

# Technical Report 5

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## *Bicycle System Inventory Analysis*

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## *Bicycle System Inventory*

### Project Purpose

The goal of the bicycle element of the Highway 99 plan is to provide mobility in the corridor. In other words, the bicycle element of the plan should facilitate the safe movement of bicyclists from downtown Vancouver to NE Salmon Creek Drive, and between activity areas in the Hwy 99 sub-area plan. Activity areas are defined as schools, parks, community, and commercial areas.

To ensure that the bicycle element of the Highway 99 plan meets this goal of mobility throughout the planning area, a detailed inventory of bicycle facilities was undertaken. Unlike pedestrian trips, bicycle trips are typically longer in length and used more often for purposes of a commuter trip. Both Public Works and Community Planning staff identified roads in the Highway 99 planning area that could facilitate bicycle mobility both through and within the Highway 99 planning area. Arterial and collector streets were a focus of the inventory.

Two products of the inventory are a map of the Highway 99 bicycle lane inventory (Appendix A) and a spreadsheet inventory of the bicycle system that includes a column prioritizes these roads for future ranking of bicycle improvement projects (Appendix B).

### Inventory Process

As previously mentioned, both Public Works staff and Community Planning staff met to agree on which streets should be inventoried. A bicycle lane with a stamped bicycle symbol was considered as a full bike-lane. The presence of a four foot shoulder or wider, without the bicycle lane stamp, was considered a partial bike lane.

Every street in the Highway 99 planning area was viewed with the aerial feature on Clarkview to determine if bicycle facilities were available. Similar to the sidewalk inventory, Clarkview was used (the County's Geographic Information System) for reviewing streets for whether or not adequate bicycle facilities were available. Clarkview has a feature called "aerial" which shows how an area appears from above. Google Earth was also used for areas where roads could not be clearly observed.

Members of the Clark County Bicycle Advisory Committee were consulted to provide information regarding bicycle facilities, or the lack thereof, and to solicit their opinion regarding streets to be given priority for future ranking for bicycle projects. A meeting was held with the Clark County Bicycle Advisory Committee on January 22<sup>nd</sup>, 2008 where they reviewed both the Highway 99 bicycle map and the inventory spreadsheet. A copy of both the map and the inventory spreadsheet were also emailed to the Clark County Bicycle Advisory Committee members for further review and comment. Their observations and suggestions proved invaluable to the bicycle inventory and project ranking processes.

This bicycle inventory map was also presented for comment at the Highway 99 Community Design Forum and Neighborhood Association meeting. This meeting was held on September

27<sup>th</sup>, 2007. The location of the meeting was the First Church of God at 3606 NE 78<sup>th</sup> Street in Vancouver, WA. This location, of course, was in the Highway 99 planning area.

## Database and Mapping

For the purposes of this inventory, only paved surfaces were reviewed for bicycle lanes.

Both the map and spreadsheet inventory includes the following descriptions:

1. FBL (Full Bike Lane) - As previously mentioned, a bicycle lane with a stamped bicycle symbol was considered a full bike lane. It is considered a full bike lane because the bike lane is clearly designated and intended for bicycles. In addition, the Clark County Arterial Atlas would show a facility as requiring a bike lane. NE 25<sup>th</sup> Avenue, for example, is designated as "C-2b." In other words it is designated a two lane collector road with bicycle lane. NE 25<sup>th</sup> Avenue has bicycle lanes on it that are clearly delineated.
2. PBL (Partial Bike Lane) - A road with four foot or wider shoulders were considered partial bike lanes. The shoulder is usually marked with a white stripe or "fog line." Several locations on Highway 99, for example, have a wide shoulder for bike lane. These shoulder areas, however, do not have the bike lane stamp.
3. NBL (No Bike Lane) - Road sections with no bike lane do not have a clearly marked bike lane and have shoulders narrower than four feet, or even no shoulders at all.

## Prioritization Approach

For bicycle improvements, Clark County Public Works currently has no set system of ranking. Both Clark County Community Planning Staff and Clark County Public Works staff are currently establishing criteria that will be used to rank future bicycle projects.

