled by semi-actuated traffic signals. The posted speed along 92nd Avenue is 25 miles per hour.

Parking is provided on both sides of 92nd Avenue north of Foster Road and south of Woodstock Boulevard. No parking is allowed between Foster Road and Woodstock Boulevard. Sidewalks, ranging in width from 5 to 8 feet, are provided along both sides of the roadway. Designated bicycle facilities along 92nd Avenue start just south of Woodstock Boulevard.

BICYCLE

Foster Road, Woodstock Boulevard, and 92nd Avenue are designated as City Bikeways within the couplet area.³ This designation is given to 92nd Avenue north of Foster Road and south of Woodstock Boulevard.

Designated bicycle facilities within the study area are found along Foster Road from 101st Avenue to the west end of the couplet, along Woodstock Boulevard from 84th Avenue to the west end of the couplet and then again on the south side of Woodstock Boulevard from the I-205 southbound frontage road to 101st Avenue. Bicycle facilities are also found along 92nd Avenue just south of Woodstock Boulevard. The I-205 Off-street path also runs north and south through the study area on the west side of I-205.



*I-205 Bike and Pedestrian Off-street path
at Foster Road*

³ *Transportation Element City of Portland Comprehensive Plan, Effective June 21, 1996, pp 98.*

The bicycle volume counts during the peak periods at the study area intersections is less than 15 bicycles per peak hour.

PEDESTRIAN

The study area encompasses the Lents Pedestrian District as designated by the City of Portland in the Comprehensive Plan.⁴ Within the study area, sidewalks are provided along Foster Road and Woodstock Boulevard throughout most of the study area. Generally, these facilities range in size from 5 to 12 feet which adequately provide for the pedestrian volumes experienced.

Sidewalks are not provided along the south side of Foster Road between the I-205 freeway on and off-ramps, along the north side of Woodstock Boulevard between the I-205 freeway on and off-ramps, and 3-5 foot sidewalks exist along the south side of Woodstock Boulevard between the I-205 northbound off-ramp and 97th Avenue. Figure 3 shows the existing pedestrian volumes in the AM and PM peak hours.



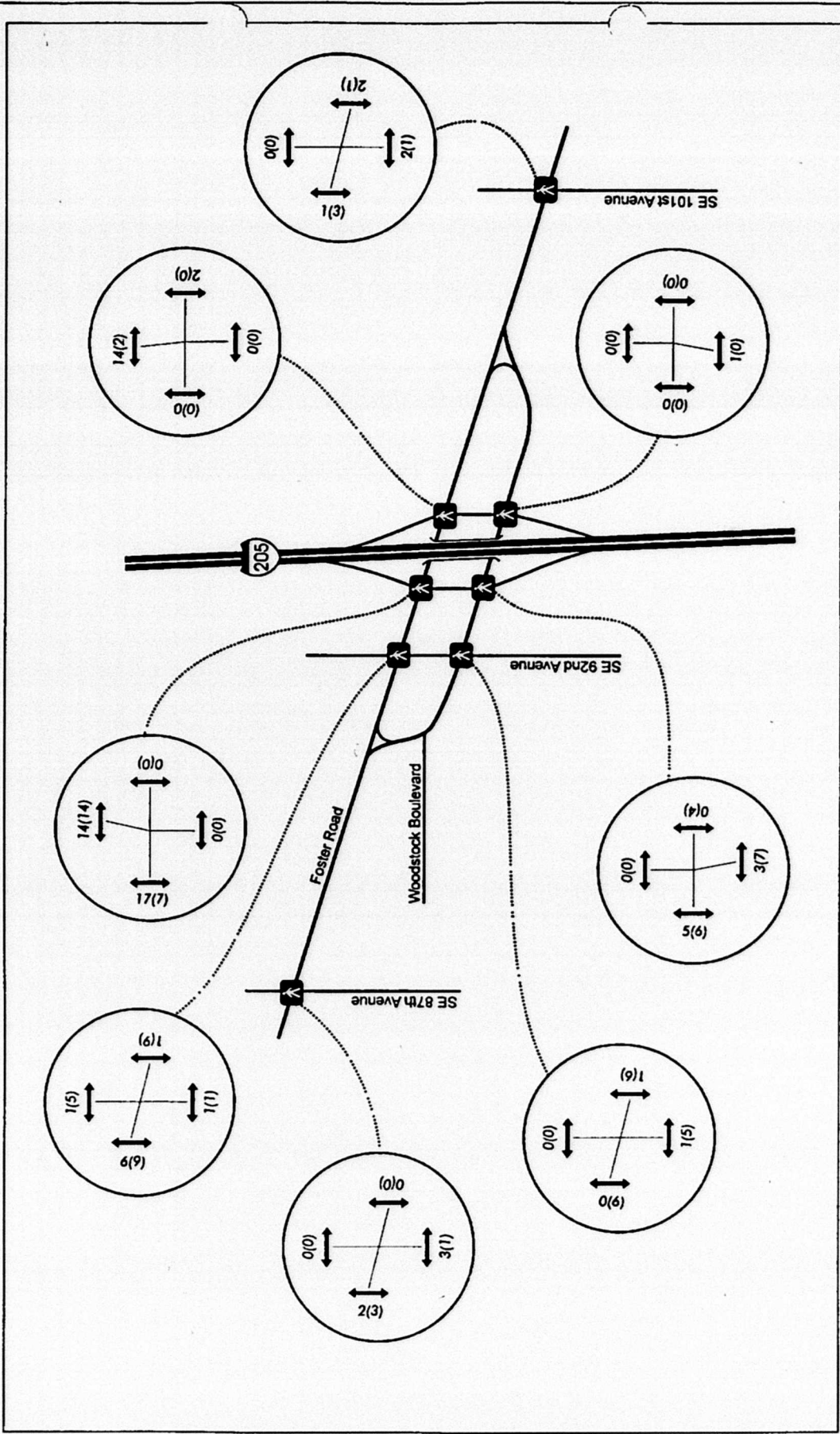
Signalized pedestrian crossing at Foster Rd/87th St

Pedestrian access is not provided to the area bounded by Foster Road/Woodstock Boulevard, the I-205 southbound frontage road and the I-205 northbound frontage road. Minimal pedestrian sidewalks currently exist around this area with a width of approximately 3 feet.

Signalized pedestrian crossings are located at the following locations:

- Foster Road/87th Avenue (crosswalk striping on the east and west legs only)
- Foster Road/92nd Avenue (crosswalks on all four legs)
- Woodstock Boulevard/92nd Avenue (crosswalks on all four legs)
- Foster Road/I-205 southbound ramps (crosswalks on the north and west legs only)
- Woodstock Boulevard/I-205 southbound ramps (crosswalks on the south and west legs only)
- Foster Road/I-205 northbound ramps (crosswalks on the north and east legs only)
- Woodstock Boulevard/I-205 northbound ramps (crosswalks on the south and east legs only)

⁴ *Transportation Element City of Portland Comprehensive Plan, Effective. June 21, 1996, pp. 99*



LEGEND

- Pedestrian Count Location

AM(PM) - Peak Hour Pedestrian Volumes

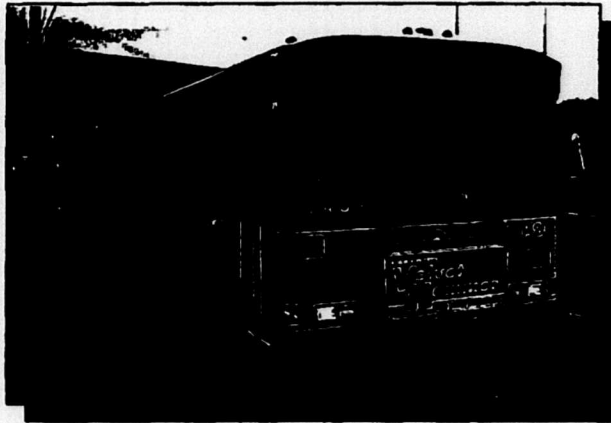
Figure 3
EXISTING PEDESTRIAN VOLUMES
AM/PM PEAK HOUR

A pedestrian crossing either Foster Road or Woodstock Boulevard at unsignalized locations can be difficult within the study area because of high traffic volumes, moderate speeds, long crossing distances at some locations, and restricted sight distance on portions of Woodstock

Boulevard at the couplet ends. Pedestrian crossings are particularly difficult at both ends of the couplet where a number of merge and diverge movements take place in the traffic stream and vehicle drivers are often concentrating on avoiding a collision with another vehicle rather than looking for pedestrians.

The I-205 pedestrian/bike path runs north and south along the west side of I-205, intersecting the Foster Road/Woodstock Boulevard couplet within the study area. This path is designated as a Off-street Path by the City of Portland.⁵ The path crosses Foster Road on the west leg of the I-205 southbound off-ramp intersection and crosses Woodstock Boulevard on the west leg of the I-205 southbound on-ramp intersection.

TRANSIT



Bus staging area along Foster Road

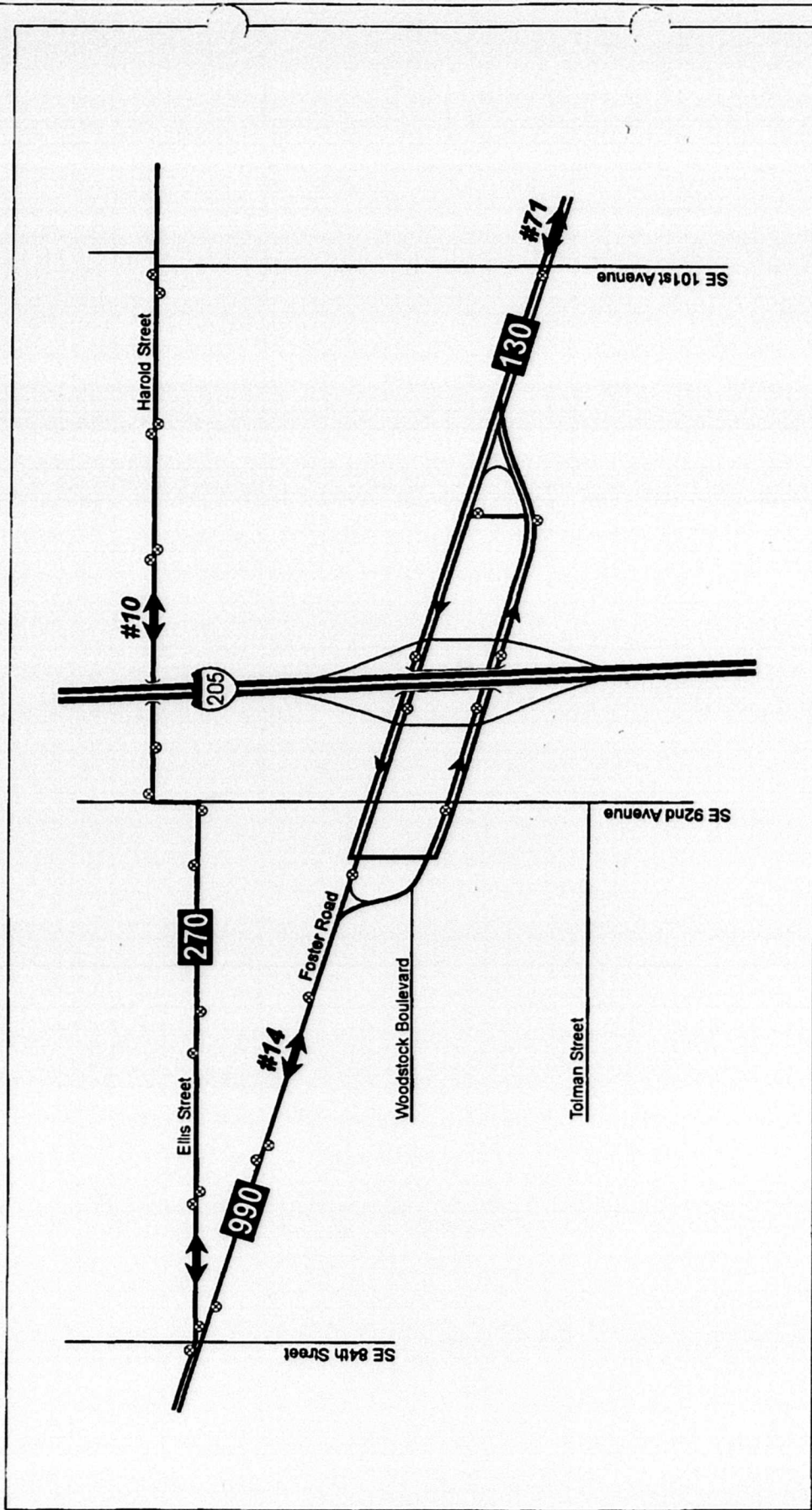
There are three Tri-Met routes servicing the study area. Two of these routes run directly along Foster Road and Woodstock Boulevard, while the other route services the norther part of the study area.

