

TESTIMONY SIGN-UP FOR

35615

755 - TC 9:30 am - NW Bikeways Project

IF YOU WISH TO SPEAK TO THE CITY COUNCIL,
PLEASE PRINT YOUR NAME AND ADDRESS BELOW

NAME

ADDRESS & ZIP CODE

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Date: 5/28/97

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ESCO CORPORATION 2141 N.W. 25TH AVENUE P.O. BOX 10123 PORTLAND OREGON 97210 U.S.A. TELEPHONE (503) 228 2141

May 28, 1997

Portland City Council
City of Portland
1220 S.W. Fifth Avenue
Portland, OR 97204

Reference: ESCO Comments on Northwest Bikeways
Project--Vaughn Wardway 24th to Nicolai

Dear City Council Members:

ESCO Corporation ("ESCO") is opposed to the Northwest Vaughn/Wardway Project and asks that it be stricken from the Northwest Bikeways Project list at this time.

ESCO has its headquarters at 25th and Vaughn. Its steel service center is between 24th and 25th on Vaughn. Approximately 400 employees work at Plant No. 1, one block from Vaughn on York Street. The main entrance to Plant No. 1 is from 25th and Vaughn. ESCO also has access to its plant off 26th, so the intersection of 26th and Vaughn is very important. ESCO uses Vaughn for both incoming and outgoing cars and trucks onto the Interstate 405 ramps, for which Vaughn serves as direct access. ESCO's trucks are at least eight feet in width and its trailers are 22 feet in length.

In the material presented, there is no discussion of the truck/bike interface, other than one comment at page A-27, which states:

"The Industrial Area is too busy to narrow streets for bikes. Trucks are now 100" + mirrors wide. I think contract work to change curbs is far too high."

Staff response to this comment was some kind of a reference to Front Avenue. There was simply no consideration of streets like Vaughn. Vaughn serves as the southern access to the Northwest Industrial Sanctuary.

In response to many of the City's concerns, ESCO and other industries operating through the Northwest Industrial Neighborhood Association ("NINA") have undertaken an extensive study to prepare a neighborhood plan which recognizes not only

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what goes internally in the sanctuary, but the interfaces of the Northwest Neighborhood District Association ("NWDA") area, the Pearl District, and the Linnton neighborhood. NWDA, NINA, and Linnton currently have neighborhood plans underway and have met to discuss areas of mutual concern, including the Northwest Industrial Sanctuary. At the first meeting of that group, there was discussion of retaining Vaughn as a thruway. We urge you to reject this particular project improvement until such time as an adequate concept for the industrial-residential interface has been established between the NWDA and NINA in their ongoing and immediate planning processes.

This project determination for Vaughn is premature and undercuts the efforts presently underway in both the NINA and NWDA planning efforts.

From a policy standpoint, we also object strongly to the project. Transportation Goal 6 seeks to protect the transportation system. One of its aims is to provide for a safe and efficient movement of goods. The current bike plan, as originally proposed for the area between 24th and 27th on Vaughn, fails to do this for several reasons. First, while Vaughn is designated a bikeway, there is a direct conflict with heavy truck use. Vaughn serves as the border of the truck district for the area (see Comprehensive Plan, Transportation Element [as updated June 21, 1996], page 88). Continued attempts to gentrify Vaughn, not only sabotage the southerly access into the Northwest Industrial Sanctuary, but force heavy industrial operations at or near the edge to pull away from Vaughn. The choice for many industries, however, is not merely to pull away from Vaughn, the choice is whether to leave the area. If the City does not want family wage jobs in the City, then it should not send out messages that it does. Two lanes of bike use interfere with that truck use needed in support of these jobs in a very material way.

Second, committing two five-foot bike lanes and a parking strip requires a narrowing of the travel lanes and loss of the center left-turn/refuge lane. This arrangement is not acceptable because of the increased congestion caused by loss of the left-turn refuge. Further, narrowing the travel lanes from 12 feet increases hazards from trucks and pushes the limits of the AASTHO standards for truck lanes.

As mentioned earlier, Vaughn serves as a prime interchange for the Interstate 405 freeway. The peak p.m. volume

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of 1,570 cars is significant. Higher speeds and high volumes result from this feature. This is a hazard for bikes.

Bike lanes on N.W. Vaughn are not required by state law. First, they are not required where they would be contrary to public safety. See ORS 366.514(2)(a). Large trucks in an industrial district do not mix well with bicycles because the truckers cannot see the bikers and in this area, there is much turning of trucks. Second, bike lanes are only required where there is construction, reconstruction, or relocation, but are not required where there is no widening or realignment (see ODOT interpretation of ORS 366.514 as set forth on page B3 of the Bicycle Master Plan). Now the street is 40 feet; if the project is done, the street will be 40 feet; thus, there is no realignment or widening.

Under the Bicycle Master Plan, projects such as this are mere recommendations, and are not required to be implemented by the City Council. See page 38, Section III, of the Bicycle Master Plan.

Choking Vaughn with multi-modal activity and increased residential use increases high volume commercial and residential activity and strangles its use for freight movement.

ESCO's traffic analysis (done by David Parisi, traffic engineer) shows, N.W. Vaughn west of N.W. 23rd Avenue, during the evening peak hour, there are about 1,470 vehicles traveling in both directions. Eight hundred seventy vehicles travel westerly and almost 700 vehicles travel easterly. Approximately 3 percent of these vehicles are trucks.

The capacity of the neighborhood collector roadways is typically near 800 to 900 vehicles per hour per lane, inclusive of left-turn lanes at critical intersections. During the evening peak hour, N.W. Vaughn is currently operating at near capacity conditions. It is highly likely that removal of N.W. Vaughn's key left-turn lanes would result in over-capacity conditions along segments of the roadway, causing some motorists to use alternative routes. Motorists turning left from N.W. Vaughn would delay vehicles behind them as they wait for a safe-crossing gap in the opposing traffic stream. In addition, motorists turning left onto N.W. Vaughn from unsignalized side streets would likely incur substantially increased delay due to removal of the continuous center turn lane, which they currently use as a refuge area when making a two-stage turn.

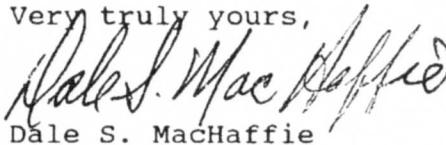
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It is a significant hardship to have bike lanes on Vaughn at this time. Where constraints exist, a parallel bikeway within one-quarter mile is acceptable according to the Design and Engineering Guidelines of the Bicycle Master Plan (see note, page A2). Thurman serves as an excellent connection for bikes between 23rd and St. Helens Road. Thus, Vaughn's constraints point to Thurman as a proper place for bike lanes. Rather than the proposal, ESCO favors the design for Vaughn shown in the enclosed section for the 24th to the 27th area.

While recent discussions with the Portland Department of Transportation indicate that some of our ideas are being considered, the project contained in the May 16, 1997 draft is not acceptable.

Please allow the neighborhoods to finish their work before jamming this project on them.

Very truly yours,



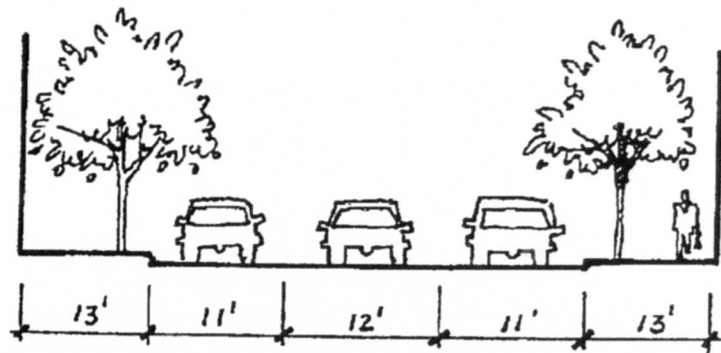
Dale S. MacHaffie

DSM:emg
Enclosure

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NW Vaughn

35615



Section

NORTHWEST BIKEWAYS PROJECT

May 16, 1997

Final Draft

CITY OF PORTLAND

BUREAU OF TRAFFIC MANAGEMENT BICYCLE PROGRAM

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NORTHWEST BIKEWAYS PROJECT

□ Project Framework

The Northwest Bikeways project objective is to

Project Objective Encourage safe bicycle use in the project area through the development of bikeway facilities by, in part, retrofitting existing streets for use by cyclists in a manner consistent with the Bicycle Master Plan design guidelines, and by seeking other improvements that enhance bicycle use

This project is an important part of implementing the Portland Bicycle Master Plan, which was adopted by City Council in May, 1996. Developed over the course of two years through numerous public forums and workshops involving more than 2,500 city residents, the Bicycle Master Plan seeks to work toward the realization of the City's Comprehensive Plan, Goal 6 (Transportation), which states in part the following

Portland Comprehensive Plan Goal 6 Provide for and protect the public's interest and investment in the public right-of-way and transportation system by encouraging the development of a balanced, affordable and efficient transportation system by

- providing adequate accessibility to all planned land uses,
 - providing for the safe and efficient movement of people and goods while preserving, enhancing, or reclaiming the neighborhoods' livability,
 - reducing reliance on the automobile and per capita vehicle miles traveled,
 - guiding the city street system to control air pollution, traffic, and livability problems, and
 - maintaining the infrastructure in good condition
-

The Bicycle Master Plan identifies objectives for encouraging safe bicycling in Portland, thereby contributing to the attainment of Goal 6, and elaborates on the actions needed to accomplish these objectives. These actions involve a broad spectrum approach to encouraging bicycle trips, including improved bicycle parking at trip destinations, changing and shower facilities for commuters, better linkage of bike

and transit trips, and better education and skills development for cyclists of all ages. However, the salient emphasis of the Bicycle Master Plan is on the development of a comprehensive bikeway network that links cyclists to their destinations. National and local surveys, as well as commentary received from Bicycle Master Plan participants, indicate that a interconnected network of bikeways is essential to encouraging bicycle use, both for extending usage among existing cyclists and attracting new riders.

The specific policies and objectives of the Bicycle Master Plan related to the extension and enhancement of the city's bikeway network that have been adopted by City Council are listed in Policy 6 12, as follows:

Policy 6 12 Bicycle Transportation *Make bicycling an integral part of daily life in Portland, particularly for trips of less than five miles, by implementing a bikeway network, providing end-of-trip facilities, improving bicycle/transit integration, encouraging bicycle use, and making bicycling safer.*

Objectives

- *complete a network of bikeways that serves bicyclists' needs, especially for travel to employment centers, commercial districts, transit stations, institutions, and recreational destinations*
 - *provide bikeway facilities that are appropriate to the traffic classification, traffic volume, and speed on all right-of-ways*
 - *maintain and improve the quality, operation, and integrity of bikeway network facilities*
-

This project is an important part of implementing this aspect of the Bicycle Master Plan. Other existing city projects, such as Bike Central, the BikePark program, and Community Traffic Safety Initiative, are working on a citywide basis to accomplish the Plan objectives related to end-of-trip facilities and education.

❑ Project Selection and Public Process

A main task of the Bicycle Master Plan process was to identify a citywide bikeway network. Initial selection of potential bikeways was made by the Bicycle Master Plan Steering Committee and Bicycle Program staff. It was then revised based on public review and comment (The Bicycle Master Plan includes the complete bikeway selection methodology). Potential bikeways thus identified were then prioritized, based on their relative merits and importance. This ranking became the starting point for more discussion, and eventual selection of Northwest Bikeways projects.

Most of the
Northwest Bikeways
project streets are
designated as City
Bikeways in the City's
Transportation
Element of the City's
Comprehensive Plan
(or as Central City
Bikeways in the
Central City
Transportation
Management Plan)

BIKEWAY PROJECT RANKING CRITERIA

- barriers to cyclists overcome by installing a bikeway
- connections to destinations (commercial, employment, etc)
- connections to existing or funded bikeways
- lack of nearby parallel bikeways, either existing or funded
- existing and potential usage by cyclists
- topographical constraints
- relative ease of implementation

They were so designated after being identified as important components of Portland's Bikeway Network by Portland residents and city staff in the Bicycle Master Plan

Three streets included in the project—NW Flanders, NW Johnson, and SW Alder—are not classified as Bikeways. They are included to substitute for Everett and Glisan Streets, which will not now be developed over their entire length as Bikeways. Though Everett and Glisan are classified as City Bikeways from NW 24th to NW 2nd/3rd (Central City Bikeways in the Central City), the Northwest Bikeways Project recommends only implementing bike lanes on the segments between 14th and 19th Avenues at present. A separate and ongoing project—the Northwest Intersections Study, Phase II—is taking a comprehensive look at improving Everett and Glisan, including bike lanes. Until that project is complete, we recommend no treatment on those sections of Everett and Glisan that significantly alter traffic operation. Flanders Street, between 16th and 24th, Johnson Street, between 24th and 14th, and Alder Street, between Burnside and SW 12th will substitute for the east-west connection that Everett and Glisan would have provided.

An extensive public process was followed to solicit comments on this plan. Two open houses were held at the NW Service Center, the first in early January, and a second late in February (see Appendix C for a report on the Open Houses). Two mailings—a total of more than 24,000 pieces announcing the open houses—were sent to every mailbox in the project area. The postcards included name, phone, email, and mailing address of the project manager, mentioned the possibility of parking removal, and prominently displayed the question, “are bike lanes coming to your street?” A total of 88 people attended the two open houses, approximately 20 more residents provided comments via phone, email, and regular mail.

We contacted neighborhood and business associations in the project area and offered to present the project to their boards of directors and/or appropriate subcommittees.

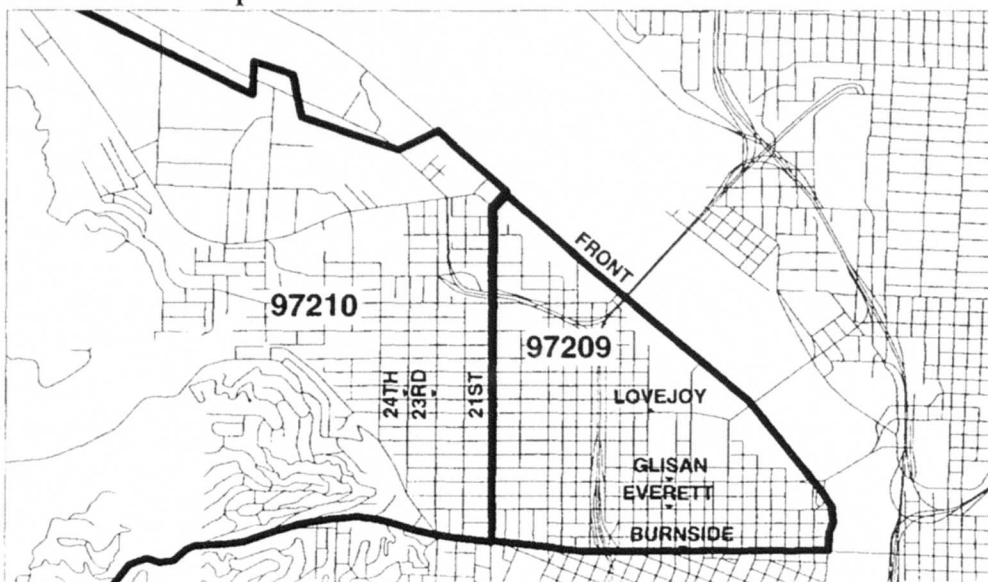
We met twice with the Northwest District Associations' Transportation Committee, once with the Pearl Districts' Planning and Transportation Committee, once with Northwest Industrial Neighborhood Associations' Board of Directors, and once at a general meeting of the Nob Hill Business Association. In addition, the project and open houses received considerable media attention, with several stories in the NW Examiner, a story on Channel 2 News, and notices in The Oregonian. Area residents were also notified by flyers posted in local shops.

□ NW Portland Neighborhood Demographics

The 1990 Census reveals information about those living in the project area that contributes to the idea of encouraging bicycle transportation in that area. Note that zip code 97209 encompasses the bulk of the project area (see below map). The total number of people living in those zip codes as of 1990 was 15,094, they lived in 8,928 households (approximately 1.7 persons per household). In 1990, there were approximately 7,929 motor vehicles available to NW Portland residents. This equates to 0.88 vehicles per household. Indeed, 35% of all households (3,124) reported having no automobiles (see Table 1). Note that approximately 50% of all adult Portland residents own a bicycle.

There were 9,405 workers aged 16 years or older living in these two zip codes in 1990, and 399 of them worked at home (4.2%). Of the 9,006 who commuted to work, slightly over half (53%) drove alone to work and 3.5% bicycled to work as their

NW Portland Zip Codes



primary commute mode. This mode split compares favorably to other areas of Portland, where there is a higher proportion of people driving alone (closer to 70%) and fewer bicycling to work (slightly under 2%). The commuting transportation profile for NW Portland is displayed in Table 2.

