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

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*TriMet*

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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

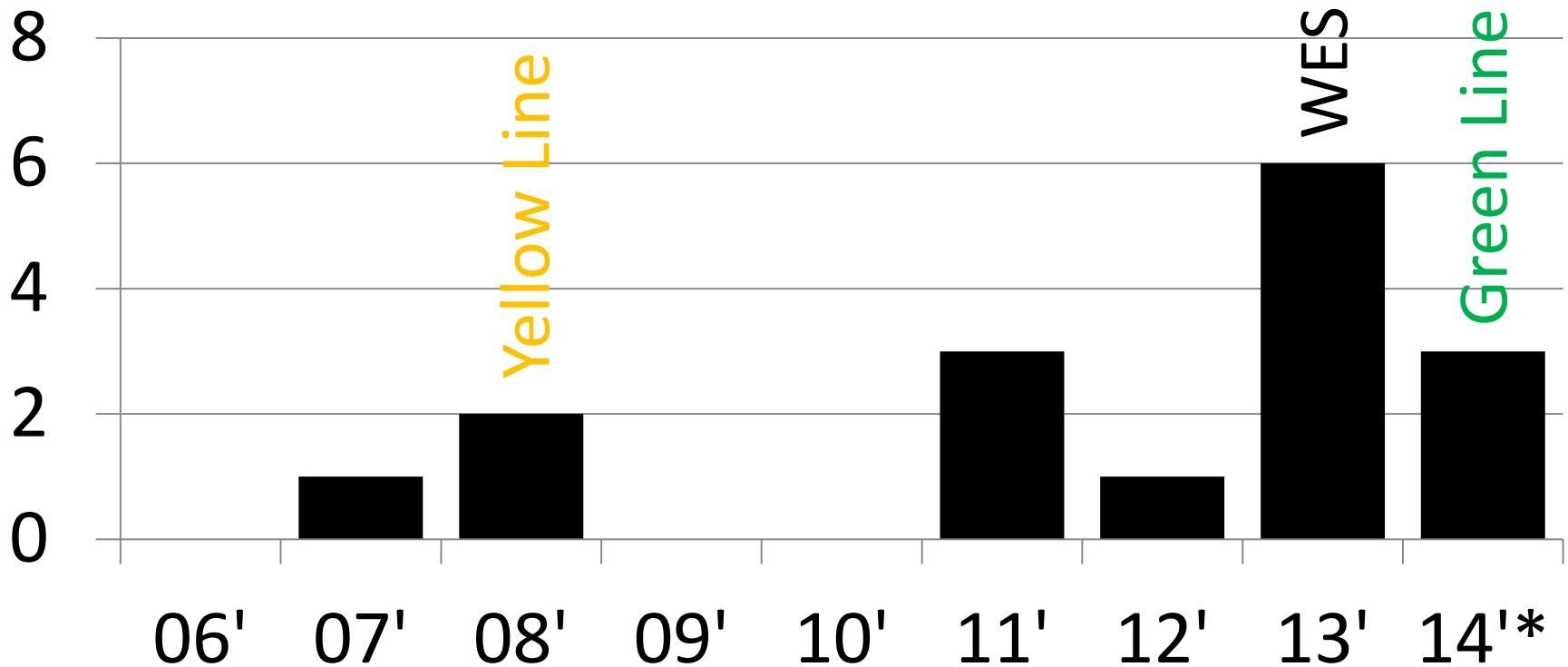
- New Starts program = discretionary \$\$
- Pickrell report (1990) on early transit projects (70s & 80s)
- FTA increases oversight
  - Project Management Oversight Contractors (PMOC)
  - Cost-effectiveness calculations
  - Risk assessments
  - Before and after studies