The two routes that directly service Foster Road and Woodstock Boulevard area are route #14 and route #71. Route #14 (Hawthorne) runs between the Portland downtown to the Foster Road/Woodstock Boulevard/I-205 couplet via the Hawthorne district. The headways for the #14 route are approximately 6 minutes in the AM and PM

peak directions with approximately 9 minute headways in the opposite peak direction. Route #71 (60th to 122nd Avenue) runs between the Foster Road/Woodstock Boulevard/I-205 to Sunnyside Road/Kaiser with approximate headways of 13-15 minutes in the AM peak period (6 - 8am) and approximately 15 minute headways in the PM peak period (4 - 6pm).

The third Tri-Met route is the #10 (Harold) and runs along Ellis Street. The headways for route #10 are approximately 12-15 minutes in the AM peak period, and approximately 13-17 minutes

⁵ *Transportation Element City of Portland Comprehensive Plan, Effective June 21, 1996, pp 97.*



LEGEND

- Tri-Met
- - #10
- - #71
- - #14
- 800** - Number of Daily Passengers
Traveling Through the Lents area
- ⊗ - Transit Stop

Figure 4
DAILY TRANSIT CIRCULATION

in the PM peak period. Figure 4 shows the Tri-Met routes within the study area with the transit stop locations and the daily ridership for each route. Metro has forecasted 2015 transit ridership and auto vehicle occupancy to and from the Lents area.⁶ Table 2 summarizes these forecasts.

Table 2
2015 Transit and Auto Vehicle Occupancy Data For Study Area Land Uses

Mode	Lents Downtown Core
Transit	
From Lents to all locations	4%
From all locations to Lents	10.3%
Auto Vehicle Occupancy (persons/vehicle)	
From Lents to all locations	1.14
From all locations to Lents	1.14

MOTOR VEHICLES

This section describes the vehicle traffic conditions within the study area along the key roadways. Items discussed in this section traffic performance, safety, driveway access, street cross sections, and parking information.

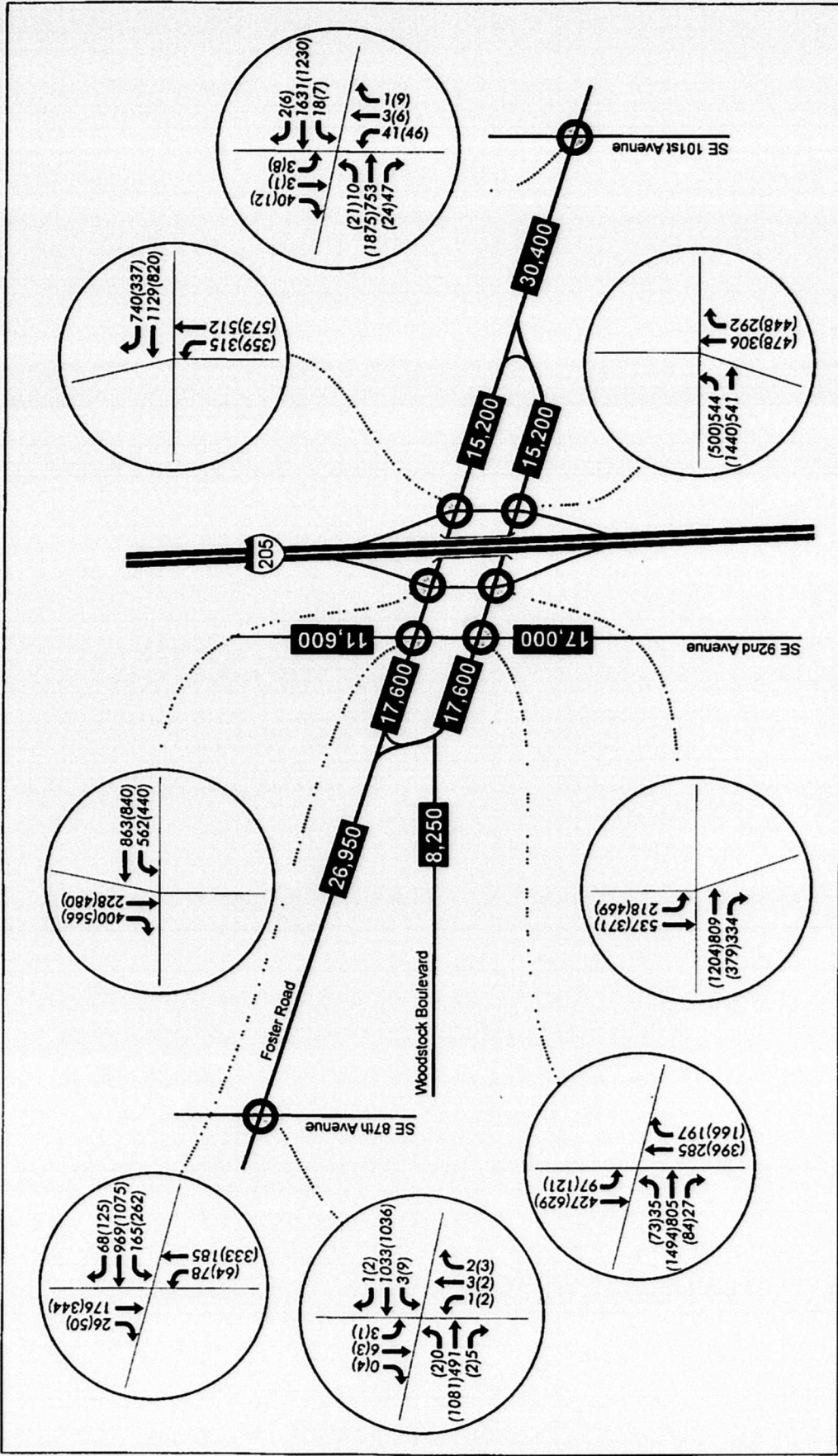
Traffic Performance

Traffic data for the study area was supplied by the City of Portland for traffic volumes, speed surveys, pedestrian gap data, and existing AM and PM peak hour turn movement counts.⁷ Figure 5 shows the AM and PM peak hour turn movement counts as well as the average daily traffic volumes for the six signalized study area intersections.

While analysis of traffic flows is useful in attempting to reach an understanding of the general nature of traffic in an area, traffic volume alone indicates neither the ability of the street network to carry additional traffic nor the quality of service provided by the street facilities. For this

⁶ *Transit Mode Split and Average Vehicle Occupancy Data*, Provided by Metro, March 1996.

⁷ Data supplied by the City of Portland Bureau of Traffic Management. All data with the exception of the AM and PM peak hour turning movement counts was historic data from within the past six years.



LEGEND

- Study Intersection
- AM(PM) - Peak Hour Traffic Volumes
- 8,250** - Average Daily Traffic Volumes

Figure 5
EXISTING TURN MOVEMENTS
AM/PM PEAK HOUR

reason, the concept of level of service (LOS) has been developed to correlate traffic volume data to subjective descriptions of traffic performance at intersections.

An intersection's level of service (LOS) is similar to a "report card" rating, based on average vehicle delay. Level of service "A", "B" and "C" indicate conditions where vehicles can move freely. Level of service "D" and "E" are progressively worse. LOS "D" is generally accepted as the minimum acceptable LOS during peak periods. For signalized intersections, level of service "F" represents conditions where the average delay for all vehicles through the intersection exceeds 60 seconds per vehicle, generally indicated by long queues and delays. Under this operating condition, delay is highly variable, and it is difficult to estimate average delay accurately because congestion often extends into, and is affected by adjacent intersections. Descriptions of levels of service for signalized and unsignalized intersections are contained in the appendix.

Capacity conditions at the six signalized intersections in the study area were evaluated in the AM and PM peak period. For both the AM and PM peak period, traffic operation is at level of service D or better conditions. Table 3 provides a summary of intersection performance for the AM and PM peak hour level of service and volume-to-capacity ratios.

Table 3
Intersection Performance in Peak Periods

	AM Peak			PM Peak		
	Delay	LOS	V/C	Delay	LOS	V/C
Signalized						
Foster/92nd Avenue	10.2	B	0.50	27.7	D	0.76
Woodstock/92nd Avenue	10.3	B	0.52	16.2	C	0.78
Foster/I-205 SB off-ramp	9.7	B	0.47	14.6	B	0.37
Woodstock/I-205 SB on-ramp	9.5	B	0.63	5.1	B	0.54
Foster/I-205 NB on-ramp	10.7	B	0.73	10.1	B	0.46
Woodstock/I-205 NB off-ramp	17.7	C	0.46	15.9	C	0.72
Foster/101st Avenue	11.1	B	0.60	21.7	C	0.71
Unsignalized						
Foster/84th Avenue		A/E			B/F	

Signalized Intersection
LOS = Level of Service
Delay = Average delay per intersection
V/C = Volume-to-capacity ratio

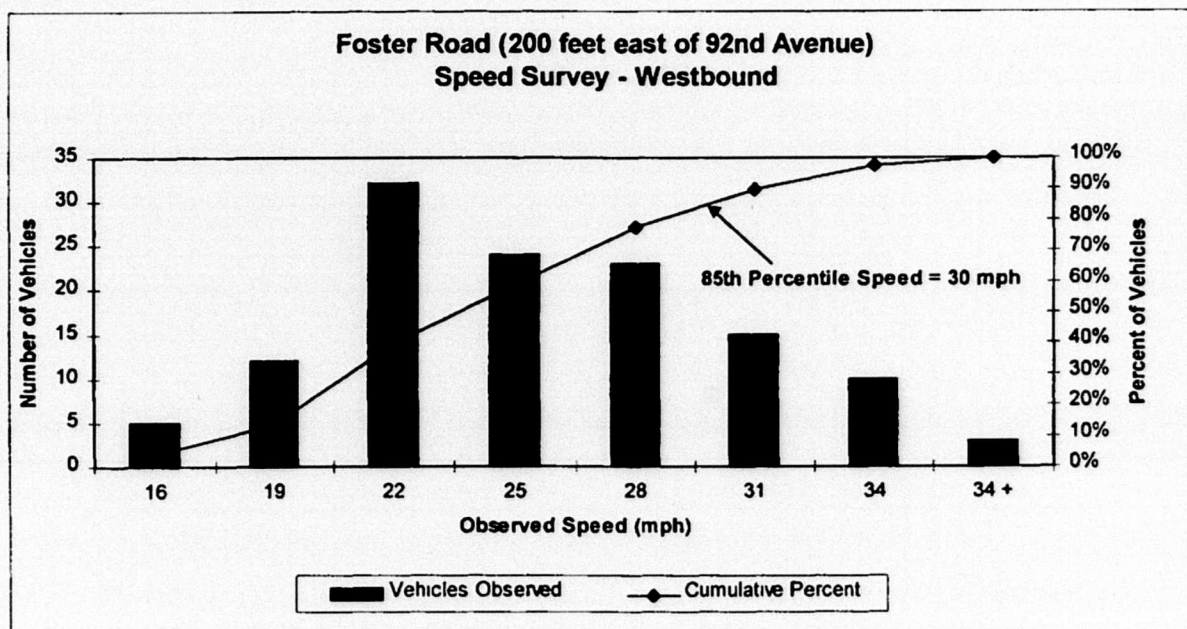
Unsignalized Intersection
X/X = Major roadway left turn/Minor roadway movement

Field observations showed that in the north and southbound directions along the frontage roads connecting the I-205 on and off-ramps from Foster Road and Woodstock Boulevard, vehicle queues extended from one side of the couplet to the other due to poor lane balance. Vehicle queuing extending for upwards of one block was also observed in the north and southbound directions turning left onto Forster Road and Woodstock Boulevard along 92nd Avenue.

