Embracing Transit in Central Puget Sound: Challenges and Community-Building Opportunities

City of Bellevue

Seattle Planning Commission

2010 Conference
October 5 & 6, 2010
Kennewick, Washington
Session Speakers

Barb Wilson
Colie Hough-Beck, ASLA
Kevin McDonald, AICP
Presentation Outline

Downtown Bellevue Light Rail

• Sound Transit East Link
• Downtown Bellevue Concept Design Report
• Transportation Decision Criteria

Seattle Transit Communities

• Transit Modes Creating Opportunities
• Transit Community Typologies
• Recommendations
Bellevue population & employment

<table>
<thead>
<tr>
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<th>Employment Estimates</th>
<th>Employment Forecasts</th>
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<td>2030</td>
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<table>
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<tr>
<th>Year</th>
<th>Population Estimates</th>
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<td>2030</td>
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<td>148,400</td>
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</table>
Downtown Bellevue Today

2010 Estimates
5,500 Residents
38,000 Jobs
Downtown Bellevue Growth

2030 Forecasts
19,000 Residents
79,000 Jobs
Transportation Investments to Support Growth

• Regional
  o I-405, SR 520

• Local Roadways
  o Arterial Connections and Expansions
  o Operational Improvements

• Transit
  o Light Rail
  o Express and Local Bus

• Pedestrian and Bicycle
Sound Transit East Link
Downtown Seattle - Bellevue - Redmond
East Link – Sound Transit Preferred Alternatives
Downtown Alternatives

- Bellevue Way Tunnel (C1T)
- 106th NE Tunnel (C2T)
- 108th NE Tunnel (C3T)
- Couplet At-Grade (C4A)
- 112th NE Elevated (C7E)
- 110th NE Elevated (C8E)
Light Rail in Downtown Bellevue  
Finding the Best Fit  

Sound Transit Peer Review Panel – Oct 2009

• National Light Rail Experts
• Charge:
  ▪ Review analysis methodology
  ▪ Recommend changes to analysis methodology – not to state a preferred alignment
• Recommendations:
  ▪ Modify the alignments
  ▪ Sound Transit and Bellevue should collaborate rather than develop parallel analysis
Light Rail in Downtown Bellevue
Finding the Best Fit

Downtown Bellevue Light Rail Alternatives
Concept Design Report
FEBRUARY 2010

PREPARED FOR
Sound Transit

PREPARED BY
CH2M HILL
Concept Design Report

- Basis for comparing alternatives
- Not a recommendation
- Evaluation of conceptual designs
- Screening level analysis of environmental impacts
- Criteria and the methods used to assess each alternative
- Describes the relative trade-offs of the alternatives
- Visual simulations and graphics to illustrate how each alternative would look in Downtown Bellevue
Grade Separated Alternatives

C9T - 110th Avenue NE Tunnel

C14E - 114th Avenue NE Elevated
At Grade Alternatives

C9A - 110th Avenue NE At Grade

C11A - 108th Avenue NE At Grade

At-Grade
Elevated

Segment C
Segment B

CONNECTORS

Bellevue Transit Center Station

East Main Station

From B2A
From B3S

Scale in Miles
0 0.25

Bellevue Transit Center Station

108th Station

CONNECTORS

Scale in Miles
0 0.25

From B2A
From B3S
## Concept Design Report Evaluation Criteria

<table>
<thead>
<tr>
<th>Criteria category</th>
<th>Criteria</th>
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<tbody>
<tr>
<td>Cost</td>
<td>Capital cost</td>
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<tr>
<td>Land Use accessibility/Walk distance</td>
<td>Land use within walking distance of stations</td>
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<tr>
<td>Ridership</td>
<td>Estimated 2030 ridership and light rail travel time</td>
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<tr>
<td>Traffic operations</td>
<td>Downtown traffic congestion for vehicles</td>
</tr>
<tr>
<td>Environmental impacts</td>
<td>Displacements, Noise and vibration, Parks, Ecosystems</td>
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<tr>
<td>Construction effects</td>
<td>Construction effects</td>
</tr>
<tr>
<td>Construction risk</td>
<td>Construction risk</td>
</tr>
<tr>
<td>Consistency with City plans and policies</td>
<td>Consistency with policies related to downtown alignments</td>
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</table>
## Concept Design Report Evaluation Criteria

