Capital Trade-Offs

• Evaluated three major capital expenditure scenarios
  – Speed and Reliability Corridor Improvements
  – Direct Access Ramp Improvements
  – Park and Ride Expansion
Speed and Reliability Improvements

- About 240 miles of Speed and Reliability Improvements
- Focused on 2040 network frequent/very frequent transit corridors
- Assumed 15 percent improvement in travel speeds over baseline conditions
- No specific improvements identified (TSP, BAT lanes, etc.)
- Cost assumed at $2.0M per mile (based on TCRP research)
- Assumes new Ship Canal Crossing at $100M with bus lanes
Direct Access Ramps

• Assumed five new direct access ramp projects
  – SODO Busway to Seattle Blvd/Airport Way
  – West Seattle Freeway to 1st Avenue S/SR 99
  – I-5 to Industrial Way/SODO Busway
  – I-5 to SR 900
  – SR 167/James St

• These ramps are in addition to the I-405 Corridor Master Plan ramps

• Ramps assumed to cost $96M each, mid-range price of I-405 ramp project cost estimates

• Each ramp reduces transit route travel time by 4-6 minutes
Park and Ride Expansion

• Double the number of publicly owned park-and-ride spaces (20,500 to 41,000 stalls)
• Assumed to be located at existing high-utilization lots
• Mix of surface lots and garages
• $30,000 per stall
## Impacts: Boardings and Rev. Hours

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Change in Daily Boardings</th>
<th>Change in Annual Revenue Hours with Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Percent</td>
</tr>
<tr>
<td>Speed and Reliability Improvements</td>
<td>+47,300</td>
<td>4.9%</td>
</tr>
<tr>
<td>Direct Access Ramps</td>
<td>+13,000</td>
<td>1.4%</td>
</tr>
<tr>
<td>Park-and-Ride Expansion</td>
<td>+42,000</td>
<td>4.6%</td>
</tr>
</tbody>
</table>
# Capital Improvements: Total Costs

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Total Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed and Reliability Improvements</td>
<td>$574 million</td>
</tr>
<tr>
<td>Direct Access Ramps</td>
<td>$480 million</td>
</tr>
<tr>
<td>Park-and-Ride Expansion</td>
<td>$615 million</td>
</tr>
</tbody>
</table>
Payback and Amortization Assumptions

- Cost per revenue hour: $161 (based on 2014 data from Metro)
- Interest rate: 5%
- Lifespan of capital investments (amortization period): 50 years
  - Assumes the bulk of the improvements have long life spans
- Average fare per boarding: $1.24 (based on 2014 data from Metro)
## Payback Period and Annual Cost per Rider

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Payback Period</th>
<th>Annualized Capital Cost per Annual Boarding</th>
<th>Benefit/Cost Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed and Reliability Improvements</td>
<td>6 years</td>
<td>$2.10</td>
<td>1.77</td>
</tr>
<tr>
<td>Direct Access Ramps</td>
<td>29 years</td>
<td>$6.30</td>
<td>0.63</td>
</tr>
<tr>
<td>Park-and-Ride Expansion</td>
<td>36 years</td>
<td>$2.50</td>
<td>0.49</td>
</tr>
</tbody>
</table>
Findings

• Speed and reliability improvements are the most cost effective type of capital improvement
  – Combination of high ridership and service hours savings
  – Only type of improvement with a positive benefit/cost ratio
• Direct access ramps have a high annualized cost per annual boarding, but provide service hours savings, offsetting the cost somewhat
• Park-and-ride stalls generate riders and fares, but have the lowest benefit/cost ratio (this could change if parking is not free)