

## DRAFT MEMORANDUM

**DATE:** October 9, 2006

**TO:** Bill Hoffman, City of Portland

**FROM:** Peter Coffey, P.E.  
Alan Snook, AICP

**SUBJECT: Potential Streetcar Alignment Summary Evaluation**

P05092-005

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The purpose of this memorandum is to summarize the initial qualitative assessment of potential streetcar alignments that are proposed to operate in the downtown Portland area to connect Old Town/Chinatown to the Pearl District up in to the Northwest District (NW 23<sup>rd</sup> Avenue) area.

### ***Initial Findings***

Four potential alignments that accomplish this goal were assessed from a qualitative perspective. This assessment allows for a general overview to identify potential opportunities and/or constraints with each alignment and compare the potential alignments to one another. Categories assessed were impacts to capacity, impacts to traffic operations, impacts to parking, ability to cross I-405, bicycle/pedestrians conflicts and urban connectivity. Table 1 summarizes the assessment on a comparative basis by evaluating each of these categories on a scale from low to high.

Based on the qualitative assessment of the various potential alignment options, it is recommended that the Everett/Glisan (Alignment 2), Burnside/Couch/Everett (Alignment 3) and Burnside/Couch (Alignment 4) options be furthered in the process of consideration for additional quantitative assessment. It is not recommended to pursue an alignment utilizing Davis Street due to the cost and difficulty associated with crossing Interstate 405.

**Table 1: Potential Streetcar Alignment Options Summary Qualitative Evaluation Matrix**

Alignment Option	Alignment 1 Davis/Everett/Glisan	Alignment 2 Everett/Glisan	Alignment 3 Burnside/Couch/Everett	Alignment 4 Burnside/Couch
<b>Evaluation Criteria</b> <i>Description</i>	Starting in Old Town, the alignment follows NW Davis Street in the westbound direction and crosses Interstate 405 via a new overpass (the new overpass would add significant cost to this alignment). At NW 18 <sup>th</sup> Avenue the alignment runs northbound to NW Glisan Street and travels along NW Glisan Street westbound to NW 23 <sup>rd</sup> Avenue. At NW 23 <sup>rd</sup> Avenue the alignment heads southbound to NW Everett Street then travels eastbound on NW Everett Street crossing I-405 and turning southbound at NW 1 <sup>st</sup> Avenue to connect back with NW Davis Street.	The alignment is a single loop running westbound along NW Glisan Street from NW 2 <sup>nd</sup> Avenue, crossing over Interstate 405 on the existing NW Glisan Street overpass, then up to NW 23 <sup>rd</sup> Avenue where the alignment turns southbound. The alignment then runs along NW 23 <sup>rd</sup> Avenue (southbound) to NW Everett Street and runs eastbound along NW Everett Street, crossing over Interstate 405 on the existing NW Everett Street overpass down to NW 2 <sup>nd</sup> Avenue. The alignment then turns northbound on NW 2 <sup>nd</sup> Avenue and completes the loop by connecting back to NW Glisan Street.	Streetcar would travel westbound on NW Couch Street from NW 1 <sup>st</sup> Avenue to NW 19 <sup>th</sup> Avenue, then turn south to W Burnside and travel westbound on W Burnside up to NW 23 <sup>rd</sup> Avenue. At this point streetcar would travel north on NW 23 <sup>rd</sup> Avenue to NW Everett Street and turn eastbound to run along NW Everett Street to NW 19 <sup>th</sup> Avenue. The streetcar would then turn southbound and travel on NW 19 <sup>th</sup> Avenue to W Burnside to then turn eastbound and travel down W Burnside to NW 2 <sup>nd</sup> Avenue to complete the loop and connect back to NW Couch street via NW 2 <sup>nd</sup> Avenue.	Streetcar would travel westbound on NW Couch Street from NW 2 <sup>nd</sup> Avenue to NW 19 <sup>th</sup> Avenue, then turn south to W Burnside and travel westbound on W Burnside up past NW 23 <sup>rd</sup> Avenue. Once past NW 23 <sup>rd</sup> Avenue streetcar could utilize two options for turning back to run eastbound. The first utilizes W Burnside as a switchback point, and the second utilizes a side street north of W Burnside. Once back on W Burnside the eastbound streetcar would run along W Burnside from NW 23 <sup>rd</sup> Avenue to NW 2 <sup>nd</sup> Avenue then turn north and travel up to NW Couch Street completing the loop. Coordination of this alignment with the Burnside/Couch project could reduce potential cost of implementation.
<i>Impact to Capacity</i>	■	■	■	■
<i>Impact to Traffic Operations</i>	□	■	■	■
<i>Impact on Parking</i>	□	■	■	■
<i>Ability to cross I-405</i>	□	■	■	■
<i>Bicycle/Pedestrian Impacts</i>	■	■	■	■
<i>Urban Connectivity</i>				

