Port and Modal Elasticity Study Phase II Findings

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SOUTHERN CALIFORNIA
ASSOCIATION of GOVERNMENTS

Dr. Rob Leachman
Leachman & Associates LLC

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Agenda

- Brief Review of Elasticity Analyses (Dr. Leachman)
- Discussion (All)
- Next Steps (SCAG)

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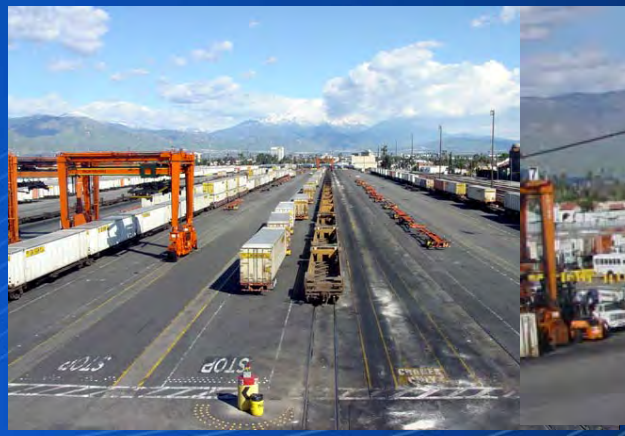
Background

Pollution and traffic in port cities are severe



Background (cont.)

- There are proposals to increase infrastructure and proposals for environmental mitigation, funded by proposed user fees
- Policy Questions:
  - Will importers stay and pay?
  - What investments are wisest?

The Alameda Corridor
Proposed in 1983
Opened in 2002
Cost: $2.4 billion

Elasticity Analysis

- What is response of import volume to range of potential container fees and/or to potential changes in infrastructure?
- Approach developed by Leachman & Associates LLC:
  - Model entire Asia – USA import economy
  - Iteratively solve supply-chain optimization for each importer and tally import volumes by port and landside channel

Modeling the Import Economy

- Top 83 actual importers, 19 “generic proxy” importers to represent everyone else
  - Large, nation-wide importers had 40% market share in 2007
- Volumes scaled to match actual US customs data on distribution of imports by declared value
- Actual transportation rates, handling charges, container flow-time statistics

Modeling the import economy (cont.)

- Supply-chain optimization
  - Considering total transportation, handling and inventory costs, determine best import supply-chain from Asian ports to regional distribution centers (RDCs)
  - Optimize supply chains for 102 importers and tally volumes by port and landside channel

Elasticity Analyses

- *Long-run elasticity analysis* – what happens if all ports and RRs spend as much money as necessary to maintain current container flow times
  - Developed in Phase I 2003-2005
  - Updated in Phase II 2006-2009
- *Short-run elasticity analysis* – what happens if no one spends any money
  - Developed in Phase II 2006-2009
  - Fixed infrastructure and staffing, model predicts container flow times

Phase I Highlights

- Based on 2003/2004 data
- Six (6) percent projected total diversion away from SPB ports if $60 per FEU fee is imposed without any congestion relief investments
- Four (4) percent projected total diversion away from SPB ports if $200 per FEU is imposed and congestion relief investments are implemented

Phase II Analyses

- Elasticity Analysis of 2006 - 2007 Base-Case Scenario
- Elasticity Analyses of Future Scenarios
  - Near-term likely
  - Optimistic
  - Pessimistic
  - Near-term likely supplemented with major congestion relief

