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- Transportation
- Urban Design
- Streetcar
- Cost/Benefit Analysis
The Burnside/Couch project presented in this report covers a variety of alternatives that were analyzed to help verify and determine the best alternative for future uses of W Burnside and NW Couch Streets. This report is meant to provide a comprehensive overview of the analysis that took place. The analysis and evaluation resulted in a set of recommendations related to improving the transportation and urban livability along W Burnside and NW Couch Streets. Detailed design concepts, analysis reports and memoranda are contained in the supporting documentation section of this report to provide the detailed information that guided the decisions and recommendations of this project.

Background
In December 2002, the Burnside/Couch Transportation and Urban Design Plan was adopted by Portland City Council. This plan called for West Burnside Street to be converted to a one-way eastbound roadway from NW 15th Avenue to NW 2nd Avenue, and NW Couch Street to be converted to a one-way westbound roadway within the same limits.

When Commissioner Sam Adams took office in 2005, he felt it necessary to reevaluate the adopted Burnside/Couch plan. His evaluation focused on a variety of issues related to cost, urban planning, new development (and redevelopment), safety and streetcar operations just to name a few. Commissioner Adams wanted to revisit the prior adopted plan and verify that it was the best transportation, urban design and economic use of W Burnside and NW Couch Streets. To help accomplish this, he asked the Portland Office of Transportation to refine and analyze additional transportation and urban design concepts, as well as utilize the previous effort of analysis. In doing so he asked one primary question:

- **What is the best alternative for improving Burnside and Couch?**

Commissioner Adams was willing to entertain all concepts for analysis regardless of current policy, as long as all modes were balanced. This analysis allowed for all concerns to be addressed without any preconceived or predetermined outcome.

Ten transportation and urban design concepts were developed that considered traffic and transit operations, livability, and economic development potential. Each alternative was evaluated against transportation and urban design criteria, and was reviewed by the Stakeholder Advisory Committee, Northwest District Association, Old Town Chinatown, the Bureau of Planning and the Friends of Burnside and Couch (a non-profit property owner and neighborhood group).

Goals & Objectives
Through an in-depth exploration of the adopted plan and other potential alternatives the goal of the Burnside/Couch technical evaluation was to enable Commissioner Adams to better understand the detailed mechanics of the 2002 adopted Burnside Transportation and Urban Design Plan and to make a recommendation to City Council for implementation of the west segments of the project. Additionally, the goal included responding to City and public requests for additional analysis of alternatives.

The primary objective of the project focused on specific detailed transportation and urban design analysis to inform the decision making process.

The additional streetcar analysis goal was to preliminarily evaluate potential streetcar alignments that would fit within the regional transit system network, and be able to connect Old Town/Chinatown with the Pearl District up to NW 23rd Avenue while working with any recommended outcome of the Burnside/Couch project.

Study Area
The study area is along W Burnside and NW Couch Street from NW/SW 2nd Avenue west to NW 24th Place. This study area also includes portions of NW Couch Street from NW 2nd Avenue west up to NW 19th Avenue.
**Recommendation**

Implementation of the Extended Couplet to NW 19th Avenue with the addition of streetcar operations on W Burnside/NW Couch Street from NW 2nd Avenue to NW 24th Place. The streetcar would operate in the outside (curb) lanes in a four lane cross section on W Burnside from NW 19th Avenue to the west, and would operate in the outside (curb) lane on W Burnside and NW Couch Street with the direction of traffic flow between NW 2nd Avenue to NW 19th Avenue. The following shows this recommendation with prototypical cross-sections of the roadway.

**Key Findings**

**Transportation**
- Retain four lane cross-section on Burnside west of NW 19th Avenue.
- Extend one-way street network to include W Burnside and NW Couch Street.
- Pedestrian environment safer due to shorter street crossings and new signals.
- Up to 13% travel time savings.
- One-way street grid provides better access by providing left turn opportunities at signalized intersections.