Table 1 Households and Vehicles by Zipcode (source: 1990 Census)

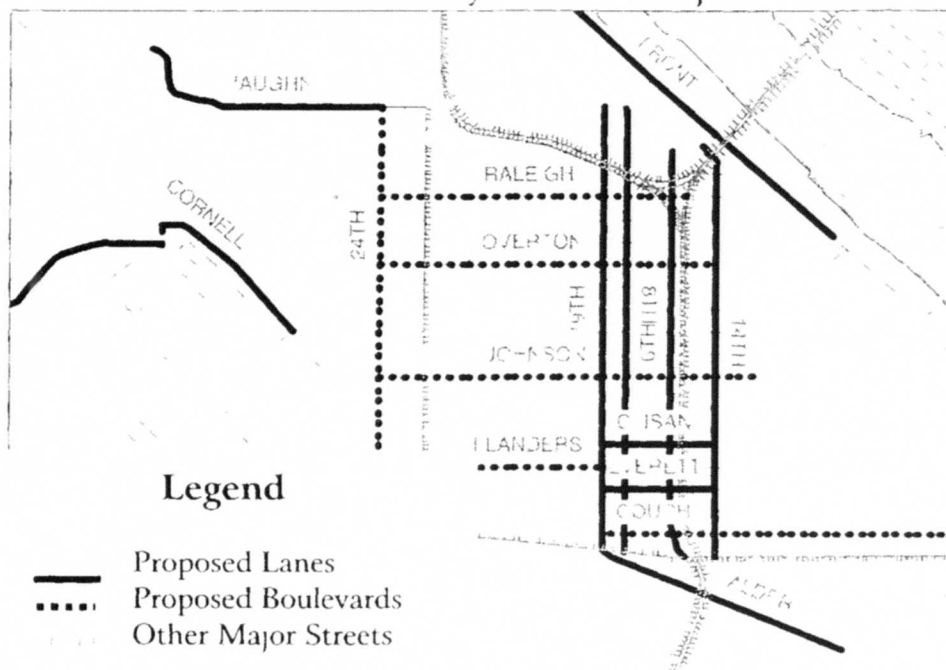
	97210		97209		Combined	
People	9,284		5,810		15,094	
Households	5,155		3,773		8,928	
People/Household	1.8		1.5		1.7	
Motor Vehicles	5,834		2,095		7,929	
Motor Vehicles/Household	1.13		0.55		0.89	
Households without Motor Vehicles	1,187	23%	1,937	51%	3,124	35%

Table 2 NW Portland Means of Transportation to Work by Zipcode
(source: 1990 Census)

Means of Transportation to Work	97210		97209		Combined	
Drove Alone	3,405	60.0%	1,343	40.3%	4,748	52.7%
Carpooled	432	7.6%	198	5.9%	630	7.0%
Bus	627	11.0%	641	19.2%	1,268	14.1%
Light Rail	14	0.2%	27	0.8%	41	0.5%
Railroad	6	0.1%	0	0.0%	6	0.1%
Taxi	16	0.3%	11	0.3%	27	0.3%
Motorcycle	29	0.5%	32	1.0%	61	0.7%
Bicycle	209	3.7%	103	3.1%	312	3.5%
Walked	919	16.2%	929	27.9%	1,848	20.5%
Other	19	0.3%	46	1.4%	65	0.7%
Totals	5,676	100.0%	3,330	100.0%	9,006	100.0%

The above demographic information, NW Portland's favorable topography for bicycling, and its proximity to major employment areas, all paint a favorable picture

Northwest Bikeways Possible Projects



for the use of bicycles both for commuting and utility trips. The primary means by which these types of trips can be encouraged is through the implementation of adequate bicycle facilities in the project area.

□ Bikeway Project Elements

The project area is within the district of Northwest Portland, bounded by the Willamette River, SW Alder Street, Skyline Boulevard, and Front Avenue. The Portland Office of Transportation has budgeted \$250,000 over the fiscal years 1996-97 and 1997-98 Capital Improvement Program for planning, design, and development of Northwest Bikeways projects.

Bikeway components include the following treatments:

- **marking bicycle lanes** on several project streets, involving travel lane narrowing or removal, and in some instances limited parking removal, to provide adequate space for cyclists on roadways with moderate to high motor vehicle volumes,
- **creation of bicycle boulevards** on most project streets (Couch, Flanders, Johnson, Overton, Raleigh, 24th) by enhancing the arterial crossings where needed with curb extensions, altering selected stops to

favor through bicycle movements, and providing pavement cuts on one project (Couch) to allow westbound movement at 15th, and

- **adding traffic signal markings** to assist cyclists to activate traffic signals at selected locations in the project area

Other improvements include

- shared lane markings and signage on NW 19th between Hoyt and Everett Streets,
- railroad crossing improvements at NW Everett at 12th, NW Glisan at 12th, NW Couch at 12th, and NW Johnson at 15th,
- limited road-widening on Cornell,
- bicycle oases, which combine bicycle parking and route maps on project curb extensions, and,
- signage on project streets including Thurman Street, which is designated in the Bicycle Master Plan as a Signed Connection

SOME BIKEWAY DEFINITIONS

A *BICYCLE BOULEVARD* is a shared roadway where the through movement of bikes is given priority over motor vehicle traffic. Traffic calming devices are used to control speeds and discourage through trips by motor vehicles, and traffic control devices are designed to limit conflicts between bikes and autos and favor bike movement.

A *BICYCLE LANE* is that portion of the road designated by striping and pavement markings for the preferential use by bicycles.

Following is a discussion of each project element and its initial proposed design, and other relevant features

□ Bikeway Project Descriptions

This section provides background information about each project street, including land uses, average daily traffic volumes, street classification, and connections the proposed bikeways will make with other existing and proposed bikeways

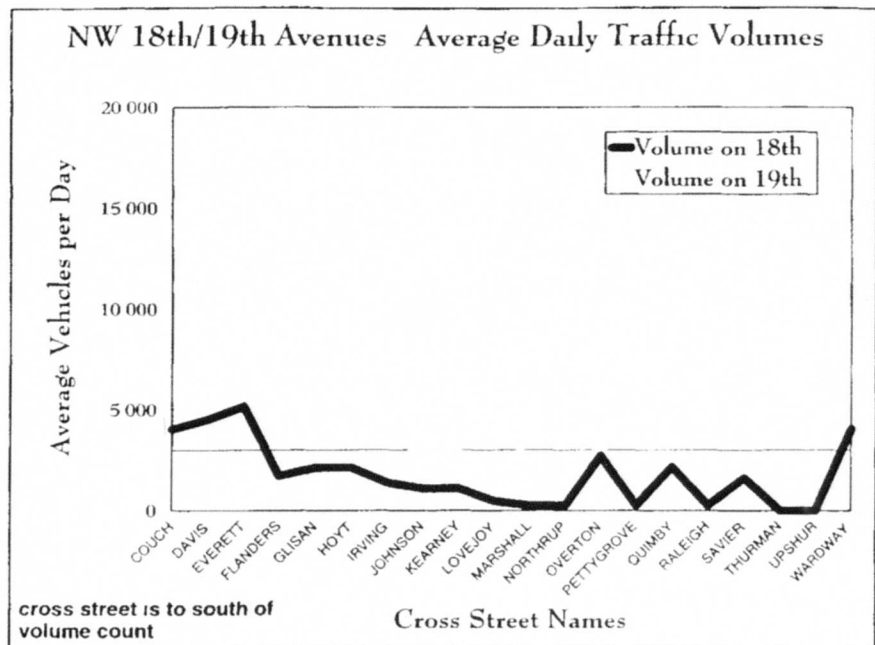
NW 18th Avenue (Burnside to Vaughn)

Provide a bicycle lane from Burnside to Vaughn (project length is 0.8 miles). Project connects on the north with planned bike boulevards on NW Raleigh, NW Overton, and the signed connection NW Thurman, and on the south to the proposed bike boulevards for NW Johnson, NW Flanders, and NW Couch, and proposed bike lanes

on NW Glisan and NW Everett. One auto travel lane will be eliminated to provide a bicycle lane. However, to accommodate two lanes of traffic entering from SW 18th and Burnside, the bicycle lane will not begin until Everett Street, and then will extend north to Vaughn.

Adjacent land uses are chiefly higher density residential, with some institutional and

commercial uses scattered throughout. The NW Service Center is located at the corner of 18th and Everett. Street width throughout is 36 feet.



Average daily traffic volume (ADT) peaks at 5,200 between Everett and Davis, and then again at 4,000 between Wardway and Vaughn. There are traffic signals at Burnside, Everett, Glisan, and Lovejoy. The street is classified by the city's Transportation Element of the Comprehensive Plan as Local Service Street, Major City Transit Street, City Bikeway, and is part of a Pedestrian District.

NW 19th Avenue (Vaughn to Burnside)

Provide bicycle lane from Vaughn to Burnside (project length is 0.8 miles). 19th Avenue is the southbound portion of the 18th-19th couplet. It will provide the same bikeway connections as NW 18th Avenue, and will also connect to the proposed bike lane on SW Alder that will provide a direct route to Downtown from Northwest Portland.

Adjacent land uses are high density residential and small commercial, with some institutional uses at the southern portion. Street width is 36' throughout with two travel lanes and parking on both sides of the street. ADT peaks at 7,900 between Flanders and Everett and reaches 6,900 between Lovejoy and Kearney. There are traffic signals at Lovejoy, Glisan and Everett. The street is classified by the Transportation Element identically to 18th, except for the block between Lovejoy and Marshall streets, which is classified as a Neighborhood Collector.

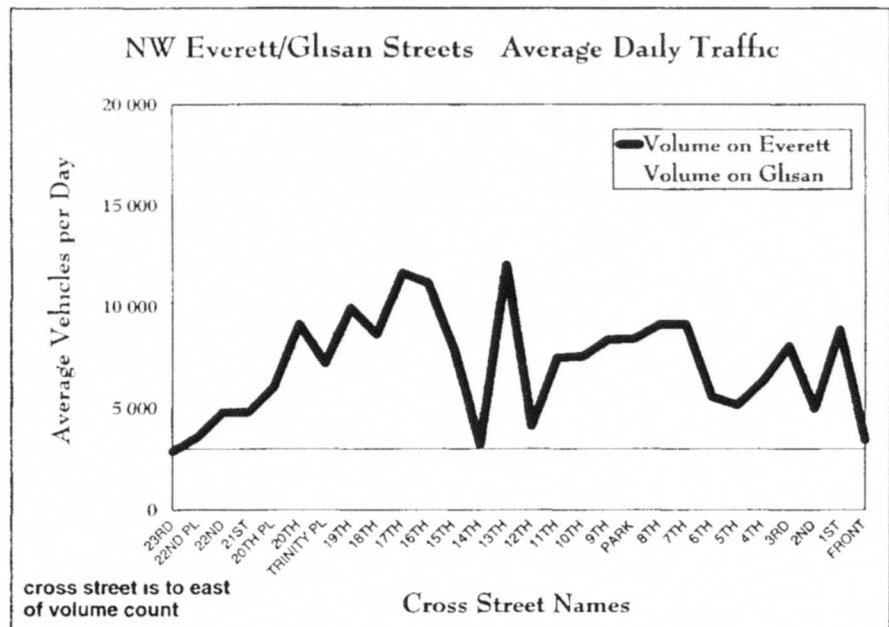
Providing a southbound bicycle lane the entire project length requires removing either a travel lane or parking. Because of the higher automobile volumes on 19th compared to 18th, and because of the type and frequency of turning movements, a travel lane cannot easily be removed in the vicinity of Glisan, Everett, Lovejoy and Marshall, and Burnside Streets. For this reason, this project recommends maintaining the existing two-lane cross-section on 19th between Hoyt and Everett, with the bicycle lane resuming south of Everett to Burnside. Also, the existing three-lane cross-section between Marshall and Lovejoy will be maintained, though the lanes will be signed for "right only," "through only," and "left only," rather than the existing "right only," "through only," and "through-left." The bike lane will resume after south of Lovejoy by having both the right- and left-only lanes drop. For the rest of its length, a bicycle lane can be provided on 19th by removing an automobile travel lane without significantly disrupting traffic operations.

Providing a bicycle lane from Couch to Burnside necessitates removing four lightly-used on-street parking spaces to maintain three lanes for the turning movements at Burnside.

NW Everett-Glisan Streets (between 14th and 19th)

Provide bike lanes between 14th and 19th Avenues (project length is 0.25 miles)

Everett and Glisan Streets are being studied for improvements as part of the ongoing NW Intersections Study, Phase 2. Because for much of its length providing bike lanes on this couplet will require a dramatic reconfiguration of traffic patterns, we will take no action until the NW Intersection Study is complete.



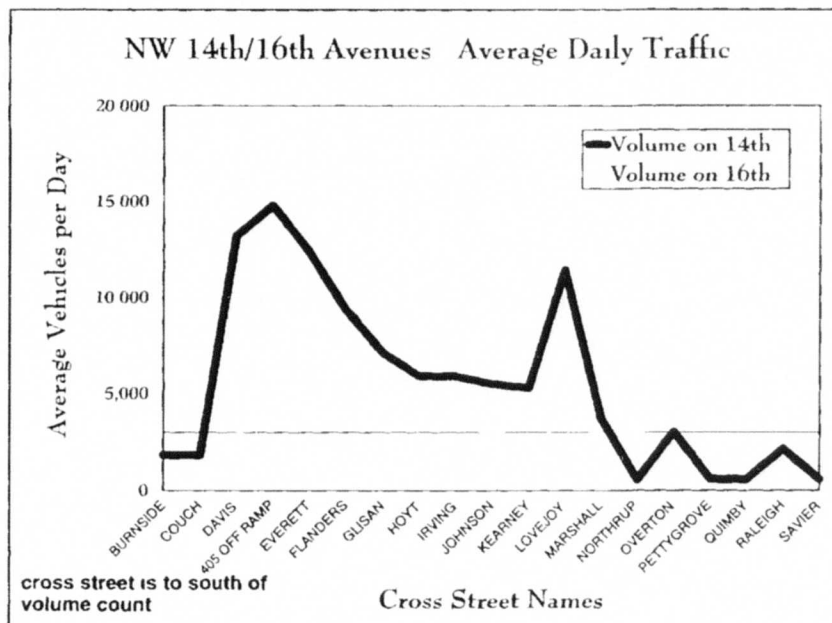
The NW Bikeways Project can provide bike lanes without interfering with traffic operations between NW 14th and 19th Avenues. On this segment, curb-to-curb width is 44 feet. Traffic volumes on this segment range from 8,000 to almost 12,000.

vehicles per day on Everett and 8,700 to 13,000 vehicles per day on Glisan

These lanes will provide a link between the existing bike lanes on SW 13th and SW 14th, with the proposed bike lanes on NW 14th, 18th and 19th West of 16th, Everett is classified by the Transportation Element as Local Service Street, City Bikeway, and is part of a Pedestrian District Glisan, west of 16th, is classified as Local Service Street, Major City Transit Street, City Bikeway, and part of the Pedestrian District East of 16th, Everett and Glisan are classified by the Central City Transportation Management Plan (CCTMP) as Traffic Access Streets, Transit Access Streets, Central City Bikeways, and Central City Walkways

NW 14th Avenue (Burnside to Thurman)

Provide bicycle lane the length of project (project length is 0.87 miles) Project connects on the south with existing bicycle lanes on SW 14th Avenue and with proposed bike boulevards on Couch and proposed bike lanes on Glisan and Everett Project connects at north with Thurman, a signed connection, and with proposed bike boulevards on Johnson, Overton, and Raleigh



Adjacent land uses are chiefly commercial and industrial

14th Avenue is a heavily used northbound street, forming one half of the 14th-16th Avenue couplet. It serves the Truck District north of Hoyt. Average daily traffic approaches 15,000 between Davis and Flanders as traffic feeds in from the I-405 off-ramp. Volumes drop precipitously north of the

Lovejoy viaduct. Its width varies widely--ranging from 22 feet to 32 feet in the blocks between Burnside and Davis, widening to 44 feet between Davis and Flanders, to 36 feet for the rest of its length except for the blocks between Kearney and Lovejoy, where the street width ranges from 56 feet to 60 feet, before dropping back to 36 feet north of Lovejoy.

NW 14th is classified as a Central City Bikeway, a Major City Traffic Street, and is part of a Truck District

NW 16th Avenue (Burnside to Thurman)

Provide one bicycle lane, southbound for project length (0.77 miles). Project will provide same connections as 14th Avenue, and will also connect to proposed bicycle boulevard on Flanders, which has its terminus at 16th.

Adjacent land use is primarily commercial and industrial. Street width varies. There is no on-street parking on the east side of the segments between Johnson and Burnside, and between Overton and Lovejoy, and no parking on the west side on the segments between Lovejoy and Kearney. There is no on-street parking on either side between Raleigh and Overton.

At its southern end, 16th merges into 15th at Couch, which then proceeds to a signalized intersection at Burnside. 16th also continues to Burnside, where it forms a functional T-type intersection, as SW 16th approaches Burnside one-way to the north.

The ADT peaks at almost 19,000 in the block between Flanders and Glisan, decreasing to 11,000 between Glisan and Hoyt, and then dropping precipitously to the north.

Street width varies from 30 feet between Burnside and Everett, to 48.5 feet between Everett and Flanders, to 44 feet between Flanders and Glisan. Beyond Glisan, street widths vary between 30 feet and 36 feet, with the entire segment between Johnson and York being 36 feet.