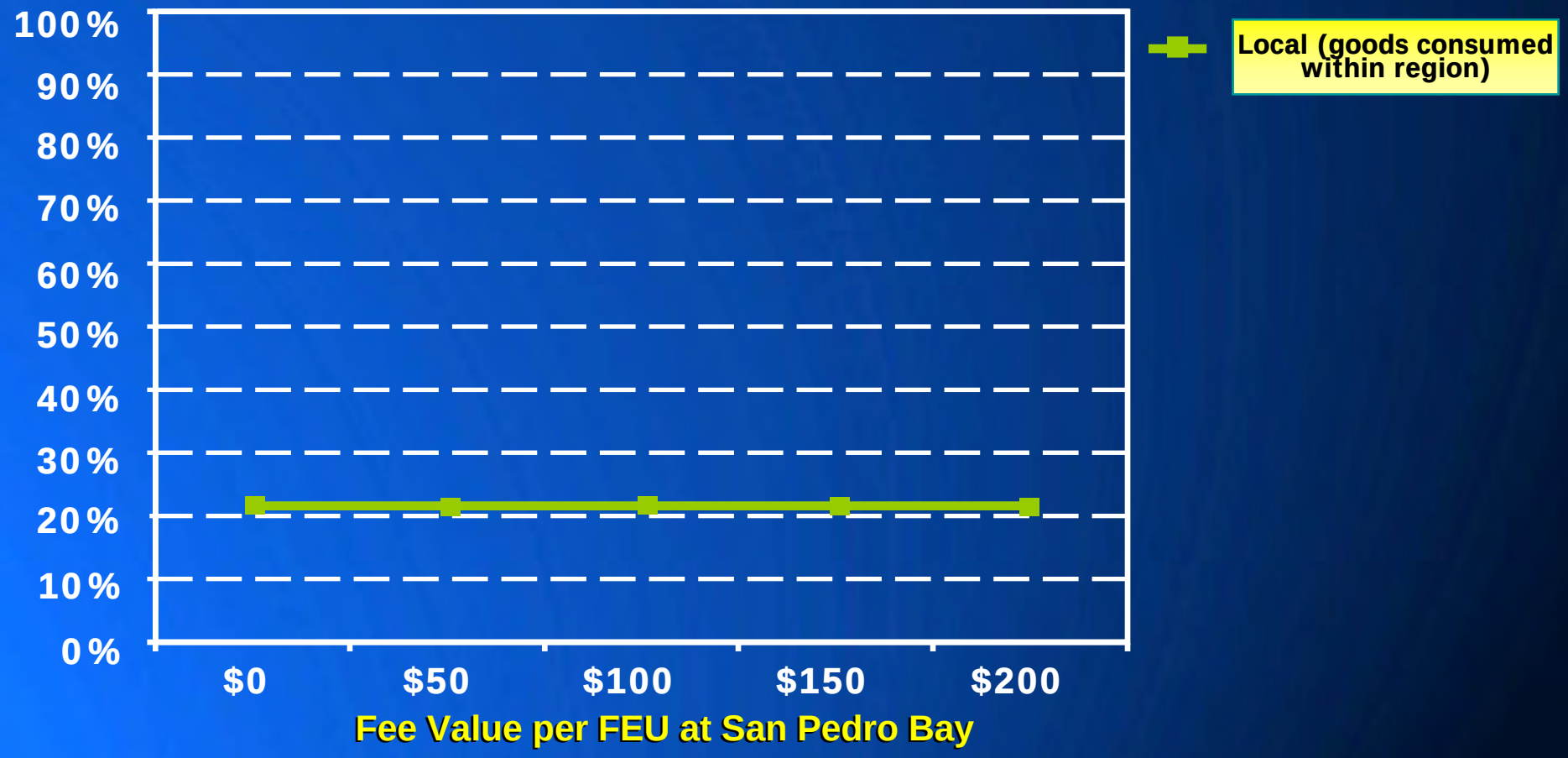
Elasticity Numbers

- All figures are expressed as percentages of the San Pedro Bay ports' market share of 2006 - 2007 Base-Case imports.
- No attempt is made to forecast the overall level of Asia – USA imports in future years. The 2006 total Asia – USA import volume is assumed in all scenarios.

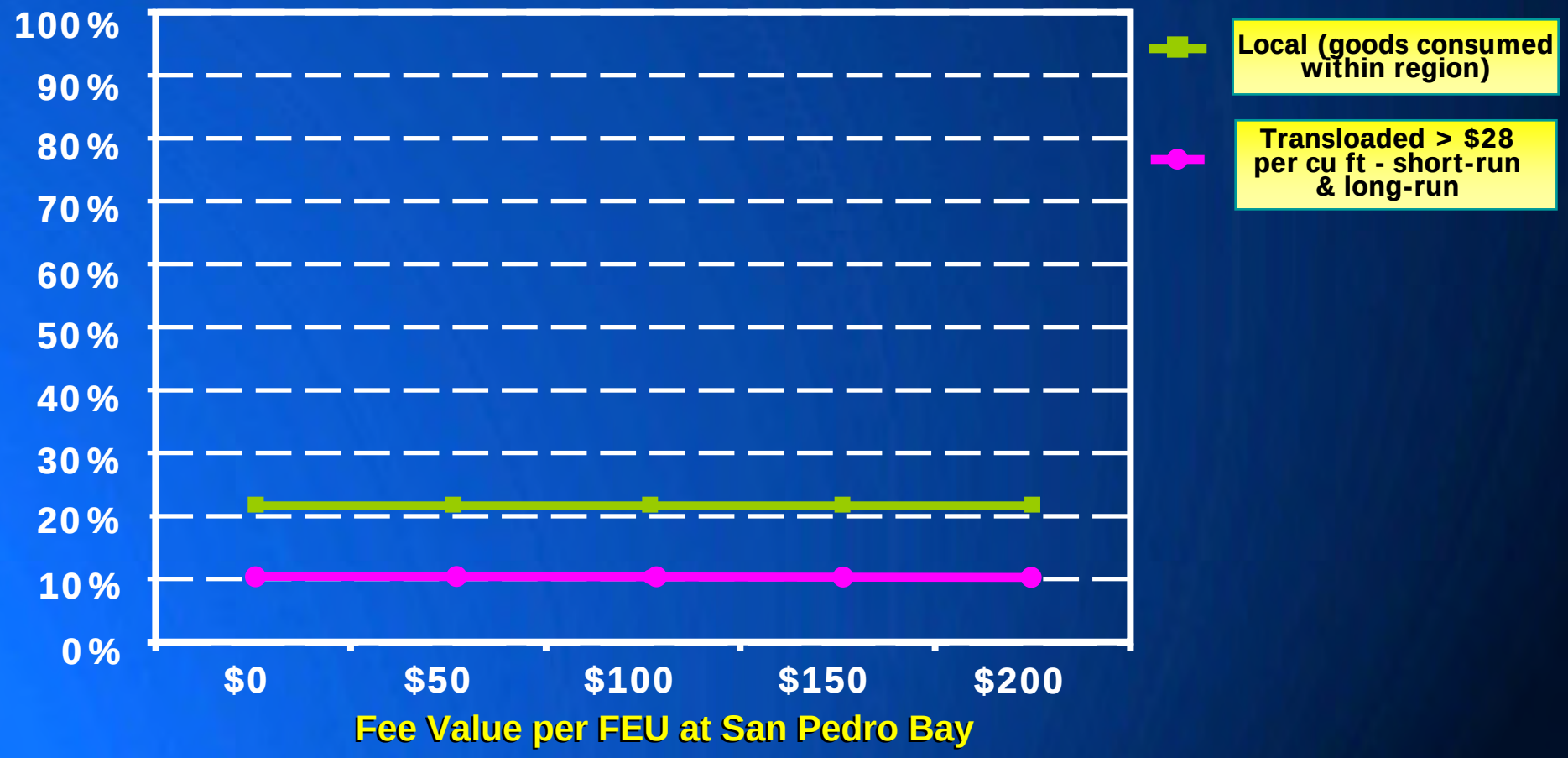
2006–2007 Base-Case Scenario

- 2006 total Asia – USA import volume
- 2007 rate quotations, mid-2006 infrastructure
- Assume large, nation-wide importers have 40% share of total Asia – USA imports
- Assume destinations for imports are proportional to purchasing power
- Good match to 2007 actual import volumes by port and landside channel

