Economic Benefits of Additional Rail Bridge Capacity

A case study on the benefits of replacing the Merchants Bridge main spans at St. Louis

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Future of the Rail Industry

- FRA predicts total tonnage moved by rail will see a 35% increase from 2010 to 2050.
  - AAR suggests $148 billion must be invested to accommodate forecasted 2035 demand levels.
    - Without improvements, 30% of rail miles in primary corridors will be congested by 2035.
- U.S. DOT estimates that ***demand*** for freight tonnage will increase 88% from 2002 to 2035.
  - Quantity demanded will exceed quantity supplied.

Merchants Bridge, St. Louis, MO-IL

- Built in 1890.
- Operates at limited capacity due to weight restrictions.
- Improvements will restore it to a double-tracked bridge.
  - This will allow the Merchants Bridge to alleviate congestion on other routes.
- Without improvements, Merchants Bridge will ***close in 2034***.

Merchants and MacArthur Bridge Crossing

- At and average of 72.8 trains per day, the bridges make up the most heavily trafficked Mississippi River crossing in the country.
- One of the few crossings open to all railroads.

2014 Train Count - Mississippi River Bridges

Rank	Bridge	States	Count	Average TPD	Source
1	Ft Madison BNSF	IL-MO	23152	63.4	AEI 178 179
2	Thebes UP	IL-MO	16699	45.8	AEI 625
3	Clinton UP	IL-IA	15644	42.9	AEI 475 476
4	MacArthur Bridge-TRRA	IL-MO	14790	40.5	AEI 68 69
5	Memphis BNSF	TN-AR	12023	32.9	AEI 137
6	Merchants Bridge-TRRA	IL-MO	11798	32.3	AEI 1150 1151
7	Hastings CP	MN		20.0	Estimate
8	La Crosse CP	WI-MN		20.0	Estimate
9	Burlington BNSF	IL-IA		20.0	Estimate
10	Huey P Long Bridge NOPB	LA	6907	18.9	AEI 473/474
11	Vicksburg KCS	MS-LA	6309	17.3	AEI 1121
12	Camden Place (Minneapolis) CP	MN		16.0	Estimate
13	Hoffman UP	MN	5562	15.2	AEI 418
14	Memphis UP	TN-AR	4954	13.6	AEI 235 236
15	Hannibal NS	IL-MO		11.0	Estimate
16	East Minneapolis BNSF	MN		10.0	BNSF TPD map
17	Rock Island IAIS	IL-IA		10.0	Estimate
18	Sabula CP	IL-IA		8.0	Estimate
19	Quincy BNSF	IL-MO		8.0	Estimate
20	Roberts Street UP	MN		7.0	Estimate
21	Baton Rouge	LA		7.0	Estimate
22	Louisiana KCS	IL-MO		5.0	Estimate
23	Bridge 15 UP	MN		4.0	UP Volume map

Benefits of Project

Benefits are gained by:

1. Avoiding diversion of freight to longer rail routes.
   - Nearest bridge accessible to all railroads takes an additional 300 miles to travel.
2. Diverting freight from truck to rail.
   - Mile-for-mile, rail is cheaper than truck.
3. Run time improvements.
   - Increase speed over bridge from 6 mph to 14 mph.

Cost Savings

Benefits can be further broken down into:

1. Transportation Cost Savings
   - Labor, Fuel, Maintenance, Congestion, etc.
2. Environmental Cost Savings
   - Emissions, Noise.
3. Inventory Cost Savings
   - Cost of delayed lading.

