

Using Scenario Planning to Prepare for the Future Washington State Case Study

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Scenario Planning to Support Investments in Freight Systems

- The Transportation Research Board (TRB) National Cooperative Highway Research Program (NCHRP) Report 750: Strategic Issues Facing Transportation, Volume 1 analyzed the driving forces behind high-impact economic and social changes as well as sourcing patterns that may affect the U.S. freight transportation system.
- This project developed four future global freight scenarios and a detailed method that planners can follow to conduct their own scenario planning workshops. Please see <http://www.trb.org/main/blurbs/168694.aspx>
- To receive funding under the National Highway Freight Program (23 U.S.C. 167), the FAST Act requires State freight plans to comprehensively address the State's freight planning activities and investments (both immediate and long-range); (section 8001, 70202).
- The law states that a State freight plan shall address a 5-year forecast period, and that projects may be included in the plan if they can be reasonably expected to be funded within that time frame.
- Infrastructure investments last 30 to 100 years. How do you know whether the freight projects you fund in 2021 will support the economy of 2071?

Why Are Freight Trade Forecasts Always Wrong?

- Trade forecasts take historical economic trends and project them forward based on a set growth rate. But we are planning transportation projects that won't be built for 10 years or more, and are then used for another 50 years.
- Think about global economic conditions in 1941 as the U.S. entered WWII, or U.S. relations with the Soviet Union and China in the 50s and 60s. Would planners and engineers have imagined the era of global trade we live in? During the oil shock of the 70s how many foresaw abundant U.S. energy in 2016?
- In the next 60 years it is likely that U.S. and global industries and economic centers will reorganize, collapse, grow in unknown areas and radically change.
- When we predict we often focus on our preferred future, what we want to have happen, instead of other possibilities.
- How can we know where to invest today to meet industries' future needs?

Case Study: Scenario Planning for Freight Investments in Washington State

- The Washington State Department of Transportation (WSDOT) published its current Freight Plan in 2014. They are updating it to meet FAST requirements now.
- The 2014 Plan tested USDOT Freight Analysis Framework (FAF) forecasts against the results of near-term trends analysis, and used scenario planning to prepare for the long-term.
- It doesn't matter if the scenarios don't happen as imagined. Remember we're not predicting, we're learning to prepare for multiple possible futures.
- The work did not focus on particular events, but on the effects of many possible events.

How Did WSDOT Use Scenario Planning?

- They used scenario planning to prepare for long-term (30-year) freight demand, not to predict it.
- They immersed over 60 attendees at a statewide Future of Freight workshop in four different long-range scenarios:
 - **One World Order** - A highly-regulated green world
 - **Naftastique!** - A North American trading bloc
 - **Technology Savior** – A world of plenty
 - **Global Marketplace** – Global free trade, much like today
- Let's take a look at clips from two of the scenario immersion videos.

Nasfastique! <https://youtu.be/0FBDrY0j-l8>

Global Marketplace <https://youtu.be/qkJksNjwpY4>

What Happened at the WSDOT Freight Scenario Planning Workshop?

- Attendees considered how their scenario would impact demand on the state's multimodal freight corridors, and selected key corridors that would matter most in their future world.
- There are only five supply chain outcomes any event can impact:
 1. Sourcing patterns
 2. Freight flow destination
 3. Routing – choice of trade lanes
 4. Freight flow volume
 5. Value density (the value of goods per ton shipped)
- Participants also discussed potential investment 'bundles' to meet demand:
 - Land use solutions
 - Policy and regulatory initiatives
 - Infrastructure
 - Operational improvements

Strategic Highway Freight Corridors - Washington State 2037

Major State Corridors

- North/South
 • I-5 corridor and neighboring highways
 • US 395
- East/West
 • I-90
 • I-82

Regional Corridors that provide Washington State access-

- North/South
 • BC Route 99 and neighboring highways
- East/West
 • I-84
 • BC Route 3
 • Highway 1 (Trans-Canada Highway)

Please feel free to consider other corridor segments as part of preparing for the future of freight in Washington State.

Potential Investment Bundles

Please consider the following bundles as part of your solutions:

Land Use Solutions

This bundle improves overall freight mobility through changes in zoning and land use. Possible changes include designation of specific industrial centers, mandating the inclusion of freight transportation in the municipal/regional comprehensive planning process, and development of a state-wide intermodal terminal plan.