The 2006–2007 Base Case
No Diversion for Local Goods



The 2006-2007 Base Case
No Diversion for High Value Transload



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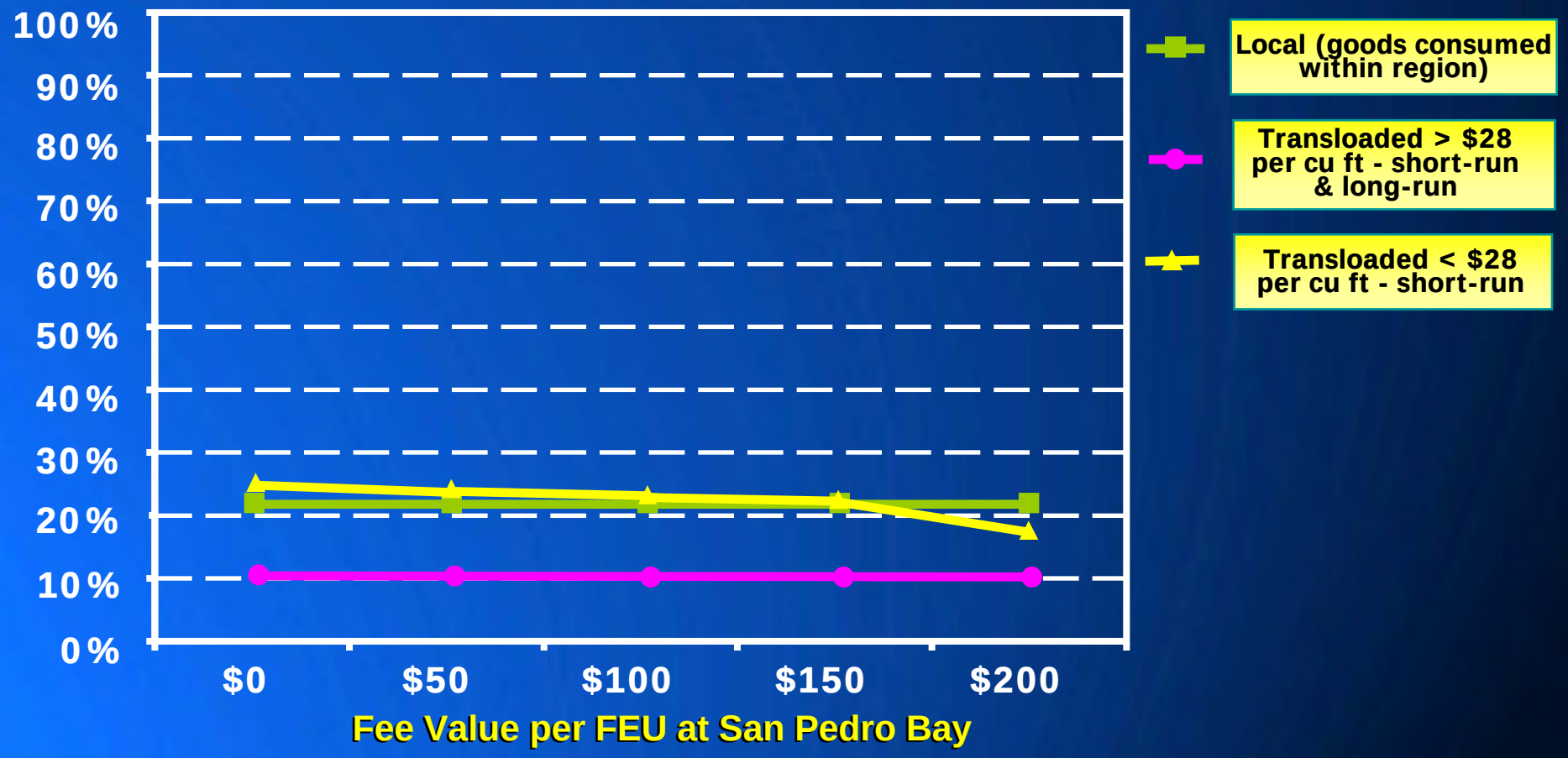
The 2006-2007 Base Case

Some Diversion for Lower Value Transload (Short-Run)



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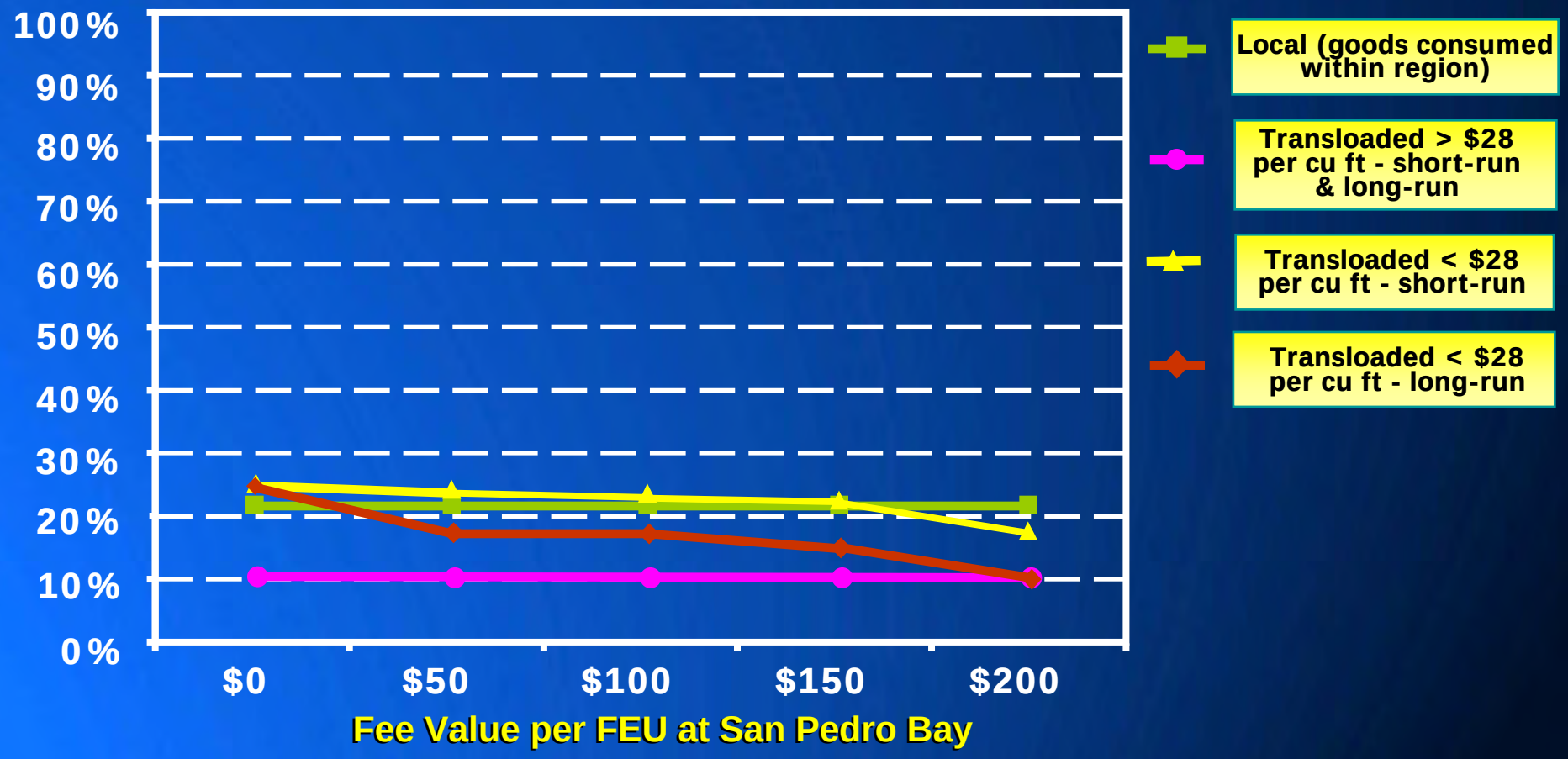
The 2006-2007 Base Case