Summary of Project Costs

1. Construction costs.
2. Costs of closing bridge during construction.

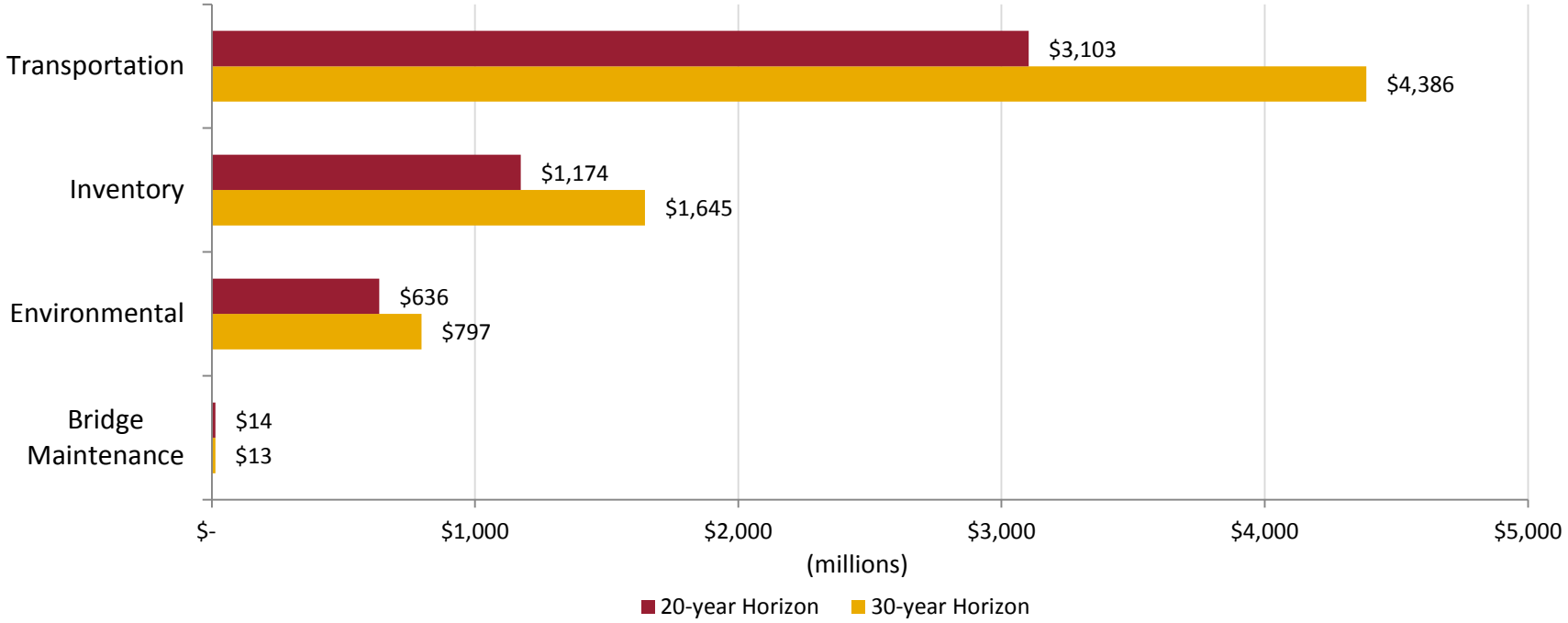
- Use upper bound and lower bound construction cost estimates.
  - Upper bound: $212 million.

Construction cost: $212 million, 7% discount rate (in millions)

Year	Total Cost of Construction	Total Cost of Transportation	Total Cost to Environment	Total Cost of Delay	Total Annual Cost
2017	$ 72.0	$ 10.3	$ 3.7	$ 4.3	$ 90.3
2018	$ 65.4	$ 9.7	$ 3.3	$ 4.1	$ 82.6
2019	$ 61.1	$ 9.2	$ 3.0	$ 3.9	$ 77.2
				Total Cost	***$ 250.0***

  - Lower bound: $150 million
    - Total project cost: $191.9 million.

Summary of Project Benefits



Net Present Value of Project (Benefits – Costs)