Speed Survey

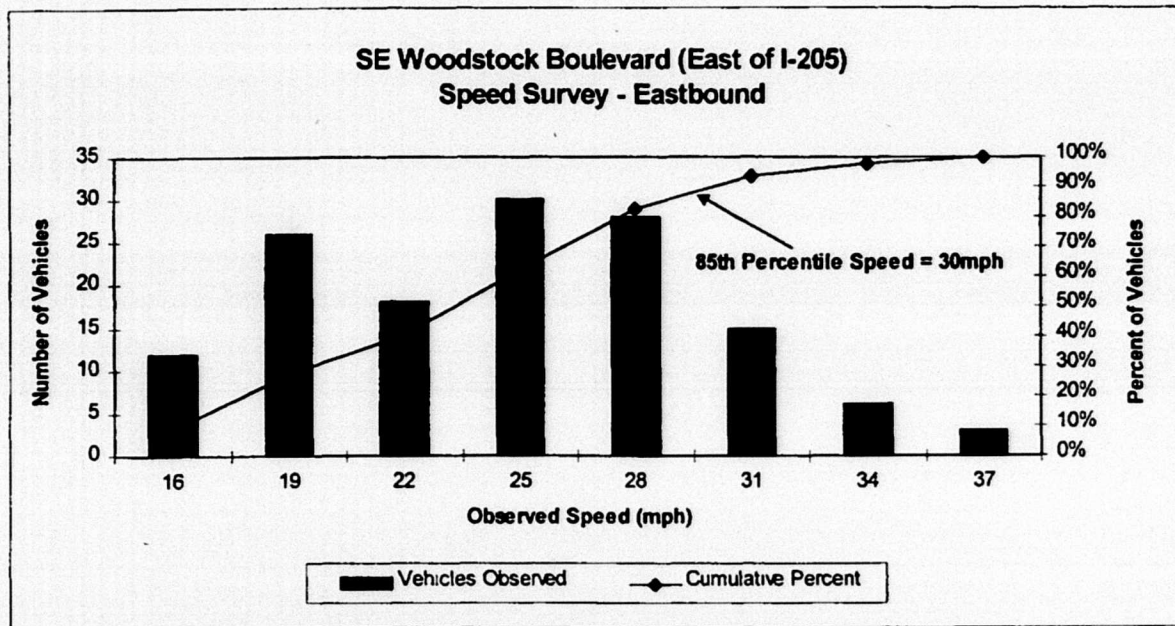
Historical speed survey data was provided by the City of Portland for the location along Foster Road at 94th Avenue and Woodstock Boulevard at 93rd Avenue.⁸ The posted speed along Foster Road and Woodstock Boulevard is 35 miles per hour throughout the couplet. These speed surveys track the volume and speed of vehicles as they pass a point on the roadway. Figure 6 and 7 summarize the speed surveys at these locations.

Figure 6
Speed Survey Along Foster Road 200 Feet East of 92nd Avenue



⁸ Speed survey data provided by the City of Portland Bureau of Traffic Management was taken along Foster Road and Woodstock Boulevard within the couplet in January 1993. Although it does not represent existing conditions today, it does give a representation of the number of vehicles traveling within certain speed categories. This information is useful to determine the 85th percentile speed and the average speed that the largest number of vehicles are traveling at.

Figure 7
Speed Survey Along Woodstock Boulevard East of I-205

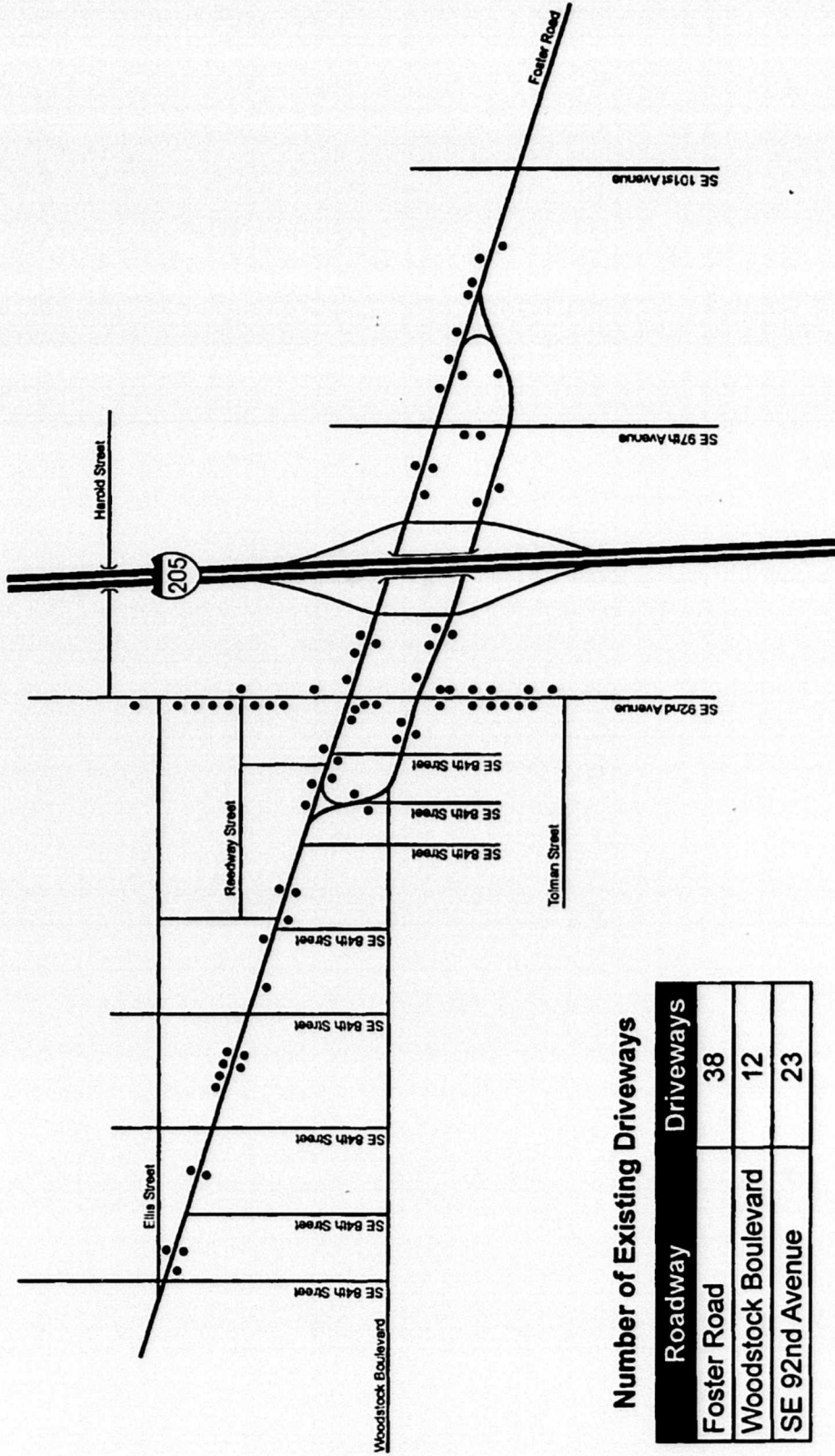


At each of these locations the 85th percentile speed observed is lower than the posted speed limit of 35 miles per hour just outside the study area. This 85th percentile speed is used as a measure of the upper limit of reasonable speeds for the prevailing conditions. Typically, facilities and controls are designed for this 85th percentile characteristics. These characteristics include speeds, reaction times, visibility, and other characteristics within which 85 percent of the driver population exists.

Driveways and Cross Sections

Along Foster Road and the Woodstock Boulevard couplet there are many driveway ingress and egress points. Most of these ingress and egress points are low volumes residential driveways, however, there are a number of commercial driveways also located along the corridor. Figure 8 shows the approximate location of the driveways along the key roadways within the study area (Foster Road, Woodstock Boulevard and 92nd Avenue).

Figure 9 shows cross sections for five locations within the study area. Cross sections are provided to the west of the couplet and within the couplet for both Foster Road and



Number of Existing Driveways

Roadway	Driveways
Foster Road	38
Woodstock Boulevard	12
SE 92nd Avenue	23

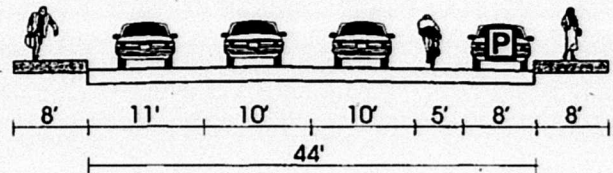
LEGEND

- - Driveway Location

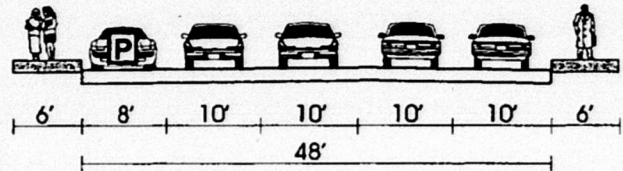
Figure 8
EXISTING DRIVEWAY INVENTORY

Foster Road

Foster Road
West of SE 92nd Avenue
Within Couplet

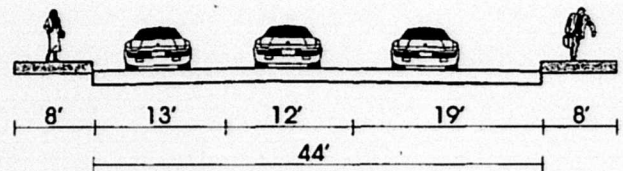


Foster Road
West of Couplet

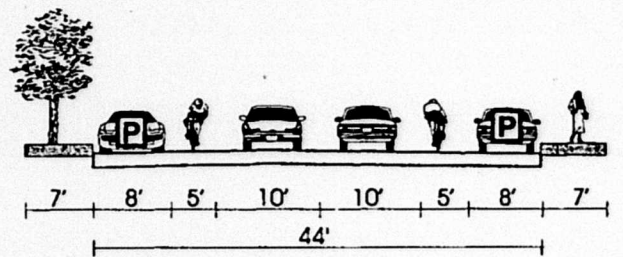


Woodstock Boulevard

Woodstock Boulevard
West of SE 92nd Avenue
Within Couplet

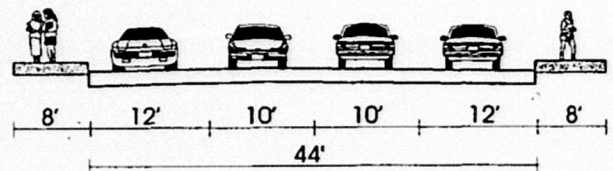


Woodstock Boulevard
West of Couplet



SE 92nd Avenue

SE 92nd Avenue
Between Foster Road
and Woodstock Boulevard



LEGEND

 - Vehicle On-street Parking

Figure 9
LENTS TOWN CENTER
STREET CROSS SECTIONS

Woodstock Boulevard. Also shown is a cross section of 92nd Avenue between the Foster Road and Woodstock couplet.

Collision Data

Collision data was supplied by the City of Portland for the intersections within the study area. Of the eight intersections being evaluated, four of these locations were reported in the City of Portland's High Accident Location (HAL) report.⁹ These four intersections are not ranked within the top 40 intersections with high accidents in the City of Portland.

One fatality has occurred in the study area in the past three years. In 1996, a vehicle was struck by another vehicle at the intersection of Foster Road and the northbound I-205 on-ramp intersection. One vehicle was heading northbound from the frontage road onto the on-ramp and another vehicle was heading westbound on Foster Road. The passenger of one of the vehicles was killed when the other vehicle struck it.