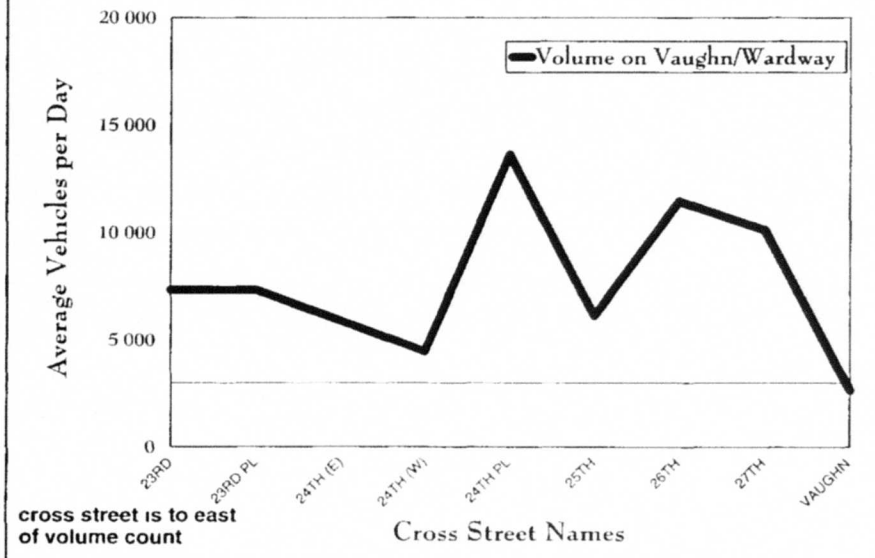
NW 16th is classified as a City Bikeway, a Major City Traffic Street, and a Major Truck Street.

NW Vaughn/Wardway (24th to Nicolai)

Provide bicycle lanes for length of project (0.6 mile). Remove center-left turn lane from Vaughn, and replace with a left-turn pocket at NW 25th. This project will connect at its east end with the proposed bike boulevard on 24th, and at its west end with existing bike lanes on Nicolai Road.

Vaughn is 40 feet wide over the project width, narrowing to 36 feet as it crosses 27th.

NW Vaughn/Wardway Streets Average Daily Traffic



westbound There is no on-street parking on Vaughn in the project area

Average daily traffic on Vaughn ranges from 6,000 to 13,600 vehicles per day between 24th and 27th, dropping off significantly west of 27th

Land use along Vaughn is residential, commercial and industrial Vaughn is

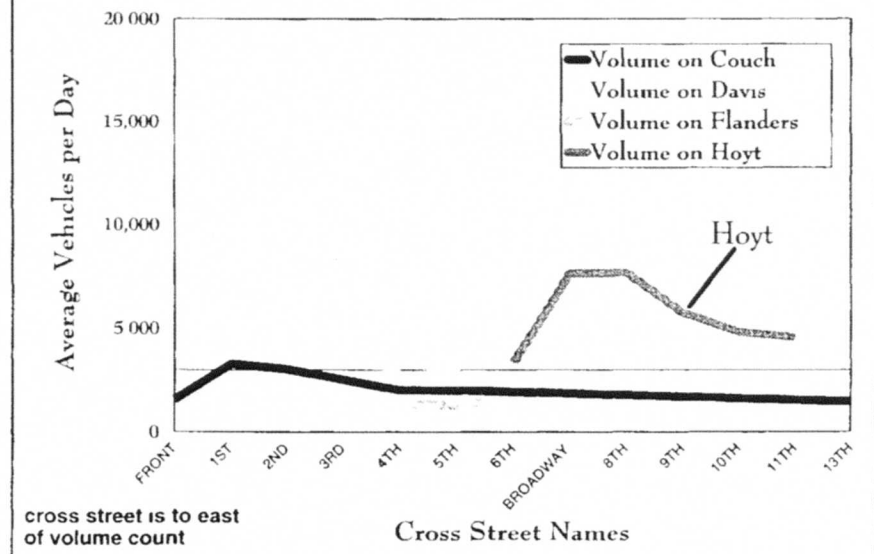
classified as a City Bikeway, a Neighborhood Collector, a Minor City Transit Street, and is part of a Pedestrian District

NW Couch Street (Front to 19th)

Provide bike boulevard for project length (0.9 mile), providing connections from Northwest Portland into Old Town and to routes leading Downtown (bike lanes are proposed for NW/SW Broadway from the Broadway Bridge to SW Jefferson as part of the Central City Bikeways Project) This project will connect with proposed bike lanes on 18th and 19th to the west, and proposed bike lanes on 14th and 16th

Presently, Couch is one-way to the west between Broadway and 10th Creating a bicycle boulevard will require making most, if not all

NW Couch/Davis/Flanders/Hoyt Average Daily Traffic



of that length two-way. There is a traffic diverter on Couch at 15th, routing all westbound traffic south onto 15th. There are two pedestrian-activated crossing signals at that signal that can be used by cyclists to continue west on Couch. There are railroad tracks in poor condition crossing Couch at 12th.

Adjacent land uses are commercial and high density residential. The Blitz-Weinhard brewery at 12th often has tractor-trailers loading and unloading along Couch and 12th, which reduce line of sight for bicyclists.

Couch is designated a Central City Bikeway and City Bikeway, part of a Pedestrian District in Northwest Portland, and a Local Service Street. Average Daily Traffic on Couch is slightly above 3,000 vehicles per day in the vicinity of 1st and 2nd, and then drops to well below 3,000 vehicles per day to the west.

NW Flanders (24th to 16th)

Create a bicycle boulevard over project length. Flanders is included in the Northwest Bikeways Project to provide an east-west bikeway as an alternative to Everett and Glisan. Flanders Street ends in a T-intersection at 16th. Flanders is a Local Service Street that is part of a Pedestrian District. Traffic volumes are low, hovering around 1,000 vehicles per day on those blocks where information is available. Land use is chiefly residential.

NW Johnson (24th to 14th)

Create bike boulevard over project length. This will provide a connection at the west end with the proposed bike boulevard at 24th and at the east end with the proposed bike lanes on 16th and 14th. This boulevard will also connect with proposed bike lanes on 18th and 19th. Johnson is not a designated City Bikeway, but is included in this project to provide an east-west bikeway as an alternative to Everett and Glisan. Johnson is one of the few streets toward the southern end of the project area that provides a crossing of the I-405 freeway (the only other streets that do so to the south are Glisan, Everett, and Couch). Land uses along Johnson are primarily residential with some commercial.

NW Overton (24th to 14th)

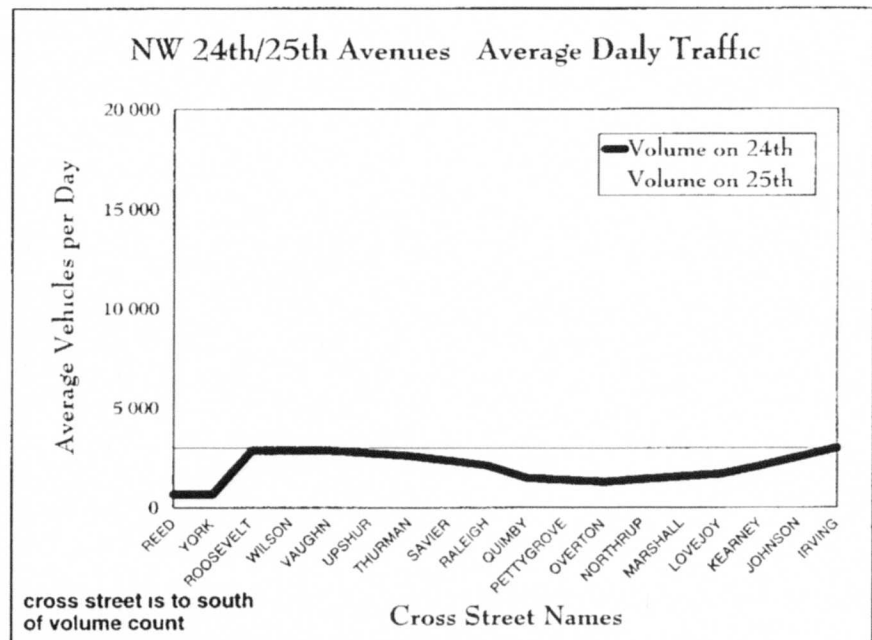
Create a bicycle boulevard over project length. Overton is classified as a City Bikeway and is part of a Pedestrian District. Its traffic classification is Local Service Street. Land use is chiefly residential, with some commercial uses. Overton provides a connection at the west end with the proposed bike boulevard on 24th, and at the east end with the proposed bike lanes on 19th, 18th, 16th, and 14th.

NW Raleigh (24th to 14th)

Create a bicycle boulevard over project length. Raleigh is classified as a City Bikeway and is part of a Pedestrian District. Its traffic classification is Local Service Street. Land use is chiefly residential, with some commercial and industrial uses. Raleigh provides a connection at the west end with the proposed bike boulevard on 24th, and at the east end with the proposed bike lanes on 19th, 18th, 16th, and 14th.

NW 24th (Flanders to Vaughn)

Create a bicycle boulevard over project length. 24th is classified as a City Bikeway and is part of a Pedestrian District. Its traffic classification is Local Service Street. Land use is chiefly residential. 24th provides a connection at the north end with the proposed bike lanes on Vaughn and on the south end with existing lanes leading to Burnside and with the planned bike boulevard on Flanders. 24th is also the terminus for planned boulevards on Johnson, Overton and Raleigh.



NW Naito Parkway (Front Avenue) (9th to Kittredge)

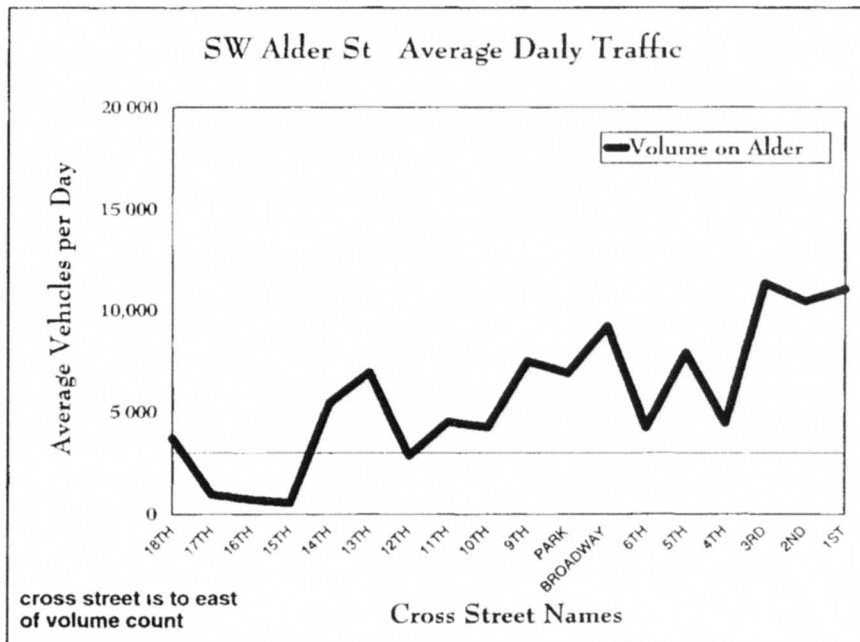
Provide bike lanes over project length (project length is 3 miles). This will connect will planned bike lanes on Front from 9th Avenue to the Steel Bridge that will be installed as part of the Central City Bikeways Project. Front Avenue is a City Bikeway to its terminus, a Major City Traffic Street from 9th to Kittredge and then a Neighborhood Collector from Kittredge to the north. Front is also a Minor City Transit Street, and is part of a Truck District. Land uses are chiefly commercial and industrial.

NW Cornell (29th to Skyline)

Provide spot improvements along Cornell. Cornell is designated a City Bikeway, and the required design treatment calls for a bicycle lane its entire length. However, because much of Cornell is too narrow to fit a bike lane, extensive widening of the road would be required, which is a very costly undertaking that is beyond the scope of this project. The Bicycle Master Plan estimates the cost for striping a bike lane on Cornell, including widening the road surface, to be in the neighborhood of \$1 million. The Northwest Bikeways Project will look at selected segments along Cornell where spot paving can enhance that road for bicycle use.

SW Alder (Burnside to 12th)

Provide a bike lane over project length. This will connect to the proposed bike lane on 19th and provide a continuous connection from Northwest Portland to Downtown. At its eastern end, this project will connect to and existing bike lane on SW 13th.



Land uses along Alder are primarily commercial. Alder is not classified as a Central City Bikeway, but is included in this project to provide an alternative to Everett. Alder is classified as a Local Service Street and as a Pedestrian

Walkway

Traffic volumes on Alder range from almost 7,000 vehicles per day at SW 13th to under 1,000 vehicles per day between 18th and 14th.

❑ Bikeway Issues, Impacts and Costs

This section provides a more detailed description of each proposed bikeway, identifies and discusses issues and impacts associated with the development of each, and estimates the cost of implementation

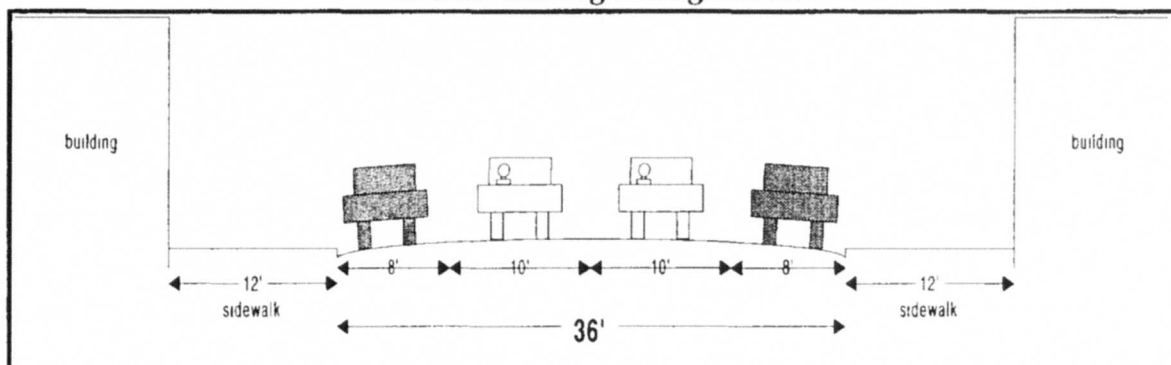
NW 18th Avenue (Burnside to Vaughn)

Removing one travel lane will not adversely affect automotive traffic operation. In addition to providing for bicyclists, reducing 18th from two lanes to one is likely to have the benefit of reducing automotive speeds. No on-street parking will be removed.

Limited sight distance for drivers at the southern end of NW 18th (due to a slight rise in the street) precludes dropping a travel lane until Everett. The alternative to this is dropping the travel lane at the intersection with Burnside. However, this would necessitate creating a dedicated left-turn only lane at SW 18th and Burnside, which cannot be accomplished safely due to the unusual configuration of that intersection.

Estimated Cost Total \$5,000, with \$3,500 for grinding existing lane marking and striping bike lane, and \$1,500 for pavement markings/signing for bike lane.

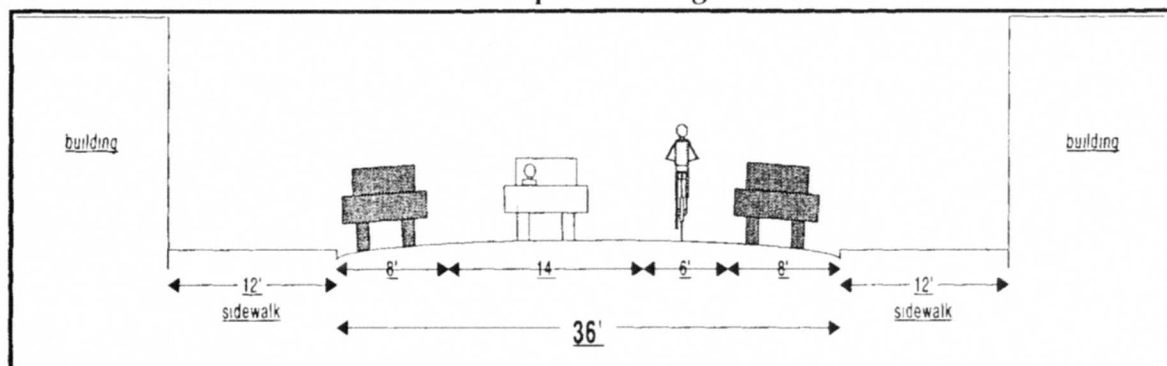
18/19th Existing Configuration



NW 19th Avenue (Vaughn to Burnside)

Travel Lane Removal Removing a travel lane between Hoyt and Everett would increase congestion, extend the peak period conditions, and divert traffic from 19th onto other streets (see Appendix A for an evaluation of traffic operation on 18th and

18/19th Proposed Configuration



19th) Under existing conditions, the intersections of 19th with Everett and Glisan require the present lane configuration to work within traffic guidelines. Maintaining the current configuration for these intersections at existing traffic volumes, as well as parking along both sides of the street, means that a bike lane cannot be provided between Hoyt and Everett. Unfortunately, this segment sees the highest traffic volumes along 19th and is just where bike lanes are needed to provide for the safe passage of bicycles.