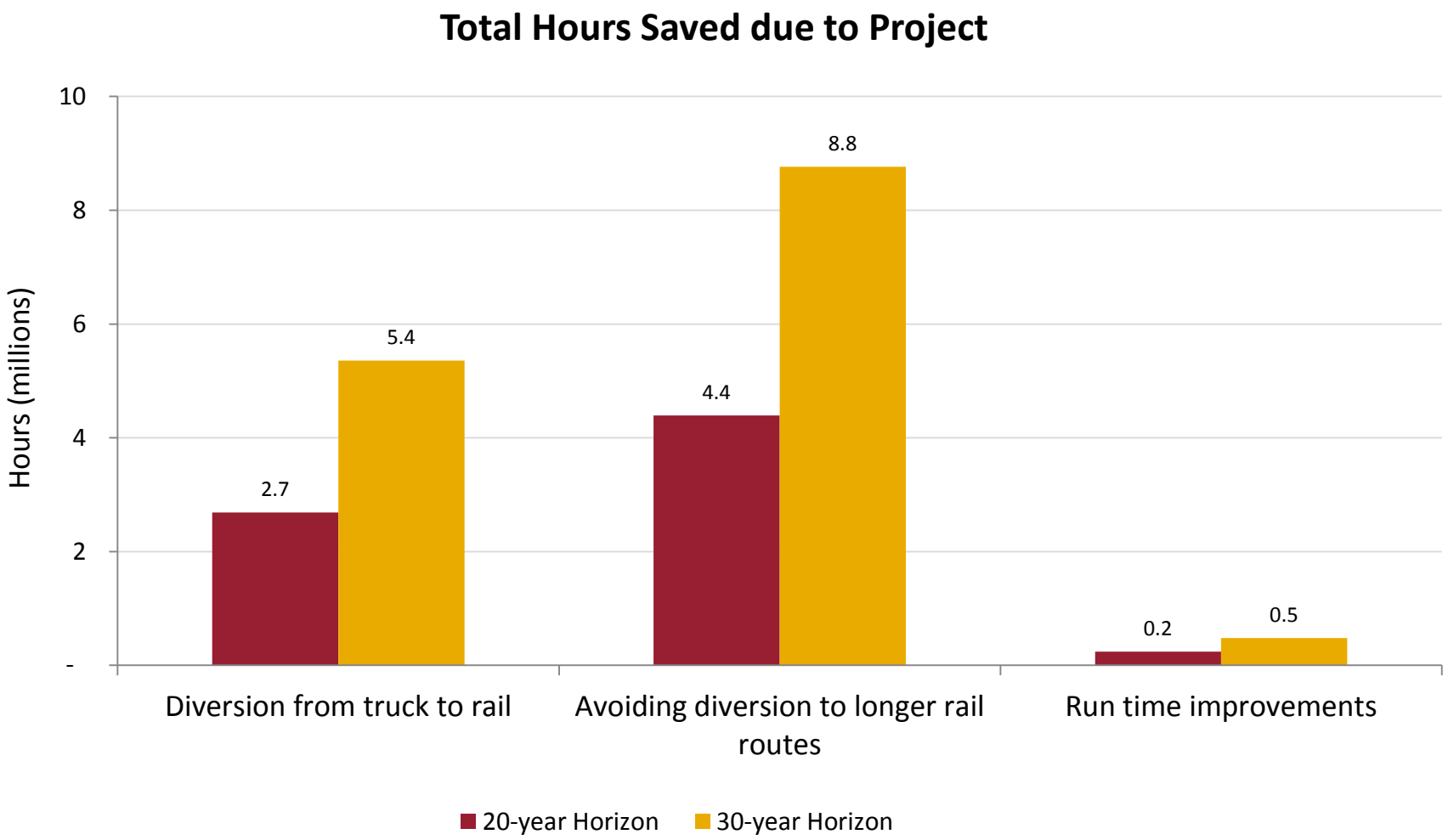
	NPV (20-year Horizon: 2017-2036)	*NPV (30-year Horizon: 2017-2046)*
3% discount rate	$ 7.1 billion	$ 11.9 billion
7% discount rate	$ 4.7 billion	$ 6.6 billion

TIGER Guidelines

Project benefits should be realized across 5 categories:

1. Livability
2. Economic Competitiveness
3. Safety
4. State of Good Repair
5. Sustainability

Livability



- 7.3 million hours saved in 20-year horizon.
- 14.6 million hours saved in 30-year horizon.

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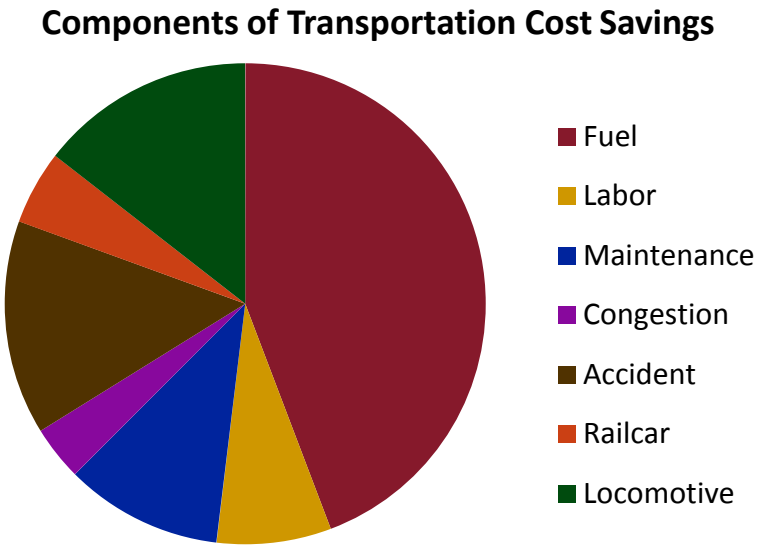
Economic Competitiveness

- Approximately $3.1 billion saved in transportation costs from 2017-2036.