Table 4 summarizes the collision activity within the study area at key roadways intersections between January 1994 to December 1997.¹⁰

Table 4
Accidents Data at Key Study Area Intersections (1994-1997)

Location	Total Accidents	Total Injuries	Total Non-injuries	Total Fatalities	Average Number per Year
Foster Road/92nd Avenue	71	20	51	0	17.75
Woodstock Blvd./92nd Avenue	34	17	17	0	8.5
Foster Road I-205 SB off-ramp	22	6	16	0	5.5
Woodstock Blvd /I-205 SB on-ramp	13	5	8	0	3.25
Foster Road/I-205 NB on-ramp	35	12	22	1	8.75
Woodstock Blvd /I-205 off-ramp	8	4	4	0	2.0

* Non injuries for this data is qualified as property damage only

⁹ HAL 96 1993-1996 High Accident Locations, City of Portland Bureau of Traffic Management Ranking of the high accident location intersections within the study area was Foster/92nd Ave (#42), Foster/94th Ave (#66), Foster/96th Ave (#45), and Woodstock/96th Ave (#136)

¹⁰ Collision data compiled and supplied by the City of Portland Bureau of Traffic Management

Parking

Parking is generally provided on-street within the Lents Downtown area. An on-street parking occupancy study was conducted from 8:00 AM to 5:00 PM (in half hour increments) during a weekday on Foster Road, Woodstock Boulevard, and 92nd Avenue.¹¹ The number of available stalls was inventoried as well as the maximum number of parking stalls occupied during the survey time. Figure 10 summarizes the parking survey results for the study area.

Generally, the highest use of parking occurred along 92nd Avenue north of Foster Road, and along Foster Road from 92nd Avenue west to 91st Avenue. The occupancy rate per hour varied within the study area ranging from 0% to 90% occupancy. On the average, the occupancy rate per hour was generally less than 50% within the study area which would allow for adequate parking needs.

¹¹ Parking occupancy survey data supplied by the City of Portland Bureau of Traffic Management

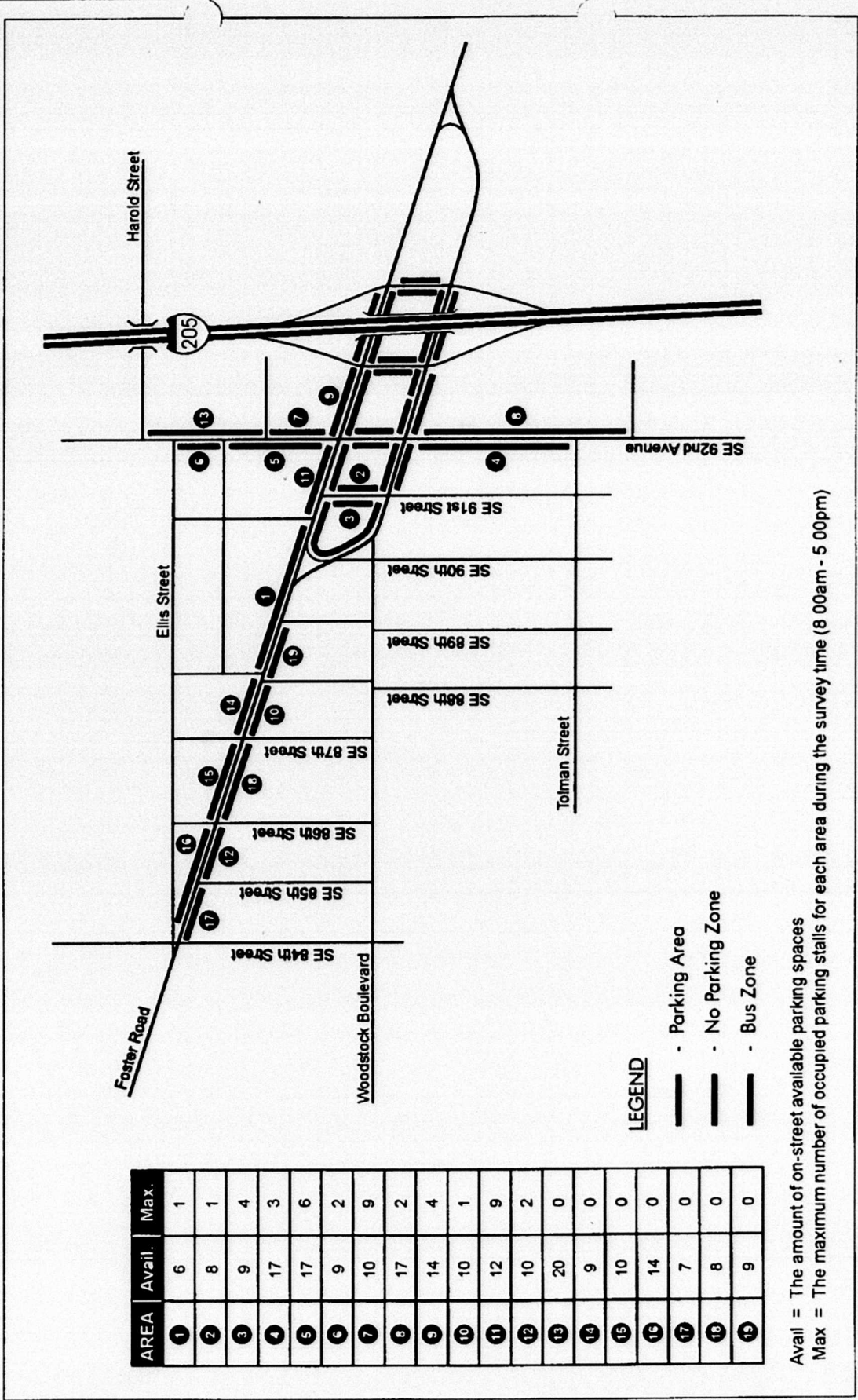


Figure 10
EXISTING PARKING INVENTORY

Note: Parking surveys not conducted for non-colored areas

SUMMARY OF FACTS

Traffic Performance

- The level of service along the Foster Road/Woodstock Boulevard couplet is generally at C or better. This is considered to be better than other collector streets in SE Portland.
- Speed survey data indicates that the average travel speed along the couplet is approximately 30 mph which is less than the posted speed on Foster Road and equal to the posted speed on Woodstock Boulevard

Bicycle

- The I-205 bicycle/pedestrian path at Foster Road is narrow and can be confusing to users due to the rerouting of the bike route to the east in the opposing direction of Foster Road.
- Woodstock Boulevard does not contain continuous bicycle lane striping throughout the area and offers only limited space along the west end of the couplet.
- Bicycle volumes in the peak hours at signalized intersections is generally less than 15 bicycles per hour.

Pedestrian

- Some areas contain deficient and/or narrow sidewalks for pedestrians.
- The configuration of the couplet ends (east and west) can create difficult areas for pedestrians to cross at unsignalized intersections.
- Pedestrian access is not provided to the area bounded by Foster Road/Woodstock Boulevard and the I-205 northbound and southbound frontage roads.

Transit

- Three Tri-Met busses currently service the area: #14 (Hawthorne), #71 (60th/122nd) and the #10 (Harold). The #14 and #71 run along the Foster Road/Woodstock Boulevard couplet while the #10 runs along Ellis Street and Harold Street to the north.
- The bus staging area for Tri-Met is under the I-205 freeway along Foster Road and Woodstock Boulevard. Busses wait in this area after finishing their route before starting a new route.

Parking

- Generally, the highest usage of parking occurs along 92nd Avenue north of Foster Road, and along Foster Road from 92nd Avenue west to 91st Avenue.
- The occupancy rate per hour varies within the study area ranging anywhere from 0% to 90% occupancy.
- On average the occupancy of parking in the study area was generally less than 50% and allows for current parking usage.

CHAPTER 2 STREET NETWORK TRANSPORTATION ANALYSIS

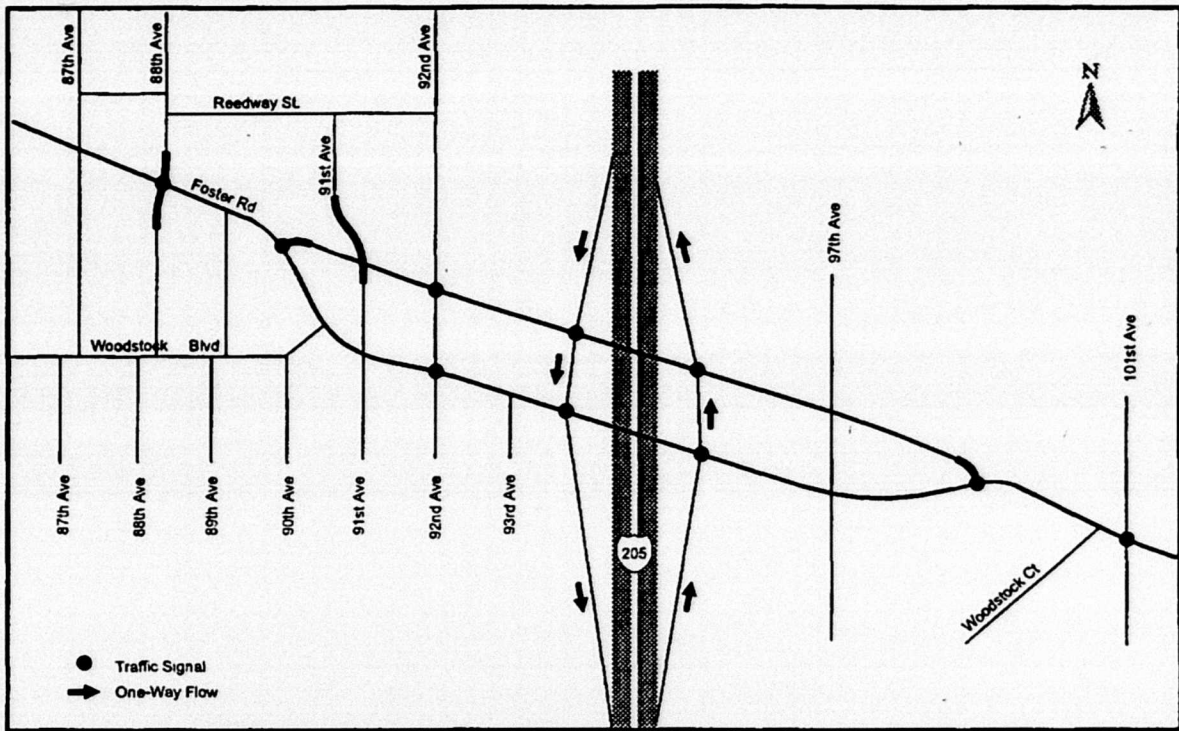
This chapter presents the evaluation of the various street network transportation alternatives that were developed. Impacts to motor vehicle, bicycle, pedestrian and transit modes were evaluated for each alternative developed. The alternatives developed include roadway networks that both maintained the existing one-way couplet along Foster/Woodstock and decoupled Foster/Woodstock into two-way streets. The initial alternatives developed included the following (See Figures 11, 12 and 13):

