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Evaluating the Planning and Implementation of Major Transit Capital Projects in the Portland Region

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Evaluating the Planning and Implementation of Major Transit Capital Projects in the Portland Region

December 5, 2014
PSU Transportation Seminar
Joe Recker, TriMet Capital Projects
Overview

• The *New Starts/Small Starts* program
• Before and After studies
• Findings from TriMet’s studies
• Findings from around the nation
New Starts/Small Starts

• FTA’s primary grant program for major transit capital investments
• New lines or extensions
• Rail, BRT, or ferries
• Evaluation process and milestones
  – Full Funding Grant Agreement (FFGA)
• $1.9 billion annually
A Before and After Study...

- Required component of a New Starts project
- **analyzes** a project’s impact
- **evaluates** the consistency of the predicted performance, and
- **identifies** sources of differences
Report Topic Areas

- Project Scope
- Capital Costs
- Service Levels
- Operating & Maintenance Costs
- Ridership
Background

- New Starts program = discretionary $$
- Pickrell report (1990) on early transit projects (70s & 80s)
- FTA increases oversight
  - Project Management Oversight Contractors (PMOC)
  - Cost-effectiveness calculations
  - Risk assessments
  - Before and after studies
FTA Requirements

• Before and After Study requirement (2001)
• Documentation of capital costs (2005)
  – Standard Cost Category (SCC) format
  – Compare projects across the nation
  – Compare same project over time
• Annual reports to Congress (SAFETEA-LU2005)
• Preservation of ridership forecasts (2006)
  – Software compatibility over time
Completed FTA Before & After Studies

* Estimated

Yellow Line
Green Line
WES

06' 07' 08' 09' 10' 11' 12' 13' 14'*

TRIOMET
Report Contents

• Analyze
  – As-built/current conditions for each topic area

• Evaluate
  – Transit service before vs. after
  – Consistency of predictions (at NS milestones) vs. as-built/after

• Identify
  – Findings and recommendations
Project Scope

• What was built?
• What did we plan to build?
• Why are there differences?
Capital Costs

• What did it cost?
• What did we think it would cost?
• Why are there differences?
Service Levels

• What is the service we are providing?
• What did we plan to provide?
• Why are there differences?
Operating and Maintenance (O&M) Costs

• What does it cost to operate?
• What did we think it would cost?
• Why are there differences?
Ridership

• What is the ridership (after it settles)?
• What did we expect?
• Why are there differences?
How Did TriMet Do?
Interstate MAX

• 5.8 mile light rail extension on urban arterial
• Replaces local bus service (line 5)
• 10 stations
• 2 park-and-ride lots
• $350 million ($2004)
• 15,200 average daily riders today
Interstate MAX (con’t)

• Came in **under budget**
• Ridership projections
  – 13,900 (2005)
  – 18,100 (2020)
• Actual (2005)
  – 11,700 average weekday riders
• On target for horizon year projections
  – 15,200 (current)
Figure 4.12
Interstate Max Corridor
Average Weekday Route Ridership
2004 & 2005

Ridership

Yellow Line  Line 5  Line 4  Line 6  Line 8  Line 40  Line 85

2004: 0 6,940 8,130 5,180 4,390 2,330 200
2005: 11,830 7,930 8,340 4,780 2,110 400

TRIOMET
Interstate MAX Takeaways

• Built at right time
• CMGC contracting
• Experience matters
• Opening year vs. horizon year
WES Commuter Rail

- 14.7 mile commuter rail
- Shared with freight railroad
- 5 stations
- 4 park-and-rides
- Premium transit service
- $162 million
- 2,000 average daily riders
WES Commuter Rail (con’t)

• Cost estimate
  – (2001) $84.8 million/planned opening 2004
  – (2001) $103 million using actual inflation rates
  – Assumptions incorrect
    • Project scope
    • Freight railroad negotiations
    • Federal $$ request changed past a threshold of “exempt”
    • Construction inflation
WES Commuter Rail (con’t)