**Urban Design**
- Provides greatest opportunity for significantly improving urban form.
- Provides stronger gateways and transitions between the public right-of-way and buildings.
- Provides the greatest number of opportunities for improving sustainability within the public right-of-way.

**Streetcar**
- Could operate within the proposed alternative.
- Retain four lane cross-section west of NW 19th Avenue to minimize potential delay to motor vehicle operations.
- Utilizes existing crossings of Interstate 405 to help minimize costs for implementation.
- Minimal potential delay to motor vehicles (approximately 15 seconds)
The transportation alternatives analysis and evaluation is part of a larger study of ten alternatives that propose improvements to West Burnside and NW Couch between the Burnside Bridge and NW 24th Place. Below is a list of supporting documents that are available following the Executive Summary.

- Burnside/Couch Alternatives Analysis Comparison Chart
- Assumptions for Evaluation
- Diversion Analysis Graphics
- Burnside/Couch Alternatives - Traffic Operations Criteria Summary
- West Burnside Couplet Alternative Analysis Transportation Evaluation Component
- Burnside/Couch One-way Street Grid Extension Memorandum

**Key Assumptions**

There were some key assumptions that were in place for analysis to be conducted. Many of these assumptions were asked to be provided by key stakeholders. The assumptions focused on the analysis period, planning horizon year, mode split, land uses and growth in traffic.

Additional detail regarding these assumptions can be found in the transportation section of the supporting documents at the end of this Executive Summary.

**Goals**

The transportation alternatives and analysis had specific goals in mind for evaluation.

- **Improve circulation and access for all modes of travel**
- **Provide balanced operations for all modes of travel**
- **Enhance safety for all modes of travel**

**Evaluation Criteria**

A variety of criteria were used to help evaluate each alternative. Some of these criteria were qualitative in nature, while other criteria were quantitative (having a measured value) in nature. The criteria were used for each alternative to be able to equally evaluate and compare the alternatives to one another. The following list summarizes the key evaluation criteria used for evaluation.

- **Auto Safety**
- **Pedestrian Safety**
- **Vehicle Operations**
- **Vehicle Access/Circulation**
- **Transit Operations**
- **Bicycle Mobility**
- **Diversion Acceptability**

Please refer to the transportation section in the supporting documentation for additional detailed criteria of evaluation for each alternative.

**Diversion Analysis**

All ten of the alternatives were modeled using the regional travel demand model to help determine the amount of vehicles that may divert from W Burnside to the surrounding roadways and neighborhoods.

The diversion analysis indicated that as capacity was taken off W Burnside (for example converting portions to a three lane cross-section), the impacts to surrounding neighborhoods increased.

For detailed diversion analysis information, graphics that show the diversion analysis can be found in the transportation section in the supporting documentation.

**Alternatives**

A number of alternatives were evaluated for this analysis. They focused on providing a variety of options to address the project goals and objectives while balancing the needs for all modes of travel along the corridor(s). The following are the 10 alternatives that were analyzed:

- No Action
- Proposed Couplet to NW 15th Avenue
- Truncated Couplet to NW 8th Avenue
- 5-4-3 Alternative
- Three Lane (1/1/1)
- Three Lane (2/1)
- Enhanced Existing
- Extended Couplet to NW 19th Avenue (three lane)
- Extended Couplet to NW 19th Avenue (four lane)
- Proposed Couplet to NW 15th Avenue (three lane)

The alternatives included some mixing and matching of alignments to provide due diligence that all options and concerns were being addressed. A graphical representation/comparison of these alternatives can be found in the supporting documents in the transportation section at the end of this Executive Summary.
**Key Findings**

- The proposed extension of the one-way grid network offers better traffic operations, and provides better travel time savings.

- The proposed extension of the one-way grid network helps to enhance pedestrian safety through shorter crossing distances, enhanced visibility and implementation of new signals for crossing. This should allow for a long term reduction in pedestrian collision rates.