◆ Decouple Alternatives

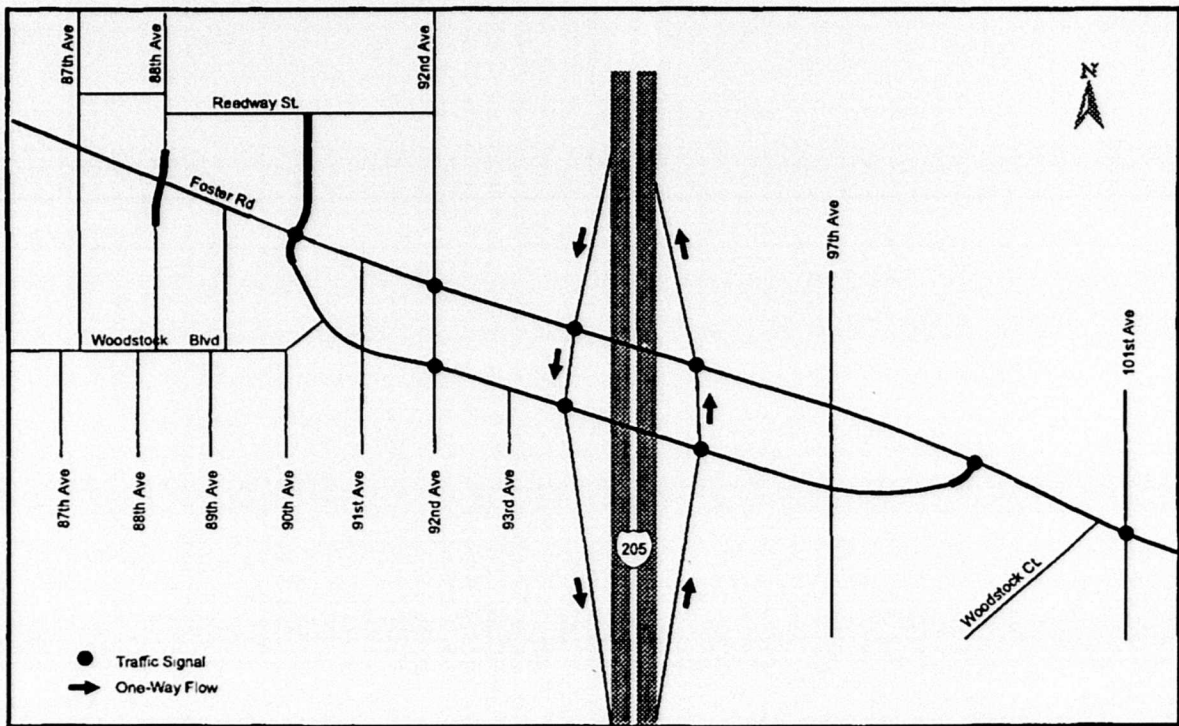
- **Decouple Option 1** - Decouple Foster/Woodstock and reconstruct Woodstock Boulevard as a five-lane roadway and reconstruct Foster Road as a two/three lane roadway. "T" Foster Road into Woodstock Boulevard at approximately 90th Avenue (west end) and "T" Foster Road into Woodstock Boulevard at approximately 99th Avenue (east end).
- **Decouple Option 2** - Decouple Foster/Woodstock and reconstruct Foster Road as a five-lane roadway and reconstruct Woodstock Boulevard as a two/three lane roadway. "T" Woodstock Boulevard into Foster Road at approximately 90th Avenue (west end) and "T" Woodstock Boulevard into Foster Road at approximately 99th Avenue (east end).
- **Decouple Option 3** - Decouple Foster/Woodstock and reconstruct Woodstock Boulevard as a five-lane roadway and reconstruct Foster Road as a two lane roadway. "T" Foster Road into Woodstock Boulevard at approximately 90th Avenue (west end) and "T" Foster Road into Woodstock Boulevard at approximately 93rd Avenue (east end).
- **Decouple Option 4** - Decouple Foster/Woodstock and reconstruct Woodstock Boulevard as a five-lane roadway. "T" Foster Road into Woodstock Boulevard at approximately 90th Avenue (west end) and "T" Foster road into Woodstock Boulevard at approximately 93rd Avenue (east end). Reconstruct I-205/Foster/Woodstock Interchange into "single point" (urban) interchange with Woodstock Boulevard connecting with Foster Road at approximately 97th Avenue.

◆ Couplet Alternatives

- **Couplet Option 1** - Maintain Foster/Woodstock couplet and provide a minimum of three through lanes in each direction along both Foster Road and Woodstock Boulevard. Provide traffic signals on both Foster and Woodstock at 91st Avenue.
- **Couplet Option 2** - Maintain Foster/Woodstock couplet and provide only two to three through lanes in each direction along both Foster Road and Woodstock