# 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

# 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?



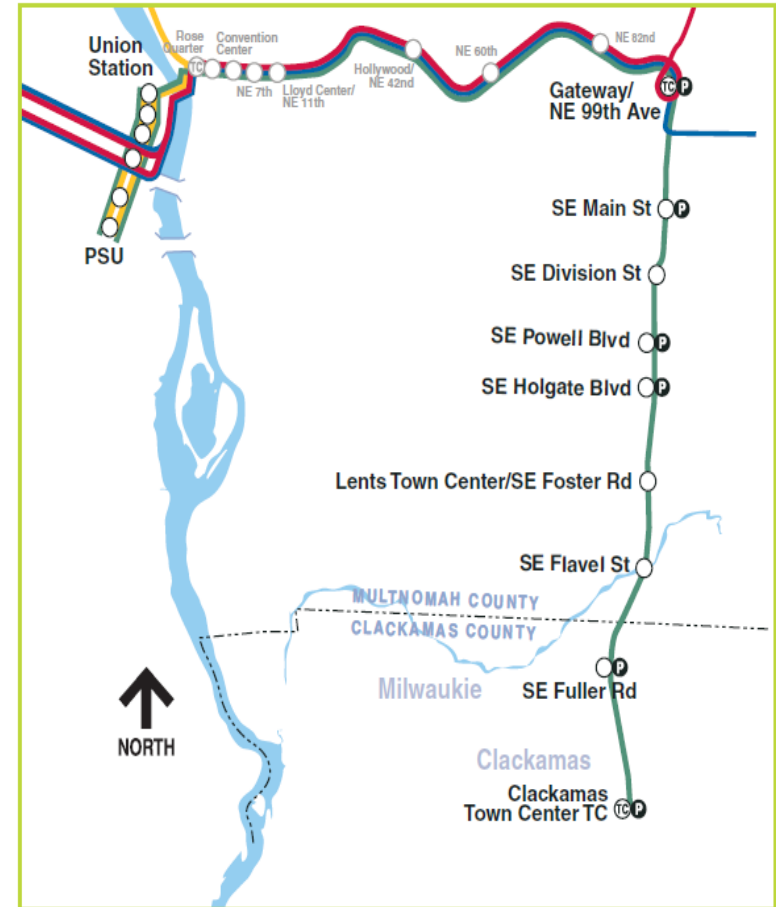
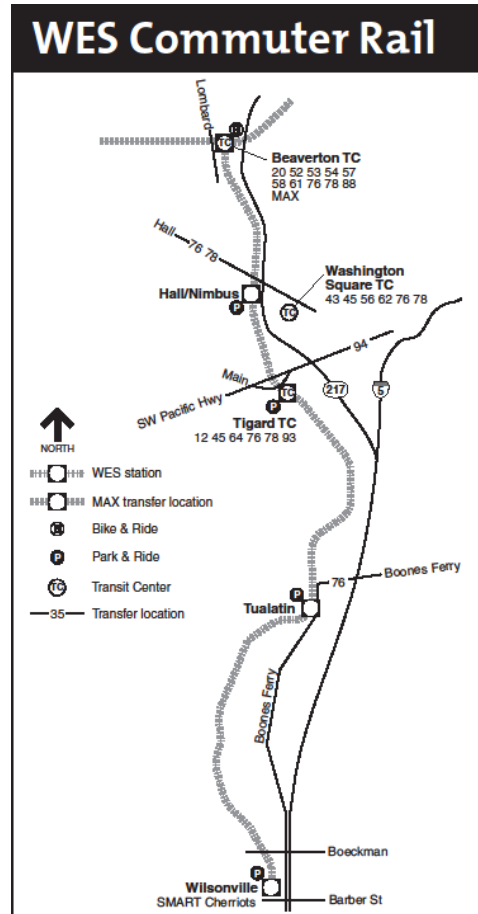
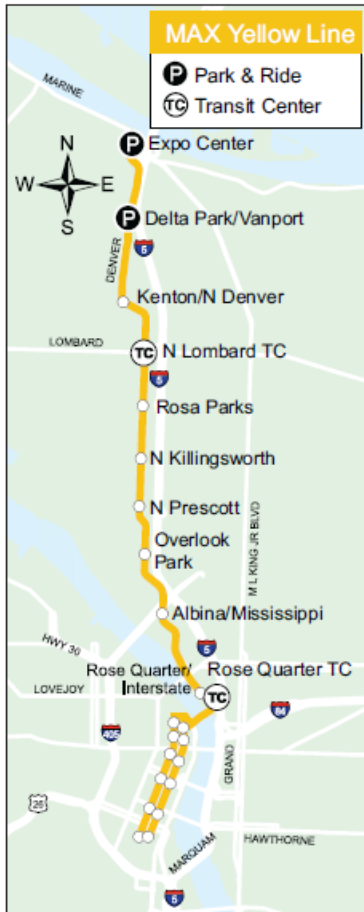


# Ridership

- What is the ridership (after it settles)?
- What did we expect?
- Why are there differences?