It was determined that not every street would be inventoried. Arterial and collector streets were inventoried. And local neighborhood streets, which were viewed as facilitating bicycle trips between activities, were also inventoried. Bicycle mobility within and through the Highway 99 planning area was agreed upon by both Public Works staff and Community Planning staff as an important priority for proposed bicycle facility improvement projects. Safety was also another accepted priority for proposed bicycle improvement projects. Public Works and Community Planning then performed a "first-cut" analysis of streets that would later be ranked in a future bicycle lane improvement ranking system.

Public Works and Community Planning then took a list of potential bicycle improvements to the Bicycle Advisory Committee for their review and comments. Street sections identified in Appendix B of this document were not ranked. Streets sections were instead assigned priority index numbers, and are not ranked within their given priority index numbers. The priority index addresses more the types of improvements that should or should not be considered.

Because no ranking criteria exist and because bicycle improvements can be operational as well as adding bike lanes, a different prioritization approach was used for bicycle facilities than sidewalks. For the roads with fully improved bike lane, no score was given on the

spreadsheet (Appendix B). The fully improved roads are also white in color on the spreadsheet and are located at the bottom of the spreadsheet.

Roads where a Capital improvement project will occur were given a score of "0." And they are shown toward the top of the bicycle inventory spreadsheet and are yellow in color.

Roads sections that met the priorities identified by the Bicycle Advisory Committee, Public Works staff, and Community Planning staff for providing key bicycle connections were placed toward the top of the spreadsheet (Appendix B). In other words, these road sections need to have full-bike lanes placed on them. They were given a priority index number of "1" and are shown as green on the spreadsheet.

Unlike the sidewalk inventory spreadsheet, the bicycle spreadsheet includes a category for operational improvements. Road sections given priority for operational projects could have existing fully improved bike lanes. Examples of operational improvements include placing signal loop detectors in the bike lanes or re-stripping bike lanes so they are located to the left of dedicated right-turn lanes. These street sections were given a priority index number of "2" and are shown as blue in color on the spreadsheet (Appendix B). Since few streets were given a priority index number of "2" for operational improvements, please refer to the text of this document for a description of these operational improvements instead of finding the description of those specific improvements on the spreadsheet (Appendix B). The description of the proposed operational improvement is located on page 6 of this document, under the heading of "Street sections recommended for operational improvements."

Finally, roads that had either partial or no bike lanes and were not deemed to be a current priority for road improvements were given a priority index number of "3" and are pink in color. The priority index number of "3" does mean, however, that these road sections should be considered when another round of ranking for bicycle improvement projects occur in the future.

### **Priority Index score for fully improved streets and streets with future road projects**

As previously mentioned, streets with Full Bike Lane (FBL) were given no score and are shown as white in color on the bicycle inventory spreadsheet (Appendix B).

The following streets were given a "0" score because they are slated for improvement projects that will include bike lane:

- NE 88<sup>th</sup> Street: Highway 99 to BPA Right-of-Way
- Highway 99: NE 119<sup>th</sup> Street to NE 104<sup>th</sup> Street
- NE Salmon Creek Avenue: I-205 to NE 119<sup>th</sup> Street

### **Streets considered as priorities for bike lane improvements**

As previously mentioned, street sections that should be given priority for bike lane improvements were given a priority index of "1." They are yellow in color on the spreadsheet (Appendix B). Please note that these streets are recommended for being the first to be considered for formal ranking for adding bicycle lanes. These streets are not ranked in Appendix B of this technical report. When a formal ranking system is established, these streets from the Highway 99 planning area should be the first to be included in that process.

The following street sections were supported by Public Works and the Bicycle Advisory Committee because these roads facilitate east-west movement within the Highway 99 sub-area plan:

- **NE 99<sup>th</sup> Street** (NE Hazel Dell Avenue to NE 25<sup>th</sup> Avenue)-Members of the Bicycle Advisory Committee believed this bicycle connection would facilitate connections to the new transit center that was built on NE 99<sup>th</sup> Street, near its intersection with NE 7<sup>th</sup> Avenue.
- **NE 78<sup>th</sup> Street** (NE Hazel Dell Avenue to NE 13<sup>th</sup> Avenue)-These road sections were also considered priority improvements because they facilitate east-west movement in the Highway 99 planning area.