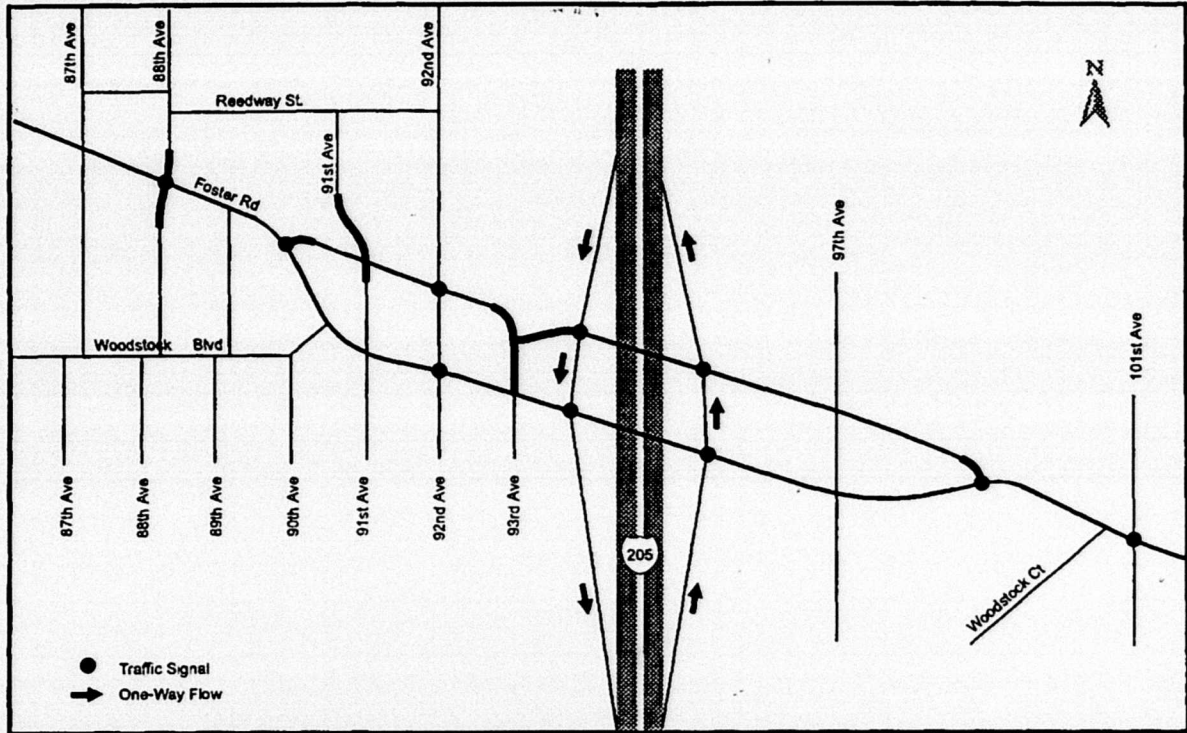


Decouple Option 1

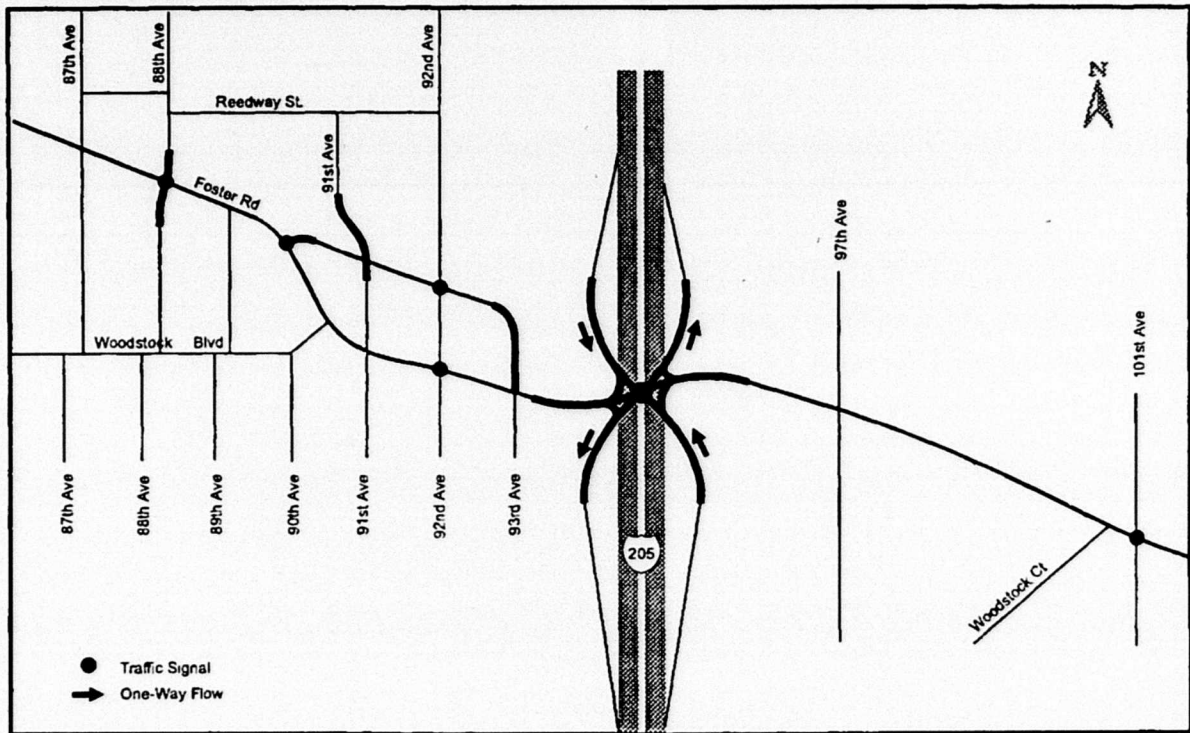


Decouple Option 2

Figure 2-11

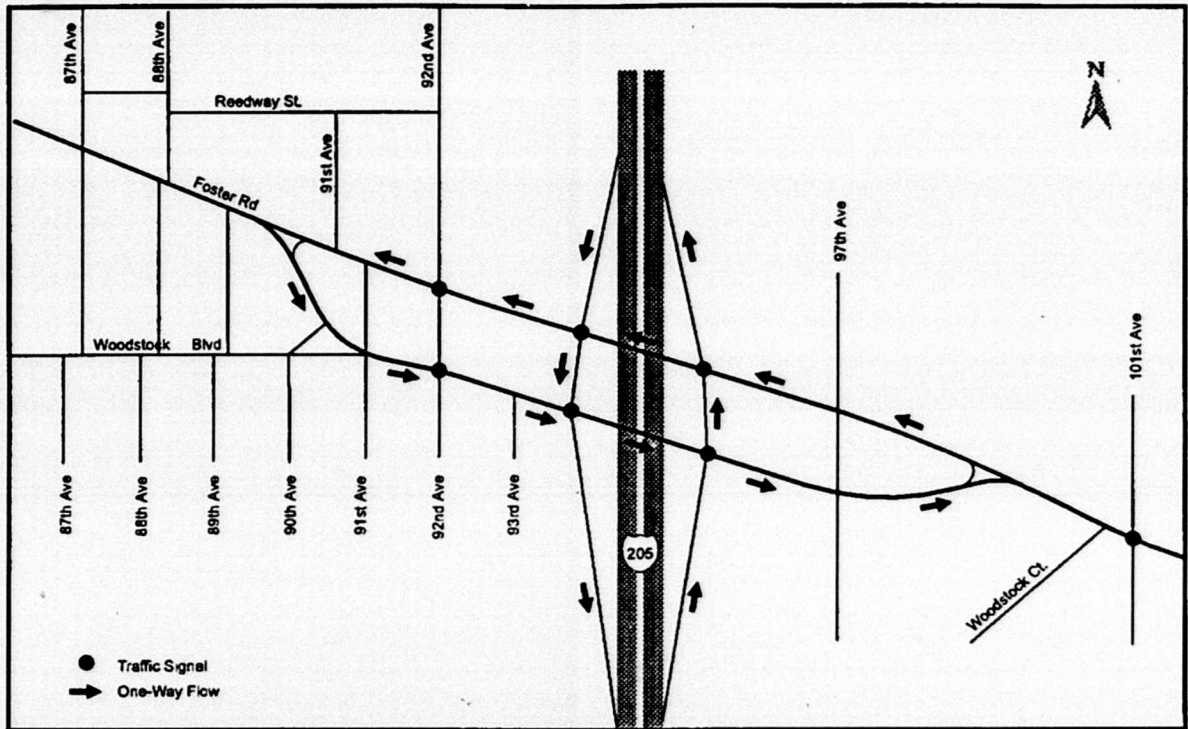


Decouple Option 3

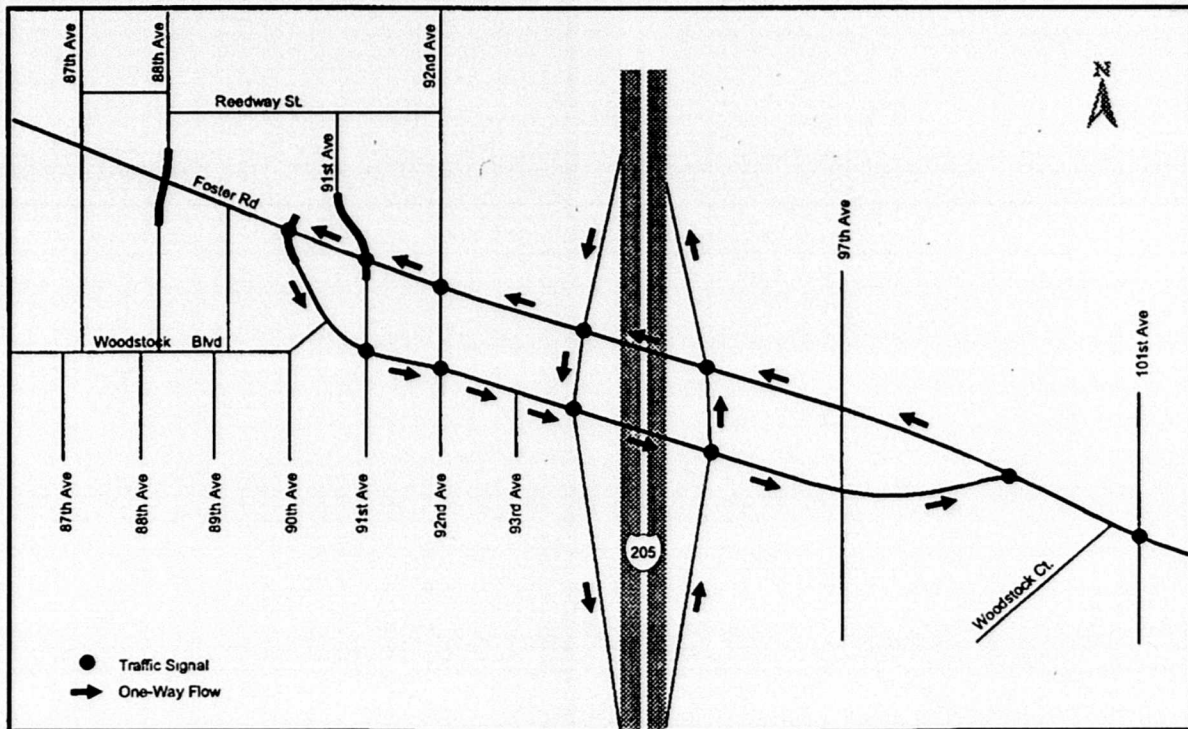


Decouple Option 4

Figure 2-12



Existing Conditions



Couplet Options 1/2

Figure 2-13

- Boulevard. Provide traffic signals on both Foster and Woodstock at 91st Avenue.
- **Couplet Sub-Options** - Several sub-options were developed which were applicable to both of the couplet options described above. These sub-options included:
 1. Realign 88th Avenue at Foster Road
 2. Extend 89th Avenue to Reedway Street and signalize
 3. Signalize Foster/Woodstock at 90th Avenue and extend 90th Avenue to the north to Reedway Street
 4. Signalize Foster/Woodstock at 90th Avenue and provide a driveway access to the parcel immediately north of Foster Road
 5. Realign 91st Avenue at Foster Road
 6. Provide bike lane along 92nd Avenue between Harold Street and Tolman Street
 7. Improve geometric alignment of 91st Avenue at both Foster Road and Woodstock Boulevard by providing raised median island
 8. Provide on-street parking on both sides of Foster Road
 9. Provide on-street parking on both sides of Woodstock Boulevard
 10. Provide pedestrian signals across both Foster Road and Woodstock Boulevard at the east end of the couplet

PRELIMINARY ALTERNATIVES SCREENING

A preliminary screening of alternatives was conducted to determine fatal flaws associated with the preliminary list of alternatives. The fatal flaws analysis considered impacts to all modes of travel (motor vehicles, pedestrians, bicycles and transit), impacts to right-of-way and impacts to the operation of the I-205/Foster Road/Woodstock Boulevard Interchange.

Decouple Alternatives

Of the four decouple alternatives, Decouple Option 1 (Foster "Main Street" and 5 Lane Woodstock) best meets the project goals and objectives. Decouple Options 2 through 4 were eliminated for the reasons listed below.

- ◆ Decouple Option 2 was eliminated because of:
 - Significant right-of-way impacts to Foster Road (96 feet of right-of-way required).
 - Lack of an enhanced pedestrian environment on Foster Road (even with 12 foot sidewalks) due to a five-lane cross section.
 - The five-lane cross-section of Foster Road split the business district and did not support local commercial redevelopment opportunities.
- ◆ Decouple Option 3 was eliminated because of:
 - Significant right-of-way impact to the parcels bounded by Foster/I-205/Woodstock/92nd.

- Inability of the Woodstock/93rd intersection to operate at an acceptable level of service. The intersection can not be signalized (due to the close proximity to existing signals at 92nd and I-205) and in the unsignalized mode would operate at level of service F with a lack of available gaps in the Woodstock Boulevard traffic stream to allow unsignalized movements from southbound 93rd Avenue.
- ◆ Decouple Option 4 was eliminated because of:
 - Significant right-of-way impact to the parcels bounded by Foster/I-205/Woodstock/92nd.
 - Cost of improvements to the I-205/Foster/Woodstock interchange.
 - Difficulty in achieving the appropriate geometric configuration for the "single point" (urban) interchange.

Couplet Alternatives

The two primary couplet options (provide three lanes on Foster/Woodstock and provide two/three lanes on Foster/Woodstock) are similar in nature and would both generally meet the project goals and objectives. A detailed level of service analysis of the two options is necessary to determine the specific lane requirements necessary. Of the 10 couplet sub-options only sub-option #2 (extend 89th Avenue to Reedway Street and signalize at Foster) and option #3 (signalize Foster/Woodstock at 90th Avenue and extend 90th Avenue to the north to Reedway Street) were determined to be not feasible. The significant impact these sub-options have on the parcels north of Foster Road does not meet the project goals and objectives.

ANALYSIS OF ALTERNATIVES

Based on the results of the preliminary alternatives screening, one decouple and one couplet alternative was carried forward to detailed analysis. For each of the two alternatives, sub-options were developed which focused in on detailed design elements on a portion of the study area

- ◆ Alternative A - Decouple with Foster "Main Street" and 5 Lane Woodstock
 - 92nd Avenue Sub-Option 1: 2 travel lanes, bike lanes and parking both sides
 - 92nd Avenue Sub-Option 2: Add a center turn lane to sub-option 1
 - 92nd Avenue Sub-Option 3: Remove bike lanes and center left turn lane
- ◆ Alternative B - Enhanced 3 Lane Couplet
 - 92nd Avenue Sub-Option 1: 2 travel lanes, bike lanes and parking both sides
 - 92nd Avenue Sub-Option 2: Add a center turn lane to sub-option 1
 - 92nd Avenue Sub-Option 3: Remove bike lanes and center left turn lane
 - Foster Road Sub-Option 1: 3 travel lanes, WB bike lane and parking north side
 - Foster Road Sub-Option 2: Add parking on the south side
 - Woodstock Sub-Option 1: 3 travel lanes, EB bike lane and parking north side
 - Woodstock Sub-Option 2: Add parking on the south side

Future Traffic Volumes

Future travel forecast information was developed for the Lents Town Center area for 2015 conditions. The City of Portland's version of the Metro regional travel demand forecast model was utilized as a source for determining future motor vehicle volumes given 2015 projections for land use within the study area.

Forecasting the amount of future traffic at the signalized intersections was done by using a methodology incorporating existing traffic counts, base case travel demand model counts (1994), and future travel demand model (2015) counts. This methodology minimizes the effects of model error by adding the increment of growth projected by the travel demand model (modeled 2015 volumes - modeled volumes for existing base conditions) to the base year counts.

The land uses contained within the study area were disaggregated to represent the future conditions in the study area. Growth within the study area was compared between the City of Portland travel demand model and the City of Portland Comprehensive Plan. This future growth was then reallocated within the study area based on future land use patterns.

Trip distribution represents the estimation and forecast of where trips go to and come from. It is based upon the predicted patterns from the City of Portland regional travel demand forecast model. These trip distribution patterns were applied to the disaggregated future land uses to help forecast the future volumes. The future forecasts were then assigned to the transportation network using this distribution pattern.

Traffic Operations

The traffic operations analysis focuses on both level of service and travel time through the corridor for year 2015 conditions. The process used consisted of: 1) development of future (year 2015) traffic volume projections for both alternatives, 2) analysis of intersection operations (level of service) based on existing and assumed geometric conditions for both alternatives 3) development of modifications (mitigation) to each alternative to achieve acceptable operating conditions (level of service D or better), 4) evaluation of travel time results for each alternative, and 6) evaluation of the impact sub-options would have on traffic operations.

Figures 14 and 15 show the estimated year 2015 PM peak hour and daily traffic volumes within the study area for both Alternative A (Figure 14) and Alternative B (Figure 15). Table 5 shows the results of the level of service analysis for year 2015 conditions. All study area intersections would operate at level of service D or better conditions under either Alternative A or Alternative B. The amount of mitigation required under Alternative B was such that a minimum of three through lanes were required on both Foster Road and Woodstock Boulevard. This essentially eliminated the couplet option which had two to three lanes on Foster Road and Woodstock Boulevard.

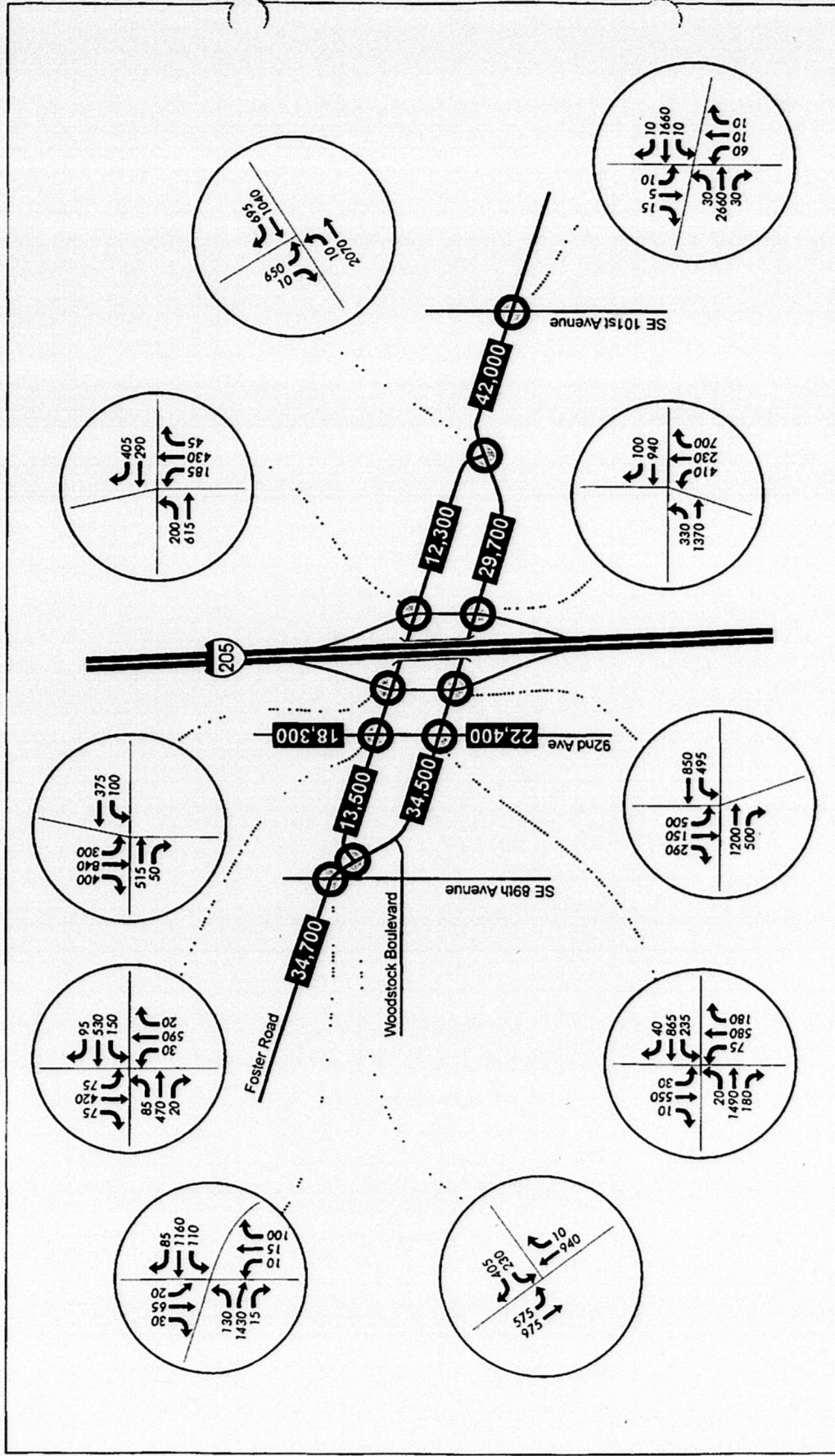


Figure 2-14
ALTERNATIVE "A" FUTURE TURN MOVEMENTS
2015 PM PEAK HOUR

- LEGEND**
- - Study Intersection
 - - Additional Intersection Information
 - 35,100** - Average Daily Traffic Volumes