Policy and Regulatory Initiatives

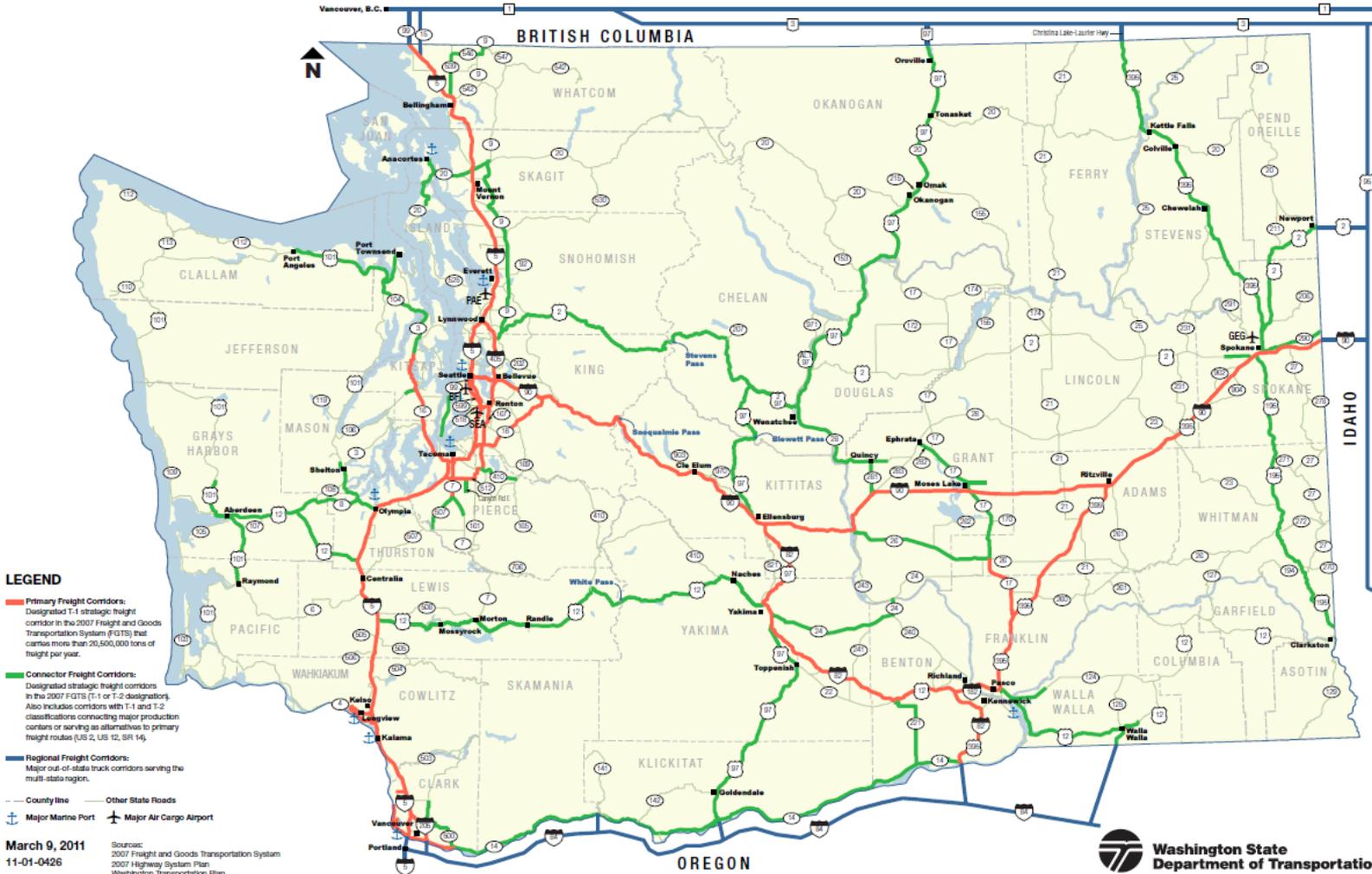
This bundle reduces regulatory restrictions on freight transportation. Potential initiatives include increasing the weight capacities and/or trailer configurations across the state, streamlining licensing procedures, etc.

Infrastructure

This bundle improves overall freight mobility through improvements in infrastructure. Potential solutions include improvements to existing infrastructure and the addition of new infrastructure (extension of SR 167; SR 509; US 395; grade separation projects).

Operational Improvements

This bundle facilitates smoother and more efficient transfer between modes of freight transportation. Improvements could encompass truck to rail, rail to rail, truck to barge, as well as truck to air operations. Also improvements to existing facilities through the use of technology (ITS), dedicated facilities, and improved truck parking.



Strategic Rail, Waterway and Pipeline Corridors - Washington State 2037

LEGEND

Strategic Rail Corridors

- I-5 North-South Corridor
- Columbia River East-West Corridor UP
- Columbia River East-West Corridor BNSF
- Stevens Pass East-West Corridor
- Stampede Pass East-West Corridor
- Grays Harbor-Chehalis Corridor
- Major Rail Terminals

Strategic Waterway Corridors

- Snake/Columbia River Strategic Waterways
- Strait of Juan de Fuca - Puget Sound Strategic Waterways

Strategic Pipeline Corridors

- Olympic Pipeline
 - Yellowstone Pipeline
 - Chevron Pipeline
 - Terminals
- County line --- Other State Roads
⚓ Major Marine Ports ✈ Major Air Cargo Airport ⌋ Dam or Locks



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Source:
WSDOT State Rail and Marine Office
rail@wsdot.wa.gov 360-705-7900

How Did WSDOT Combine the Power of Scenario Planning with a Trends Analysis in the Freight Plan?