The following street sections were supported by Public Works and the Bicycle Advisory Committee because these roads facilitate north-south movement through the Highway 99 sub-area plan:

- **Highway 99** (NE 63<sup>rd</sup> Street to NE 129<sup>th</sup> Street)-Highway 99 facilitates the most direct route for bicyclists attempting to ride from downtown Vancouver up to Salmon Creek. It needs to have full bike lanes all the way through the planning area, in locations where full-bike lanes are currently not present.
- **Highway 99** (NE Minnehaha Street to City Limits)-One key area on Highway 99 is its intersection with the railroad bridge located just south of NE 63<sup>rd</sup> Street. Public Works currently is planning to revise the lane configuration, or combine lanes, so that bike lanes can be added. One suggestion, for now, is to place signs before and after the bridge notifying motorists that bicyclists may be present through the bridge area. This section of Highway 99 should ultimately be widened under the bridge for full bike-lanes. In addition, bike lanes need to be provided to facilitate bicycle traffic from NE Ross Street to Highway 99.
- **NE Hazel Dell Avenue** (NE 77<sup>th</sup> Street to NE 78<sup>th</sup> Street)-Although NE Hazel Dell is not technically located within the planning area; it represents an alternative to Highway 99 for bicycle traffic. Per the members of the Bicycle Advisory Committee, bicyclists should be able to safely use both NE Hazel Dell Avenue and Highway 99 for north-south movement through the planning area.

The following streets are given a priority of "1" because of they are adjacent to schools:

- **NE 23<sup>rd</sup> Avenue** (NE 104 Street to NE 99<sup>th</sup> Street)-Part of this road section runs by Sarah J. Anderson Elementary. The Washington Department of Transportation (WSDOT) has funded a project for the section of NE 23<sup>rd</sup> Avenue (NE 100 Street to NE 102<sup>nd</sup> Street), however, only shoulder will be provided for bicyclists. It is recommended this road be constructed with full-bike lane for the students, as well as, bicyclists in the residential area.
- **NE 104<sup>th</sup> Street** (Highway 99 to NE 23<sup>rd</sup> Avenue)-This proposed road will facilitate bicycle traffic from the existing residential area to Highway 99. This street section also serves pedestrians from the neighborhood to Sarah J. Anderson Elementary school. WSDOT is also funding a sidewalk improvement project on this section to provide a connection between Sarah J. Anderson elementary and Gaiser Middle School. Only shoulder will be provided for bicyclists. It is recommended that full bike-lane should be provided in this area.

The following street is a currently proposed neighborhood street, which means the classification does not require bicycle lanes be constructed when this road section is built. The Bicycle Advisory Committee recommended that this street include bike lanes when it is constructed, because the bike lanes will facilitate bicycle traffic from the neighborhood to major roads:

- **NE 15<sup>th</sup> Avenue** (NE 96<sup>th</sup> Way to NE 88<sup>th</sup> Street)-The proposed road will facilitate bicycle traffic from NE 88<sup>th</sup> Street ultimately north to Highway 99.

### **Street sections recommended for operational improvements**

Per the recommendation of the Bicycle Advisory Committee, some of streets were recommended for operational improvements. Streets to be considered for formal ranking for operational improvements are given the priority index number of "2" and are blue in color. Those streets with a description of those operational improvements are as follows:

- **Highway 99** (NE 68<sup>th</sup> Street to NE 96<sup>th</sup> Way; NE 102<sup>nd</sup> Street to NE 104<sup>th</sup> Street; and NE 134<sup>th</sup> Street to NE 20<sup>th</sup> Avenue)-These sections of Highway 99 already have full bike-lanes; however, the bike lanes need to be moved so that it is to the left of the existing dedicated right-turn lane. A cross-section of this proposed improvement is located in Appendix C of this document.
- **NE Hazel Dell Avenue** (NE 59<sup>th</sup> Street to NE 117<sup>th</sup> Street)-The Bicycle Advisory Committee suggested that intersection signal loops be installed in the existing bike lane near major intersections, so that bicyclists would have the ability to trip the street signal. The two most important intersections, for placement of signal loops, would be NE 78<sup>th</sup> Street and NE 99<sup>th</sup> Street.