- A three-lane cross section at the west end with one lane in each direction and a center turn lane has operational constraints for motor vehicles, including motor vehicle diversion to adjacent neighborhoods.

- Diversion of vehicles into surrounding study areas is the highest when the maximum amount of capacity is taken from W Burnside (which occurs under Alternatives 5-4-3, Three Lane (1/1/1), Three Lane (2/1), Extended Couplet to 19th Avenue (3 Lane) and Extended Couplet to 15th Avenue (3 Lane).

- Retaining a four lane cross section on W Burnside (to the west of 19th Avenue) minimizes diversion, and is essential for vehicle operations, as well as three lanes eastbound on W Burnside east of 4th Avenue.
**URBAN DESIGN**

The urban design analysis and evaluation is part of a larger study of ten alternatives that propose improvements to W Burnside and NW Couch between the Burnside Bridge and NW 24th Place. Below is a list of supporting documents that are available following the Executive Summary.

- **Burnside/Couch Alternatives Analysis Urban Design Technical Memorandum**
- **Burnside/Couch Alternatives Analysis Urban Design Analysis and Evaluation**

**Assumptions**

Three fundamental assumptions guided the urban design evaluation process:

- Burnside and Couch are both mixed use urban streets with ground floor commercial and retail combined with residential and office uses above. This pattern is found throughout much of the Central City.
- Quantity or volume of vehicles is not a significant issue. Rather, the issues are the imbalance between roadway and pedestrian space and vehicle speed and congestion.
- Burnside is grossly out of balance within the context of Portland’s Central City grid system. The lack of pedestrian space and excessive traffic speeds and congestion creates a barrier.

**General**

The urban design analysis and evaluation is part of a larger study of ten alternatives that propose improvements to W Burnside and NW Couch between the Burnside Bridge and NW 24th Place. Today, Burnside lacks area for people, parking and building access. By any standard, the sidewalks are far below acceptable widths and are uncomfortably narrow (mostly 8-feet west of the park blocks and 12-feet in the densest areas of lower Burnside) which prohibits any significant streetscape improvements that would invite pedestrians to use Burnside to access businesses or destinations.

**W Burnside between 5th and 6th Avenues showing 12-foot sidewalks without curb extensions at a bus stop.**

**Goals**

The urban design analysis had specific goals in mind for evaluation.

- **Answer one primary question:** What is the best alternative for improving Burnside and Couch?
- **Improve urban form**
- **Stitch Burnside into City’s walkable street system**
- **Strengthen gateways**
- **Make plazas and transitions between the public right-of-way and buildings**
- **Make Burnside a great place**
**Evaluation Criteria**

Five urban design evaluation criteria were developed as a basis for comparing each alternative against a No-Build/Existing Conditions alternative. They include human scale, urban form, urban identity, linkages and sustainability. Other statistical evaluation criteria such as economics, safety and bicycle and transit operations are found in the Transportation analysis section of this report.

**Human Scale**

The definition of “Human Scale” includes three parts: Pedestrian Scale, Objects and Elements of Scale and Balancing Scale.

**Pedestrian Scale:** Pedestrian scale refers to the relative size of objects, elements and spaces compared to the dimension and proportions of the human body.

For comfort and movement pedestrians need adequate space in addition to objects such as furnishings and utilities.

**Objects and Elements of Scale:** Objects and elements share and define the public right-of-way and organize the space between buildings and the roadway. Buildings establish enclosure by creating edges that reinforce the City’s block system and define urban scale of public spaces. Storefronts, building entries, public art, trees, street lights and landscape plantings define the human scale at street level and the hierarchy of spaces.

**Balancing Space:** A fundamental to reallocating urban space is how much area to assign to pedestrians. “Balancing space is a concept that is used to describe allotting space to meet pedestrian needs—encouraging a lively, active public space—while at the same time maintaining appropriate vehicular space for deliveries, parking, local access and through movement.”