<table>
<thead>
<tr>
<th>2030 Downtown jobs within walking distance of a station</th>
<th>Percent within a 5 &amp; 10-minute walk</th>
</tr>
</thead>
<tbody>
<tr>
<td>2030 Downtown residents within walking distance of a station</td>
<td>Percent within a 5 &amp; 10-minute walk</td>
</tr>
<tr>
<td><strong>Traffic Operations</strong></td>
<td><strong>Southbound/Northbound vehicle travel time (minutes)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Eastbound/Westbound vehicle travel time (minutes)</strong></td>
</tr>
<tr>
<td></td>
<td>Percent of vehicle demand into and out of Downtown served</td>
</tr>
<tr>
<td></td>
<td>Average Downtown vehicle delay at intersections (seconds)</td>
</tr>
<tr>
<td></td>
<td>Average vehicle delay at key affected intersections (seconds)</td>
</tr>
</tbody>
</table>
Land Use Forecasting Zones
2030 Land Use Intensity

Darker colors indicate higher intensity in 2030
Development of Walksheds
Alternative C9A (At-Grade)
Alternative C9A (At-Grade)
Alternative C9A (At-Grade)
Walk Analysis
Alt C9A
(At-Grade)
Alternative C11A (At-Grade)
Alternative C11A (At-Grade)
Walk Analysis
Alt C11A
(At-Grade)
Alternative C9T (Tunnel)
Alternative C9T (Tunnel)
Walk Analysis
Alt C9T (Tunnel)
Alternative C14E (Elevated)
Alternative C14E (Elevated)
Walk Analysis
Alt C14E
(Elevated)
Walk Analysis
Primary Downtown stations
### Analysis Results Downtown Bellevue Alternatives

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Measure</th>
<th>C9T</th>
<th>C9A</th>
<th>C11A</th>
<th>C14E</th>
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</thead>
<tbody>
<tr>
<td>2030 Jobs 79,000</td>
<td>% w/in 5 minute walk</td>
<td>44%</td>
<td>51%</td>
<td>76%</td>
<td>27%</td>
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<tr>
<td></td>
<td>% w/in 10 minute walk</td>
<td>97%</td>
<td>96%</td>
<td>99%</td>
<td>79%</td>
</tr>
<tr>
<td>2030 Residents 19,000</td>
<td>% w/in 5 minute walk</td>
<td>21%</td>
<td>28%</td>
<td>53%</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td>% w/in 10 minute walk</td>
<td>66%</td>
<td>63%</td>
<td>92%</td>
<td>46%</td>
</tr>
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</table>
Downtown Bellevue Traffic Operations

Traffic Modeling and Analysis

• Travel Demand Modeling

• Traffic Simulation
Downtown Bellevue Light Rail/Traffic Modeling and Analysis Process

**MACRO ANALYSIS - BKR Travel Demand Model**

- Based on land use forecast (i.e., 2030)
- Where trips go on the street network
- SOV, HOV, Transit, Ped/Bike
- Trips assigned to specific streets

**Travel Demand (Traffic Volume)**

**Post Processing Analysis - BKR, Synchro Models**

- Turn movements & volumes at intersections
- Traffic volume on streets
- Level of Service (LOS)
- Signal Assumptions
- Iterative process to determine LOS

Typical model output shows PM Peak hour traffic volume for each lane at an intersection, and the Level of Service (LOS) at intersections.

**MICRO ANALYSIS - VISSIM Model**
2030 Roadway Configurations
Downtown Bellevue Travel Demand

350,000 Daily Trips 2008

- Work: 140,000
- Non work: 160,000
- NonHome based: 50,000
- Home to school: 100

695,000 Daily Trips 2030

- Work: 315,000
- Non work: 260,000
- NonHome based: 119,000
- Home to school: 100
Downtown Bellevue
Travel Demand

Total PM Peak Trips
Alternative C9T

Total PM Peak Trips
Alternative C11A
Downtown Bellevue
Travel Demand

Total Trips PM Peak – Difference between C9T and C11A
VISSIM analysis performed for alternatives C9T, C9A, and C11A

VISSIM output:

- Assesses and simulates all relevant traffic movements:
  - SOV, HOV, Transit (Bus), Transit (Light Rail), Pedestrian
- Reveals how traffic would flow and interact with other modes and pedestrians:
  - Speed and travel time for traffic and light rail
  - Queue lengths and delay at intersections
- Animation to show traffic, light rail and pedestrian movements

Downtown LRT Decision Criteria

- Traffic Modeling and Analysis
- Consistency with Policy
- Support of Land Use Plan
- Visual/urban design assessment
- LRT Ridership
- Construction risk and impacts
- Cost
VISSIM Street Network