These intersections will operate within guidelines if approximately 150 (17%) of the more than 900 cars presently using the street during the afternoon rush hour divert to other streets. A license-plate matching study, conducted to determine where traffic was entering and exiting NW 19th during the pm peak hour (see Appendix B), revealed that approximately one-half of automobiles entering the street north of, or at, Lovejoy continue the entire length (i.e., are using it as an arterial street). Two-thirds of these automobiles could find effective passage on NW 16th—a more appropriately-designated street for through trips—and thus allow NW 19th to still function within acceptable limits. However, the change would still be striking. Therefore, bike lanes are not recommended now on the blocks between Hoyt and Everett or between Marshall and Lovejoy. Rather, shared lane pavement markings and signing will be provided in these segments as they will not disrupt automotive traffic. Of course, they provide only slight benefit for bicyclists. While wide-scale parking removal in these segments is an alternative, it did not receive significant neighborhood support and is therefore an unlikely option. A future project should reexamine the option of providing lanes on these segments, particularly between Hoyt and Everett, should the street not operate optimally for bicyclists.

Similarly, the block between Marshall and Lovejoy will not operate within acceptable guidelines without three travel lanes due to the heavy left- and right-turning movements there. Because Lovejoy and Marshall operate as a couplet between 14th

and 19th, and because 19th provides a major connection between these two streets, there are no good alternative routes for the traffic that would need to divert from 19th were the number of lanes reduced along this segment. Thus, the only way to provide a bike lane along 19th Avenue between Lovejoy and Marshall, is to remove the remaining parking along one side of the street, an action that is also not now recommended.

Parking Removal Four on-street parking spaces will need to be removed in the block between Burnside and Couch. A parking survey conducted in NW Portland in 1995 indicates these spaces are lightly used (see below Table). Average usage of these spaces amounted to an average usage of 0.9 cars for all 5 spaces, which represents 22% of the spaces available.

Parking Space Usage 19th Avenue Between Burnside and Couch, 1995 (east block face)

Time/Date	August 12 (Saturday)	August 18 (Friday)	August 19 (Saturday)	August 29 (Tuesday)	August 30 (Wednesday)	August 31 (Thursday)	September 9 (Saturday)
3:00am			3		1		0
8:00am		0				0	1
10:00am				0			
Noon						0	
3:00pm	1			0			0
6:00pm						1	
8:00pm	5						0
10:00pm				1			

Traffic Speed Removing one travel lane will likely slow down the speed of traffic on 19th, as automobiles in a line will go at the speed of the slowest vehicle in that line, there will no longer be the opportunity to change lanes and accelerate around slower moving vehicles.

Construction Two semi-diverters will be created, one at the southeast corner of 19th and Everett and one at the southeast corner of 19th and Lovejoy. Their purpose will be to encourage traffic to turn left at the left-turn only lanes that will be created at these intersections.

Estimated Cost \$29,000 total, with \$3,250 for grinding of lane markings and striping bike lane, \$1,250 for signing and pavement markings, and \$24,500 for construction of two semi-diverters.

NW Everett and Glisan Streets (between 14th and 19th)

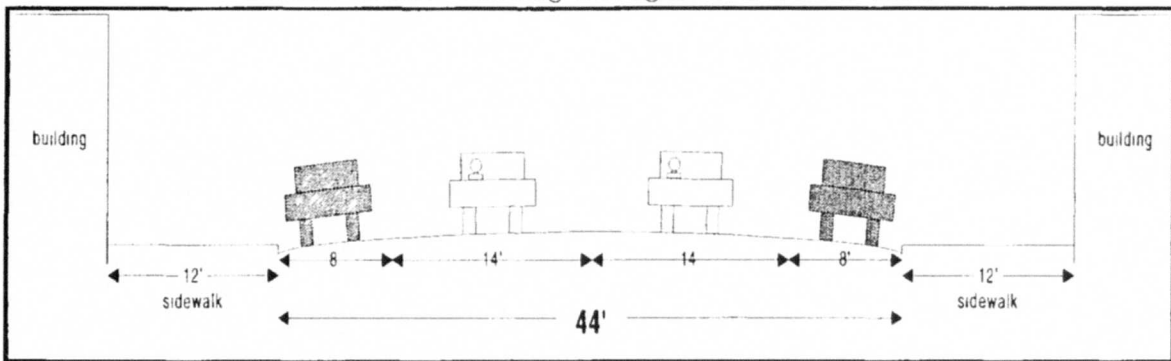
No impact Bike lanes on this five-block stretch of the couplet can be accomplished by narrowing existing automobile travel lanes from 14 to 11 feet without adversely affecting traffic operation

The railroad crossing of Everett at 12th will be improved with a concrete pad

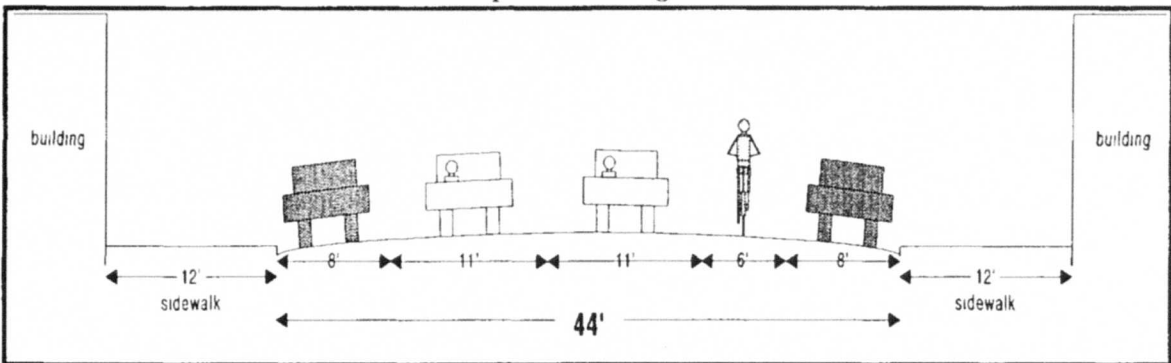
Estimated Cost \$28,000 total, with \$3,000 for grinding existing lane markings and striping bike lanes, \$2,000 for signing and pavement markings, and \$23,000 for the railroad crossing

NW 14th Avenue (Burnside to Thurman)

Everett-Glisan Existing Configuration (14th to 19th)



Everett-Glisan Proposed Configuration (14th to 19th)



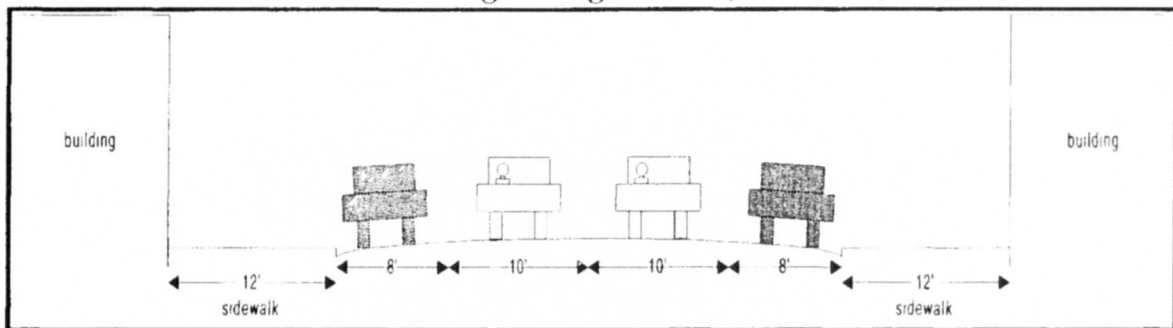
A bicycle lane can be accommodated with little impact on the segments between Burnside and Glisan, and Johnson and Lovejoy, by narrowing the existing travel lanes. A bicycle lane can similarly be provided with little impact on the segment north of Marshall by eliminating one travel lane, though a half block of parking between Lovejoy and Marshall may need to be removed. Providing a bicycle lane on the

segment between Glisan and Johnson will require the removal of parking along one side of the street. Due to commercial development in the Pearl District to the east of 14th Avenue, parking removal along the west side of 14th is likely preferable to the east side. Regardless of which side (either can be done), approximately 21 on-street parking spaces will be removed. Most of these are metered, and include at least one truck loading zone. The high automotive traffic volumes and narrow lane widths on 14th make a shared auto-bicycle lane inadequate.

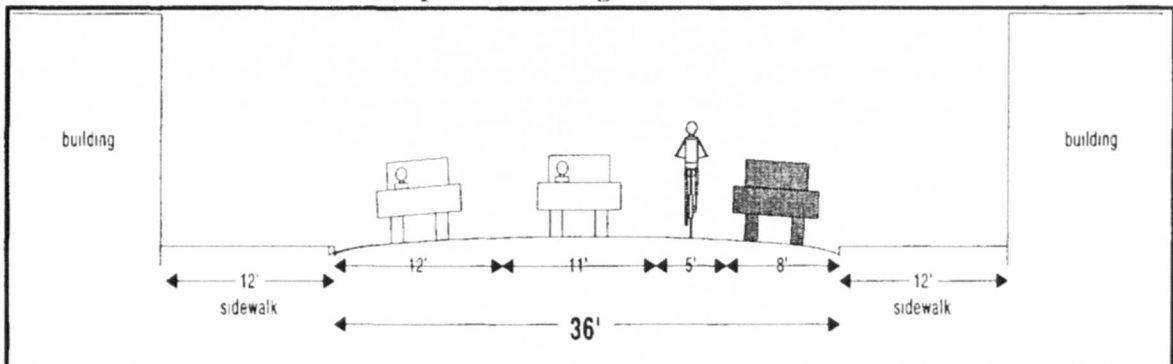
Estimated Cost \$6,000 total, with \$4,800 to grind and re-stripe roadway, and \$1,200 to provide signage and pavement markings.

NW 16th Avenue (Burnside to Thurman)

14th Avenue Existing Configuration (Glisan to Johnson)



14th Avenue Proposed Configuration (Glisan to Johnson)



No impact on traffic operation over much of the length as a bicycle lane can be provided by narrowing existing travel lanes. Some parking on the east side of the street between Lovejoy and Johnson will need to be removed, as will parking on the west side of the street between Glisan and Johnson. However, parking can be added on the west side of the street between Raleigh and Overton.

At present, because of the scope of required parking removal, we do not recommend providing a bicycle lane on 16th between Glisan and Overton until further study can be undertaken to evaluate the extent to which parking is utilized in the areas targeted for parking removal

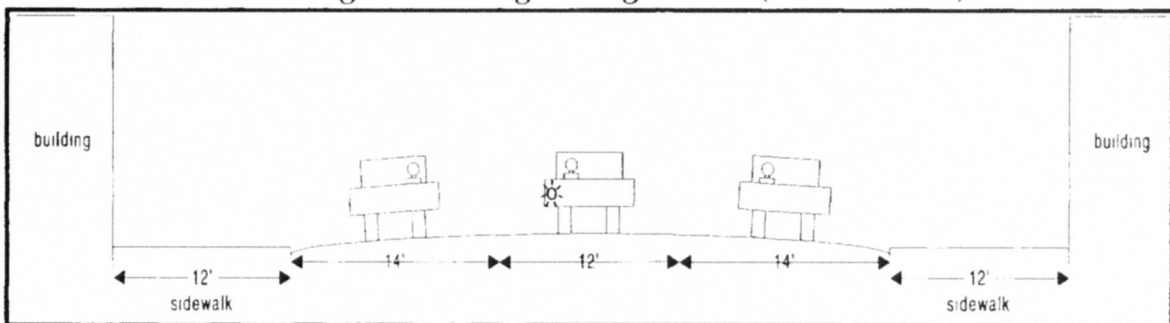
Estimated Cost \$4,100 total, with \$3,100 for grinding and re-stripping roadway, and \$1,000 to provide signage and pavement markings

NW Vaughn/Wardway (24th to Nicolai)

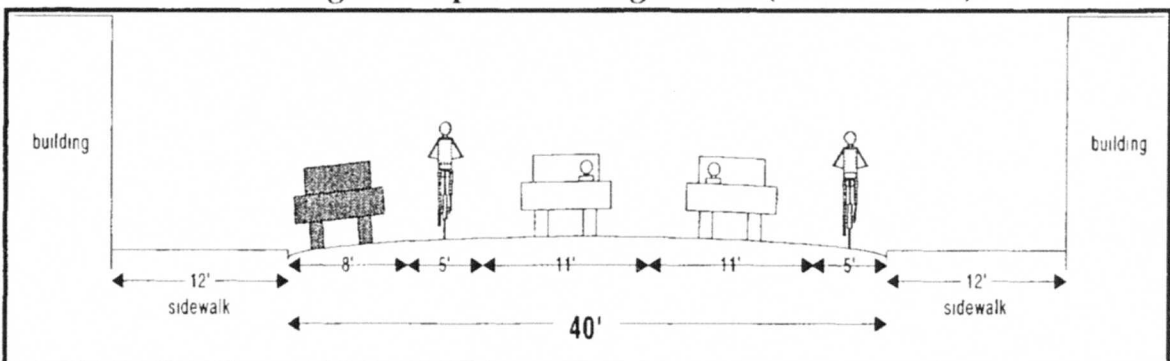
Project will restore approximately 500 feet of on-street parking (approximately 34 spaces) on the south side of the street between 24th and 27th. Replacing center-left turn lane with a left-turn pocket only at 25th will marginally decrease accessibility to Northwest neighborhoods. Because Wardway narrows to 36 feet west of 27th, only one bike lane can be provided the entire length of that segment, thus, an uphill bike lane will be provided between Nicolai and 27th, the downhill lane will extend from approximately halfway between 27th and Nicolai to Nicolai.

A planned development at 28th Place and Wardway will create a driveway onto Wardway and a 2-foot center median to prevent left turns into or out of the development. Because this median will provide 16 feet of lane width in each of the

NW Vaughn Existing Configuration (24th to 27th)



NW Vaughn Proposed Configuration (24th to 27th)



two travel lanes on Wardway, accommodating a bicycle lane will not be hindered

A left-turn pockets will be provided at the signalized intersection of 25th, only One will not be provided at 27th There is a traffic diverter at 27th and Upshur that is intended to prohibit southbound traffic on 27th, routing it instead west onto Upshur This project recommends not providing the left-turn lane at 27th because of the neighborhood's desire to limit traffic entering the residential neighborhood at 27th, and because the traffic diverter is commonly disregarded

Estimated Cost \$7,100 total, with \$6,100 for grinding lane markings and restriping the roadway, and \$1,000 for signing and pavement markings

NW Couch Street (Front to 19th)

To accommodate two-way bicycle traffic, the segment of Couch between 10th and Broadway will need to be changed to two-way traffic for most, if not all of its length The segment in the North Park Blocks can possibly be maintained as a one-way street for automobiles and two ways for bicycles with the addition of a contra-flow bicycle lane Maintaining at least a short one-way segment has the advantage of discouraging through automotive traffic on Couch Street

The traffic diverter at 16th, and the sidewalk approaching at westbound on 15th needs to be modified to permit westbound bicycle travel Bicyclists can likely make use of existing pedestrian crossing lights at these intersections A stop sign will likely need to be provided for southbound traffic on 16th at the intersection with Couch A loop detector and/or pavement markings for bicyclists will be needed for the signal at 15th and Couch for eastbound bicycle traffic

Traffic on Couch is stopped at every block between Front and 19th by stop signs (there is a full traffic signal at 1st and a flashing red signal at 12th) The intersections of Couch with 8th and Park will have stop signs moved to favor through movements on Couch

Crossing Broadway can be difficult, Hoyt Street should be investigated for providing an alternative crossing for east-west bicycle traffic during peak hours, as the intersection of Hoyt and Broadway is signalized To facilitate crossing Broadway, which has three lanes, high volumes, and two-way traffic, a median refuge will be provided This will necessitate the removal of 3 metered parking spaces

Finally, the railroad crossing at 12th will be improved

Estimated Costs Total cost of \$24,900, with \$11,500 to improve the railroad crossing, \$13,000 to provide a crossing at 16th and median refuge at Broadway, and \$400 for signing

NW Flanders (24th to 16th)

As part of the Tanner Creek Extension Project, Flanders Street will have a six to eight foot trench dug down the middle of the street from 17th to the west at some point in the 1998-1999 fiscal year. This construction will not interfere with the development of Flanders as a bike boulevard. At the intersection of Flanders and 21st east-bound traffic can turn right only due to a high frequency of collisions at the intersection. Flanders has stop signs at every block in the project area. The intersections with 20th and 17th will have their stop signs moved to favor through movement on Flanders.

Crossing Treatments The goal in improving crossing conditions on Flanders is to provide a sufficient number of adequate gaps in traffic to allow cyclists to safely cross busy intersections. There are three possible treatments: median refuge, half curb extensions, and full curb extensions. Each has their merits. Median refuges work by allowing cyclists to cross only one direction of traffic at a time, and wait in the median until traffic in the opposing lane clears. Curb extension, by decreasing the crossing distance from one side of the street to the other, decrease the crossing time, and thus increase the number of usable gaps in traffic. Existing rush hour conditions at Flanders and 21st provided only 41 adequate crossing gaps per hour. Sixty gaps per hour is considered minimally acceptable for crossing busy intersections.

Half curb extensions, at which only two corners of the intersection receive treatment, increases to 55 the number of gaps per hour. Full curb extensions increase the number of gaps per hour to 68. The below table compares the costs and benefits associated with each treatment. Medians are not being considered for this intersection due to the high number of parking spaces that would have to be removed.

There already exists a half curb extension at Flanders and 23rd, though there remains a crossing problem as traffic stopped at the signals at both Everett and Glisan tend to spill back and block the intersection at Flanders. A marked, ladder-type crosswalk may help to better define the intersection and keep motorists from blocking it.