**Urban Form**

Urban form refers to the shape of the City. The dimensions and interconnections between streets and public or private space at the ground plane establish the horizontal form of the City. Urban form is also defined by the edges and vertical planes formed by buildings, bridges and other objects that influence views and define the scale and shape of urban spaces.

**Urban Identity**

Urban Identity refers to the cultural and historical references within a place, such as architecture, memorials, civic developments, public art, public and private activities and monuments that define its identity.

Public art, cultural features, streetscape objects and architecture provide identity.

**Linkages**

Linkages refers to the paths, urban spaces and views that connect objects, features and destinations within neighborhoods, districts and the city.

**Sustainability**

Sustainability refers to the ability to integrate programs and practices that conserve energy, reduce waste and eliminate redundant processes.

Stormwater management and comfortable and convenient pedestrian access to transit and other destinations support sustainability.
How will NW Couch Street be improved?
The configuration of NW Couch Street will remain the same with on-street parking, 12-foot sidewalks and two 11-foot travel lanes. The proposed improvements will enhance both the function and environment of OldTown/Chinatown and the Pearl District. Benefits include:

- The character of NW Couch will not change. More blocks to the east will assume the character of the Brewery Blocks segment of NW Couch (ornamental street lights, street trees, curb extensions) which will add continuity between the Pearl District and Old Town/Chinatown.
- Additional traffic will benefit retailers along NW Couch.
- Left turns will improve access to residential and retail destinations around the Brewery Blocks.
- Left turns will help eliminate out-of-direction travel and confusing circulation for drivers using NW Couch to access areas south of W Burnside.
- Improving W Burnside with wider sidewalks and on-street parking will likely create more overall retail vitality from SW Washington Street to NW Davis Street.
- The NW Couch Street improvements will reduce pedestrian and auto conflicts especially at 10th and 11th where pedestrians and automobiles compete for the same space.
Extending the couplet to NW 19th Avenue

How will W Burnside and NW Couch Street be improved?

Extending the proposed improvements to W Burnside and NW Couch to NW 19th will enhance both the function and environment of those two streets. Benefits include:

- The character of NW Couch Street will be improved with curb extensions, street trees, street lights and streetcar service.
- Provides wider sidewalks (12-feet wide) with curb extensions on Burnside creating a more hospitable pedestrian environment.
- Improves pedestrian crossings with signalized intersections and reduced crossing distance. Provides on-street parking which is supportive of local retail and restaurants.
- 12-foot sidewalks allow adequate room for street trees and stormwater management.
- There is a higher chance of new development and redevelopment projects with on-street parking and wider sidewalks than under existing configuration.
- Provides better access to north and south retail and residential destinations with left turn capability.

Analysis

Each of the alternatives were evaluated on how well they met the Urban Design Evaluation Criteria on a scale of 1 to 5, where 1 is “Poor” and 5 is “Good”. Based on the initial evaluation, some alternatives were eliminated. Below is a matrix comparing four primary alternatives.

Urban Design Evaluation Criteria Matrix

Measure of Effectiveness: How well does each alternative address the evaluation criteria?

Evaluation Scale

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Alternative</th>
<th>No-build Alternative</th>
<th>Enhanced Existing</th>
<th>Proposed Couplet</th>
<th>Extended Couplet to 19th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Scale</td>
<td>☐ ☐ ☐ ☧ ☦</td>
<td>☐ ☐ ☦ ☧ ☦</td>
<td>☦ ☦ ☦ ☧ ☦</td>
<td>☦ ☦ ☦ ☧ ☦</td>
<td></td>
</tr>
<tr>
<td>Urban Form</td>
<td>☐ ☐ ☧ ☦ ☦</td>
<td>☐ ☦ ☦ ☧ ☦</td>
<td>☦ ☦ ☦ ☧ ☦</td>
<td>☦ ☦ ☦ ☧ ☦</td>
<td></td>
</tr>
<tr>
<td>Urban Identity</td>
<td>☦ ☦ ☦ ☦ ☦</td>
<td>☦ ☦ ☦ ☧ ☦</td>
<td>☦ ☦ ☦ ☧ ☦</td>
<td>☦ ☦ ☦ ☧ ☦</td>
<td></td>
</tr>
<tr>
<td>Linkages</td>
<td>☦ ☦ ☦ ☦ ☦</td>
<td>☦ ☦ ☦ ☧ ☦</td>
<td>☦ ☦ ☦ ☧ ☦</td>
<td>☦ ☦ ☦ ☧ ☦</td>
<td></td>
</tr>
<tr>
<td>Sustainability</td>
<td>☦ ☦ ☦ ☦ ☦</td>
<td>☦ ☦ ☦ ☧ ☦</td>
<td>☦ ☦ ☦ ☧ ☦</td>
<td>☦ ☦ ☦ ☧ ☦</td>
<td></td>
</tr>
</tbody>
</table>