Travel lanes

Turn pockets

Signalized intersections

Signalized driveways

Mid-block crossings
## VISSIM Spreadsheet Output

<table>
<thead>
<tr>
<th>Key Intersection</th>
<th>C9T/C14E</th>
<th></th>
<th>C9A</th>
<th></th>
<th>C11A</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>LOS</td>
<td>Delay</td>
<td>LOS</td>
<td>Delay</td>
<td>LOS</td>
<td>Delay</td>
</tr>
<tr>
<td>108th Avenue/Main Street</td>
<td>C</td>
<td>25.3</td>
<td>D</td>
<td>50.5</td>
<td>F</td>
<td>94.1</td>
</tr>
<tr>
<td>108th Avenue/2nd Street</td>
<td>D</td>
<td>42.7</td>
<td>F</td>
<td>123.6</td>
<td>F</td>
<td>132.0</td>
</tr>
<tr>
<td>108th Avenue/4th Street</td>
<td>E</td>
<td>79.9</td>
<td>F</td>
<td>106.8</td>
<td>F</td>
<td>120.0</td>
</tr>
<tr>
<td>108th Avenue/6th Street</td>
<td>E</td>
<td>73.6</td>
<td>E</td>
<td>61.7</td>
<td>F</td>
<td>111.5</td>
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<tr>
<td>110th Avenue/Main Street</td>
<td>C</td>
<td>26.0</td>
<td>E</td>
<td>55.5</td>
<td>D</td>
<td>53.5</td>
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<tr>
<td>110th Avenue/2nd Street</td>
<td>D</td>
<td>41.0</td>
<td>F</td>
<td>137.3</td>
<td>E</td>
<td>55.2</td>
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<tr>
<td>110th Avenue/4th Street</td>
<td>F</td>
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<td>F</td>
<td>117.3</td>
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<td>125.6</td>
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<tr>
<td>110th Avenue/6th Street</td>
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<td>83.9</td>
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<tr>
<td>112th Avenue/Main Street</td>
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<td>D</td>
<td>52.6</td>
<td>E</td>
<td>70.6</td>
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</table>
Interconnection LOS E and F in LRT Alternatives C9T and C14E

Intersection average delay in seconds

12 LOS F

5 LOS E

35 Downtown Intersections within the perimeter of: Main St./Bellevue Way/NE 12th St./112th Ave. NE
Intersection LOS E and F in LRT Alternative C9A

Interaction average delay in seconds

**12 LOS F**

**13 LOS E**

35 Downtown Intersections within the perimeter of: Main St./Bellevue Way/NE 12th St./112th Ave. NE
Intersection LOS E and F in LRT Alternative C11A

Intersection average delay in seconds

11 LOS F

12 LOS E

35 Downtown Intersections within the perimeter of: Main St./Bellevue Way/NE 12th St./112th Ave. NE
Intersection Delay Significantly * Worse in C9A or C11A than in C9T/C14E

* More than 10 seconds difference in total delay resulting in LOS E or F.

Average delay in seconds more than C9T/C14E (15 locations)

35 Downtown intersections within the perimeter of: Main St./Bellevue Way/NE 12th St./112th Ave. NE
Intersection Delay Significantly * Worse in C9A or C11A than in C9T/C14E

Average delay in seconds more than C9T/C14E (12 locations)

Intersection Delay Significantly * Worse in C9A or C11A than C9T/C14E
* More than 20 seconds difference in total delay resulting in LOS E or F.

35 Downtown intersections within the perimeter of:
Main St./Bellevue Way/NE
12th St./112th Ave. NE
Intersection Delay Significantly * Worse in C9A or C11A than in C9T/C14E

V1.2

Average delay in seconds more than C9T/C14E (8 locations)

Intersection Delay Significantly * Worse in C9A or C11A than C9T/C14E
* More than 30 seconds difference in total delay resulting in LOS E or F.

35 Downtown intersections within the perimeter of:
Main St./Bellevue Way/NE 12th St./112th Ave. NE
## Concept Design Report

### Downtown Bellevue Vehicle Travel Time

<table>
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<tr>
<th>Criteria</th>
<th>C9T 110th Tunnel</th>
<th>C9A 110th At-Grade</th>
<th>C11A 108th At-Grade</th>
<th>C14E 114th Elevated</th>
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<tr>
<td>Southbound vehicle travel time (minutes)</td>
<td>6.5</td>
<td>8.0</td>
<td>7.4</td>
<td>6.5</td>
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<td>Northbound vehicle travel time (minutes)</td>
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<td>Eastbound vehicle travel time (minutes)</td>
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<td>5.3</td>
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<td>Westbound vehicle travel time (minutes)</td>
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<td>5.2</td>
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<td>4.9</td>
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<td>Average travel time (minutes)</td>
<td>5.55</td>
<td>6.15</td>
<td>6.03</td>
<td>5.55</td>
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I-405 / NE 4th to 108th Ave NE/NE 8th St via Key Tower