### **Projects to be considered in future bicycle project ranking lists**

The rest of the streets without full bike-lane facilities to be considered at a future date were given a priority index number of "3." These sections of road do need full bike-lanes. It is recommended that the roads with the priority index of "3" be eventually submitted to Public Works for future ranking. Circulation plans for these areas need to be prepared most likely prior to ranking to identify the roads that will best facilitate bicycle traffic. They are pink in color on the spreadsheet in Appendix B.

## **Key Findings**

Not many bicycle connections are available in the Highway 99 planning area. Highway 99 itself represents a key impediment to bicycle circulation. Traffic is heavy on this road and it does not have full, continuous bike-lane on the entire section of road. Pockets without bike lane do exist on this road.

On the south side of Highway 99, the railroad bridge represents another key impediment. Public Works currently plans to re-stripe the lanes under the bridge so that bike lanes can be retrofitted, as part of an upcoming slurry seal project. This solution is a temporary measure until a permanent solution can be implemented. The bridge ultimately needs to be replaced and the road widened underneath.

Access to and from the JD Ross Substation Complex on the south side of the Highway 99 planning area needs to be considered. As part of the Highway 99 bicycle improvement project located south of NE 63<sup>rd</sup> Street, bicycle facilities need to be provided to serve bicycle traffic from the Ross Complex site to Highway 99.

Providing a system of off-road bike paths would be another consideration for the Highway 99 sub-area plan. Two trails are located in the Highway 99 planning area. The Salmon Creek Trail is located on the far north side of the Highway 99 planning area and the Ellen Davis Trail along NE Minnehaha is located on the south end.

The Salmon Creek trail meanders primarily on the northwest side of the Highway 99 planning area. With the replacement of Kline line bridge and improvements to its surrounding roads, the Salmon Creek trail will extend eastward toward the BPA right-of-way. It is too steep around I-205 and NE Salmon Creek Avenue to easily provide bicycle connections to the BPA right-of-way. Other ways to connect the BPA right-of-way to the Salmon Creek trail would require further investigation.