Flanders & 21st Comparison of Crossing Treatments

Configuration	Gaps per Hour	Parking Removal	Cost
Existing Conditions	41		
Half Curb Extensions	55	0 spaces	\$20,000
Full Curb Extensions	68	2-3 spaces	\$40,000

Additional Considerations--Flanders and 21st At present, traffic eastbound on Flanders must turn right (southbound) on 21st. This mandatory turn was put in place almost ten years ago following a significant number of accidents resulting from northbound traffic colliding with eastbound autos crossing the intersection. This arose from southbound traffic on 21st queuing at the signal at Everett and blocking the vision of motorists eastbound on Flanders. Unable to see approaching northbound traffic, those continuing east on Flanders cautiously crept out into the intersection, hoping for a better look. Inevitably, many collisions resulted.

Unfortunately, since the mandatory turn sign was installed, the same type of accident occurs, mostly because some eastbound motorists tend to disregard the "Right Turn Only" sign and proceed straight. An average of almost two accidents of this type have occurred here since the sign was installed, with two occurring in 1996 and three in 1995. Since a signed correction does not seem to be working, the next step is a physical correction, i.e., physically preventing eastbound traffic from crossing the intersection. Though this can be accomplished by a full diverter at the intersection, which would allow no through movements on Flanders at 21st, it would remove a significant amount of parking and will not be considered as an option at present.

Instead, we propose to install full curb extensions at Flanders and 21st, and maintain the current turning restrictions. Bicyclists, because they can see further than motorists (they are up higher and have no "blind spot"), and can stop quicker, will be permitted to make the through, eastbound movement on Flanders. The intersection will be resigned, "Right Turn Only Except Bicycles".

Estimated Costs \$48,500 with full curb extensions, with \$48,000 for the curb extensions and \$500 for signing.

NW Johnson (24th to 14th)

Of the 10 blocks crossing Johnson between 24th and 14th, only three are stopped at

Johnson--they are 20th, 17th, and 15th. There are four-way stops at Johnson and 22nd and Johnson and 24th. No additional stop signs will be moved on this street. The intersections of Johnson and 23rd and Johnson and 21st all have existing parking restrictions and should be considered for curb extensions to improve crossing these collector streets. There is a railroad crossing at 15th in poor condition that needs to be improved. The block between 15th and 14th is brick, and is an extremely rough riding surface for bicycles, it should be repaved, either in its entirety or at least a strip paving to provide a smooth riding surface for bicycles. The underpass of I-405 is poorly lit and may pose a safety hazard for bicyclists riding at night. It should be considered for improved lighting.

As with Flanders, crossing 23rd and 21st at Johnson is problematic. Gap studies at 23rd and 21st indicate the lack of sufficient gaps at both intersections. The below tables display the results of the gap studies and the potential impacts and costs associated with half-curb and full-curb extensions. We recommend full curb extensions for both intersections.

Johnson & 21st Comparison of Crossing Treatments

Configuration	Gaps per Hour	Parking Removal	Cost
Existing Conditions	35		
Half Curb Extensions	53	0 spaces	\$20,000
Full Curb Extensions	76	possibly 1 space	\$40,000

Johnson & 23rd. Comparison of Crossing Treatments

Configuration	Gaps per Hour	Parking Removal	Cost
Existing Conditions	39		
Half Curb Extensions	55	1 space	\$20,000
Full Curb Extensions	73	1 space	\$40,000

NW Kearney was suggested, and considered as an alternative to Johnson as Kearney has existing half curb extensions at 23rd and 21st. In general, half curb extensions are considered inferior to full curb extensions because they do not provide the same number of gaps. In addition, Kearney is stopped at every block except 17th, and

turning the stop signs at 22nd and 20th does not result in as advantageous a placement as their current location. Johnson also has the advantage of a four-way stop at 22nd, which provides a safe and easy crossing. For these reasons, Johnson is considered a better candidate for a bike boulevard than Kearney.

Estimated Cost Total cost of \$109,200 with full curb extensions, with \$11,000 to improve the railroad crossing, \$98,000 to provide curb extensions, and \$200 for signing.

NW Overton (24th to 14th)

Of the 10 blocks crossing Overton, three are stop-signed, they are 22nd, 17th, and 15th. The intersection at 20th will have its stop signs moved to give priority to Overton. Full curb extensions will be constructed at the intersection with 23rd. The railroad tracks at 15th are considered in good condition for a bicycle crossing, and are not presently targeted for improvement.

While there are an adequate number of crossing gaps at Overton and 21st (84 per hour at the afternoon peak), there are not at the intersection with 23rd. The below table compares the potential treatments to facilitate crossing 23rd.

Overton & 23rd Comparison of Crossing Treatments

Configuration	Gaps per Hour	Parking Removal	Cost
Existing Conditions	37		
Half Curb Extensions	64	0 spaces	\$20,000
Full Curb Extensions	112	0 spaces	\$40,000
Medians	107	6-7 spaces	\$18,000

There is an advantage to medians over full curb extensions beyond their lower cost. Though the number of gaps is similar for medians and curb extensions, the time available per hour to cross the intersection is twice as high with medians as it is with curb extensions. Medians allow the bicyclist (and pedestrian) to cross only one lane of the street at a time, permitting them to take refuge in the median. Curb extensions require crossing of the full street at once. With medians, and the traffic pattern at Overton and 23rd, there is much more gap time available for crossing than there is for curb extensions. The cost, of course, is the parking removal necessitated by the

medians, and for that reason alone, full curb extensions are recommended over medians

Estimated Cost \$48,500 total with full curb extensions, with \$48,000 for the curb extensions and \$500 for signing

NW Raleigh (24th to 14th)

Of the 10 blocks crossing Raleigh, four are stop-signed, they are 24th, 22nd, 20th and 17th. No additional stop signs will be moved. Curb extensions will be constructed at the intersection with 23rd. The railroad tracks at 15th are considered in fair condition for a bicycle crossing, and are not suggested for improvement as part of this project.

The below table displays the existing crossing conditions at Raleigh and 23rd and compares potential treatments.

Raleigh & 23rd Comparison of Crossing Treatments

Configuration	Gaps per Hour	Parking Removal	Cost
Existing Conditions	41		
Half Curb Extensions	62	0 spaces	\$20,000
Full Curb Extensions	90	0 spaces	\$40,000
Medians	not available*	6-7 spaces	\$18,000

*though this data is not available, the gaps per hour is likely to be similar to that for full curb extensions, as it was at Overton and 23rd

Estimated Cost \$48,500 total with full curb extensions, with \$48,000 for the curb extensions and \$500 for signing

NW 24th (Flanders to Vaughn)

24th is one-way to the north on the block between Westover and Glisan. A contra-flow bike lane to the south will be provided. This will necessitate relocating existing parking in that block, which is currently on the west side, to the east side of the block. Presently, there are 140 feet of parking space available in this block on the

west side. Moving the parking to the east side will result in 142 feet of parking space. There should be no net loss of parking spaces.

Of the 15 streets crossing 24th, 24th is stopped at Glisan (four-way), Johnson (four-way), Lovejoy (four-way), Marshall, Northrup, Pettygrove, Raleigh, Thurman, and Vaughn. The stop signs at Marshall will be moved to favor traffic flow on 24th. This move simply maintains the pattern currently found north of Marshall, where every other block on 24th is stopped. This change will extend that pattern back to Kearney.

Estimated Cost Under \$1,000 for signing and striping the contra-flow bike lane between Glisan and Flanders.

NW Naito Parkway (Front Avenue) (9th to Kittredge)

The City's Bicycle Advisory Committee recommends not striping Front Avenue at present due to the numerous and dangerous railroad crossings. They recommend striping Front with bike lanes only when safety at all railroad crossings can be addressed, something that is beyond the scope of this project.

Estimated Costs Grinding and striping, and improving one railroad crossing will cost close to \$65,000, depending on the number of grinding passes required.

NW Cornell (29th to Skyline)

Spot road-widening will enhance bicycle operation along Cornell with no impact on automotive traffic.

Estimated Costs No cost estimate yet.

SW Alder (Burnside to 12th)

A bicycle lane can likely be provided between Burnside and SW 12th without removing traffic or altering existing travel lanes. To extend the lane past 12th to Broadway (where it will connect with a proposed bike lane on Broadway) would require either parking removal or removal of a travel lane.

Estimated Costs \$2,500 total, with \$1,800 for grinding and striping and \$700 for signing.

❑ Other Bicycle Facility Enhancements

Along with the bikeway improvements described above, several other types of improvements for cyclists are considered for the project area

- Vehicle-actuated traffic signals will be marked to show cyclists the correct location to place their bicycles in order to activate the signal--this is a continuation of an existing city-wide program
- Opportunities to provide a bicycle oasis--i.e., covered bicycle parking combined with a district map of bikeways--will be explored at each location where a curb extension is implemented
- Railroad crossings at the following locations will be upgraded with concrete to provide smoother, more level crossings: Glisan & 12th, Everett & 12th, Couch & 12th, and Johnson & 15th

Appendices

Appendix A: Analysis of Traffic Operations on 18th and 19th Avenues

Both NW 18th and 19th Avenues have a 36 foot cross-section, just enough to accommodate their present configuration of two travel lanes with on-street parking on both sides. To provide bike lanes, a trade-off with some of this space is required. Because the NW Bikeways Plan calls for creating bike lanes by eliminating a travel lane rather than on-street parking, this analysis considers the effect of lane removal on traffic operations.

Two main factors are considered in this analysis:

- the volume to capacity ratios (v/c), and
- delay waiting for a green light (in seconds)

Before delving into the analysis, those terms will be defined and/or explained.

Volume is the number of vehicles passing through an intersection during a specified time period.

Capacity is the maximum traffic volume that can pass through the intersection, or perform a specific movement at the intersection (i.e., right-turn, left-turn, through) under the prevailing traffic, roadway, and signalization conditions.

Volume to capacity ratio is the actual traffic volume divided by the intersections' capacity (v/c). A v/c ratio of 1.00 means that the movement or the intersection is at capacity. A ratio greater than 1.00 means that the intersection is over capacity. Generally, city traffic engineers work to maintain a v/c ratio of less than 0.96.

Delay is based on the average stop time per vehicle. Although the volume to capacity ratio affects delay, other aspects of intersection operation, such as length of green time, overall signal cycle lengths, and the quality of vehicle progression, exert a stronger influence.

Both v/c and delay are used to describe the operation of an intersection. Analysis of traffic operation on streets is typically conducted at signalized intersections because the intersection has less capacity than a free-flowing street.

Traffic conditions on 18th and 19th Avenues were evaluated at the intersections with Everett, Glisan, Lovejoy, and Marshall Streets.

19th Avenue Analysis

As Table 1 shows, traffic volumes south of Marshall are more than 2.5 times higher on 19th than they are on 18th. Several different scenarios were evaluated for future traffic operations on NW 19th with one travel lane. The intersection with the highest potential to create a bottleneck on 19th is at Glisan.

19th and Glisan Because the overwhelming majority of peak-hour traffic on 19th entering this intersection continues straight (88%), two lanes are required to handle the existing volumes. For this analysis, volumes on 19th were increased by 3% to mimic the volumes shown in older traffic counts. Table 2 displays the v/c ratios associated with several scenarios.

Table 1 Peak Hour Traffic Volumes on 18th & 19th Avenues

Street	Movement	Volumes at Cross-Street (vehicles per hour)			
		Everett	Glisan	Lovejoy	Marshall
19th	Right	na	87	149	19
	Straight	447	634	469	359
	Left	263	na	219	na
	Total	710	721	837	378
18th	Right	60	na	68	na
	Straight	192	223	228	161
	Left	na	69	na	83
	Total	252	292	296	244

Scenario I represents existing conditions at the intersection of 19th and Glisan, where there are two lanes that carry through traffic. Converting the right lane to a right-only lane, thus providing only one lane for through traffic on 19th—as in Scenario II—will not work. The v/c ratio for the through movement exceeds 1.0 and the intersection fails. Scenarios III and IV explore how that lane configuration could work within acceptable guidelines. To approximate existing traffic conditions two things would have to occur: additional green time would have to be provided to the signal on 19th, and 200 vehicles would have to be diverted to other streets during the peak hour.

A License Plate Matching Study conducted on NW 19th evaluated the likelihood of peak hour traffic diversion. Results from that study indicate diversion from NW 19th to NW 16th is

possible for approximately 250 vehicles during the peak hour. However, there are signal timing issues on NW 16th to be considered before such a diversion could work optimally (see Appendix B).

Table 2 Volume to Capacity Ratios and Delay at NW 19th and Glisan—Scenario Analysis

Scenario	Measurements				Description
	Intersection		Through Movement		
	v/c	delay (sec)	v/c	delay (sec)	
I	0.72	13.0	0.86	16.8	Existing conditions
II	0.87	NA ¹	1.26	NA ¹	Right-Turn Only Lane & Through Lane Existing Signal Timing Existing Traffic Volumes
III	0.8	19.3	0.98	31.4	Right-Turn Only Lane & Through Lane Add 3 seconds green time to 19th Divert 100 vehicles
IV	0.73	16.0	0.94	27.5	Right-Turn Only Lane & Through Lane Existing Signal Timing Divert 200 vehicles

¹ When the intersection, or one or more of the movements through the intersection, is substantially over capacity (i.e., $v/c > 1$), then the delay cannot be calculated.

19th and Everett Table 3 shows that going to one lane through the Everett intersection will be problematic. Changing from two to one through lanes with a left only lane will have a noticeable effect on the operation of the intersection. However, this change does result in adequate operation of the intersection.

Table 3 Volume to Capacity Ratios and Delay at NW 19th and Everett—Scenario Analysis

Scenario	Measurements				Description
	Intersection		Through Movement		
	v/c	delay (sec)	v/c	delay (sec)	
I	0.71	11.4	0.76	12.2	Existing conditions
II	1.18	NA ¹	1.70	NA ¹	One lane
III	0.79	14.9	0.92	25.0	One Left-Only Lane One Through-Only Lane

¹ When the intersection, or one or more of the movements through the intersection, is substantially over capacity (i.e., $v/c > 1$), then the delay cannot be calculated.

19th and Marshall The segment of 19th between Marshall and Lovejoy is the only segment of 19th classified as a neighborhood collector. There are two existing lanes there, presently with much excess capacity. However, as with 19th and Glisan, the through movement on 19th at Marshall, at 95%, dominates movements at the intersection and seems to necessitate two lanes, as is shown in Table 4.

Table 4 Volume to Capacity Ratios and Delay at NW 19th and Marshall—Scenario Analysis

Scenario	Measurements				Description
	Intersection		Through Movement		
	v/c	delay (sec)	v/c	delay (sec)	
I	0.48	8.3	0.57	14.6	Existing conditions
II	0.72	NA	1.32	NA	1 Lane Only Existing Signal Timing Existing Traffic Volumes
III	0.72	18.7	0.98	38.4	1 Lane Only Add 6 seconds green time to 19th
IV	0.74	16.8	0.95	31.5	1 Lane Only Add 8 seconds green time to 19th

Only Scenario IV provides acceptable results, though the change from existing conditions would be significant. Changing the signal timing by this amount would require an analysis of the signal timing and progression for the intersections of 18th with Marshall and Lovejoy, as well as for 19th at Marshall and Lovejoy.

19th and Lovejoy. Table 5 shows that providing a bike lane on 19th between Marshall and Lovejoy will result in substantial impacts to the operation of 19th.

While eliminating a travel lane on 19th in this block will not work well, the analysis shows that creating two dedicated turn lanes—one left and one right—has little impact on the intersection. This will allow dropping both turning lanes and accommodate a bike lane and one travel lane south of Lovejoy.

Table 5 Volume to Capacity Ratios and Delay at NW 19th and Lovejoy—Scenario Analysis

Scenario	Measurements				Description
	Intersection		Through Movement		
	v/c	delay (sec)	v/c	delay (sec)	
I	0.76	12.8	0.66	10.7	Existing conditions
II	0.98	NA	1.12	NA	Right-Turn Only Lane Through-Left Lane
III	0.75	12.9	0.65	11.1	Right-Turn Only Lane Through Only Lane Left-Turn Only Lane

18th Avenue Analysis

As shown in Table 1, the intersections of 18th with Everett and Glisan are quite similar in terms of overall volume and the split between turning movements. An analysis of 18th and Everett was conducted that modeled a 35% increase above present traffic volumes through the intersection. The analysis showed that 18th and Everett will operate adequately with one lane on 18th. Whereas the existing v/c for northbound traffic is 0.23 and the existing delay is 9.0 seconds, going to one lane increases the v/c to 0.54 and the delay to 11.4 seconds, both well within acceptable standards.

A separate analysis of 18th and Glisan was not conducted because it operates similarly to 18th and Everett. Though the intersection with Glisan does carry more total volume than does the intersection with Everett, 18th has an additional three seconds of green signal time at Glisan than at Everett.

The traffic volume at 18th and Lovejoy is less than 300 vehicles during the peak hour, with a green time of 26 seconds, which is more than enough green time to accommodate these vehicles in one travel lane.

Recommendations

NW 18th Avenue can be changed to one lane operation to provide room for a bike lane without undue effect on traffic. NW 19th should maintain two lane traffic flow with the right-turn lane on the segment between Marshall and Lovejoy. We also recommend two lane traffic flow on NW 19th between Hoyt and Everett. While the necessary diversion of traffic from 19th to 16th could occur, allowing one lane operation of 19th between Hoyt and Everett, the change in that segment would still be a striking degradation of service from existing conditions.