Table 5
Intersection Levels of Service Year 2015 PM Peak Period

Intersection	Alternative A			Alternative B		
	Delay	LOS	V/C	Delay	LOS	V/C
Foster Road/90th Avenue	-	-	-	4.2	A	0.66
Foster Road/92nd Avenue	31.1	D	0.89	17.6	C	0.92
Woodstock Boulevard/92nd Avenue	35.3	D	0.99	28.0	D	0.96
Foster Road/I-205 SB off ramp	17.0	C	0.81	15.6	C	0.81
Woodstock Boulevard/I-205 SB on ramp	21.8	C	0.92	10.6	B	0.72
Foster Road/I-205 NB on ramp	10.0	B	0.54	12.4	B	0.67
Woodstock Boulevard/I-205 NB off ramp	18.9	C	0.89	14.2	B	0.81
Foster Road/101st Avenue	31.1	D	0.97	31.1	D	0.97
Foster Road/Woodstock Boulevard (west end)	18.8	C	0.93	-	-	-
Foster Road/Woodstock Boulevard (east end)	11.2	B	0.90	-	-	-

Delay = Average vehicle delay at intersection
 LOS = Level of service
 V/C = Volume-to-capacity ratio

Figures 16 (3 sheets) and Figure 17 (3 sheets) show the lane geometry which is required for Alternatives A and B to operate at the level of service numbers shown in Table 5. A series of mitigation measures were necessary for each alternative to bring them to level of service D conditions for the year 2015 analysis and these mitigation measures are shown on Figures 16 and 17. Table 6 shows the results of the travel time comparison for existing conditions as well as Alternatives A and B in the year 2015.

Table 6
Travel Time for Study Area

Travel Times	Existing	Alternative A	Alternative B
Westbound	2 min 26 sec	3 min 27 sec	2 min 48 sec
Eastbound	1 min 58 sec	3 min 14 sec	2 min 42 sec

Notes: Travel time from 87th Avenue to Spring Water Trail
 Alternative A is the travel time along Woodstock Boulevard both eastbound and westbound

Traffic Operations findings for Alternative A include:

- Greater potential for non-local traffic on local streets than Alternative B due to overall greater intersection delay and longer travel times
- 34,700 daily vehicles (yr 2015) on Foster west of couplet (7,750 more than today)
- 13,500 daily vehicles (yr 2015) on Foster west of 92nd (4,100 less than today)
- 34,500 daily vehicles (yr 2015) on Woodstock west of 92nd (16,900 more than today)
- 42,000 daily vehicles (yr 2015) on Foster east of couplet (11,600 more than today)
- 18,300 daily vehicles (yr 2015) on 92nd north of Foster (6,700 more than today)
- Two-way configuration of both Foster and Woodstock impedes efficient traffic flow and

provides for poor signal progression.

- Marginally adequate capacity to meet level of service (LOS) requirements
- Woodstock/92nd is most congested intersection with 35.3 sec/vehicle of delay (LOS D) and 0.99 volume to capacity ratio
- Short block spacing between Foster and Woodstock along 92nd Ave. impacts traffic flow due to vehicle queuing exceeding available storage
- East/west travel times along Woodstock from 87th to Spring Water Trail increase 51 percent by the year 2015 (avg. 132 seconds today and 200 seconds in year 2015)

Traffic Operations findings for Alternative B include:

- Adequate capacity provided which minimizes potential for non-local traffic to utilize local streets
- 34,700 daily vehicles (yr 2015) on Foster west of couplet (7,750 more than today)
- 24,000 daily vehicles (yr 2015) on Foster west of 92nd (6,400 more than today)
- 24,000 daily vehicles (yr 2015) on Woodstock west of 92nd (6,400 more than today)
- 42,000 daily vehicles (yr 2015) on Foster east of couplet (11,600 more than today)
- 18,300 daily vehicles (yr 2015) on 92nd north of Foster (6,700 more than today)
- Three lane Foster and Woodstock along with one-way couplet provides for efficient traffic flow and excellent signal progression
- Adequate capacity to meet level of service (LOS) requirements
- Woodstock/92nd is most congested intersection with 28.0 sec/vehicle of delay (LOS D) and 0.96 volume to capacity ratio
- Short block spacing between Foster and Woodstock along 92nd Ave. impacts traffic flow due to vehicle queuing exceeding available storage
- Traffic signals can facilitate speed regulation on one-way Foster and Woodstock
- Center turn lane on 92nd under Option 1 does not significantly improve capacity
- East/west travel times along Woodstock from 87th to Spring Water Trail increase 51 percent by the year 2015 (avg. 132 seconds today and 200 seconds in year 2015)

Pedestrian Circulation

The objective of the pedestrian environment for each alternative is to "*Enhance pedestrian access and circulation throughout the business district; improve connections into the neighborhood and to transit service*". Issues which should be addressed relating to the pedestrian environment include:

- Sidewalk width - A desirable sidewalk width in commercial areas is 12 feet which allows for the use of street trees, benches, light poles and trash receptacles in a "furniture zone" while still providing adequate width for pedestrian movements (three abreast).
- Signalized versus unsignalized crossings - The volume of both pedestrians and vehicles along with the spacing between signals and overall safety will determine the need for signalized pedestrian crossings.

- Width of each roadway crossing - A narrow roadway crossing is desirable to minimize the pedestrian/vehicle conflict area.
- The use of buffers (parking and bike lanes) adjacent to pedestrian facilities - Buffers provide additional distance between vehicles and pedestrians.
- One-way versus two-way street crossings - At unsignalized pedestrian crossings one-way streets provide fewer conflicts as vehicles are only approaching from one direction. Additionally, one-way flow typically arrives in platoons from upstream traffic signals and gaps in the traffic stream are typically experienced after the platoon has passed. At unsignalized pedestrian crossings on two-way streets the vehicle arrivals from both directions are typically random and are dependent on the adjacent traffic signal operations.
- The use of curb extensions at crossings- Curb extensions at both signalized and unsignalized intersections shorten the crossing distance and provide for a larger pedestrian landing/queuing area.

Both Alternatives A and B provide for 12 foot sidewalks throughout the couplet area and along 92ⁿ Avenue and also provide for curb extensions where possible. Traffic signals have been added under both alternatives to improve pedestrian crossing opportunities although in slightly different configurations. The greatest difference between the alternatives in terms of pedestrian environment relate to the width of Woodstock Boulevard under Alternative B, the use of or lack of use of buffering treatment and the one-way versus two-way flow.

Pedestrian findings for Alternative A include:

- Wider (12') sidewalks on Foster, Woodstock and 92nd
- Signalized pedestrian crossings at Foster/Woodstock "T" connections (west and east ends) and at Foster/88th
- Parking buffers sidewalk on Foster and 92nd
- Bike lanes buffer sidewalk on Woodstock and 92nd
- Unsignalized pedestrian crossings on two-way streets create more conflicts
- 5/6 lanes on Woodstock creates "theoretical barrier" for pedestrians

Pedestrian findings for Alternative B include:

- Wider (12') sidewalks on Foster, Woodstock and 92nd
- Signalized pedestrian crossing at Foster/90th, Foster/91st Woodstock/91st, Foster/98th and Woodstock/98th (signals facilitate movements from couplet "ends")
- Parking and bike lanes buffer pedestrians on north side of Foster
- No sidewalk buffer on south side of Foster except under Option 1 which provides parking as buffer on south side
- Parking buffers pedestrians on north side of Woodstock (91st to I-205)
- Bike lanes (and parking under Option 1) buffers pedestrians on south side of Woodstock
- Unsignalized pedestrian crossings on one-way streets have fewer conflicts

Parking

The change in on-street parking associated with each option is summarized in Table 7. On 92nd Avenue there is no change in on-street parking. For Alternatives B the change in parking associated with each of the sub-options is listed. The greatest increase in on-street parking occurs under Alternative B sub-option 2 where a total of 82 on-street parking stalls are added.

Table 7
Parking Impacts West of I-205
Change in Parking Related to Existing Conditions

Location	Alternative A	Alt B - Option 1	Alt B - Option 2
92 nd Avenue	+ 0 stalls	+ 0 stalls	0 stalls
Foster Road (87 th Avenue to 90 th Avenue)	+ 31 stalls	+ 26 stalls	+26 stalls
Foster Road (90 th Avenue to I-205)	+ 30 stalls	+ 0 stalls	+27 stalls
Woodstock (90 th Avenue to I-205)	- 14 stalls	+ 9 stalls	+29
Total	+ 47 stalls	+ 35 stalls	+82 stalls

Parking findings for Alternative A include:

- No change in parking stall count on 92nd Avenue
- 31 parking stalls added on Foster from 87th to 90th
- 30 parking stalls added on Foster from 90th to I-205
- Parking/bus layover zone provided on both sides of Foster under I-205 (potential for 36 parking stalls)
- 10 parking stalls added on Foster from I-205 to 98th Avenue
- No on-street parking provided on Woodstock results in a loss of 14 stalls on Woodstock from 90th to I-205

Parking findings for Alternative B include:

- No change in parking stall count on 92nd Avenue
- 26 parking stalls added on Foster from 87th to 90th
- No change in parking stall count on Foster from 90th to I-205 except under Option 2 which adds 27 stalls on Foster from 90th to I-205
- Parking/bus layover zone provided on north side of Foster under I-205 (potential for 18 parking stalls)
- 21 parking stalls added on south side of Foster from I-205 to 98th Avenue
- 9 parking stalls added on north side of Woodstock from 92nd to I-205 and under Option 2 additional 20 stalls added on south side of Woodstock from 91st to I-205

Transit

The travel times for transit routes #14 and #71 are different for the two alternatives. Busses would operate more efficiently with the one-way couplet. Curb extensions under the two options improve transit operation as the buses would be allowed to stop in the travel lane.

Transit findings for Alternative A include:

- Bus layover zone for eastbound direction moved from Woodstock to Foster
- Eastbound Routes #14 and #71 should shift to Foster
- Transit circulation through Lent's slowed due to two-way street configuration and increased travel times through Lents

Transit findings for Alternative B include:

- Transit circulation not impacted
- Curb extensions can improve operation

Bicycle Circulation

Both options provide for adequate bicycle facilities except for sub-option 3 on 92nd Avenue under which no bicycle facilities are provided on 92nd Avenue. Under Alternative A the bicycle facilities along Foster/Woodstock are both provided along Woodstock Boulevard. Under Alternative B the bicycle facilities are split between Foster (westbound) and Woodstock (eastbound).