Key Findings

- The No-Build/Existing Conditions alternative scored lowest while the Burnside/Couch one-way system to 19th Avenue scored highest. The other alternatives scored lower because they either preserved the imbalance between vehicular space and pedestrian space or made minimal contribution to improving linkages or changing the overall identity of Burnside.
- The Burnside/Couch one-way system provided the greatest opportunity for significantly improving urban form by better complementing the Central City’s walkable street system, providing stronger gateways, making plazas and providing transitions between the public right-of-way and buildings.
- The one-way system also provides the greatest number of opportunities for improving sustainability within the public right-of-way by enabling the greatest area for “green streets” applications, adding bicycle use to Burnside and significantly improved access to transit.
Proposed Improvements to W Burnside and NW Couch Streets

W Burnside looking east at the Crystal Ballroom

North Park Blocks gateway looking east on W Burnside

NW Couch Street at 5th looking east

NW Couch Street at NW 3rd looking east

NW Couch Street at NW 2nd looking south

W Burnside looking west from NW 2nd Ave
Proposed Improvements to W Burnside and NW Couch Street

Boulevard event on W Burnside looking west

Boulevard parking on W Burnside looking west

Bicycle Oasis in the boulevard at NW 3rd and W Burnside looking west

NW 4th Avenue looking north from W Burnside

W Burnside at NW 5th Avenue looking east

W Burnside gateway at 2nd looking north
An additional component was analyzed related to the potential for a streetcar to operate along the evaluated alternatives. The analysis looked at opportunities and constraints associated with potential streetcar alignments in the study area. Below is a list of supporting documents that are available following the Executive Summary:

- Potential Streetcar Alignment Summary Evaluation Memorandum
- Burnside/Couch Alternatives Urban Design Streetcar Alignment Alternatives

**Alignments**

Four potential streetcar alignments were analyzed that would potentially serve northwest and southwest Portland. Modal interchange, access, service area and development potential were analyzed for each alignment. These four alternatives were:

**Alignment 1: NW Davis/NW Everett/NW Glisan**

This alignment utilized NW Davis and NW Everett Streets east of I-405, and the NW Everett/NW Glisan couplet to the west of I-405. It would require a new overpass crossing of I-405 at the NW Davis Street alignment.

**Alignment 2: NW Everett/NW Glisan**

This alignment utilized NW Everett and NW Glisan Streets both east and west of I-405. It would utilize the existing crossings of I-405 on NW Everett and NW Glisan Streets.

**Alignment 3: W Burnside/NW Couch/NW Everett**

This alignment utilized W Burnside and NW Couch Streets east of I-405, and W Burnside and NW Everett Streets to the west of I-405. It would not require any new crossings of I-405 (utilizing W Burnside and NW Couch Street overpasses).

**Alignment 4: W Burnside/NW Couch**

This alignment utilized W Burnside and NW Couch Streets up to NW 19th Avenue, and the utilizes two-way operation on Burnside Street up to NW 24th Place. This alternative would not require any new crossings of I-405.

A qualitative transportation assessment was conducted for these four alternatives to help determine if there were any potential issues associated with the alignments.