# How Did TriMet Do?





# Interstate MAX

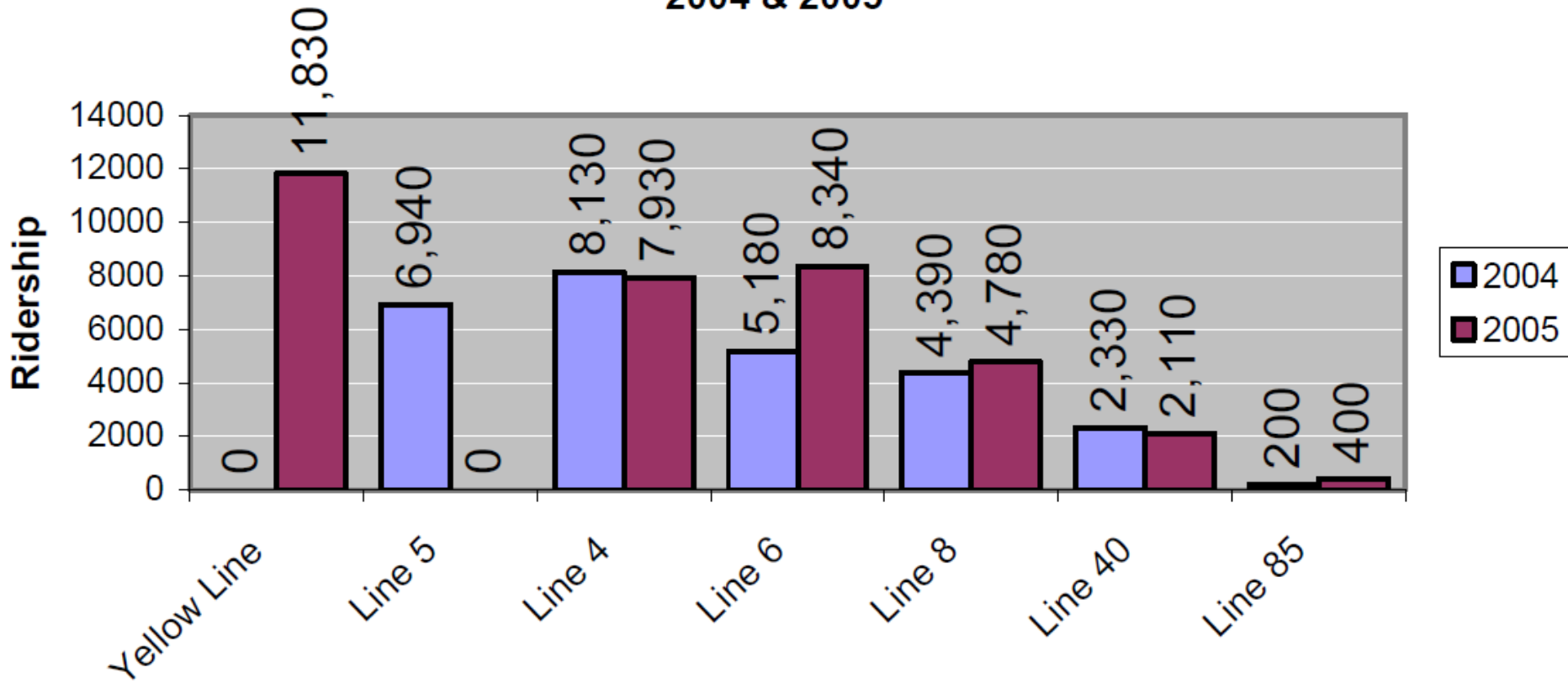
- 5.8 mile light rail extension on urban arterial
- Replaces local bus service (line 5)
- 10 stations
- 2 park-and-ride lots
- \$350 million (\$2004)
- 15,200 average daily riders today