Typical Downtown Routes - Travel Time Analysis

- I-405 / NE 4th to 108th Ave NE/NE 8th St via Key Tower

V1.2
Typical Downtown Routes - Travel Time Analysis

I-405 to Main Street via City Hall/110th Ave NE

<table>
<thead>
<tr>
<th>Route</th>
<th>SB</th>
<th>NB</th>
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<td>C9T</td>
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<td>7.3</td>
</tr>
<tr>
<td>C11A</td>
<td>9.0</td>
<td>6.0</td>
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Typical Downtown Routes - Travel Time Analysis

V1.2

I-405 to Bellevue Way via 110th Ave NE

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<tr>
<th>Route</th>
<th>WB</th>
<th>EB</th>
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<td>C9T</td>
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<td>C9A</td>
<td>13.3</td>
<td>10.4</td>
</tr>
<tr>
<td>C11A</td>
<td>12.5</td>
<td>10.4</td>
</tr>
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VISSIM Traffic MicroSimulation
VISSIM Traffic MicroSimulation
February 2010 Findings/Recommendations

- Traffic modeling, simulation, and operational analyses sufficient to inform decisions
- Surface alternatives will impact traffic operations similar to Portland, Denver, and San Diego
- Maintain east-west traffic flow through signal timing and operation strategies
- Use maps or other graphical displays to communicate information – not tables
- Commend Sound Transit and Bellevue for working together
Bellevue City Council

City Council Recommendation
Spring 2010

- Alternative C9T
  - Traffic impacts
  - Accidents
Sound Transit Board

ST Board Recommendation April 2010

- Alternative C11A, or
- Alternative C9T with Bellevue $150M contribution
  - Reduce ST cost
  - Increase ST funding
Sound Transit
Supplemental DEIS

• Draft Environmental Impact Statement (DEIS) published in December 2008
• New alternatives have been developed
• Supplemental DEIS November 5, 2010
• 45-day public comment period
• Public hearing November 30
Seattle Transit Communities
Integrating Land Use and Essential Components with Transit

A report from the Seattle Planning Commission
Seattle Planning Commission

- 16 member volunteer advisory board
- Professional experts and neighborhood planners
- Provide the Mayor and City Council with independent and objective analysis on land use and zoning matters, transportation and housing issues.
- Produce independent reports, white papers, user guides and policy recommendations
- Conduct public involvement processes on planning policies and development plans and projects.
Background

April 2008 SPC Retreat
• Initiative to encompass high priority objectives
  ▪ Develop densely near transit hubs
  ▪ Increase supply of affordable housing
  ▪ Provide essential components of livability in dense neighborhoods
  ▪ Foster local businesses

November 2008 Roundtable Discussion
• Challenges – Opportunities – Best Practices
  ▪ Elected officials
  ▪ Department representatives
  ▪ Transit agency representatives
Background

Applicable Policies and Regulations

- Comprehensive Plan
- Transportation Plan
- Pedestrian and Bicycle Master Plans
- Land Use Code

Basic Principles

- Compelling reasons to live/do business
- Unique context, not cookie-cutter
- Choice and diversity
- Prioritize people over cars
Background

Case Studies

• Portland
• Washington, DC
• Vancouver, BC
• SEATTLE!

Best Practices

• Transit creates opportunities depending on mode
• Mix up the uses
• Make it a neighborhood
Goals for Seattle Transit Communities

- Create vibrant, walkable communities
- Accommodate expected growth sustainably
- Create opportunities from transit investment
- Develop transit oriented communities
  - Land use – jobs, housing, services
  - Infrastructure – vehicle, pedestrian, bicycle
Transit Communities
Not a New Idea
Transit Communities Report will help decision makers understand what it takes to develop successful communities around transit.
Transit Communities Accommodate Growth
Transit Communities
Saving Households Money

- Auto Community: $811
- Transit Community: $234 + $970 = $1184

- Auto: $65
- Home Ownership: $970

Total Savings in Transit Community: $1184 - $65 = $1119

Comparison between Auto Community and Transit Community in terms of money saved.
Different types of transit create different opportunities

- Ferries
- Commuter rail
- Local bus
- Bus Rapid Transit
- Light rail
- Streetcar
Much of Seattle is well served by transit.