**Opportunities/Constraints**

Each alternative had opportunities and constraints associated with their individual alignments. Of primary concern was crossing Interstate 405 and the affect to capacity on the roadway system.

The assessment showed that the NW Davis/NW Everett/NW Glisan alignment had significant constraints due to the requirement of a new overcrossing of I-405, and the potential conflict with the existing I-405 off-ramp. Changes in grade from the east side of I-405 to the west side of I-405 would make it difficult to construct a new overcrossing on the NW Davis Street alignment.

In addition, the NW Davis Street alignment would run through the newly constructed festival street between NW 3rd and 4th Avenues. These streets were constructed with the potential of being temporarily closed for special events.

All other alignments did not have these significant constraints.

**Goals**

The streetcar alternatives and analysis had specific goals in mind for evaluation.

- Provide east/west connectivity within Old Town, Chinatown, Pearl District and Northwest District
- Maximize nodal connectivity and intermodal connectivity
- Minimize potential impacts to traffic
- Maximize development potential along Burnside and Couch Streets
**Evaluation**

The alternatives were assessed based on their opportunities and constraints, as well as the potential to meet project goals and objectives. The following table summarizes the assessment using this criteria.

<table>
<thead>
<tr>
<th>Evaluation Scale</th>
<th>Alt 1: Davis/Everett/Glisan</th>
<th>Alt 2: Everett/Glisan</th>
<th>Alt 3: Burnside/Couch/Everett</th>
<th>Alt 4: Burnside/Couch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Medium</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Good</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

**Impact to Capacity**

- Alt 1: ●
- Alt 2: ●
- Alt 3: ●
- Alt 4: ●

**Impact to Traffic Operations**

- Alt 1: ○
- Alt 2: ○
- Alt 3: ○
- Alt 4: ●

**Impact on Parking**

- Alt 1: ○
- Alt 2: ●
- Alt 3: ●
- Alt 4: ●

**Ability to Cross I-405**

- Alt 1: ○
- Alt 2: ●
- Alt 3: ●
- Alt 4: ●

**Bicycle/Pedestrian Impacts**

- Alt 1: ●
- Alt 2: ●
- Alt 3: ○
- Alt 4: ●

**Overall Rating**

- Alt 1: ○
- Alt 2: ●
- Alt 3: ●
- Alt 4: ●

In addition to the criteria evaluated in the previous table, an assessment was conducted as to the potential impact to motor vehicle travel time with streetcar operations on Burnside/Couch.

*It is expected that the addition of a streetcar to any section of roadway that has two or more lanes of through travel would impact motor vehicle travel times by approximately 15 seconds (or less).*

The minimal impact to travel time is due to the fact that a motor vehicle traveling in the same direction of streetcar with two travel lanes has the opportunity to pass streetcar. If only one lane is available for both streetcar and motor vehicle, it is expected that every streetcar station would incur approximately 30 seconds of additional delay.

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**Key Findings**

- Based on the traffic evaluation the Burnside/Couch alignment seemed to meet more objectives related to operations while minimizing impacts to motor vehicles and other modes of travel.

- A similar qualitative assessment was conducted for both Urban Design and Economic components. Of the four alternatives, the Burnside and Couch alignment provided the greatest modal interchange with (4 connections including LRT, streetcar, and bus), most improved access, most convenient walking distance to destinations and highest potential for stimulating new development and regeneration of existing underutilized properties.

- The Burnside/Couch alignment could be phased to extend to the east side of the Willamette River and onto to Hollywood or to the Interstate 205 Park and Ride via Sandy Boulevard. The Sandy Boulevard corridor appears to have considerable development potential based on previous work by PDOT on the Sandy Streetscape project. Which is currently under construction.