Higher Diversion for Lower Value Transload (Long-Run)



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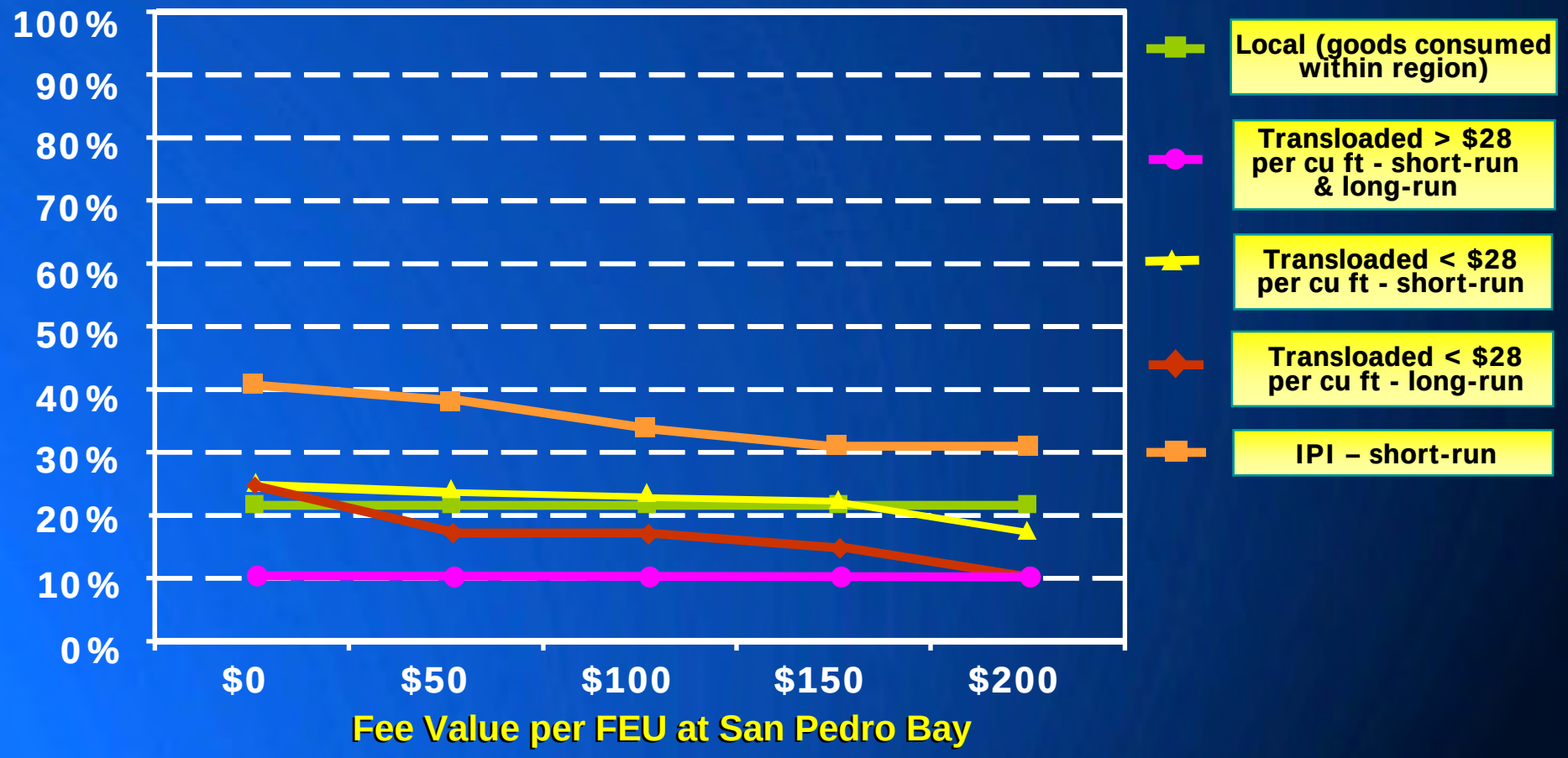
The 2006-2007 Base Case

Much Higher Diversion for the IPI Market (Short-Run)