Appendix B: Results of License Plate Matching Study on 19th Avenue

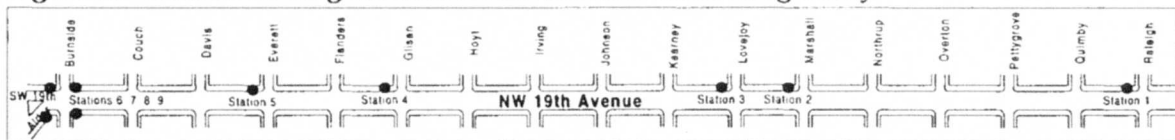
Background NW 19th Avenue is being considered for a bike lane from Thurman, south to its terminus at Burnside. To provide a bike lane while maintaining parking, one of two travel lanes will be removed. With one travel lane, acceptable volume to capacity ratios at the afternoon rush hour (the time of day with highest hourly traffic volumes) will be maintained at all intersections except at the intersection of 19th and Glisan, which would experience a volume to capacity ratio greater than 1 with only one travel lane and existing traffic volumes.¹ Preventing this failure at Glisan would require maintaining the current, two-lane cross-section from Hoyt to Everett. Maintaining acceptable operation on this segment with one travel lane will require the rush hour diversion of approximately 150 vehicles.²

The purpose of this study is to determine how NW 19th Avenue is being used during the peak hour--to determine where cars are entering NW 19th and where they are exiting. From this information a reasonable estimate can be made of how many cars might divert to streets more appropriate for handling through north-to-south traffic.

Description of Study A license plate matching study was conducted on NW 19th Avenue for 30 minutes during the afternoon peak rush hour on Wednesday, February 19, 1997 from 4:45pm to 5:15pm. Traffic volume counts along 19th indicate this period constitutes the two busiest 15-minute periods of the day.

A license plate matching study consists of data recorders positioned at key locations along a street recording the license plates of all vehicles passing them. Matching these recorded plates from one station to the next provides information about where any automobile entered the street and where it exited. Figure 1 shows where data recorders were positioned on NW 19th. Stations 6, 7, 8 and 9 recorded turning movements onto Burnside, or whether the vehicles continued on Alder or SW 19th Avenue.

Figure 18 Data Recording Stations for License Plate Matching Study



¹There will not be a bike lane on the block between Marshall and Lovejoy. This is the one stretch of NW 19th Avenue classified as a neighborhood collector and where current volumes require maintenance of the existing configuration. All intersections were modeled with slightly higher than existing traffic volumes.

²Some adjustments to signal timing--providing more green time to NW 19th during rush hour--will also be required.

For example, a license plate recorded at Stations 1, 2, 3, and 4, but not at Stations 5 or beyond, indicates that automobile entered 19th north of Raleigh and exited somewhere between Glisan and Everett (including Everett). Similarly, a license plate first noted at Station 3, and recorded again at Stations 4, 5, and 9 indicates the vehicle entered 19th between Marshall and Lovejoy, traveled the length of 19th, and then continued south on SW 19th Avenue.

Presentation of Data The gathered data reveals the following general information about NW 19th Avenue, as displayed in Table 1.

Table 1 General Conditions on NW 19th during the Afternoon Peak Half-Hour

Total Autos on NW 19th Avenue at						
Raleigh	South of Marshall	South of Lovejoy	South of Glisan	South of Everett	at Burnside	
182	311	356	392	325	354	
Autos Exiting NW 19th Avenue, and Percentage of Autos on Roadway						
	Between Raleigh & Lovejoy	at Lovejoy	Between Lovejoy & Glisan (including Glisan)	Between Glisan & Everett (including Everett)	Between Everett & Burnside	at Burnside
	67	141	155	188	54	354
	37%	45%	43%	48%	17%	100%

The lower portion of Table 1 shows the proportion of vehicles on the roadway that exited at a particular location. For example, of the 356 vehicles on the roadway just south of Lovejoy (and north of Kearney), 155 did not appear at Station 4, indicating they had exited at some point between Lovejoy and Glisan (including Glisan). This number represented 43% of those vehicles on the roadway just south of Lovejoy.

This study also revealed more detailed information about how NW 19th is being used during the afternoon peak, as shown in Table 2. Each row displays the area of egress from 19th for vehicles entering at a certain location. For example, of the 182 vehicles entering 19th north of Raleigh (i.e., they were counted at Station 1, just south of Raleigh), 35 (19%) exited at Lovejoy and 13 (7%) exited by turning left onto Burnside.

Because it is at the intersection of 19th and Glisan where conditions would deteriorate with the advent of one lane, the analysis is further focused to consider that intersection, and the 564 vehicles entering the corridor north of Glisan, as displayed in Table 3.

Table 2 Progression of Automobiles by Point of Entry Autos Counted and Percentage

Entering at		Exiting at								
		between Raleigh/ Marshall/ Lovejoy	Lovejo y	between Lovejoy/Glis an (incl Glisan)	between Glisan/ Everett/incl Everett)	between Everett/ Burnside	left onto Burnside	left onto Alder	right onto Burnside	SW 19th
Raleigh	182	67 37%	35 19%	20 11%	14 8%	3 2%	13 7%	8 4%	8 4%	14 8%
between Raleigh/Marsh all/Lovejoy	196		106 54%	26 13%	23 12%	5 3%	12 6%	9 5%	1 1%	14 7%
Lovejoy	186			109 59%	19 10%	8 4%	13 7%	14 8%	13 7%	10 5%
between Lovejoy/ Glisan (incl Glisan)	191				132 69%	11 6%	19 10%	5 3%	8 4%	16 8%
between Glisan/Everett (incl Everett)	121					61 50%	11 9%	5 4%	23 19%	21 17%

Table 3 Behavior of Automobiles Entering NW 19th North of Kearney

Entering at		Exiting at						
		between Lovejoy/Glis an (incl Glisan)	between Glisan/ Everett/incl Everett)	between Everett/ Burnside	left onto Burnside	left onto Alder	right onto Burnside	SW 19th
North of Kearney	564	363 64%	56 10%	16 3%	38 7%	31 6%	22 4%	38 7%

Analysis and Conclusions An analysis of the data indicates a high proportion of vehicles presently using NW 19th are likely using it as a collector street—despite its classification as a local service street—and could thus be diverted to other, more appropriate streets. Those vehicles using the street in this manner are shown in the

shaded areas in Tables 2 and 3. Most of these vehicles—those exiting between Glisan and Everett, left onto Burnside and left onto Alder—can, by policy, be directed to NW 16th to arrive at their likely destinations. How this conclusion was arrived at will be described in more detail, but first, Table 4 reports that 125 vehicles using NW 19th during the study period could have found a more appropriate route to arrive at their destinations.

Table 4 Total Vehicles That Could be Diverted from NW 19th Avenue

Vehicles that Could be Diverted	As a Percentage of Vehicles			
	Entering N of Kearney	Passing Through Glisan	Passing Through Everett	Passing Through Burnside
125	22%	32%	38%	35%

This analysis is based, in part, on the following assumptions:

- Assumption #1 vehicles recorded as exiting between Glisan and Everett (including Everett) are actually exiting east on Everett,
- Assumption #2 vehicles entering NW 19th north of Kearney and exiting onto Burnside or beyond are heading for non-local destinations,
- Assumption #3 vehicles exiting between Everett and Burnside are likely headed for local destinations, and
- Assumption #4 vehicles exiting west onto Burnside or continuing on SW 19th, though using 19th as an arterial street, are headed for south and west destinations, and would find that NW 16th does not provide better service to their destinations, and would likely remain on NW 19th.

Vehicles entering NW 19th north of Lovejoy and continuing either east onto Everett (i.e., heading for the steel bridge) or passing through to Burnside and destinations east (i.e., turning left onto either Burnside or Alder), are better directed to NW 16th Avenue, which is designated a Major City Traffic Street, and designed to handle arterial-type traffic. Similarly, vehicles entering NW 19th at Lovejoy and then heading east on Everett or through to eastbound on Burnside or Alder are also better directed to remain on Lovejoy (a neighborhood collector) to 16th. Vehicles entering NW 19th south of Lovejoy and continuing on to either Everett or Burnside and beyond have no viable alternative as there is no designated collector street south of Lovejoy to Burnside. In this case, if those vehicles did not use NW 19th they would simply divert onto other local service streets.

Vehicles continuing south on SW 19th or west on Burnside are likely heading to points

south and west of Portland NW 16th Avenue does not provide the same ease of connections for these vehicles as does NW 19th, and drivers would therefore tend to avoid NW 16th. For that reason, these movements, though they still constitute arterial-type use of NW 19th, are not considered viable candidates for diversion to NW 16th.

Nonetheless, the 125 vehicles that could be diverted during that half hour, when extrapolated to the full hour, indicate that approximately 250 vehicles during the rush hour could be diverted from NW 19th to NW 16th.

Appendix C Report on the Northwest Bikeways Project Open Houses held at the NW Service Center on January 9, 1997 and February 27, 1997

Attendance

There were three gauges of attendance at the meeting

a sign-in sheet,
comment forms, and
self-administered stated preference survey

Sign-In 61 people signed-in at the open house, though it is the opinion of staff on hand that more people attended who did not sign-in

Comment Forms 40 comments forms were returned

Stated Preference Survey One display presented four options for accommodating bicycles along a stretch of NW 19th Ave. Upon entering, each attendee was handed a sticker and asked to place it next to the option of their choice. 58 stickers were affixed to the display at the end of the open house.

Results

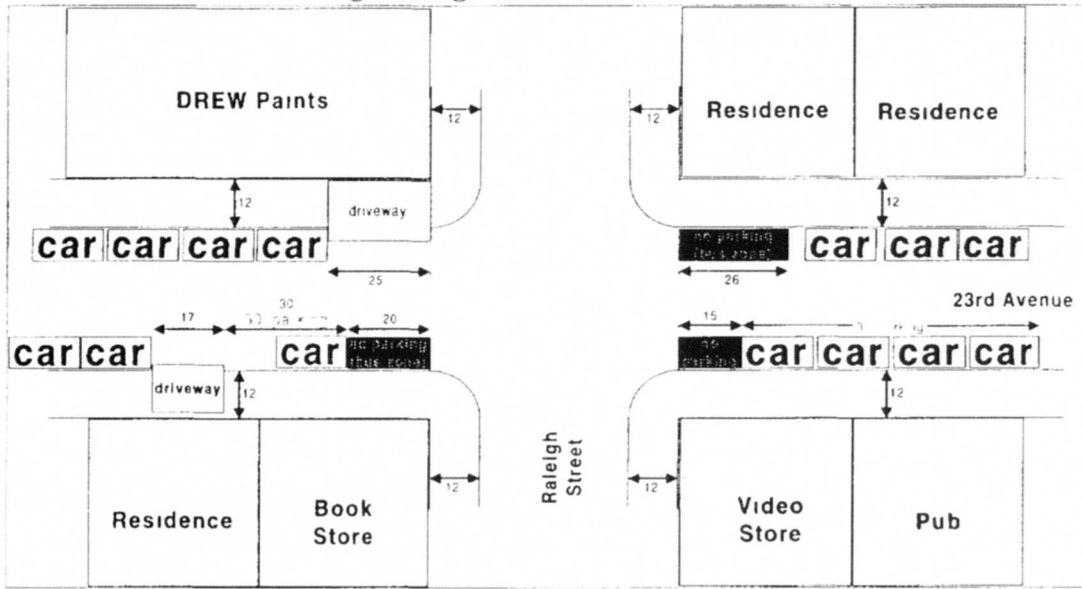
Comments Received Those filling out the comment forms were asked for information about their bicycle riding habits in the project area. Providing this information, along with their names and address on the comment form, was optional. Of the 40 comment forms returned, 24 people indicated they bicycled through the project area (60%). All comments received, and staff responses, are displayed in a separate document.

Stated Preference Survey Attendees could choose among the following options of NW 19th Avenue between Hoyt and Everett Streets.

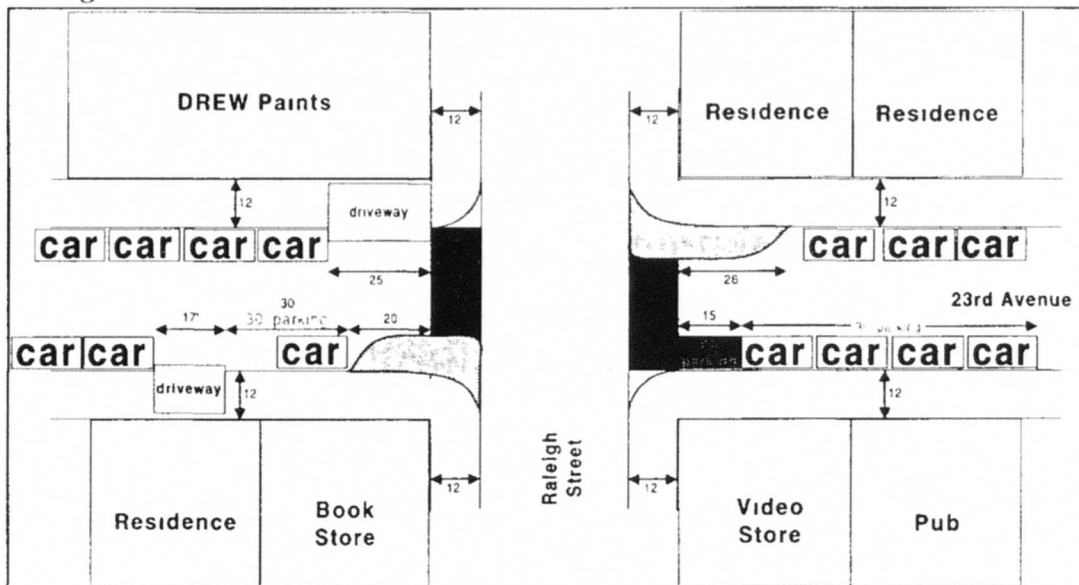
Option	Description	Selected by
1	Provide two travel lanes and signing and pavement markings to indicate lane is to be shared with bicyclists	14 people (24%)
2	Remove one travel lane to provide a bike lane	38 people (65%)
3	Remove one parking strip to provide a bike lane	5 people (9%)
4	Do nothing	1 person (2%)

Appendix D: Examples of Boulevard Crossing Treatments

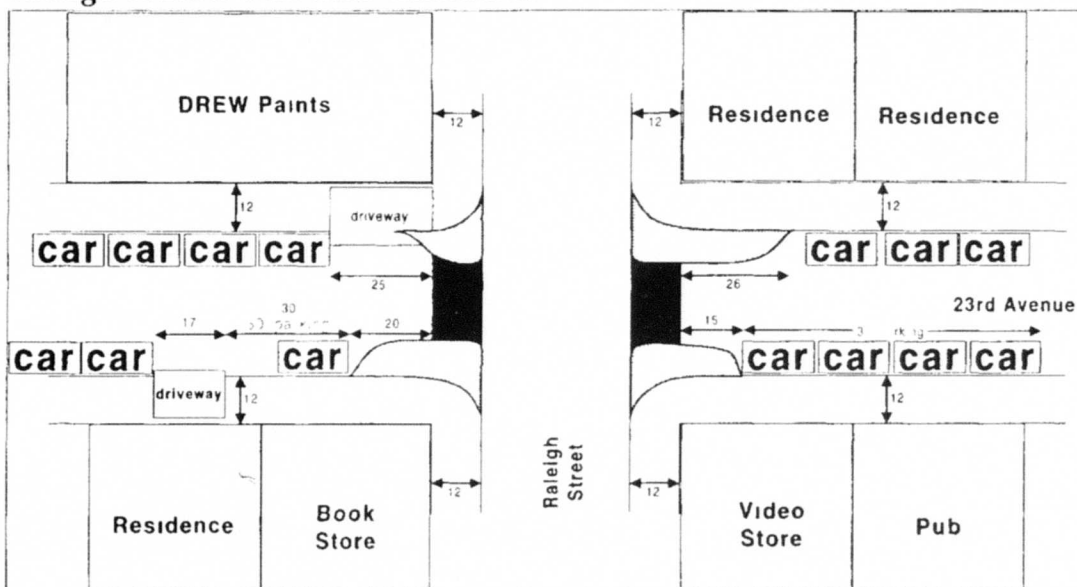
Overton & 23rd Existing Configuration



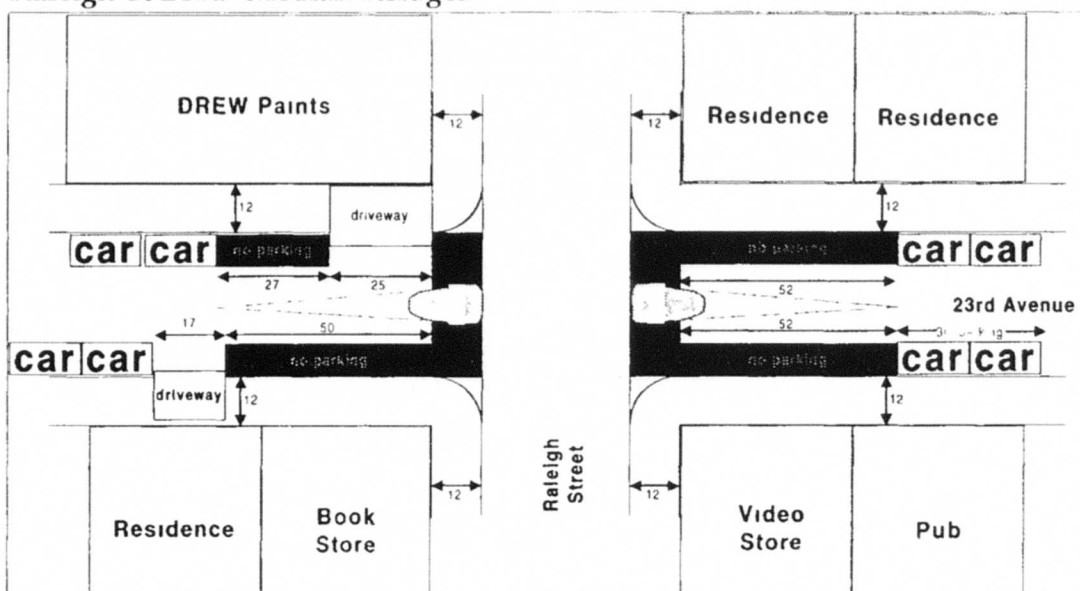
Raleigh & 23rd Half Curb Extensions



Raleigh & 23rd Full Curb Extensions



Raleigh & 23rd Median Refuges



Appendix E Comments Received at the Open Houses and Staff Responses at the Open Houses and Staff Responses