# 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**



# 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



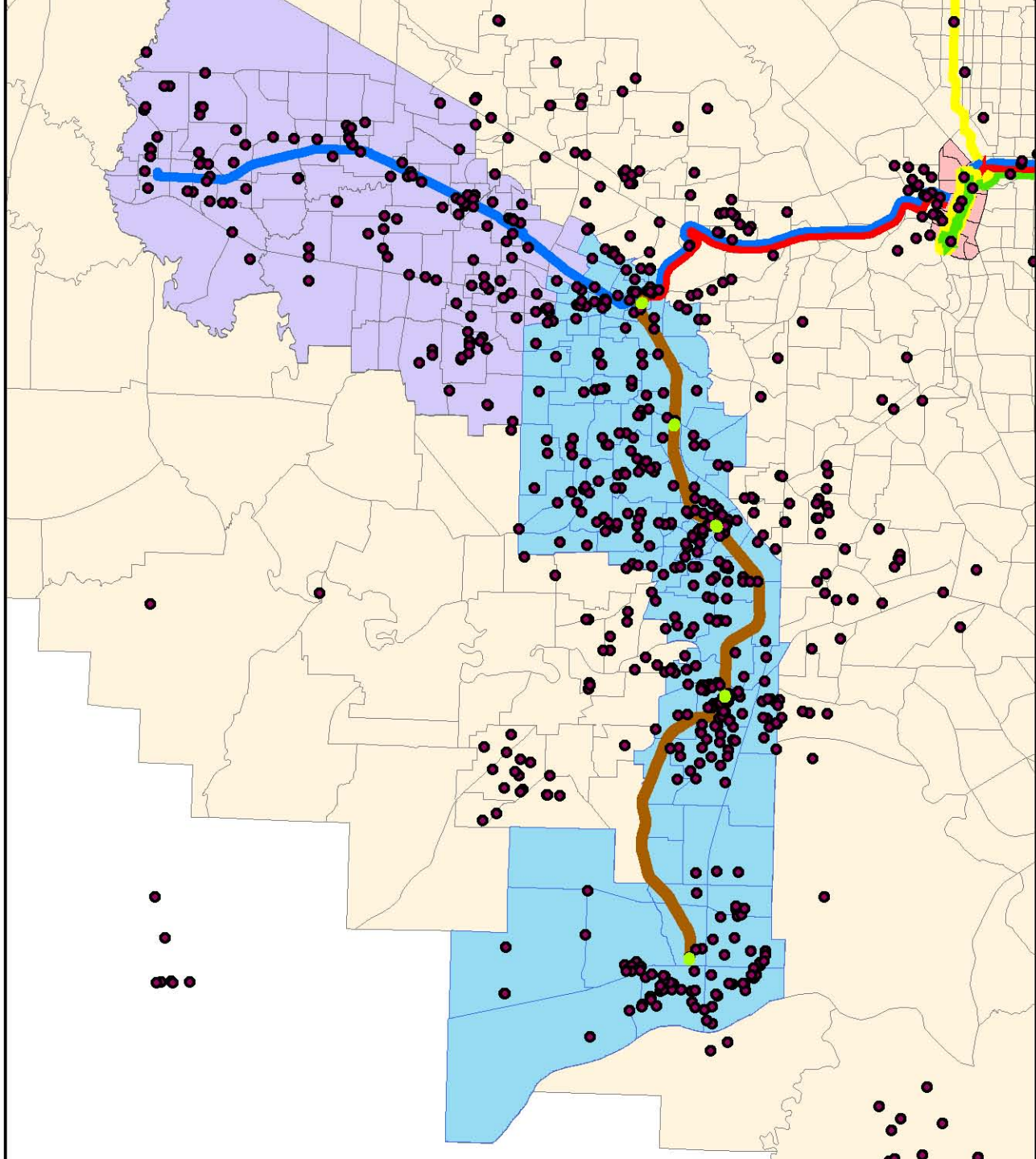
# WES Commuter Rail (con't)