**Evaluation Scale**

□	■	■	■
Low	Medium	High	High

## Alignments Options

Three alignment options were developed for this initial evaluation. The initial evaluation is focused on determining the opportunities and constraints associated with each of the potential alignments to determine if there are any fatal flaws associated with them, or if there are any areas that allow for increased opportunity of development, operations, safety and/or connectivity.

Each of the three alignment options are described in detail and accompanied by a graphic/map to show the exact alignment being evaluated.

### Alignment 1: Davis/Everett/Glisan

This alignment utilizes NW Davis Street, NW Everett Street and NW Glisan Street to create a “figure 8” loop connecting Old Town/Chinatown, Pearl District and NW District (NW 23<sup>rd</sup> Avenue). The alignment crosses Interstate 405 on both NW Davis Street (westbound) and NW Everett Street (eastbound). Starting in Old Town, the alignment follows NW Davis Street in the westbound direction and crosses Interstate 405 via a new overpass. At NW 18<sup>th</sup> Avenue the alignment runs northbound to NW Glisan Street and travels along NW Glisan Street westbound to NW 23<sup>rd</sup> Avenue. At NW 23<sup>rd</sup> Avenue the alignment heads southbound to NW Everett Street then travels eastbound on NW Everett Street crossing I-405 and turning southbound at NW 2<sup>nd</sup> Avenue to connect back with NW Davis Street. Figure 1 (located at the end of this memorandum) demonstrates the alignment of this option. Table 2 summarizes the potential opportunities and constraints with this alignment.

**Table 2: Alignment 1 Opportunities/Constraints**

	Opportunities	Constraints
<i>Impact to Capacity</i>	<ul style="list-style-type: none"> <li>▪ Use of Everett and Glisan couplet allows for minimal impact to potential capacity because of one-way street operation.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Streetcar operation on Davis is in one travel lane, creating capacity constraints in the westbound direction.</li> </ul>
<i>Impact to Traffic Operations</i>	<ul style="list-style-type: none"> <li>▪ One-way street operation on Everett/Glisan streets allows for better progression of streetcar.</li> <li>▪ Minimal potential impact to traffic operations (in Everett/Glisan section).</li> <li>▪ Minimal potential diversion west of I-405.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Two-way motor vehicle operations (on Davis) does not allow for optimal progression.</li> <li>▪ New signals along Davis could add to potential delay.</li> <li>▪ Need for signal at I-405 off-ramp.</li> <li>▪ Conflict with bicycle operations on 18<sup>th</sup> Avenue.</li> <li>▪ Minor diversion to surrounding parallel roadways east of I-405.</li> <li>▪ Cross-section on Everett/Glisan would require “skinny” lane (for non-streetcar lane).</li> <li>▪ Conflict with “festival street” on Davis between 3<sup>rd</sup>/4<sup>th</sup> Avenues.</li> </ul>
<i>Impact on Parking</i>	<ul style="list-style-type: none"> <li>▪ Could retain majority of existing parking on Everett/Glisan couplet, and 18<sup>th</sup> Avenue.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Cross-section on Davis would require removal of parking for approximately 16 blocks (about 80 parking stalls).</li> <li>▪ Stations on Everett/Glisan would impact existing parking.</li> <li>▪ Turns to/from NW 23<sup>rd</sup> Avenue would impact stalls near intersection.</li> </ul>

		<ul style="list-style-type: none"> <li>▪ Potential impact to parking on NW 23<sup>rd</sup> Avenue.</li> </ul>
<i>Ability to cross Interstate 405</i>	<ul style="list-style-type: none"> <li>▪ Utilizes one existing crossing on Couch Street.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Requires new overpass for Davis Street.</li> <li>▪ Difficult grade changes for new overpass.</li> <li>▪ Requires new signal at I-405 northbound off-ramp.</li> <li>▪ Using Sauvie Island bridge limited as new structure due to clearance issues (18 feet for streetcar, and only 15 feet available).</li> </ul>
<i>Bicycle/Pedestrian Conflicts</i>	<ul style="list-style-type: none"> <li>▪ New overpass on NW Davis could accommodate wider sidewalks and/or bicycle crossing facilities.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Conflict with existing bicycle operations on 18<sup>th</sup> Avenue.</li> </ul>