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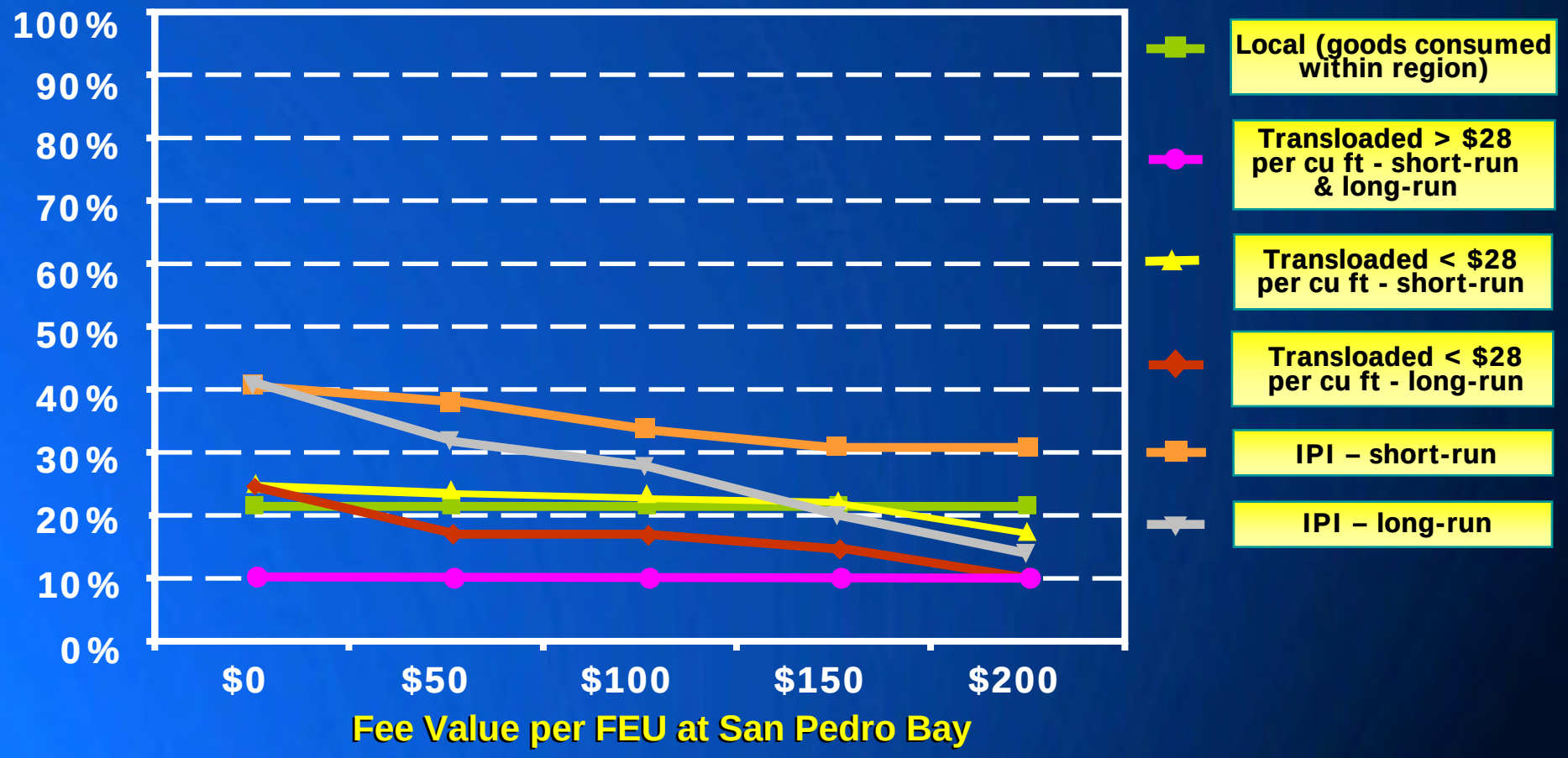
The 2006-2007 Base Case

Highest Diversion for IPI Market (Long-Run)



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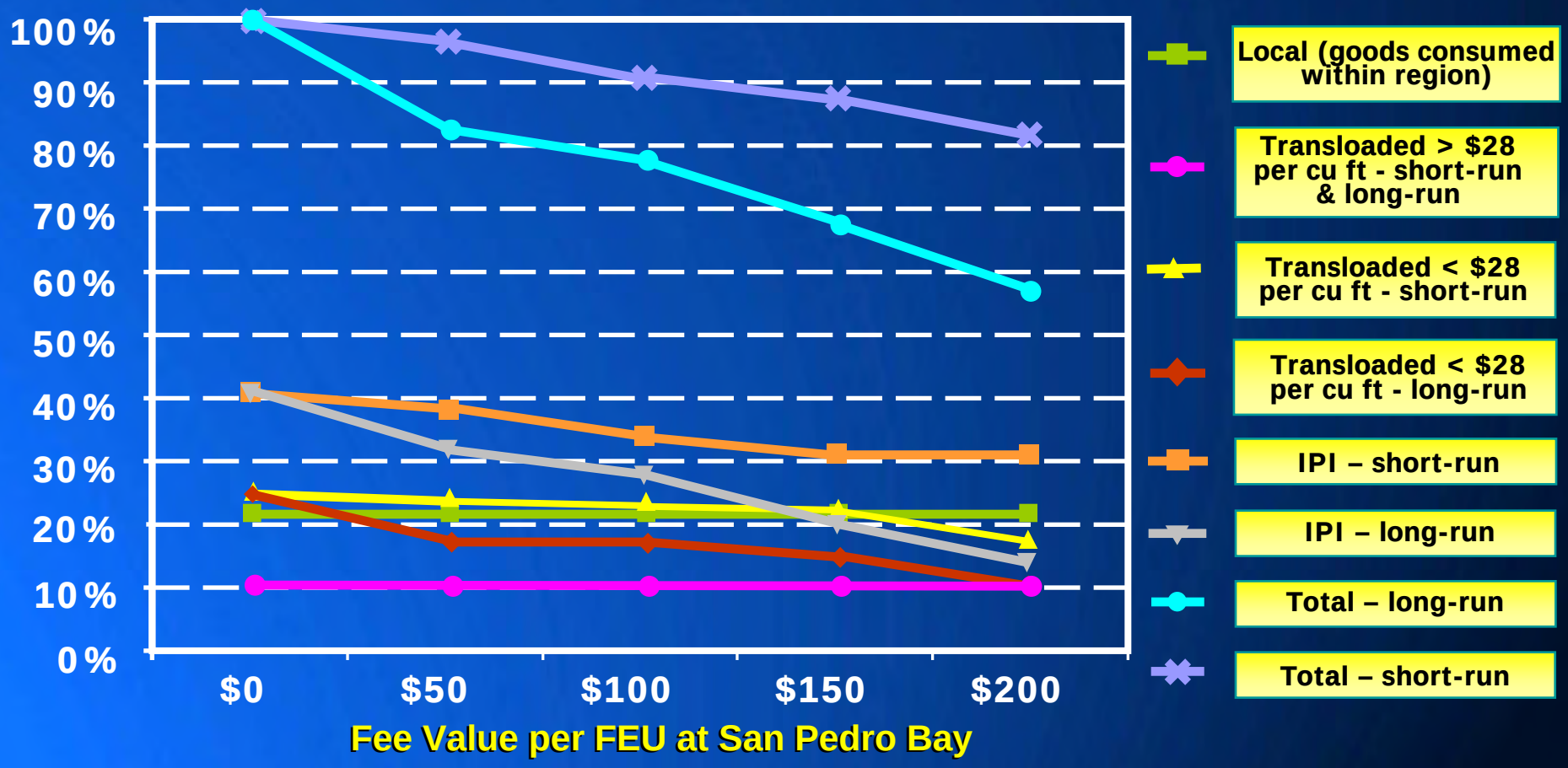
The 2006-2007 Base Case