- 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



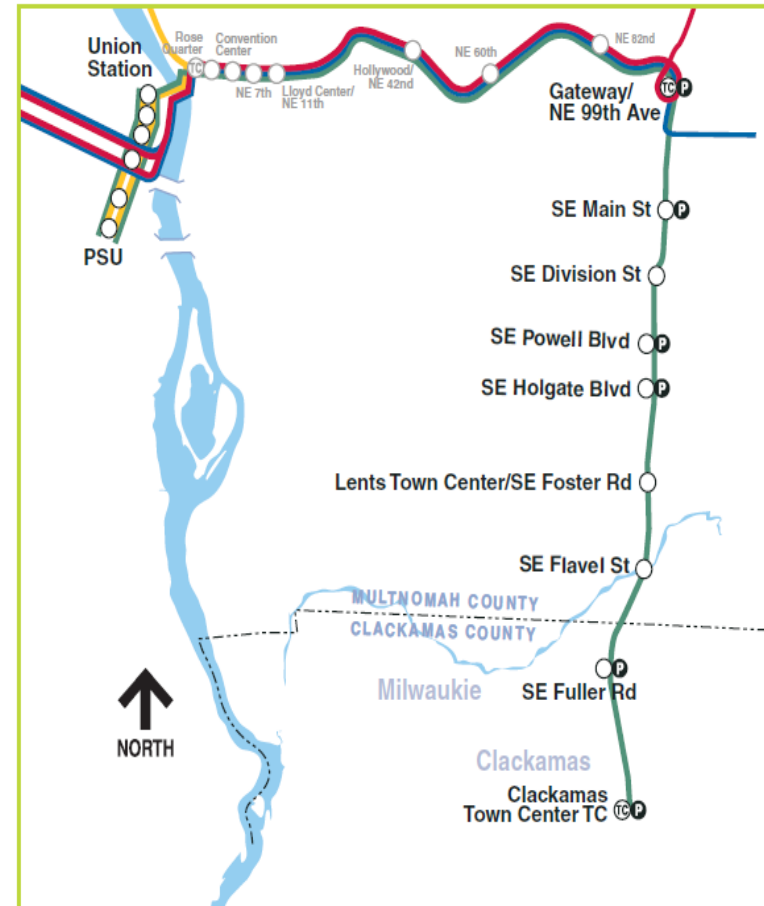


# WES Takeaways

- 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

	Forecasted Growth (00'-09')	Actual Growth (00'-10')	Difference (in # of jobs)
<b>Downtown/ Lloyd</b>	15%	-8%	-39,040
<b>Banfield</b>	7%	-10%	-6,595
<b>I-205</b>	22%	1%	-11,587
<b>Region</b>	17%	-3%	-185,951