Total Transportation Cost Savings by type, 7% discount rate, in millions.

Diverting Freight from Truck to Rail	Avoiding Diversion to Longer Rail Routes	Run Time Improvements	Total
$ 352	$ 2,701	$ 50	$ 3,103

- $4.4 billion over 30-year horizon.



Safety

1. Decreased number of trucks on the highways.
   - 1.19¢ per truck ton mile; 0.25¢ per rail ton mile.
   - Total cost of miles traveled by rail compared to cost if freight, instead, traveled by truck.

2. Decreased rail miles traveled per ton of freight.
   - Cost differential of additional miles.

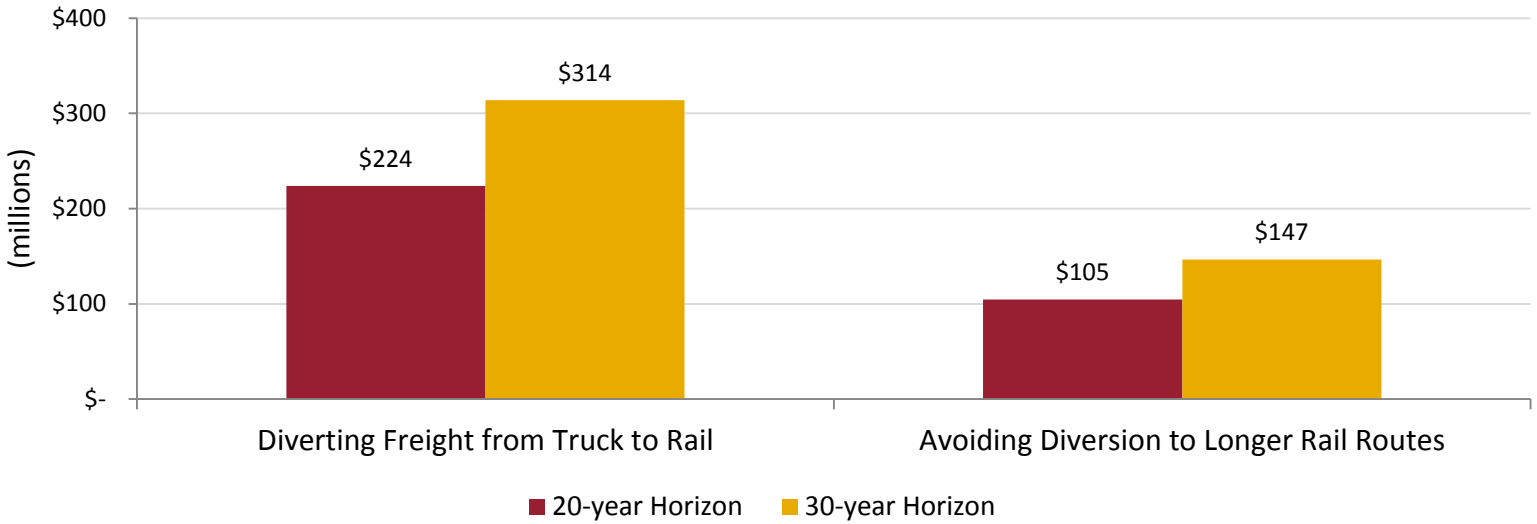
Transportation Cost Savings: 20-year horizon, 7% discount rate (in millions)

Diverting Freight from Truck to Rail	Avoiding Diversion to Longer Rail Routes	Total
$ 11.3	$ 436.5	$ 447.8

   - $628 million over 30-year horizon.