- It is expected that cost savings of $500,000 per mile could be gained by combining the streetcar construction with the Burnside/Couch improvements. This could create a savings of approximately $1.5 million in construction costs over independent line construction.
COST-BENEFIT ANALYSIS

The following technical memoranda are found in the supporting documentation under Streetcar:

- Streetcar Cost and Benefit Technical Memorandum
- Burnside and Couch Transportation and Urban Design Plan Phase II, Catalyst Development Study, 2005

Cost of Street and Streetcar Improvements

Cost was derived by preparing planning level estimates for the street and streetcar improvements. Harper Houf Peterson Righellis prepared the cost estimate for the street improvements and Lloyd D. Lindley, ASLA prepared the streetcar estimates based on data provided by Portland Streetcar, Inc.

Cost estimates were based on concept-level plans for all three alternatives. Quantity takeoffs are in 2006 dollars.

The streetcar budget estimates are a general guide for magnitude of cost purposes only. Quantities may vary and specific utility costs are unknown. Material costs may escalate or decline over time which would affect any future costs.

A potential savings of $1.25-$1.5 million may be realized by constructing the Burnside and Couch street improvements and the streetcar line simultaneously.

<table>
<thead>
<tr>
<th>Alternative Description</th>
<th>Cost</th>
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<tbody>
<tr>
<td>1. Proposed couplet ends at 19th Avenue, with Burnside 4 lanes wide beyond couplet to 24th Place - Preferred Alternative</td>
<td>$40,837,185</td>
</tr>
<tr>
<td>2. Proposed couplet from 2nd – 16th with Burnside 4 lanes wide beyond couplet to 24th Place</td>
<td>$39,126,630</td>
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<tr>
<td>3. Enhanced Existing Alternative</td>
<td>$36,792,207</td>
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Westside Streetcar Preliminary Concept Estimate

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rolling Stock 3.0 each (3 vehicles)</td>
<td>9.0</td>
</tr>
<tr>
<td>Track Slab and 2 rails $1,000 / ft. 13,000 feet</td>
<td>13.0</td>
</tr>
<tr>
<td>Electrification $1.5/ mile (2.5 miles)</td>
<td>3.75</td>
</tr>
<tr>
<td>Stations $1000,000 each (20 stations)</td>
<td>2.0</td>
</tr>
<tr>
<td>60% Contingency</td>
<td>11.25</td>
</tr>
<tr>
<td>8% General Conditions O &amp; P</td>
<td>2.5</td>
</tr>
<tr>
<td>Subtotal construction</td>
<td>32.5</td>
</tr>
<tr>
<td>Engineering (20%)</td>
<td>6.5</td>
</tr>
<tr>
<td>Total</td>
<td>39.0</td>
</tr>
</tbody>
</table>

The summary table below compares the total cost of the three alternatives.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>With Streetcar</th>
<th>Without Streetcar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed Couplet to 19th</td>
<td>79.8 million</td>
<td>40.8 million</td>
</tr>
<tr>
<td>Proposed Couplet to 15th</td>
<td>78.1 million</td>
<td>39.1 million</td>
</tr>
<tr>
<td>Enhanced Existing</td>
<td>75.8 million</td>
<td>36.8 million</td>
</tr>
</tbody>
</table>

*Cost in 2006 dollars

LDL, PSI
**Benefit of Street and Streetcar Improvements**

The economic analysis for identifying the incremental benefits of the proposed improvements to Burnside and Couch including the streetcar is based on the methodology and financial background of the Portland Development Commission’s 2005 *Burnside and Couch Transportation and Urban Design Plan Phase II, Catalyst Development Study*. The methodology is based on specific catalyst development area sketch pro formas and trend analysis calculated over a 20-year analysis period.

Five new catalyst development areas were assumed for the west side in addition to the areas from the previous study. Three development scenarios were assumed for timing of new development. One would occur within five years of project completion, the second within 10 years, and the third within 15 years. The analysis further assumed property acquisition at Real Market Value (based on county assessor’s records) and 2006 construction costs.

The incremental development benefits of adding streetcar to Burnside and Couch were factored into the previous analysis model to derive MAV and net taxes over the 20-year planning horizon.