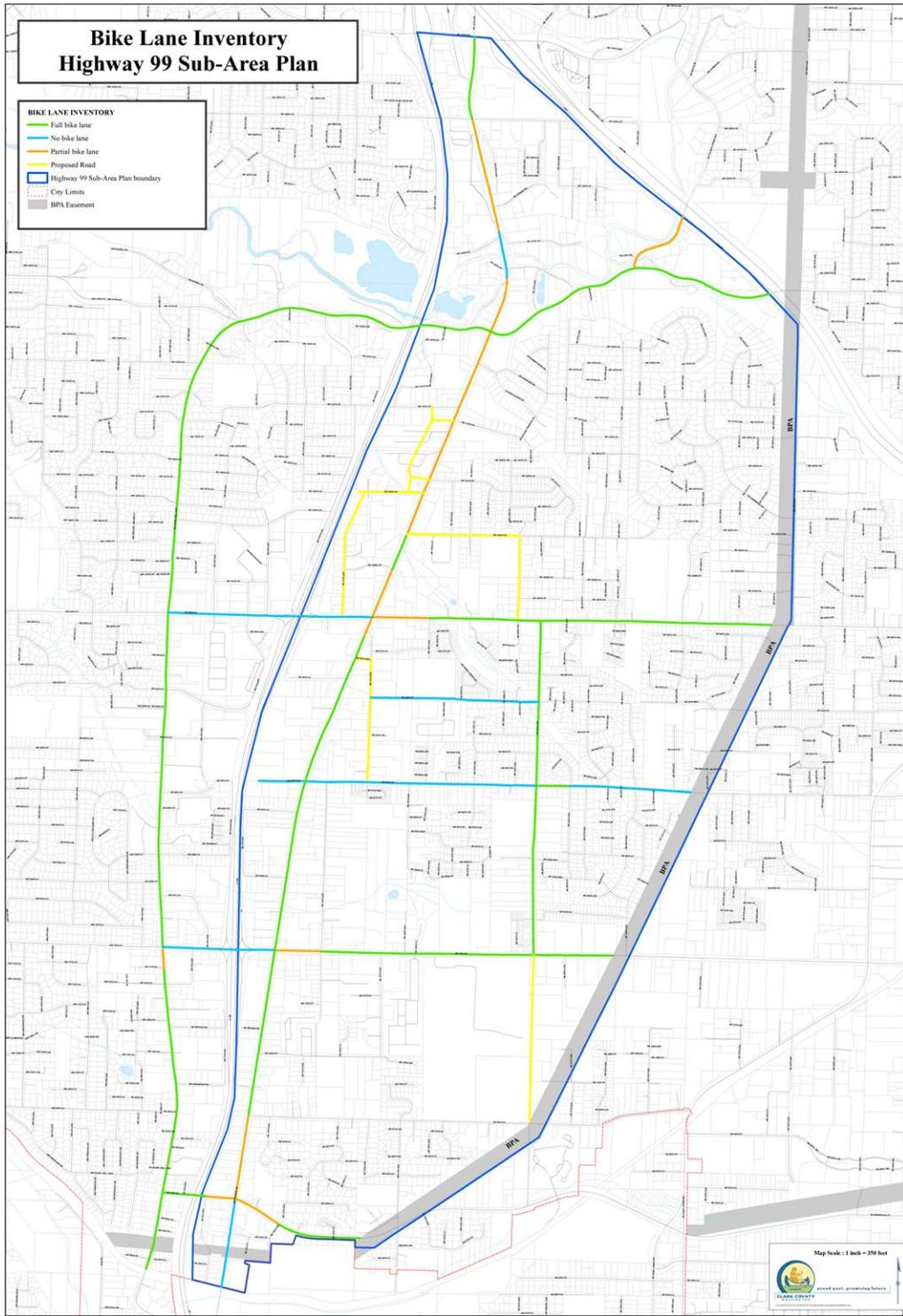
The Ellen Davis trail is a multi-use trail for both bicyclists and hikers. It begins east of the Highway 99 planning area on NE St. James Road, just south of its intersection with NE Minnehaha Street. It follows Burnt Bridge Creek through the BPA right-of-way and the Ross Complex, on NE 54<sup>th</sup> Street, then the trail turns south along a shared trail that leads to Leverich Park. The trail then winds south to NE 45<sup>th</sup> Street and west to Kiggins Bowl where the trail terminates. NE Minnehaha Street provides a parallel, fully paved bicycle connection, however, Highway 99 would need to be fully improved with bike lanes to facilitate bike traffic to Leverich Park. As previously mentioned, a bike connection needs to be provided from Ross Complex to Highway 99.

The Vancouver-Clark Parks Department is in the process of preparing a plan for a multi-use trail to follow the Chelatchie Prairie Rail. As part of this proposal, the Burnt Bridge Creek gap will be completed at Highway 99 and the Ross Complex. It will provide a connection between the Ellen Davis Trail and the future Chelatchie Prairie trail.

The Bonneville Power Administration (BPA) easement that borders the east side of the Highway 99 planning area represents a final consideration. Perhaps a shared bicycle and pedestrian path could be provided along the BPA right-of-way. East-west connections to the BPA are also a key consideration. As part of the future Chelatchie Prairie Trail, a connection should be made between the future Chelatchie Prairie Trail and the proposed multi-use trail on BPA right-of-way. This connection would need to cross Cold Creek. NE 78<sup>th</sup> Street provides a flat connection with full bike-lane. Intersection signal buttons and/or pedestrian islands may need to be provided at the intersection of NE 78<sup>th</sup> Street and the BPA right-of-way. NE 99<sup>th</sup> Street near the BPA easement is too steep to provide a bicycle connection.