Bicycle findings for Alternative A include:

- Westbound bicycle access on Woodstock at 90th Ave. is difficult
- North/south bicycle circulation along 92nd improved while under Option 3 no improvement is realized
- North/south bicycle circulation along I-205 improved at Foster and Woodstock

Bicycle findings for Alternative B include:

- Signal at Foster/90th Ave. provides westbound bicycle connection to Woodstock
- North/south bicycle circulation along 92nd improved while under Option 3 no improvement is realized
- North/south bicycle circulation along I-205 improved at Foster and Woodstock

Right-of-Way

Right-of-way impacts were identified for Alternative A as listed below.

◆ 92nd Avenue

- Masonic Lodge, west side north of Foster
- Chevron Service Station, west side between Foster and Woodstock
- 92nd Club Dancers, west side between Foster and Woodstock
- Tidee Didee Diapers, west side south of Foster
- Copper Penny Buildings on east side require approximate four foot dedication to achieve desired sidewalk width (12 feet)
- Five buildings north of Foster on east side require six foot dedication to achieve desired sidewalk width (12 feet)

◆ Foster Road

- 8705 Structure on north side, east of 87th
- Empty building mid-block between 87th and 88th (north side)
- Foster Road Carpets, north side east of 88th
- U-Haul building (parking and part of structure affected), south side east of 87th
- Mayflower Auto and Body, north side east of 88th
- Empty building, south side east of 89th
- Hogan's Electric, north side west of 91st
- One Fine Mechanic, north side east of 91st
- Plaza 9000, north side west of 92nd
- Mill Creek Antique Crossing, north side east of 92nd
- Empty Building, north side east of 92nd
- Jensen and Associates, north side east of 92nd
- Copper Penny buildings on south side require approximate three foot dedication to achieve desired sidewalk width (12 feet).
- Rattan and More buildings on south side require approximate five foot dedication to achieve desired sidewalk width (12 feet)

◆ Woodstock Boulevard

- Single family residence, south side west of 90th
- Rix Lumber Orphanage, south side west of 91st
- 9104 building (empty), south side east of 91st
- Muscle Car Restoration, south side east of 91st
- Tidee Didee Diapers, south side west of 92nd (also shown on 92nd list)
- Stride Construction, south side east of 92nd
- Single family residence, south side east of 93rd
- Single family residence, south side east of 97th
- Multi-family unit, south side west of 100th

Right-of-way impacts were identified for Alternative B as listed below.

◆ **92nd Avenue**

- Masonic Lodge, west side north of Foster
- Chevron Service Station, west side between Foster and Woodstock
- 92nd Club Dancers, west side between Foster and Woodstock
- Tidee Didee Diapers, west side south of Foster
- Copper Penny Buildings on east side require approximate four foot dedication to achieve desired sidewalk width (12 feet)
- Five buildings north of Foster on east side require six foot dedication to achieve desired sidewalk width (12 feet)

◆ **Foster Road**

- 8705 Structure on north side, east of 87th
- Empty building mid-block between 87th and 88th (north side)
- Foster Road Carpets, north side east of 88th
- U-Haul building (parking and part of structure affected), south side east of 87th
- .Mayflower Auto and Body, north side east of 88th
- Empty building, south side east of 89th
- One Fine Mechanic, north side east of 91st
- Copper Penny buildings on south side require approximate three foot dedication to achieve desired sidewalk width (12 feet).
- Rattan and More buildings on south side require approximate five foot dedication to achieve desired sidewalk width (12 feet)
- Hogan's Electric and Plaza 900 on north side (west of 92nd) require approximate seven foot dedication to achieve desired sidewalk width (12 feet)
- Mill Creek Antique Crossing, Empty Building and Jensen and Associates, north side east of 92nd require approximate eight foot dedication to achieve desired sidewalk width (12 feet)

◆ **Woodstock Boulevard**

- 9104 building (empty), south side east of 91st
- Muscle Car Restoration, south side east of 91st
- Tidee Didee Diapers, south side west of 92nd (also shown on 92nd list)
- Stride Construction, south side east of 92nd

CHAPTER 3 PARKING MANAGEMENT PLAN

This chapter presents the evaluation of parking impacts and needs generated by redevelopment of the Lents Business District. Analysis for this includes calibration of existing parking demand ratios and utilization, estimation of future parking demand created by redevelopment of the area, and discussion of various management alternatives that could be considered to address new parking demand for the area. Figure 3-18 shows the approximate study area being analyzed.

Existing parking conditions were previously analyzed and evaluated (refer to Chapter 1). Current zoning for the area is primarily EXd which is classified by the City of Portland as Central Employment. This classification allows mixed-uses with a predominant industrial type development.¹² Industrial type development is a broad based term, and in this area it focuses on manufacturing and service oriented businesses. Parking surveys were conducted by the City of Portland and parking in the area was shown to be underutilized throughout the day.¹³

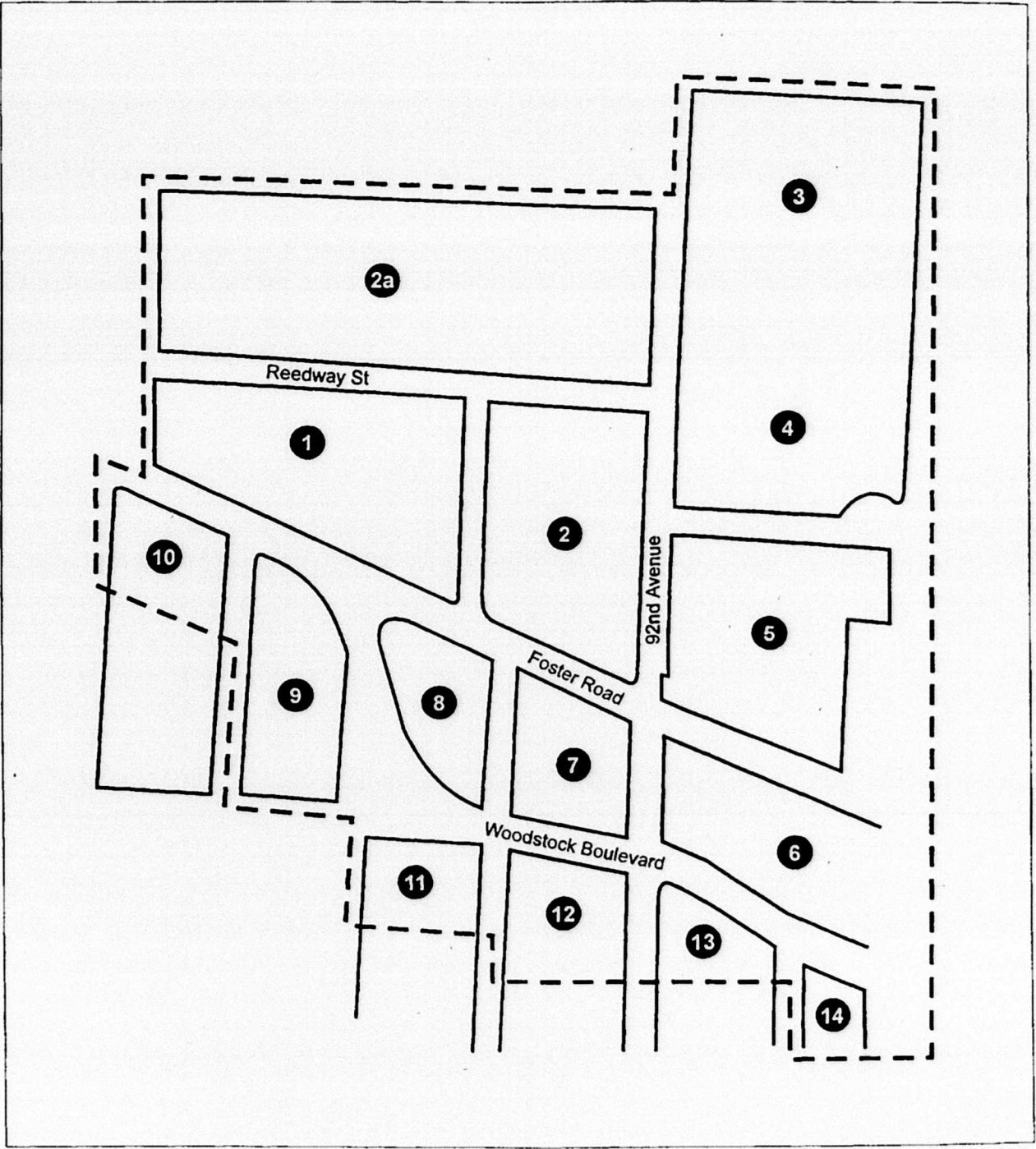
Redevelopment of the area is being proposed by the Portland Development Commission. This redevelopment focuses on new retail and office use with the availability for off-street parking to complement it. These new uses would help create a new character in the area, but would not require new zoning. The primary focus of this analysis is to determine the need for parking in the area based on potential redevelopment, and evaluate the need for shared parking or structured parking. Two potential redevelopment scenarios were analyzed. The first scenario was a low potential redevelopment of the study area, and the second scenario was a high potential redevelopment.

A calibration of the existing parking demand was done using parking demand ratios determined by Metro.¹⁴ These parking demand ratios are used to determine the number of parking stalls necessary to support the parking needs of a particular land use. Parking demand ratios are given in a range for any particular type of land use. This range can affect the number of parking stalls necessary to support the use. If a low end of the range is used, the parking demand could be underestimated in the area. Conversely, if a high end of the range is used, an overestimation of parking demand could result. This calibration of the range helps to determine the appropriate parking demand ratios for a land use that can be used in the future for similar types of existing land use.


¹² City of Portland Comprehensive Plan, Chapter 33 140 030B Central Employment


¹³ Refer to parking section of Chapter 1 and Figure 10

¹⁴ Title 2 of Metro's Urban Growth Management Functional Plan, Section 3 07 220(A)(1), Table 3 07-2 - Regional Parking Ratios, December 17, 1998



LEGEND

 - Study Boundary

 - Block Number

**Figure 3-18
STUDY AREA**

Using the data provided by the City of Portland, the existing peak demand was approximately 12 00 PM ¹⁵ The utilization of on-street parking within the area (focusing along Foster Road, Woodstock Boulevard and 92nd Avenue) during this peak period was approximately 32% occupied ¹⁶ This meant that during the peak parking conditions in the study area, 68% of the available on-street parking was not being used The off-street parking for the same peak demand period was determined to be approximately 30% utilized Table 9 summarizes the existing parking demand utilization for the peak period of the day

Table 9
Existing Peak Period Parking Demand Utilization

Parking Type	Available Parking*	Occupied Parking Spaces	Utilization of Parking
On-street parking	100 spaces	32 spaces	32%
Off-street parking	188 spaces	58 spaces	30%
Total	288 spaces	89 spaces	31%

* Along Foster Road, Woodstock Boulevard, 91st Street and 92nd Street in study area (see Figure 3-18)

ASSUMPTIONS FOR REDEVELOPMENT

Key factors that affect future parking analysis in the area include the type and level of each redevelopment scenario, analysis of the peak hour demand for parking for the entire study area, different parking demand ratios for different land uses, and implementation of future transportation improvements. All of these factors play a key role in comparing the amount of future parking supply and the future parking demand in the area.

Potential redevelopment of the area (either as a low or high redevelopment potential) included the assumed building square footage to be two stories with retail on the first floor and office uses on the second. Both Foster and Woodstock were assumed to redevelop as commercial streets with sixty foot building depths while 92nd Avenue (north of Foster Road) was assumed to redevelop as a main street with fifty foot building depths (all with 100 percent coverage).¹⁷

The difference in development potential between the low redevelopment and the high redevelopment is significant The low redevelopment scenario is approximately 280,000 square feet of area within the study area, while the high redevelopment scenario has the potential for approximately 748,000 square feet of redevelopment in the study area

¹⁵ Parking survey conducted by the City of Portland Bureau of Traffic Management

¹⁶ Parking survey data available for the study area was along Foster Road from 88th Street to I-205, Woodstock Boulevard from Foster Road to I-205, 91st Avenue between Foster Road and Woodstock Boulevard, and 92nd Avenue just south of Woodstock Boulevard to Reedway Street

¹⁷ Land use information and building development data provided by Portland Development Commission See appendix for additional information