(comments received are listed in the left-hand column with staff response in the right-hand column)

Comment	Response
Rotate/change stop signs - on Moody & in industrial area (between River Place & Trail) so bikes can go thru without breaking the law!	This is out of the scope of this project, but will be addressed as part of development in this area within the next few years
1 Unless bikeways enjoy the level of mechanical segregation from autos seen in, say, Amsterdam, (or Eugene or Corvallis) bike riding will remain dangerous, "fringy" behavior 2 If you propose to remove on-street parking in NW Portland residential areas, do something like permit parking, to reduce competition faced by residents	Bike lanes have been shown to increase the safety of both cyclists and motorists by clearly defining the roadway surface on high volume streets Mechanical separation does perhaps provide additional security, at the cost of limiting access for bicyclists (i.e., makes left-turning movements more difficult) However, there is no realistic way to accomplish this in Northwest Portland due to narrow street widths At the preliminary stage, we propose to remove only four (4) on-street parking spaces in Northwest Portland on 19th, on the east-side of the block between Burnside and Couch We will add approximately 30 spaces on Vaughn between 24th and 27th There is an ongoing process considering permit parking in Northwest Portland between the City, the neighborhood association, and business associations To date, the parties have not been able to reach an agreement about how, or whether to proceed
I question the need for bike boulevards These streets are already extremely easy to cycle on What is more important are traffic calming devices to enhance travel for cyclists & pedestrians I am absolutely opposed to removing parking, for both practical & political reasons	The streets being considered for boulevards already do work well for bicycles Our intent in creating a boulevard is to make the crossing of major streets (23rd, 21st, 19th, 18th, 16th, 14th) easier on the boulevard We will also consider traffic calming measures on those streets if needed, and other measures to give preference to bicycles To provide for bicyclists on major streets, lanes are required In some cases, lanes may necessitate the removal of parking spaces At this preliminary stage we propose to remove four (4) on-street parking spaces from 19th between Burnside and Couch We will add approximately 30 spaces on Vaughn between 24th and 27th

While it may not seem appropriate to limit parking, I think cyclists deserve one entirely safe street without having to battle traffic on the left and open car doors on the right. People who lose parking will not be happy, but perhaps they could lobby the city for a city-run parking lot/space/garage in the area.

While developing a city street exclusive for bicycles and pedestrians is a nice idea, at this time in Northwest Portland it would be politically and practically unfeasible. Wide-scale parking removal is also a difficult and politically unpopular idea in Northwest Portland at this time. Thus, this project seeks to implement as safe and useful bikeways as possible within the political and practical realities of Northwest Portland.

I'd like to see a "woonerf"

A woonerf, or "living street," would be wonderful, but unlikely within the scope of this project. However, bicycle boulevards are intended to be similar to the low volumes/slow auto traffic environment that a woonerf provides.

Voted for option 3 [ed: removing on-street parking] because 1 got to move the flow 2 choose free parking to remove 3 safer. I think use SW Montgomery all the way. Why use Vista which is steep, narrow, busy? Everett railroad track crossing should be smoother.

As part of this project, we are looking at improving selected railroad crossings within the project area, including those on Everett and Glisan in segments not presently slated for bike lanes. Neither Vista nor Montgomery is being considered for bike lanes as part of this project, both are on the Bicycle Master Plan and will be considered for future implementation.

This really doesn't deal with NW - but I really would like to see bike lanes on 20th (from Broadway NE to Hawthorne SE - maybe even past Division - take away the parked cars as that street is too narrow).

We've looked at doing this. However, there are a number of high-density residential developments along 20th with no off-street parking that require on-street parking. Removing parking on 20th, which is the only way to provide lanes, would be very difficult. Alternatives we are developing include a bike boulevard on 16th from NE Irving to Ladd's Circle. This project is funded and will be implemented this summer. At the northern end bicyclists can cross the Banfield at 12th, and continue on bike lanes along 16th Way to 16th Ave up to Broadway/Weidler. Also, NE/SE 28th is part of our recommended network. This street provides good connections to the existing bike lanes on SE 26th, and with a proposed bike boulevard on NE 29th. At present, there is no funding for developing 28th.

Publicize plans-help make people realize cyclists have a legal right to travel to roads (as well as an environmental imperative) Tell motorists to open car doors slowly & carefully-we're all had horrible near misses Also I've had someone try to run me off the roads

There is clearly a lot more education needed for both bicyclists and motorists We are exploring creating a permanent traffic education facility for children that will educate them about being good pedestrians, bicyclists, and motorists The Bicycle Program continues to work on ways to provide better education for motorists and bicyclists

I would definitely use this! Would make for a much nicer, safer neighborhood Let's get it done

All for bikes-what impact on handicapped people is looked into-NW is very busy and access streets should be limited Keep cars off freeway & freeway intersections

This project should have no negative impact on access for the handicapped At some locations where we are considering curb extensions, the pedestrian environment will benefit Bikes are not allowed on freeways within the urban area

"Shared Lane" concept is interesting - if the lane is wide enough, it can be shared side-by-side car/bike But then it's probably wide enough for a bike lane to be added If it's not wide enough for side-by-side sharing-then wouldn't it have to be shared by car & bike one behind the other In this case, the shared area is the whole width of the travel lane How would you make this clear to drivers? Wouldn't it mean that they'd be required (?) to follow a bike through the shared area?

The lane would not be wide enough to be shared side-by-side We would provide signing and pavement markings to alert motorists to the presence of bicyclists on the road and reinforce the idea that motorists should share the road and be careful Yes, it would likely mean that motorists would follow bicyclists through a shared area if the motorist could not safely switch lanes

I live at 21st and NW Everett Portland, Oregon
I am opposed to bike lanes on any streets in NW Portland OR

Johnson Street is used as a thoroughfare for commuters coming from Westover (at 25th) (or up from) down to 23rd Controlling speed & volume of this flow would help make this safer as a bicycle boulevard Please try not remove any parking (or travel lanes) in this project

We'll look carefully at Johnson to learn what we can about auto volumes and speeds Parking removal in the project area, if it occurs at all, will be minimal The overall result of the project for Northwest Portland will likely be the addition of parking because we're proposing to add approximately 30 spaces to Vaughn between 24th and 27th and remove four spaces on 19th between Burnside and Couch, and approximately a dozen spaces on 14th and 16th

The "shared" lane concept seems too confusing for some people-maybe signs that say bikes have right-of-way next 3 blocks or bike lanes resume in 3 blocks/cars share right lane w/bikes next 3 blocks

We would make the signing as clear as possible

The proposal for bike lane, shows it removed for 3 blocks due to heavy traffic volume [ed on 19th Ave] Surely this is just an area, where the presence of cycles needs to be enhanced, i.e., maintain the bike line. Are cyclists supposed to dismount? Over in NE Portland, on Weidler, a bike lane (on the right hand side, has caused the vehicle lanes to "kink" as you drive through the junction. I feel that all lanes should, where possible, be uniform and avoid causing enforced, or, uncalled for changes in a drivers field of view. Left lanes suddenly deviating can cause wrecks - to cars and bikes

Unfortunately, the very area where bike lanes might not fit is just the area where they are likely most needed. No, cyclists would not dismount, but would instead enter a shared-lane area-which would be clearly signed for both motorists and bicyclists. We are carefully evaluating 19th in the area between Hoyt and Everett to determine how we can provide bike lanes. We avoid changes in lane configuration where we can. Because of the road configuration on Weidler, and the need for a dedicated right-turn lane, we could not both provide a bicycle lane and keep the lanes straight

Please continue bike lane designations between East - West. The more lanes the better! Please make bike commuting safer! Thanks for your help!!!

I assume you are talking about Everett and Glisan. Everett and Glisan are being considered for possible improvement under a separate project--the Northwest Intersections Study--which has been ongoing for several years. Until that project makes some recommendations for those two streets, we will not attempt to implement bike lanes. The segments we have chosen on those streets--between 14th and 19th--can accommodate bike lanes with no change to existing lane and parking configurations. The other possible east-west streets that could benefit from lanes--Lovejoy and Marshall--are too narrow to stripe lanes without removing either a travel lane or on-street parking. Because those streets are two-way for much of their length a travel lane cannot be removed, the removal of on-street parking is likely politically unfeasible.

I am all for making NW more bike-friendly through the bicycle lanes and boulevards proposed. I have some design concerns, though, based on my experiences cycling in other parts of the City. Bike lanes can promote a false sense of security at intersections with heavy right-turn volumes. Dotted lines and/or jogged lanes may be appropriate to encourage cyclists to travel away from the edge of the road in these locations. Also, bicycle-actuated signals are imperative at all signalized intersections that are not timed along bikeways.

Where needed, we will provide pavement markings to indicate where bicyclists should position their bicycles to activate the signals. We are always looking at ways to improve the safety of bicycle-motorist crossings, particularly at intersections, and are already investigating advisory markings and/or signing at and through intersections.

NW 14th Glisan to Johnson 1 Best - no loss of parking 2 Better - remove the parking on west side of street not east side

A bike lane cannot be provided on NW 14th between Glisan and Johnson without removing something. Because 14th is a Major City Traffic Street, we don't feel it is desirable to remove a travel lane. We will look at removing as little parking as possible, and on the west, rather than east side of the street.

I support parking removal on 14th & 16th. Continue bike lanes on 18th and 19th (fat chance). Thanks - make it great.

We'll work on it!

NW Lovejoy from 19th to 14th - consider a bike lane. This is a one-way east bound segment. & How about westbound bike lane on Marshall - same 14th-19th segment.

Lovejoy between 19th and 14th can likely support a bike lane with the removal of one travel lane (to complete the bike lane "couplet" a lane would be provided on Marshall for this stretch, as well). However, there are two projects that will affect transportation on Lovejoy that are already on the books: the removing of the Lovejoy viaduct between 14th and 9th, and the proposed streetcar project. Before proceeding with a bike lane on Lovejoy, we need to consider how it would affect these other projects. We are continuing to explore this possibility, though.

Look at spot improvements for cyclists - i.e. - fixing semi-diverters/diverters so cyclists can use them look at 29/Wilson, 27/Upshur, 29th/Quimby - other areas Also connection to Front Ave - via 14th

The diverter at 29th and Wilson is already ramped on the east side of the street There is presently some deterioration there due to construction Presumably this will be repaired following construction There is also a ramped sidewalk to cross this diverter on the west side of the street The semi-diverter at 27th and Upshur can be signed "Do Not Enter Except Bicycles" for northbound traffic Southbound bicycles can either use the sidewalk or cross as a pedestrian until the road widens and has two-way traffic again Apparently, our Maintenance Bureau looked at, and decided against modifying the diverter at 29th and Quimby Presently, there are sidewalk ramps that can be used by bicycles The connection to Front via 14th requires some work on the railroad crossings, which are in disrepair We have budget for improving 4-5 crossings and have to prioritize, these will likely not make the final cut

Connect 18th & 19th lanes across B-side to Stadium light connect 24 via counterflow between Glisan & Flanders to Uptown/23rd Pl bike lanes

The counter-flow lane you suggest is part of our preliminary design We'll look at connections across Burnside for 18th/19th, though south of Morrison Street the light rail does not allow adequate width for bike lanes

I have concerns about traffic congestion turning 18th & 19th to one lane traffic for most of NW. Shared lanes do not sound safer. Parking on streets difficult and narrowing lanes can make the time needed to park longer. What #'s are used to determine the expected usage of all bike lanes? How often (during 24 hr) will they be used? Do you use similar criteria as used with stop signs, placements or crosswalks or traffic signals?

Traffic congestion will increase if these streets are changed to one lane from two, but it will not be more than the streets can handle. Presently, 18th and 19th are both being used as major through streets in the neighborhood although they are classified as local service streets. One lane will also slow traffic (traffic will flow at the speed of the slowest vehicle in a line), and traffic wishing to go through the district, rather than local traffic, may seek other routes more appropriate to through traffic, such as 21st, 14th, and 16th. Parking should not be more difficult as the width of the remaining travel lane will be 14 feet, compared to the existing 10 foot lanes. Regarding usage of bike lanes, we have no specific numbers for bicycle use in the Northwest, however, bikes are allowed on all but limited-access streets (freeways and highways), so the question is how to best provide for them. We have seen dramatic increases in ridership city-wide over the past few years. There are no hard criteria used for bicycles, the models just have not been developed. Instead, we rely on the criteria for striping bike lanes and creating bike boulevards as spelled out in the City's Bicycle Master Plan, which also identified most of the project streets in the Northwest as recommended bikeways.

I would like to see Thurman, from 23rd Ave to Forest Park, be a bike boulevard. This is a heavily used section. In terms of priorities I hope you emphasize the connection from the Burnside Bridge to the NW & vice versa. Lanes on Couch, Everett & Glisan are more crucial than 18th & 19th. I also think that 20th Ave should be the primary N/S Route. It is already calmed due to the Couch Park encroachment of thru-traffic. Even w/lanes on 18th or 19th, I would still prefer 20th Ave, especially if the northern section of NW (north of Pettygrove to the Highway) gets developed w/high densities. This will increase traffic on 18th & 19th & would make the elimination of an auto lane very difficult.

Presently, Thurman is recommended as a signed connection, which means no boulevard treatment, but just signing to indicate its connections. We'll take a look at it as a potential boulevard. Couch Street will provide the best, planned connection between the Burnside Bridge and Northwest. Everett and Glisan, because they are being considered for improvements under a separate project, will not be addressed, except for the sections between 14th and 19th where lanes can be provided without affecting existing traffic patterns. We will take a look at developing 20th as a bike boulevard and still continue with bike lanes on 18th and 19th as they provide signalized crossings of difficult crossings and therefore provide the easiest north-south connections through the district.

Bike lanes in the NW are badly needed. I'm happy to see the proposed bike lanes on 18th & 19th. I would also like to see bike boulevards on Couch. Turning Couch into a bicycle blvd would provide a good connection between downtown and NW, something which currently does not exist and is badly needed.

I always favor the streets least used by cars. Therefore I almost never use 18th, 19th, 21st, 23rd, Lovejoy, Everett, Glisan except when they are the only routes (e.g., Lovejoy overpass). I ride 22nd, 20th, 17th, Yamhill and Morrison (to & from downtown), Northrup. I rather not push more cars off the arterials that they are using now. I really don't have much problem with cars in traffic. The best thing to help me as a cyclist is to reduce car's speed and numbers in the neighborhood. Why are there more cyclists in Asia & Europe? Because they have better bikeways? High gasoline taxes make more sense to me with funds going to bike programs and mass transit.

Developing bike lanes on 18th and 19th is for those cyclists who prefer to use the most direct, signalized (and therefore more trafficked) streets. As with any vehicle, the choice of which street to use is entirely up to you. This project is intended to provide safe and direct facilities on streets in the Northwest so as to create a comprehensive network in the district. Better bikeways have proven to increase cycling, although higher costs associated with driving would obviously create a more compelling incentive to use mass transit and bicycles.

We like your proposed west bikeways particularly 18th, 19th, Flanders, Couch, Alder. Thank you.

My major concern is to see 19th and 18th Avenues as safe for biking as possible. A "striped" bike lane for as long as possible. From 16th Ave eastward on Lovejoy (on ramp to Broadway Bridge) is currently a nightmare. Anything that can be done would be beneficial. NW Glisan and NW Everett t/from downtown also need attention.

We will look at Lovejoy from 19th to the viaduct beginning at 14th. Any decision about Lovejoy will be influenced by the plans to bring down the Lovejoy viaduct between 14th and 9th, something slated to begin within the next year and a half. There is also a streetcar proposed for Lovejoy, that will also impact bicyclists. Everett and Glisan are being considered under a separate project (the Northwest Intersections Study) and will not be touched until some recommendations come out of that project.

Seems good to me. I'd stress that it's important to provide easy ways to get in and out of the neighborhood. So routes like Alder St (in/out of downtown), NW 24th Ave (in/out to the north and Forest Park) and Couch (in/out of Old Town) are particularly important. Re the question of providing for bicycles in a narrow right-of-way (the questions where we voted). I chose removing a lane of auto traffic, but that is because I know parking is bad in the area. Where parking is not so tight (NW 14th, for example), removing parking would make more sense.