### ***Alignment 2: Everett/Glisan***

This alignment option utilizes NW Everett Street and NW Glisan Street to link Old Town/Chinatown to/from the NW District (NW 23<sup>rd</sup> Avenue). The alignment is a single loop running westbound along NW Glisan Street from NW 2<sup>nd</sup> Avenue, crossing over Interstate 405 on the existing NW Glisan Street overpass, then up to NW 23<sup>rd</sup> Avenue where the alignment turns southbound. The alignment then runs along NW 23<sup>rd</sup> Avenue (southbound) to NW Everett Street and runs eastbound along NW Everett Street, crossing over Interstate 405 on the existing NW Everett Street overpass down to NW 2<sup>nd</sup> Avenue. The alignment then turns northbound on NW 2<sup>nd</sup> Avenue and completes the loop by connecting back to NW Glisan Street. Figure 2 (located at the end of this memorandum) graphically represents this potential alignment. Table 3 summarizes the potential opportunities and constraints with this alignment.

***Table 3: Alignment 2 Opportunities/Constraints***

	<b>Opportunities</b>	<b>Constraints</b>
<i>Impact to Capacity</i>	<ul style="list-style-type: none"> <li>▪ Use of Everett and Glisan couplet allows for minimal impact to potential capacity because of one-way street operation.</li> <li>▪ Two travel lanes on each roadway allow for options for motor vehicles traveling behind streetcar.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Higher volume roadways could create infrequent lane imbalance due to streetcar stopping at stations.</li> </ul>
<i>Impact to Traffic Operations</i>	<ul style="list-style-type: none"> <li>▪ One-way street operation on Everett/Glisan streets allows for better progression of streetcar.</li> <li>▪ Minimal potential impact to traffic operations.</li> <li>▪ Minimal potential diversion.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Cross-section on Everett/Glisan would require “skinny” lane (for non-streetcar lane).</li> <li>▪ Potential minor delay for one travel lane due to station stops.</li> </ul>
<i>Impact on Parking</i>	<ul style="list-style-type: none"> <li>▪ Could retain majority of existing parking on Everett/Glisan couplet.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Stations on Everett/Glisan would impact existing parking.</li> <li>▪ Turns to/from NW 23<sup>rd</sup> Avenue would impact stalls near intersection.</li> <li>▪ Potential impact to parking on NW 23<sup>rd</sup> Avenue.</li> </ul>

<i>Ability to cross Interstate 405</i>	<ul style="list-style-type: none"> <li>Utilizes existing crossings on Everett and Glisan Streets.</li> </ul>	<ul style="list-style-type: none"> <li>Would require some reconstruction of the existing overpasses to accommodate streetcar operations (weight and clearance of streetcar).</li> <li>Potential impact to access I-405 via existing on/off ramps.</li> </ul>
<i>Bicycle/Pedestrian Conflicts</i>	<ul style="list-style-type: none"> <li>No conflict with existing (or planned) bicycle facilities</li> </ul>	<ul style="list-style-type: none"> <li>Difficult to operate bicycles in future along NW Everett or NW Glisan with streetcar presence (if those facilities were selected as bicycle facilities).</li> </ul>

### **Alignment 3: Burnside/Couch/Everett**

This potential alignment utilizes W Burnside, NW Couch and NW Everett Street to complete single loop that would service Old Town/Chinatown west to the NW District (NW 23<sup>rd</sup> Avenue). The streetcar would travel westbound on NW Couch Street from NW 2<sup>nd</sup> Avenue to NW 19<sup>th</sup> Avenue, then turn south to W Burnside and travel westbound on W Burnside up to NW 23<sup>rd</sup> Avenue. At this point streetcar would travel north on NW 23<sup>rd</sup> Avenue to NW Everett Street and turn eastbound to run along NW Everett Street to NW 19<sup>th</sup> Avenue. The streetcar would then turn southbound and travel on NW 19<sup>th</sup> Avenue to W Burnside to then turn eastbound and travel down W Burnside to NW 2<sup>nd</sup> Avenue to complete the loop and connect back to NW Couch Street via NW 2<sup>nd</sup> Avenue. This scenario creates a “figure 8” system that crosses over each other on NW 19<sup>th</sup> Avenue between W Burnside and NW Couch Street. Figure 3 (located at the end of this memorandum) shows how the couplet scenario option would be aligned. Table 4 summarizes the potential opportunities and constraints with this alignment.