These locations are the opportunities to create and enhance transit communities:
- Urban Centers
- Hub Urban Villages
- Residential Urban Villages
- Manufacturing / Industrial Centers
Transit Community Typologies

• Each transit community is unique
• Build communities around transit
• Accommodate growth/preserve desirable characteristics
• Report identifies four types of communities
  • Mixed Use Center
  • Mixed Use Neighborhood
  • Special Districts
  • Industrial Job Center
• Distinguish by intended land use, infrastructure, and essential components for livability
Mixed Use Center

Characteristics
• Vibrant and eclectic
• Jobs, residents, services

Examples
• Downtown, Capitol Hill, Ballard

Activities
• Commuting, working, shopping

Street View
• Tall buildings, high density housing/jobs
• Regional retail
• Lots of pedestrians and street-level uses

Amenities/Essentials
• Breathing room
• Complete streets

Strategies
• Mixed-use zoning
• Design guidelines
Mixed Use Neighborhood

Characteristics
• Complete community
• Pedestrian friendly
• More housing than jobs

Examples
• Upper Queen Anne, Morgan Junction

Activities
• Evening and weekend shopping/dining
• Commuting to and from

Street View
• Mixed use along arterials with residential
• Neighborhood serving shops

Amenities/Essentials
• Vibrant street life
• Community for all walks of life

Strategies
• Mixed use
• Bicycle parking
Special Districts

**Characteristics:** Entertainment and sports venues, major institutions

**Examples:** King Street Station, Husky Stadium, Seattle Center

**Activities:** Sporting events, concerts

**Street View:** Large venue structures, wide sidewalks sometimes empty

**Amenities/Essentials:** Sidewalks accommodate large crowds, wayfinding

**Strategies:** Allow street vendors, discourage surface parking
Industrial Job Center

Characteristics: Industry and commerce
Examples: SODO station, E3 Busway
Activities: Commuting, working, lunch
Street View: No residential, big trucks - little pedestrians
Amenities/Essentials: Ped/bike infrastructure, landscaping
Strategies: Industrial zoning, development standards
Recommendations

• Identify Transit Communities
• Prioritize Transit Communities Using Guidelines
• Recommend Action for Transit Communities
• Identify Funding and Implementation Tools
Identify Transit Communities

49 “transit connections” identified by SDOT

2 Work Sessions Hosted by Planning Commission

• Seattle Department of Transportation
• Department of Planning and Development
• Office of Housing
• Design Commission
• City Council Central Staff
• Mayor’s Office
Identify Transit Communities

Work Sessions

• Typology criteria applied to 49 “transit connections”
• Each transit connection assigned a typology (or not)
Identify Transit Communities

Work Sessions

• 49 “transit connections”
  • 44 Transit Communities
    • 2 combined into 1
    • 1 eliminated
    • 3 remain “transit connection”
Recommendations

Transit Investment should support transformative change in a community

- Strengthen Comprehensive Plan to Encourage and Build Transit Communities
- Enhance Transit Communities Through:
  - Land Use
  - Zoning
  - Transportation
  - Housing
  - Environmental/Sustainability
- Maximize Opportunities for Leveraging, Collaboration and Funding
- Prioritize Planning and/or Infrastructure Investment

Provide the basics for any “transit connection” even those that aren’t designated a Transit Community
Prioritization
Guidelines for Determining Near-Term Priorities

• Land Use Readiness
  • Development environment
  • Opportunities for place making
  • Planning efforts

• Transit Readiness
  • Transit here? Soon?
  • Quality of service
  • Mode

• Balancing Considerations
  • Leveraging/funding opportunities
  • Community support
  • Social and geographic equity
Prioritization
Tools for Focused Area Planning

Comprehensive Plan  *Toward a Sustainable Seattle*
- Goals and policies to guide growth over the next 20 years

Policy Plans
- Urban Center Plans
- Neighborhood Plans

Implementation Plans
- Urban Design Framework
- Station Area Plan
- Corridor Plan
- Community Development Strategy
Prioritization

14 Transit Communities Identified

- Typology
- Planning Tool
- Key Actions
King Street Station

- Typology: Mixed Use Center
- Planning Tool: Station Area Plan
- Key Actions:
  - Connect open space and ped/bicycle infrastructure
  - Increase mixed-income housing opportunities
  - Establish a clear, consistent wayfinding system
Funding and Implementation

- Infrastructure investments
- Community development
- Parks & open space
Seattle Transit Communities

Integrating Land Use and Essential Components with Transit

A report from the Seattle Planning Commission

Seattle Planning Commission

206-684-0433
WWW. seattle.gov/planningcommission
Downtown Bellevue Light Rail Alternatives
Concept Design Report

FEBRUARY 2010

PREPARED FOR
SoundTransit

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