I live in NW Portland and commute to Beaverton. For me, there aren't any good routes to bike on. Cornell Rd is curvy & it is hard to see pedestrians and cyclists on the road. Most of the bicycle commuting efforts focus on routes to downtown PDX. It would be nice to explore options for people who don't work in downtown. I appreciate the efforts made & the time taken to host this open house. The copy of the bike network map is great & I will be reading the copy of the Bike Plan for NW that you have provided.

There is also a map published by Metro and available in many bike shops for \$3.95. The map is titled "Bike There", and is the best route map for the metropolitan area I've seen. We are looking at some spot shoulder widening improvements on Cornell, and would love to stripe it with lanes its entire length, but that is estimated to cost \$1,000,000, and we do not presently have the budget for that.

Please do not remove the stop sign at 20th & Flanders. This is a low-visibility intersection because of tall building close to the curb. Otherwise-looks great!!

We will take a close look at this intersection.

I'm concerned about the idea of reducing stop signs in the NW neighborhood. It is already very dangerous with 2-way stops (i.e., 20th & Flanders). Also 22nd & Flanders is very dangerous. The City has refused to put in 4-way stops because of the fear of congesting traffic. Wouldn't bikeways really congest the area?

No, bikeway traffic will generally not increase congestion, in fact, if some people get out of their cars and onto bikes, congestion will decrease. Congestion will likely increase in one area--on 19th in the vicinity of Hoyt to Everett if that street is narrowed to one travel lane. We will look very carefully at any intersection where we are considering moving stop signs.

Good graphic--makes sense to hold off on Everett & Glisan until transportation plan is complete--Flanders as a bike boulevard is fairly limited since you can't cross I-405.

True, there is no I-405 crossing at Flanders, but it provides a good connection to the east via Couch or Johnson.

Need 4-way stop at 20th, Flanders Too many accidents now! I am very concerned about removing traffic (auto) lanes on 18th & 19th These streets are quite busy now with emergency vehicles & regular traffic Cars trying to park through a bike lane sounds very hazardous to cyclists Other hazardous intersections that need 4-way stops are 18th & Flanders & 19th & Flanders How about turning 23rd into a pedestrian street? Provide parking at either end & a free trolley going back & forth

We will look at the intersections you mentioned to see if we can improve their operation Removing a travel lane on 18th and 19th will not affect the operation of emergency vehicles, in fact it should improve it as there will only be one lane of traffic to move over in a 14-foot lane, and it can move over into the bike lane to allow emergency vehicles to pass Parking through a bike lane is no more hazardous for either motorists or bicyclists than is parking through an existing travel lane Bikes will go around if you are blocking the bike lane While eliminating automobiles on 23rd is an interesting idea, it is well beyond the scope of this project I suggest talking to the Northwest District Association's transportation committee to see if they have any interest in championing that idea

Emergency vehicle access could be hindered by speed bumps, curb extensions, and decreased auto lanes on 1-way streets No curb extensions near fire hydrants Any removal of parking anywhere from Civic Stadium to Johnson on Kearney will be very difficult on residents as well as stadium goers

Decreased auto lanes should help emergency vehicles, because there will no longer be two lanes of automobiles, stacked side-by-side, with no room to move to the edges of the roadway Having just one travel lane will give ample width for motor vehicles to move to the side of the roadway surface to allow emergency vehicles passage Curb extensions usually extend as far out into the roadway surface as a parked car, and should not hinder emergency vehicles any more than existing parked cars do Speed bumps can slow vehicles, and are usually not placed on emergency response routes Before placing any curb extensions near fire hydrants we will talk with the Fire and Water Bureaus to make sure it is acceptable to them Parking removal will be minimal--we're looking at removing only four spaces on 19th in the block between Burnside and Couch

I live on Lovejoy and while I love the idea of bike lanes on my street, I worry about narrow space on a street like Lovejoy if 2 traffic lanes remain, 2 parking lanes remain and 2 bike lanes were added. It makes for tighter quarters, and I wonder if bicyclists suffer or do drivers drive more slowly and cautiously? In such "narrow" situations, I wonder if nearby bike boulevards would suffice. Just wondering.

We have removed most of Lovejoy from consideration for bike lanes because either a strip of parking or a travel lane needs to be removed to accommodate bicycle lanes. On the segment of Lovejoy that is two-way, only a parking strip can be removed, which is politically unfeasible. We will look at providing bike lanes on Lovejoy between 19th and 14th, but only if we can remove a travel lane without significantly affecting its operation for motor vehicles, and without disrupting plans for removing the viaduct to 9th and providing a streetcar.

1 Discontinuous lanes on 19th are troublesome-what about using turn pockets to minimize bike lane loss? 2 Can enough really be done on the east/west "boulevard" candidate street (like Overton, etc.) to make a significant difference? Crossing of 23rd and 21st remain major problems. How about consolidated project with signal @ Overton? 3 20th and Flanders is a large group intersection-maybe install 4-way stop? Have frequently almost been hit here by cars on Flanders failing to stop or see bike traffic on 20th. Others have also remarked on this tonight.

We will attempt to maintain the bike lanes the entire length of 19th. On the boulevard streets we will look for opportunities to improve the crossings, with curb extensions at a minimum, and to move stop signs to provide more through passage on the street. Flanders and 20th is an intersection oft-mentioned at the open house--we'll take a look at it.

How will the proposed condos at the end of 28th Place affect the bike lanes on Wardway?

The development will have access to and egress from Wardway. A 2-foot center median will be constructed so vehicles entering or exiting the development can turn right, only. The width of the divider will not interfere with our plans to provide a bike lane.

Going west on NW Wardway after NW 27th a bike lane will cause more problems than just ending it at 27th. Most bicyclists go left at the bottom of Wardway and can go as fast as traffic down the hill. Just make the signal sensitive to bikes.

A bike lane westbound on Wardway past 27th is unlikely to cause more trouble than the lack of a lane. Throughout the project area we will provide signal markings to indicate the proper positioning for bicyclists to trip signals.

19th & 18th from Marshall north are heavy commercial travelled. By going to one lane will cause more problems with congestion and accidents.

Yes, congestion will likely increase. There should be little affect on accidents, if anything, reduced speeds (with one travel lane everybody goes at the speed of the slowest car in line) and no opportunities to change lanes could reduce certain types of accidents. It is because that these streets are so heavily travelled that bicycle lanes are needed. We are conducting a study to see where traffic enters 19th and where it exits in order to better understand how that street is being used and to where traffic might divert.

Wonderful project for pedestrians & bicycles to experience the city, particularly this NW area. Hope to create a good model for a city. Thank you.

I liked the stickers! Well-prepared visual aids. Friendly, helpful folks to answer questions.

The industrial area is too busy to narrow streets for bikes. Trucks are now 100" + mirrors wide. I think contract work to change curbs is far too high.

I assume you are referring to Front Ave. For the time being, Front Ave is removed from consideration for bike lanes at the recommendation of Portland's Bicycle Advisory Committee due to the many difficult railroad crossings.

I would have liked to see residents on involved streets receive maps denoting the possible streets.

All residents in the project area received two mailings that listed the streets being considered for bike lane and bike boulevard treatments and announced the open houses. Also listed on the cards was a staff phone number, address, and email address so those interested in finding out more could contact staff even if they could not attend either open house.

For the long-term consider limited access to 24th from Lovejoy, Thurman, & Vaughn. Place full curb extensions at these intersections blocking in-flowing traffic.

Full curb extensions would not block traffic from entering 24th, only traffic diverters would accomplish that, and preventing traffic from entering 24th from these cross streets is beyond the scope of this project.

I think the bike boulevards are fine. Making crossings easier with curb extensions is fine. My main hesitation or objection is to taking the travel lanes out of 18th and 19th. I think we need these streets for cars. Northwest Portland has only one good auto street in each direction, Everett going east, Glisan going west, 18th going north, and 19th going south. We need to keep these to keep auto traffic off of smaller streets. And by the way--why no opportunity to vote on the 18th and 19th plans? You should have at least let people have an opportunity to say whether they like it or not. (Other than comment cards--people might not take the time to comment at length)

I think you're doing a great job so far. I'd like to see something like a Dutch "woonerf" on a street like Flanders.

18th and 19th are classified as Local Service Streets and are not intended--by policy--to carry arterial-type traffic. We are looking at how 19th is being used, it is likely that much of the traffic currently using 19th at rush hour could divert to a more appropriately classified street.

Regarding voting, residents had opportunity through this process to voice their opinions about the Northwest Bikeways Plan by either attending the open houses or contacting staff at the phone number, email, address, printed on the post cards every resident received.

At the present it is unlikely a woonerf, or "living street" could be developed in Northwest Portland. Perhaps at a future time when residents are more receptive to the ideas of less traffic and promoting alternatives.

Appendix F: Bike Lane Safety: Summary of Studies and Reports

1 Evaluation of Shared-Use Facilities for Bicycles and Motor Vehicles in Florida

Background A study conducted by North Carolina's Highway Safety Research Center demonstrates that striped bike lanes significantly improve both bicyclist and motorist safety. By clearly defining the roadway surface for both users, striped bike lanes result in two main safety gains: they reduce both the frequency and extent to which motorists swerve into the adjacent lane when passing cyclists, and they bicyclists to get further away from the curb—which is a safer place for them to be.

The study, conducted by David L. Harkey, Transportation Research Engineer, in 1995-1996, addressed the following two questions: *Which type of bicycle facility (wide curb lane vs. marked bicycle lane vs. paved shoulder) provides the most comfortable environment for bicyclists and motorists?*, and *What are the primary differences between the facility types with respect to motor vehicle and bicycle operations?* The researchers observed and video-taped the behavior of bicyclists and motorists when motorists passed bicyclists. More than 1,500 such passes were taped and analyzed. The following gauges of safety were measured:

- separation distance between the motorist and bicyclist (i.e., how much room was there between vehicles when the motorist passed?),
- distance between the bicyclist and the edge of the roadway (how close to the edge of the roadway did the bicyclist veer when being passed?),
- change in lateral position of the motorist while passing the bicyclist (how much did the motorist change their line of travel when passing?), and
- motor-vehicle encroachments while passing the bicyclist (how far did the motorist veer into adjacent lanes of traffic when passing the bicyclist?)

The researchers compared roadways with similar width, traffic volumes, and posted speed limits. The other difference between them was whether the outside lane was shared (i.e., no markings indicating travel lane for bicyclists), marked with a legal bicycle lane, or striped with a shoulder.

Findings The principal findings were:

- 1 The separation distance between bicyclists and motorists did not vary greatly by type of facility.
- 2 The distance between the bicyclist and the edge of the roadway was considerably less on wide curb lanes compared to striped lanes.
- 3 Motor vehicles moved further to the left when passing bicyclists on wide curb lanes (i.e., non-striped streets) compared to striped bike lanes or shoulders.
- 4 The percentage of motor vehicles encroaching into the adjacent left lane (i.e., crossing either the double yellow or dashed white lines) when passing a bicyclist was much higher on wide curb lanes compared to striped bike lanes or shoulders.

Interpretation and Conclusions Motorists are willing to accept a slightly smaller separation distance

when there is a stripe on the roadway designating distinct spaces for both the bicyclist and motorist. In other words, without a stripe that clearly delineates who should be where, motorists tend to swerve left and bicyclists crowd right when a motorist is passing.

Striped lanes offer three distinct advantages:

- 1 Motorists are much less likely to encroach into the adjacent lane when passing a bicyclist within a striped area.
- 2 Motorists have less variation in their lane placement (i.e., they tend to track straighter) when passing a bicyclist within a striped area.
- 3 Bicyclists are more likely to ride further from the edge of the roadway in a striped area than in a non-striped area.

All three advantages result in improved safety for both the bicyclist and motorist.

The study author concluded that "the presence of the stripe separating bicyclists from motor vehicles results in fewer erratic maneuvers on the part of motorists and enhances the comfort level for all roadway users."

2 Relative Danger Accident Rates for Various Bicycle Facilities

A survey study conducted by William E. Moritz, Ph.D., at the University of Washington, compiled information from 1,199 bicycle club cyclists in Washington and from 2,374 other North American cyclists. The Washington riders logged more than 3 million riding miles in 1994, 65% of these miles were recreational and 25% were commuting miles. The North American riders commuted 4.4 million miles to work or school for the period from mid-year 1994 to mid-year 1995.

Both surveys gathered data on serious crashes (defined to involve personal injury and/or property damage of \$50 or more). The North American group experienced a significantly higher overall accident rate than did the Washington group (61.4 versus 22.7 accidents per million miles). However, when the data is analyzed by facility type, a very similar pattern emerged for the two groups. The below Relative Danger Index was calculated by dividing the fraction of accidents occurring on a particular facility by the fraction of miles ridden on that facility.

Relative Danger Index

Facility	Washington Cyclists	North American Cyclists
Major Streets (w/o bike lanes)	1 03	1 28
Minor Streets (w/o bike lanes)	0 86	1 04
Bike lanes/Routes	0.36	0.50
Mixed-Use Paths	1 27	0 67
Off-Road	6 06	n/a
Sidewalks	n/a	5 32

Moritz concluded that "the data clearly indicates that streets with bike lanes are significantly safer than both major and minor streets without special bicycle facilities on a per mile basis "

3 Closer to Home

Two reports on bicycle lanes from the late 1970s in Oregon also demonstrate the safety offered by bike lanes. In 1979, Eugene striped bike lanes on 18th Avenue. One year later, in a report to City Council, the city reported that the introduction of lanes had resulted in an increase in bicycle use and a "substantial reduction in the bicycle accident rate." The bicycle crash rate fell from 4.5 crashes per 100,000 bicycle miles (1977) and 9 crashed per 100,000 miles (1978), to 3.9 in the first six months, and 2.6 in the following 12-month period following the striping of lanes. The motor vehicle crash rate also fell significantly.

Corvallis reported a similar experience after striping 13 miles of bike lanes in 1979. A newspaper story in 1982 reported that bicycle crashes fell from 40 in the year prior to the bike lane program to just 16 in the 12 months following their striping. Of the only five crashes that occurred on streets with bike lanes, all involved bicyclists riding at night without lights.

RESOLUTION No.

35615

Adopt the Northwest Bikeways Project to improve conditions for safe and convenient bicycling on the streets of Portland (Resolution)

WHEREAS, in May of 1996, City Council adopted a Bicycle Master Plan and directed the Office of Transportation to engage in activities aimed at implementing the projects called for in the Plan, and

WHEREAS, the Bicycle Master Plan identifies a citywide bikeway network to be developed to serve the needs of cyclists over the next 20 years, and

WHEREAS, surveys of cyclists in Portland and nationwide have consistently identified bicycle-related improvements to the street system as the best way to encourage increased bicycle use, and

WHEREAS, the use of bicycles for transportation directly improves air and water quality, reduces noise, saves energy, uses land more efficiently, reduces street maintenance costs, promotes neighborhood livability, saves individuals money and provides mobility, and improves health and fitness, and

WHEREAS, the Northwest Bikeways Project is the initial implementation of the Bicycle Master Plan and will provide 9 miles of bikeways that will enhance connections for cyclists to and from Downtown, the Pearl District, and Old Town, as well as neighborhood commercial areas, parks, schools, and other destinations, and

WHEREAS, the Northwest Bikeways Project is complementary to other projects underway, including Central City Bikeways, and

WHEREAS, the Northwest Bikeways Project has been approved by the City's Bicycle Advisory Committee, and the Northwest District Association, and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Portland, Oregon, that the Northwest Bikeways Project, attached as Exhibit A, is adopted and the Office of Transportation is directed to begin project implementation

Adopted by the Council
Commissioner Charlie Hales
R. Geller/emd
May 28 1997

MAY 28 1997

BARBARA CLARK
Auditor of the City of Portland

By *Britta Olson*

Deputy

RESOLUTION NO

35615

Title

Adopt the Northwest Bikeways Project to improve conditions for safe and convenient bicycling on the streets of Portland (Resolution)

<p>INTRODUCED BY</p> <p>Commissioner Charlie Hales</p> <p>NOTED BY COMMISSIONER</p> <p>Affairs</p> <p>Finance and Administration</p> <p>Safety <i>Ch Hales</i></p> <p>Utilities</p> <p>Works</p> <p>BUREAU APPROVAL</p> <p>Bureau Traffic Management</p> <p>Prepared by Date</p> <p>Roger Geller 5/20/97</p> <p>Budget Impact Review</p> <p>— Completed X — Not Required</p> <p>Bureau Head <i>B. Sparrman</i> Goran G. Sparrman, Director</p>	<p>Filed MAY 22 1997</p> <p style="text-align: center;">Barbara Clark Auditor of the City of Portland</p> <p>By <u><i>Cay Krohn</i></u> Deputy</p> <p>For Meeting of _____</p> <p>ACTION TAKEN</p>
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AGENDA		FOUR-FIFTHS AGENDA	COMMISSIONERS VOTED AS FOLLOWS		
				YEAS	NAYS
Consent	Regular XX				
NOTED BY		Francesconi	Francesconi	✓	
City Attorney		Hales	Hales	✓	
City Auditor		Kafoury	Kafoury	✓	
City Engineer		Sten	Sten	✓	
		Katz	Katz	✓	