Total Diversion Higher Than in 2005



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What Changed Compared to 2005?

- Domestic-box rates out of Southern California rose $0.05-$0.10 per cu. ft. more than rates out of the Pacific Northwest (PNW) and Northern California
- Dray rates went up in Southern California but not in the PNW
- Because of legacy IPI contracts and because of automatic fuel surcharges on domestic-box rates, the gap between IPI rates and domestic-box rates widened
- Competitive IPI rates via Prince Rupert

Future Scenarios Analyzed

- *Near-term likely* – new rail terminal at Tacoma, reduce gap between IPI and domestic rail rates by $0.10 per cu ft to East Coast points and by $0.05 per cu ft to Midwestern points, and reduce rates via Southern California to certain points to be more competitive
- *Optimistic I* – same as Near-term likely plus: all-water rates raised by 10%, BNSF SCIG terminal opened
- *Optimistic II* – same as Near-term likely plus: large importers' share of total imports increased from 40% to 50%, BNSF SCIG terminal opened
- *Pessimistic* – same as 2006 Base Case plus all-water rates dropped by 10%

Figure S-2. Short-Run Elasticities of Imports via the San Pedro Bay Ports in Future Scenarios

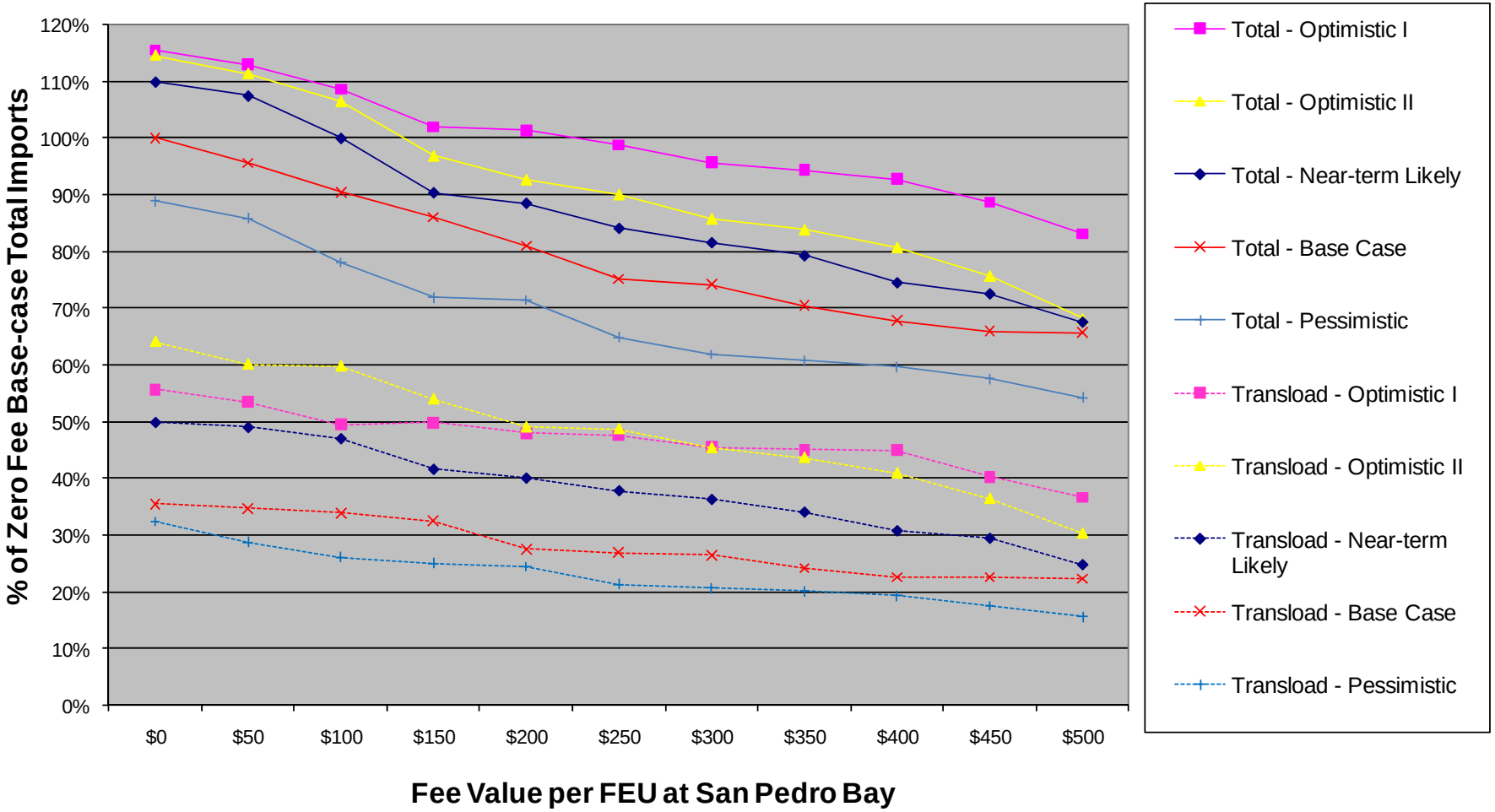
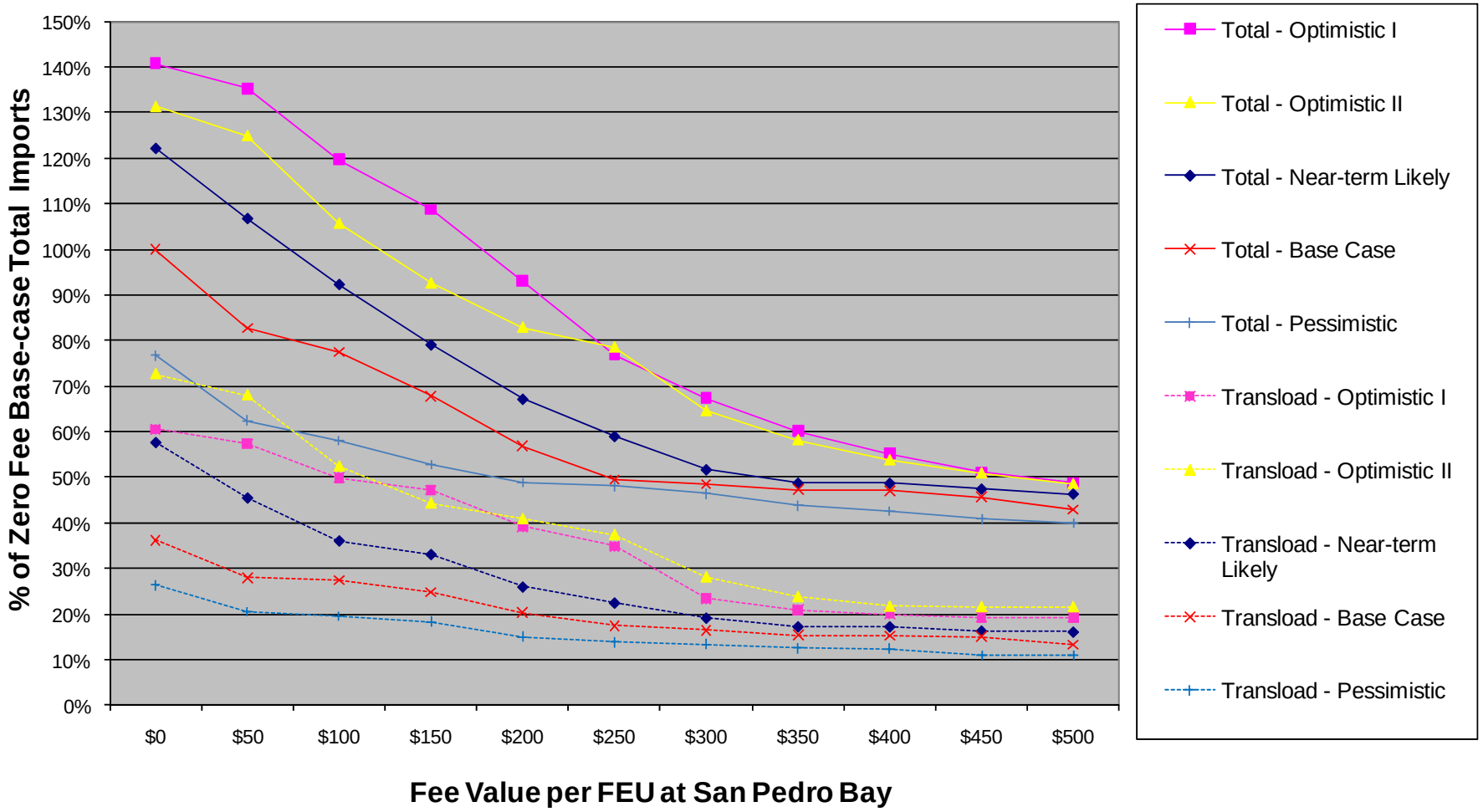


Figure S-3. Long-Run Elasticities of Imports via the San Pedro Bay Ports in Future Scenarios



Observations

- Near-term likely: Total volume surpasses Base Case until $100 per FEU in Short-Run and $75 per FEU in Long-Run. Trans-load volume holds up until $300 per FEU in the Short-Run and $100 per FEU in the Long-Run
- Optimistic scenarios: Total volume surpasses Base Case until $125 - $150 per FEU. Trans-load volume holds up until $250 per FEU in the Long-Run
- Pessimistic: Total volume down 10% with no fee, total volume in Long-Run down by more than half for a fee of $200 per FEU (!)