- As an example, the FHWA Freight Analysis Framework (FAF) forecast predicts that rapid truck growth along the north-south Interstate-5 corridor will continue to be the dominant trend in Washington State.

Viewed in 2014, this appears to be the only possible outcome.

- However, the scenario workshop caused highway-centric participants to grasp how demand on the east-west transcontinental freight rail, intermodal and waterway systems will be in the forefront no matter what actually occurs in the next 20 years; whether:
 - Governmental regimes enforce much stricter environmental policies,
 - U.S. trade is not focused on China, but within the NAFTA trading block, or
 - Advances in technology disburse goods production and produce material abundance.

How Did WSDOT Analyze Near-term Industry Trends?

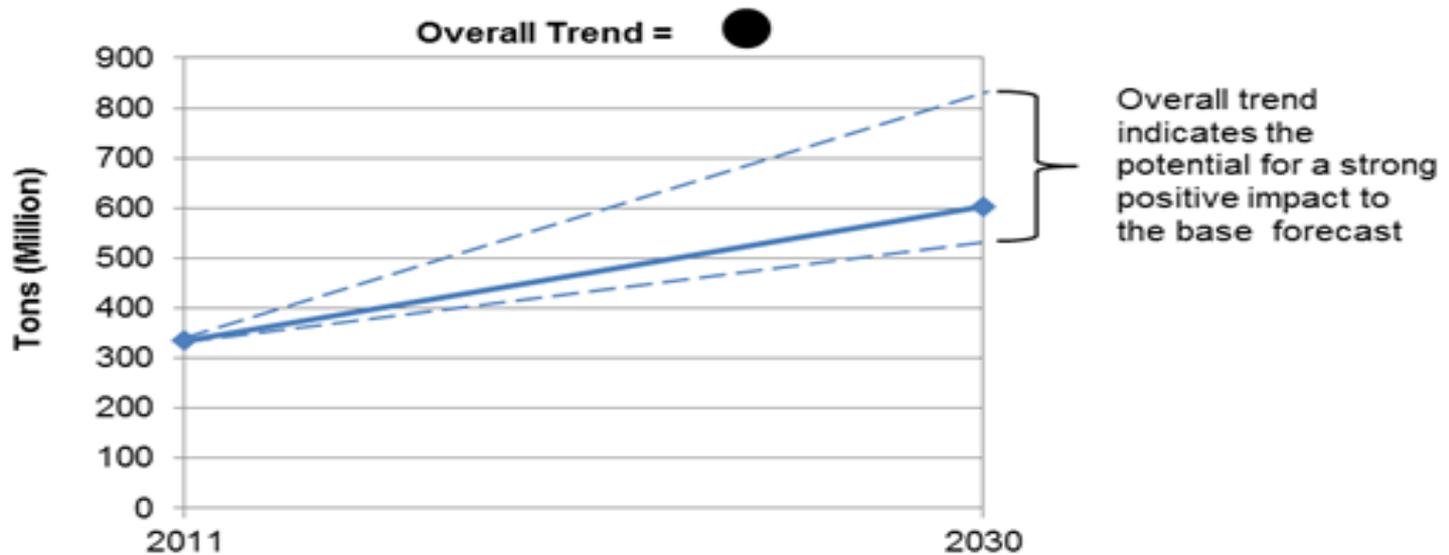
- WSDOT interviewed over 150 shippers, goods receivers and carriers across the state to understand near-term (six-year) industry trends.
- Interviewing people with deep expertise in manufacturing, agribusiness, construction, and retail-wholesale trade gives a much better understanding of demand trends.
- Information from those interviews provide the 'sensors in the ground' we need to see if the world is actually moving towards an imagined long-term scenario, and lean into preparing for it.

WSDOT Used Near-term Industry Trends To Test Straight Growth Projections

They also used the trends analysis to test assumptions in the Freight Plan's 20-year Forecasts, and to identify a range of forecasted demand.

Truck Forecast in Washington State:

FAF projection overlaid with results of WSDOT's Trends Analysis



Lessons Learned

- Although a large scenario planning workshop brings in multiple points of view, several smaller events with higher-level industry supply chain experts may provide better information. The value of scenario planning is completely reliant on the level of attendees' expertise.
- For scenario planning to deliver value to State Departments of Transportation (DOTs) and Metropolitan Planning Organizations (MPOs) they need to develop business processes along the critical decision path that make use of this new knowledge.
- Macro-economic and technology forces are impossible to predict and have tremendous impacts on supply chains.

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