State of Good Repair

1. Road and Rail maintenance cost savings.

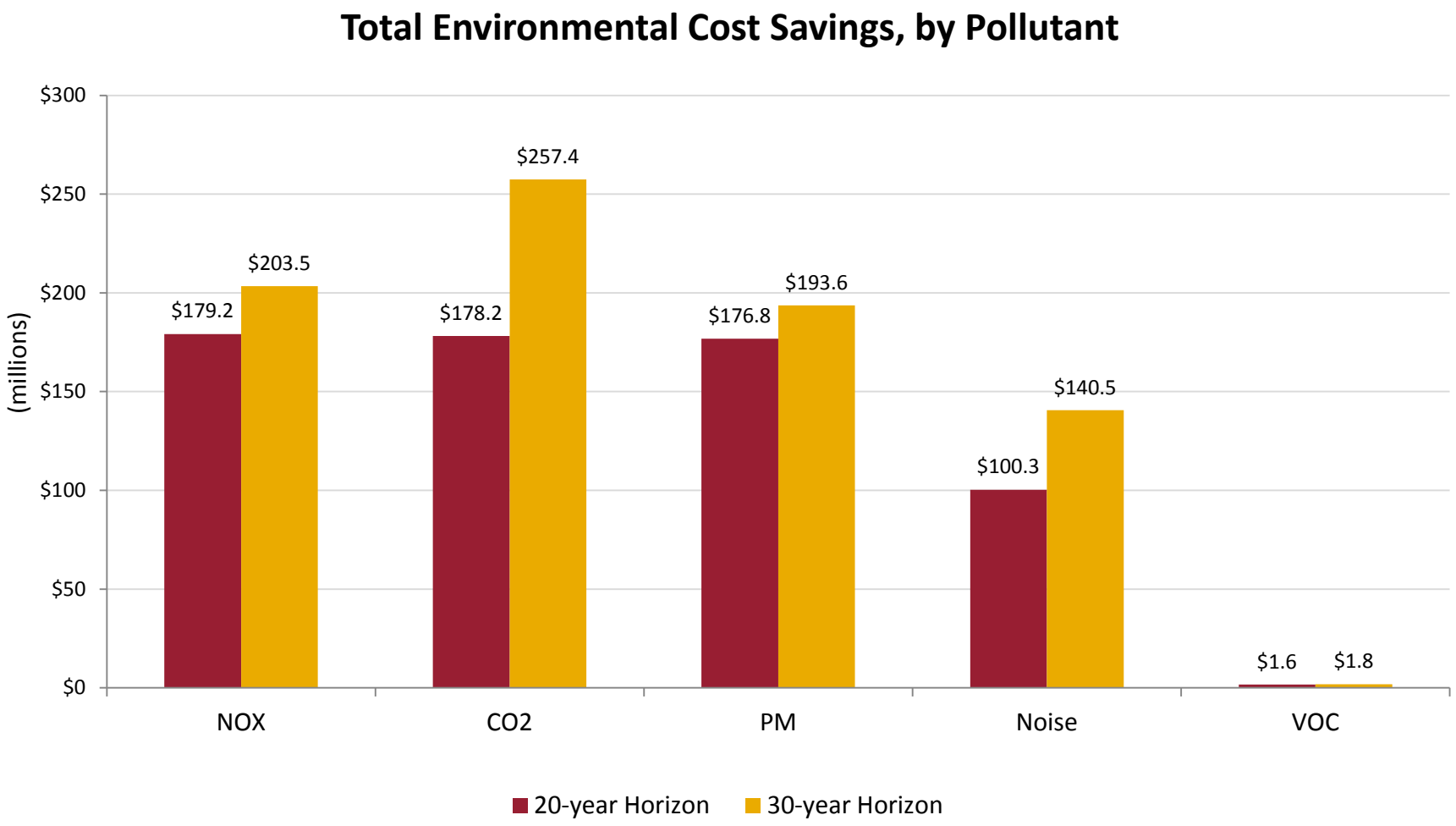


2. Bridge maintenance costs.

Total Bridge Maintenance Costs: 7% discount rate (in millions)

	Baseline Alternative	Build Alternative	Total
20-year Horizon	$ 14.7	$ 1.0	$ 13.7
2020 to 2034	$ 7. 1	$ 1.0	$ 6.2

Sustainability



- $636 million over 20-year horizon
- $797 million over 30-year horizon

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What does this mean?

- Improving the Merchants Bridge could generate billions in benefits over the coming decades.
  - Benefits shared by industry and public.
- Investing in other existing rail infrastructure will produce similar benefits, allowing the industry to keep up with growing demand.
  - Decrease costs associated with freight transport.
  - Decrease congestion on routes operating at or above capacity.
  - Decrease overall transport time.

Questions?