# 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 RRs
- 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



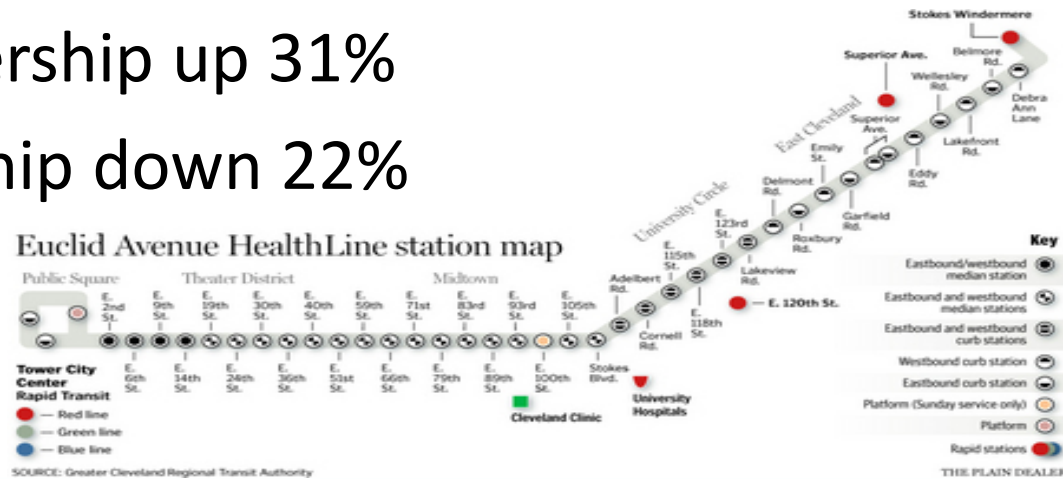
# Euclid Corridor, Cleveland OH

- 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%

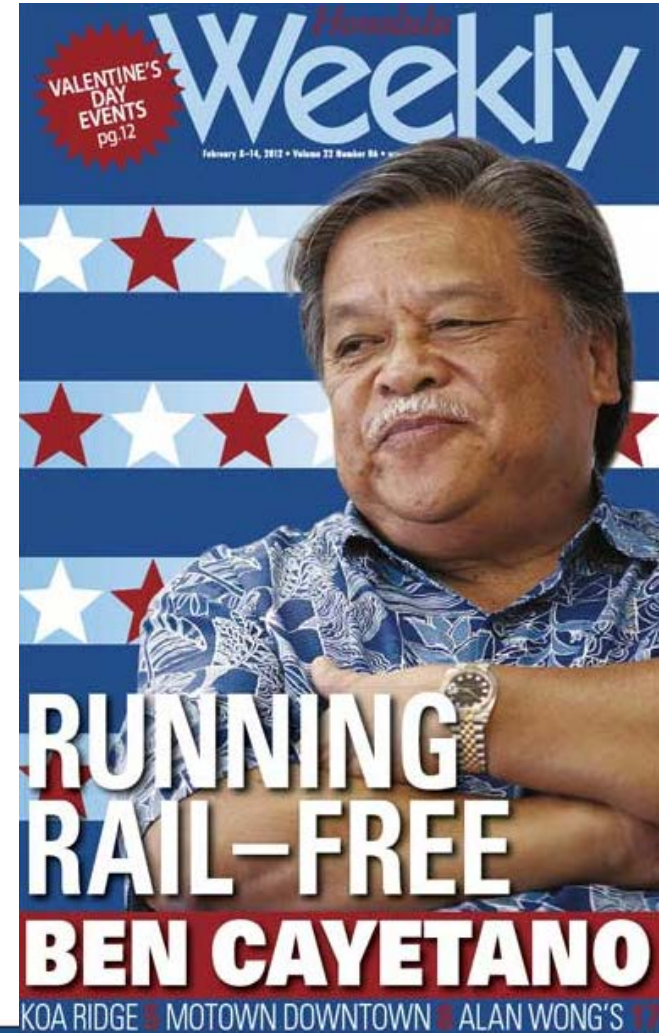


# Recap of Lessons Learned



# Project Scope: Lessons Learned

- Local requirements
- Political pressure
- Freight railroads



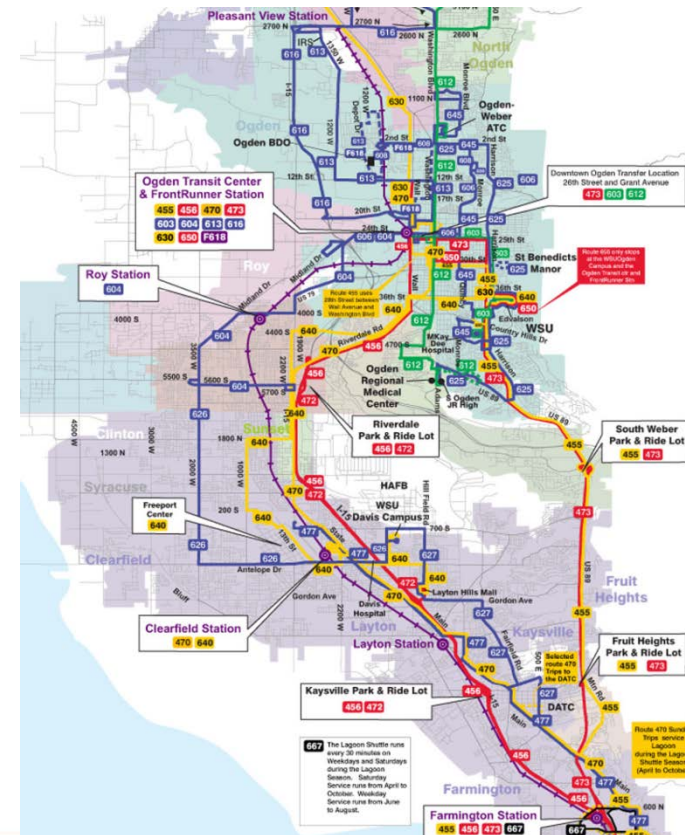
# Capital Costs: Lessons Learned

- 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



**PORTLAND-MILWAUKIE**  
LIGHT RAIL TRANSIT PROJECT





# **PORTLAND-MILWAUKIE**

**LIGHT RAIL TRANSIT PROJECT**

- 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?

Joe Recker

TriMet Capital Projects

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