• Ridership
  – Range of 1,600 – 2,400 riders (opening year)
  – Range of 3,000 – 4,650 riders (2020)
• 2009 – 1,200 average daily riders
• 2011 – 1,600 average daily riders
• 2014 – 2,000 average daily riders
• Key ridership factors
  – Employment and economy
  – Park-and-rides/transfers
  – Travel patterns
WES Takeaways

• Bad timing
  – FTA oversight growing = delays
  – Construction inflation = $$
  – High unemployment at opening = low ridership

• Freight railroad → scope changes = $$
I-205 MAX Green Line

- 8.3 mile light rail extension
- 15 new stations
  - I-205 (8)
  - Portland Mall (7 pairs)
- 6 park-and-rides (I-205 only)
- $575.3 million
- 20,400 average daily riders
Green Line (con’t)

- Cost estimates
  - (2004) $494.8 million (or $595 million w/ actual inflation)
  - (2006) $575.7 million

- Predicted Ridership
  - 25,500 (2009)
  - 46,250 (2025)

- Service still well below planned levels
Green Line Takeaways

• Project scope changes minimal
• Extensive local experience kept costs down despite rising inflation
• Travel forecasting
  – Park-and-ride behavior
  – Walk access
  – Land use
• Service assumptions incorrect
# Employment Forecasts

<table>
<thead>
<tr>
<th></th>
<th>Forecasted Growth (00'-09')</th>
<th>Actual Growth (00'-10')</th>
<th>Difference (in # of jobs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downtown/Lloyd</td>
<td>15%</td>
<td>-8%</td>
<td>-39,040</td>
</tr>
<tr>
<td>Banfield</td>
<td>7%</td>
<td>-10%</td>
<td>-6,595</td>
</tr>
<tr>
<td>I-205</td>
<td>22%</td>
<td>1%</td>
<td>-11,587</td>
</tr>
<tr>
<td>Region</td>
<td>17%</td>
<td>-3%</td>
<td>-185,951</td>
</tr>
</tbody>
</table>
Other Projects
FrontRunner, UTA

- 44 mile commuter rail, 9 stations
- $614 million (34% higher than PE estimate)
- 5,300 weekday trips
  - Predicted 8,400 (PE), 5,650 (FD) and 5,900 (FFGA)
FrontRunner (con’t)

• Construction inflation
• Freight RRss
• Recession
  – Service impacts
  – Ridership impacts
• Public pressure changed service plan
Valley Metro Rail – Phoenix, AZ

- 19.7 mile light rail on urban arterials
- 28 stations
- $1.405 billion
  - $1.076b (PE) to $1.412b (FFGA)
- 40,700 daily riders (current)
  - 25,800 – Early estimate for 2020
Valley Metro Rail (con’t)

- Unanticipated growth of universities
- Unanticipated growth of carless, low-income households
- Local requirements changed
- Travel time improved
- Underestimated O&M Costs
Euclid Corridor, Cleveland OH

- 7.1 miles BRT, 31 stations
- 4.4 miles exclusive ROW
- $197.2 million
  - 10-28% lower than early estimates
- 14,300 riders (2011)
  - 21,100 (early on)
  - 13,500 (at FFGA)
Euclid Corridor (con’t)

• Scope reductions
• 21% travel time savings
• $1 million net O&M costs per year
• Recession & drastic service cuts
  – Euclid corridor ridership up 31%
  – Systemwide ridership down 22%
Recap of Lessons Learned
Project Scope: Lessons Learned

- Local requirements
- Political pressure
- Freight railroads
Capital Costs: Lessons Learned

- Construction inflation
- Schedule
- Scope changes
- Freight RRs
- Local experience
Service Levels: Lessons Learned

• Replacing express & local service
• Economic cycles
• Transit priority
• Travel times
O&M Costs: Lessons Learned

- New transit mode
- Public demands for restoration of bus service
- Service cuts
- Freight RRs
Ridership: Lessons Learned

- Land use forecasts
- Service changes
- Travel time
- Fare policy
• Data preservation ongoing
  – Under budget and on schedule
• Bus service planning in progress
• “Before” transit rider surveys – spring 2015
• “After” surveys scheduled spring 2017.
Thank you, Questions?

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