**Table 4: Alignment 3 Opportunities/Constraints**

	<b>Opportunities</b>	<b>Constraints</b>
<i>Impact to Capacity</i>	<ul style="list-style-type: none"> <li>Use of proposed Burnside/Couch couplet allows for minimal impact to potential capacity because of one-way street operation.</li> </ul>	<ul style="list-style-type: none"> <li>Higher volume roadways could create infrequent lane imbalance due to streetcar stopping at stations.</li> </ul>
<i>Impact to Traffic Operations</i>	<ul style="list-style-type: none"> <li>One-way street operation on Burnside/Couch and Everett streets allows for better progression of streetcar.</li> <li>Minimal potential impact to traffic operations.</li> <li>Minimal potential diversion.</li> </ul>	<ul style="list-style-type: none"> <li>Potential minor delay for one travel lane on Burnside and on Couch Street due to station stops.</li> <li>Potential geometric and operational issues associated with Burnside/NW 23<sup>rd</sup> Avenue (westbound right turn requires sweeping radii for turn).</li> </ul>
<i>Impact on Parking</i>	<ul style="list-style-type: none"> <li>Could retain majority of existing parking on Everett Street couplet.</li> </ul>	<ul style="list-style-type: none"> <li>Cross-section on Couch would require removal of parking for approximately 16 blocks (about 80 parking stalls).</li> <li>Turns to/from NW 23<sup>rd</sup> Avenue would impact stalls near intersection.</li> <li>Potential impact to parking on NW 23<sup>rd</sup> Avenue.</li> <li>Limited ability to provide on-street parking on W Burnside from 19<sup>th</sup> Avenue to 23<sup>rd</sup> Avenue.</li> </ul>
<i>Ability to cross Interstate 405</i>	<ul style="list-style-type: none"> <li>Utilizes existing crossings on Burnside and Couch Streets.</li> </ul>	<ul style="list-style-type: none"> <li>Potential impact to access I-405 via existing on/off ramps.</li> </ul>

<i>Bicycle/Pedestrian Conflicts</i>	<ul style="list-style-type: none"> <li>▪ Proposed facilities could connect to Burnside Bridge for connectivity over the Willamette River.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Conflict with existing bicycle operations on 19<sup>th</sup> Avenue.</li> </ul>
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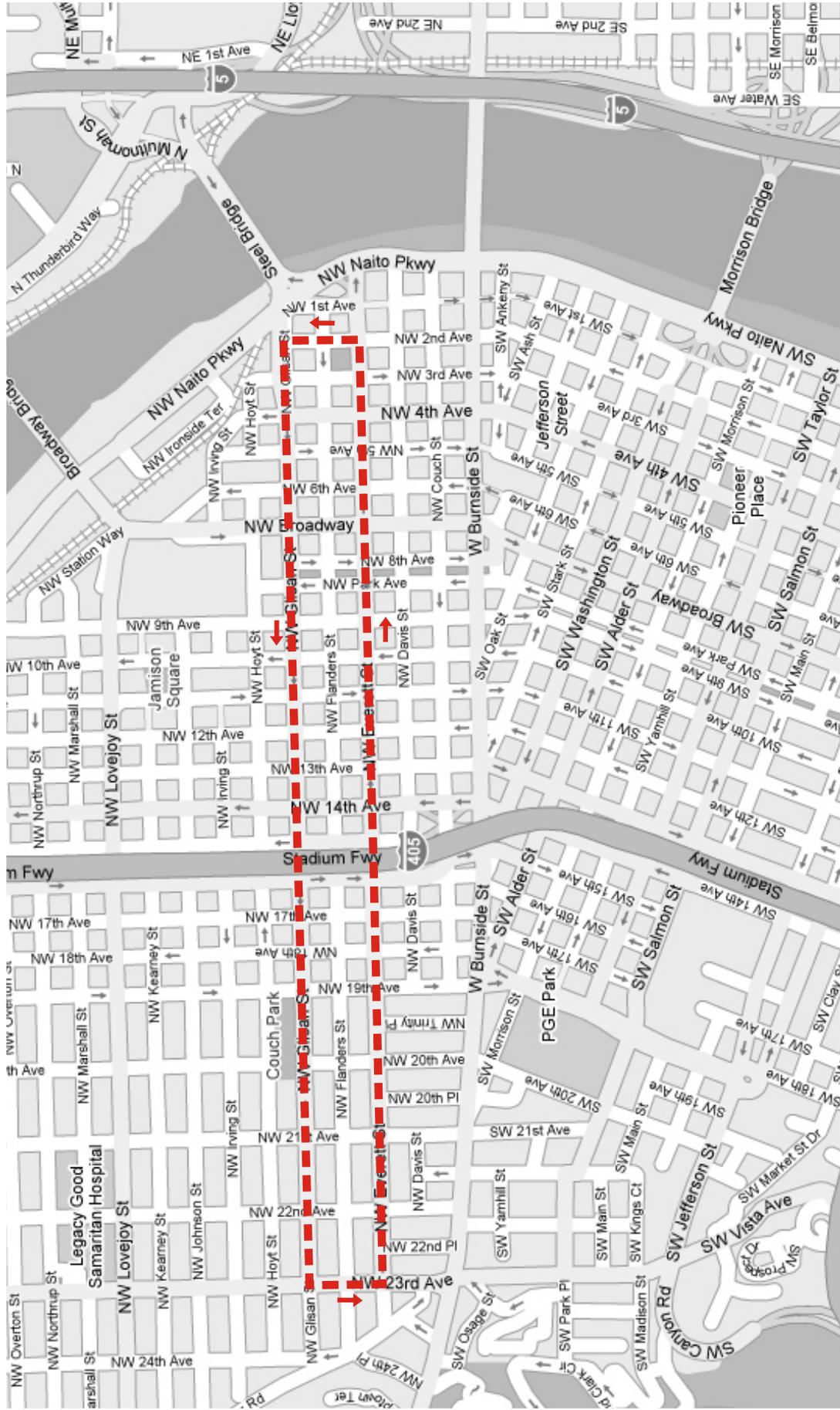
### ***Alignment 4: Burnside/Couch/Everett***