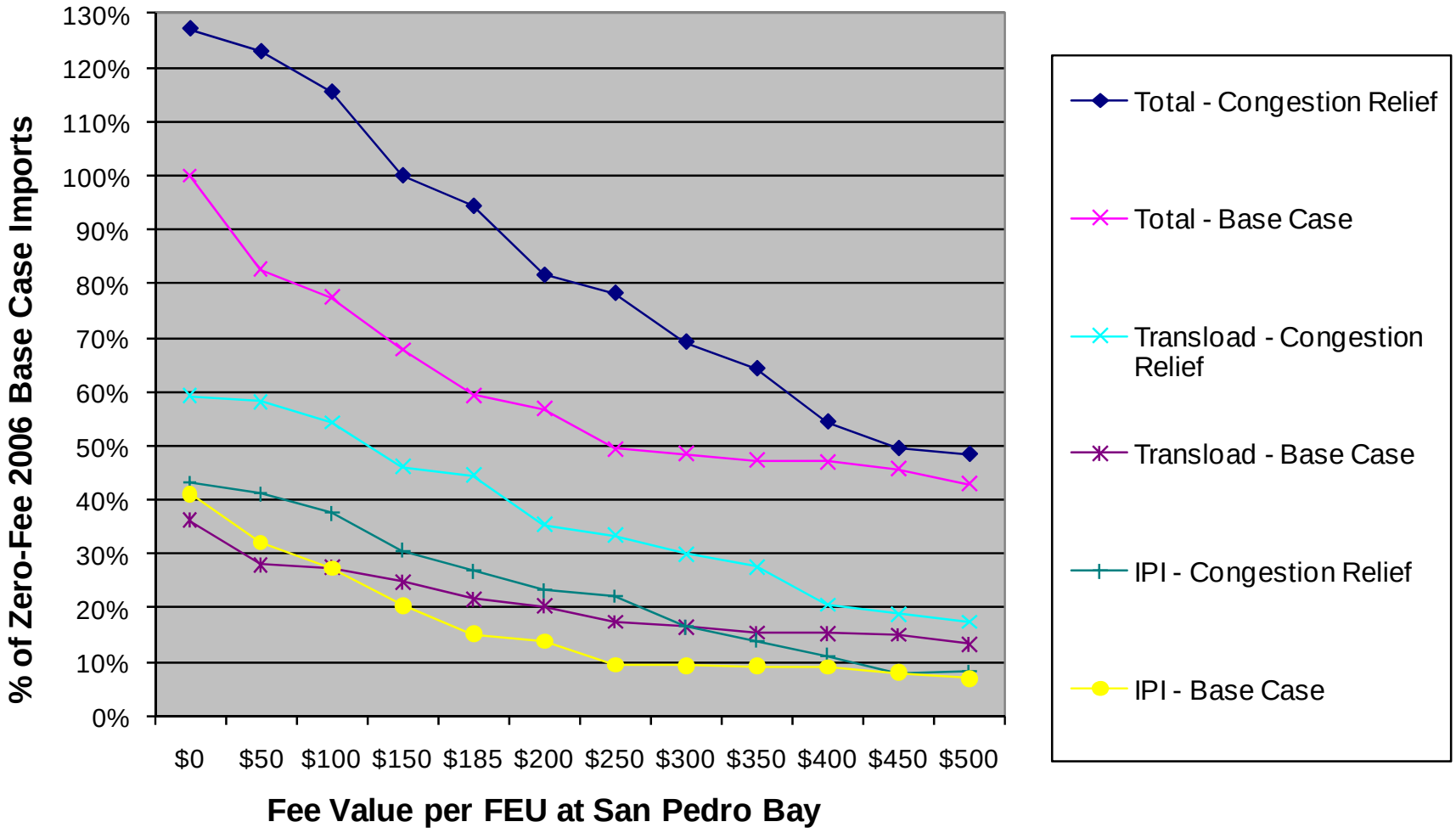
What's Going on Here?

- The IPI business at SPB is highly elastic. There are alternative ports with comparable costs. Fees make this volume go down.
- The trans-load business is more inelastic, but the amount of diversion depends strongly on scenario:
  - Pricing by the RRs (IPI vs. domestic, So Cal vs. PNW)
  - Pricing by the steamship lines and by the Panama Canal authority
  - Market share of the large importers

Impact of Congestion Relief Program

- The Long-Run Elasticity of the Near-term Likely Scenario was re-computed assuming a Major Congestion Relief Program is in place:
  - Double-bottom drays using dedicated truck lanes from ports to trans-loading and warehousing districts
  - 2005 Inland Empire Rail Plan fully implemented, Alameda Corridor and port connections fully built out
  - BNSF SCIG operational
  - Port and rail terminals fully staffed

Long-Run Elasticity of Imports via San Pedro Bay Ports, 2006 Base Case Scenario vs. Major Congestion Relief



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Observations

- Trans-load import volumes exceed the 2006 Base Case volumes until container fees rise to about $225 per FEU (was $100 per FEU without congestion relief)
  - Moderate fees + Major Congestion Relief is attractive for the Trans-loaded imports
- But IPI volume exceeds Base-Case IPI volume only until about $50 per FEU
  - Fees + Congestion Relief is not attractive for the IPI imports
- Total volume exceeds Base-Case volume until about $150 per FEU

Observations (cont.)

- In the Congestion Relief Scenario, there is a cliff in the total-volume elasticity curve around $185 per FEU
  - At $185 per FEU, the total volume is off only 6% (trans-load is up 23%, IPI is down 35%)
  - At $200 per FEU, total volume is down 18% (trans-load is down 2%, IPI is down 44%)

Insights

- The impact of fees varies widely by scenario. 10% changes in the domestic-box rates, in the all-water rates, or in the large-importer market share make big differences.
  - Elasticity to potential fees is primarily a function of the prevailing rail and steamship rates. It will be crucial to keep up with the evolution of these rates in order to predict future container flows.

Insights (Cont.)

- Improved infrastructure that reduces container flow times, paid for by container fees, can be a value proposition for the trans-load business (large, nation-wide importers, high-value imports) but not for the IPI business (inland regional importers and low-value imports).

Policy Discussion

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Potential Policy Discussion

- Raising revenues at the risk of market share?
  - If a regional fee is imposed, the degree of diversions will depend on factors beyond our control (e.g. what other ports may do, transport rates) as well as factors within our control (e.g., how we impose the fee and how the fees are used). Are we willing to take this risk?

Potential Policy Discussion

- Different types of container traffic generate different types of economic benefits for the Region (e.g., warehousing/logistics employment).
  - Should the Region consider strategies that distinguish among these? For instance, should fee pricing strategies distinguish between the different market segments?

Potential Policy Discussion

- Should all containers pay the same fee, or should the fee depend on the landside infrastructure that is utilized?
  - Elasticity analyses assumed all import boxes pay the same fee, i.e., considerable cross-subsidization was implicitly assumed

Potential Policy Discussion

- Push-Pull (AKA trans-loaded) imports generate increasing amounts of traffic
  - Should we consider policies to encourage warehousing development closer to the ports?
  - Should we consider encouraging the railroads to permit domestic containers to be loaded at near-dock terminals?
  - These would reduce truck trip lengths and VMT.

Questions? Comments?

Thank you for your attendance and comments!