## **Appendix A Bike Lane Inventory Map**

### Bicycle Lane Inventory



**Appendix B: Highway 99 Bicycle Lane Inventory Spreadsheet**

Priority Index	Street Name	From	To	Functional Class	Total Length of Section (in feet)	Bicycle lane status
0	NE 88th Street	Highway 99	BPA R/W	C-2cb	6,103'	NBL
0	Highway 99	NE 119th Street	NE 104th Street	Pr-4cb	4,463'	PBL
0	NE Salmon Creek Avenue	I-205	NE 119th Street	C-2cb	1,204'	PBL
1	NE 99th Street	NE Hazel Dell Avenue	I-5	C-2	2,016'	NBL
1	NE 99th Street	I-5	Highway 99	C-2	1,098'	NBL
1	NE 99th Street	Highway 99	NE 25th Avenue	M-4b	869'	PBL
1	NE 78th Street	NE Hazel Dell Avenue	I-5	Pr-4cb	1,119'	NBL
1	NE 78th Street	Highway 99	I-5	Pr-4cb	411'	NBL
1	NE 78th Street	Highway 99	NE 13th Avenue	Pr-4cb	735'	PBL
1	Highway 99	NE NE 119th Street	NE 121st Street	Pr-4cb	545'	NBL
1	Highway 99	NE Minnehaha Street	City Limits	Pr-4cb	1,372'	NBL
1	Highway 99	NE 129th Street	NE 121st Street	Pr-4cb	2,015'	PBL
1	Highway 99	NE 102nd Street	NE 96th Way	Pr-4cb	1,102'	PBL
1	Highway 99	NE 68th Street	NE 63rd Street	Pr-4cb	1,299'	PBL
1	NE Hazel Dell Avenue	NE 77th Street	NE 78th Street	M-2cb	330'	PBL
1	NE 104th Street	Highway 99	NE 23rd Avenue	Neighborhood Route	1,770'	Proposed Road
1	NE 23rd Avenue	NE 104th Street	NE 99th Street	Neighborhood Route	329'	Proposed Road
1	NE 15th Avenue	NE 96th Way	NE 88th Street	Neighborhood Route	1,758'	Proposed Road
2	Highway 99	NE 134th Street	NE 20th Avenue	C-2cb	838'	FBL
2	Highway 99	NE 104th Street	NE 102nd Street	Pr-4cb	612'	FBL
2	Highway 99	NE 96th Way	NE 68th Street	Pr-4cb	7,781'	FBL
2	NE Hazel Dell Avenue	NE 77th Street	NE 117th Street	M-2cb	9,681'	FBL
2	NE Hazel Dell Avenue	NE 59th Street	NE 77th Street	M-2cb	4,578'	FBL
3	NE 88th Circle	dead-end	Highway 99	C-2cb	922'	NBL
3	NE 94th Street	NE 15th Avenue	NE 25th Avenue	Neighborhood Route	2,586'	NBL
3	NE 63rd Street	I-5	NE 11th Avenue	M-4cb	1,338'	PBL
3	NE 96th Way	Highway 99	NE 15th Avenue	local	249'	NBL
	NE 117th Street	I-5	I-205	M-2cb	5,978'	FBL
	NE 117th Street	NE Hazel Dell Avenue	I-5	M-2cb	1,227'	FBL
	NE 20th Avenue	NE 134th Street	Highway 99	Pr-4cb	676'	FBL
	NE 25th Avenue	NE 99th Street	NE 78th Street	C-2cb	5,266'	FBL
	NE 63rd Street	NE Hazel Dell Avenue	I-5	M-4cb	524'	FBL
	NE 63rd Street	NE 11th Avenue	BPA R/W	M-4cb	1,407'	FBL
	NE 78th Street	NE 13th Avenue	BPA R/W	Pr-4cb	4,616'	FBL
	NE 99th Street	NE 25th Avenue	NE 32nd Avenue	M-2cb	2,172'	FBL
	NE 99th Street	NE 32nd Avenue	BPA R/W	M-4cb	1,414'	FBL

**Appendix C: Bicycle Lane and dedicated right-turn cross-section detail**