Project benefit was derived by calculating the difference between what the trended Maximum Assessed Value (MAV) would be if the project (including transportation and urban design improvements and catalyst development) moves forward as envisioned compared to the baseline trending of MAV without the project.

![SW 5th and SW Ankeny concept illustration looking north.](image)

![Estimated Maximum Assessed Value Without Project (Baseline) and With Project](chart)

![Estimated Annual Tax Collected Without Project (Baseline) and With Project](chart)
Analysis
Evaluating the benefits gained by extending the one-way street system to NW 19th Avenue and adding streetcar to the Burnside and Couch project was guided by the following six questions.

How much new development could be stimulated by adding Streetcar improvements?
The analysis focused on the West segment of Burnside and Couch from W 2 Avenue to NW 24 Place and approximately three blocks to the north and south. There appear to be a number of areas where development could occur over the next 20 years. Streetcar alone has demonstrated an ability to stimulate new development and the redevelopment of under developed properties. It is expected that the Burnside and Couch project with Streetcar service, new on-street parking, better access to north and south destinations, a safer environment for pedestrians and an improved overall image would bring added incentive for development.

How much could new taxable property values increase with the project?
New taxable property values would incrementally increase as much as $1.4 billion over a 20-year time frame ($145 million directly attributable to streetcar). See “Estimated Annual Tax Collected Without Project (Baseline) and With Project” (previous page). The $1.4 billion difference is between a $2.7 billion MAV with capital improvements and development investment, and a $1.3 billion MAV without improvements or catalyst development. This represents an 11.7% average growth rate in MAV over time, which is approximately 2% greater than the forecasted rate of 9.6% per annum from the 2005 analysis. The 11.7% growth rate is a 4.5% difference over the baseline MAV trend.

What could the project generate in new taxes?
An incremental increase in property tax return results from increased MAV. The project could produce an incremental increase of $28 million in new net property taxes per year in Year 20. At an assumed property tax rate of 2% of MAV, future property tax collections would increase to $53 million per year from the current $6 million per year collections with the project versus collections of $25 million per year without the project. The scenarios evaluated varied in their viability, with a number of currently viable development opportunities assuming Real Market Value for acquisition cost. The overall average gap as a percentage of cost is 3.2%.

Could a 10:1 or better return on investment be achieved?
Under the conditions and assumptions of this analysis it appears that a 10:1 return on investment ($800 million in MAV: $80 million capital cost) could occur as early as year 14 after completion of the project. A 10:1 return on public investment is a best practices benchmark for determining minimum acceptable return on the investment.

At what year would payback be achievable?
The earliest payback could be achieved by year 15. It should be noted that these conclusions are based on current market conditions. See “Estimated Annual Tax Collected Without Project (Baseline) and With Project.”

What is the incremental benefit of extending the Burnside and Couch one-way system to NW 19th Avenue and adding the streetcar?
For the five catalyst development areas, it was assumed that, over a 20 year period, the project would generate approximately 1,263 housing units, 120,000 square feet of retail, 171,000 square feet of office, and 1,663 supporting parking spaces. Streetcar would contribute $145 million in new MAV over 20 years after project completion.

NW 5th looking east to Couch illustrating new development opportunity.
Key Findings

- West Burnside and Couch improvements to NW 19th Avenue with streetcar are projected over the 20 year period to create an increased Net Assessed Value (NAV) of $1.4 billion which represents an 11.7% average NAV growth rate.

- The west side analysis indicates a 10:1 Return On Investment in the combined street and streetcar improvements by a minimum of Year 14.

- Streetcar improvements would contribute approximately $145 million over 20 years after completion.

- Potential savings by constructing streetcar in conjunction with the Burnside/Couch street project is estimated at $1.25 - $1.5M.

- New net taxes for the westside would total $28 M at Year 20.

- The earliest payback on $80 million capital improvements would occur in Year 15 after project completion.