This alignment utilizes only W Burnside and NW Couch Street for circulation. The streetcar would travel westbound on NW Couch Street from NW 2<sup>nd</sup> Avenue to NW 19<sup>th</sup> Avenue, then turn south to W Burnside and travel westbound on W Burnside up past NW 23<sup>rd</sup> Avenue. Once past NW 23<sup>rd</sup> Avenue streetcar could utilize two options for turning back to run eastbound. The first utilizes W Burnside as a switchback point, and the second utilizes a side street north of W Burnside. Once back on W Burnside the eastbound streetcar would run along W Burnside from NW 23<sup>rd</sup> Avenue to NW 2<sup>nd</sup> Avenue then turn north and travel up to NW Couch Street completing the loop. Figure 4 (located at the end of this memorandum) shows how the couplet scenario option would be aligned. Table 5 summarizes the potential opportunities and constraints with this alignment.

***Table 5: Alignment 4 Opportunities/Constraints***

	<b>Opportunities</b>	<b>Constraints</b>
<i>Impact to Capacity</i>	<ul style="list-style-type: none"> <li>▪ Use of proposed Burnside/Couch couplet allows for minimal impact to potential capacity because of one-way street operation.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Higher volume roadways could create infrequent lane imbalance due to streetcar stopping at stations.</li> </ul>
<i>Impact to Traffic Operations</i>	<ul style="list-style-type: none"> <li>▪ One-way street operation on Burnside/Couch streets allows for better progression of streetcar.</li> <li>▪ Minimal potential impact to traffic operations.</li> <li>▪ Minimal potential diversion.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Potential minor delay for one travel lane on Burnside and on Couch Street due to station stops.</li> </ul>
<i>Impact on Parking</i>	<ul style="list-style-type: none"> <li>▪ Could plan for maximizing parking on W Burnside and NW Couch within couplet area.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Limited ability to provide on-street parking on W Burnside from 19<sup>th</sup> Avenue to 23<sup>rd</sup> Avenue.</li> </ul>
<i>Ability to cross Interstate 405</i>	<ul style="list-style-type: none"> <li>▪ Utilizes existing crossings on Burnside and Couch Streets.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Potential impact to access I-405 via existing on/off ramps.</li> </ul>
<i>Bicycle/Pedestrian Conflicts</i>	<ul style="list-style-type: none"> <li>▪ No conflict with existing (or planned) bicycle facilities</li> </ul>	<ul style="list-style-type: none"> <li>▪ Difficult to operate bicycles along W Burnside or NW Couch with streetcar presence (if those facilities were selected as bicycle facilities).</li> </ul>





Information Sources: DKS Associates  
Base map by Google Maps

**ALIGNMENT 2  
EVERETT/GLISAN**



- LEGEND**
- - - Potential Streetcar Alignment
  - Direction of Streetcar Travel



