

# Improving Michigan's Border-Crossing Railroad Infrastructure: Implications for Metropolitan Detroit

JOSEPH P. SCHWIETERMAN

Along the Michigan-Canada border, government officials and business leaders are engaged in a highly politicized and divisive debate over Canadian National-North America's railroad tunnel project under the St. Clair River. The 6,000-ft tunnel, to link Port Huron, Michigan, and Sarnia, Ontario, is to be Michigan's first transborder facility capable of handling double-stack containers and other oversized rail cars. However, Detroit officials, concerned about their city's status as a rail hub, favor an alternative tunnel location in the Detroit-Windsor area. The economic and social implications of the two tunnel alternatives for the Detroit-Windsor metropolitan area are assessed. Using a methodological approach developed by FRA, the results show that the metropolitan Detroit area stands to gain \$5.5 million annually if the tunnel is completed as scheduled and \$4.5 million annually if the tunnel is built in the immediate Detroit area. Broad lessons are discussed about the municipal implications of rail infrastructure projects—lessons relevant in the analysis of rail projects across the country.

Railroad infrastructure projects are gaining unprecedented attention as municipalities, counties, and states vie to attract new industry. By developing comprehensive railroad plans, providing technical assistance, and offering capital grants to rail carriers, state and local governments are working to build private-public partnerships to ensure the timely completion of vital transportation projects.

Along the Michigan-Canada border, however, government officials and business leaders are engaged in a highly politicized and divisive debate over one railroad project—Canadian National (CN)—North America's tunnel project under the St. Clair River, linking Port Huron, Michigan, and Sarnia, Ontario. The 6,000-ft tunnel, located 60 mi north of Detroit, would be the most expensive privately financed railroad improvement in Michigan's recent history. As Michigan's first transborder facility capable of handling double-stack containers and other oversized rail cars, it could have a significant economic impact on the Detroit area. Detroit officials vigorously oppose the project and have released a study concluding that it will undermine Detroit's position as an expanding international rail gateway. In fact, they are pursuing regulatory actions that could delay or halt the Port Huron-Sarnia project and favor an alternative tunnel project in the Detroit-Windsor area.

This study assesses how the two alternative tunnel locations will affect the economy of the Detroit-Windsor metropolitan

area. Using a methodological approach developed by FRA, the results offer broad lessons about the municipal implications of rail infrastructure projects—lessons relevant in the analysis of rail projects across the country.

## BACKGROUND

Most rail traffic between Michigan and eastern Canada travels through one of two aging tunnel facilities—a century-old tunnel between Port Huron and Sarnia, and an aging twin-tube concrete tunnel between Detroit and Windsor built in 1910. Michigan's railroad companies have long recognized that neither facility adequately meets their changing operational needs. Because of low clearances, the facilities do not accommodate many modern types of rail cars, including double-stack container trains, high-cube box cars, or trilevel automobile rack cars. In fact, existing clearances are so low that the tunnels cannot even accommodate conventional "piggyback" intermodal cars—equipment that has been used for more than half a century. (Intermodal trains handle freight in containers or truck trailers that are suitable for conveyance by several modes of transportation.)

Railroad companies are responding to the tunnel clearance problems in several ways. First, to the extent possible, they are rerouting much of their transborder freight around Michigan. For example, the Canadian Pacific Railroad (CP) has entered a marketing agreement with the Norfolk Southern Railroad (NS) to send many double-stack intermodal cars over the Niagara Bridge, near Buffalo, New York. Second, they are using ferry services to transport oversized rail cars across the border. Often, however, this alternative is excessively costly: not only are federal harbor fees nearly \$300/car, but the process delays delivery by 12 to 24 hr (1). Finally, a new type of rail car, dubbed a "well car," is being used to allow certain truck-on-flat-car (TOFC) services to use the existing tunnels.

The two railroad companies that own the aging Detroit-Windsor tunnel, CN and CP, also have embarked on a partial enlargement project. They recently agreed to spend \$25 million to deepen one of the twin-tube tunnels to allow the passage of high-cube box cars and standard TOFC equipment. However, even when this project is completed, clearances will remain insufficient to accommodate the double stacking of containers 9 ft 6 in. and trilevel automobile rack cars 20 ft 2 in. in size.

Demand for the double stacking of containers is expected to grow rapidly throughout the decade because it virtually doubles a train's capacity. Most important, it lowers the costs of shipping containerized freight and allows railroads to compete with motor carriers for freight movements as short as 250 mi. By contrast, conventional single-stack services generally are competitive with trucks only over distances 800 mi or more (1).

CN and its U.S. subsidiary, the Grand Trunk Western Railroad (GTW), which use the CN-North America name for marketing purposes, believe the new rail tunnel will enhance its competitive position in the movement of transcontinental intermodal freight. Even though CN-North America's intermodal traffic is rising (up 15 percent between 1990 and 1991), intermodal revenues are falling (down nearly 4 percent over the period) because of escalating price competition—and additional price cuts are anticipated as technological innovations are made. The carriers maintain that low-cost transborder double-stack service is a necessary step in restoring profitability (2).

CN-North America will construct the \$128 million (\$155 million in Canadian dollars) Port Huron-to-Sarnia tunnel without government funds, with completion scheduled for late 1994. The Port Huron-Sarnia site is located on the GTW-CN main line linking Chicago with Toronto and Canadian seaports near Montreal. Because of the configuration of the 510 mi of track GTW operates in Michigan, railroad personnel believe that routing trains via Detroit would be difficult, adding 45 mi and 3 to 4 hr of travel time to the journey—thus eliminating much of the tunnel's marketing and cost-saving benefits (Figure 1). The northern route is more direct for

Chicago-bound freight and bypasses substantial congestion at Detroit.

On completion of the Port Huron-to-Sarnia tunnel, CN-North America also plans to improve service to Detroit by expanding its \$20 million investment in local terminal facilities, including its Moterm, Brownstown, and Mazda terminals. The largest of these facilities, Moterm, in north suburban Ferndale, is scheduled for additional enlargement into adjacent Detroit in upcoming months. From these terminals and those in Chicago, Lansing, Battle Creek, and Durand, CN-North America currently transports about 75,000 oversized rail cars over the Port Huron-Sarnia ferry each year and 210,000 containers through the existing tunnel.

As some Detroit officials observe, CN-America may have another motive for selecting a more remote tunnel location. The northern tunnel could preclude other railroads—including rivals CP, NS, and CSX—from sharing in the tunnel's benefits (these carriers' intermodal routes are also shown in Figure 1). Because these competitors have not yet demonstrated a financial commitment to a double-stack tunnel project, however, such allegations have been largely discounted by state rail officials. For example, the Michigan Department of Transportation (MDOT) remains supportive of the planned CN-North America tunnel.

The Detroit-Windsor Port Corporation (DeWin) has been a leading critic of CN-North America's tunnel. DeWin proposes an alternate tunnel site between Detroit and Windsor at a cost of \$172 million (U.S. dollars), not including the cost of the approach infrastructure, ultimately to be financed through railway use charges. It also seeks to convert the existing twin-tube rail tunnel between Detroit and Windsor to a motor

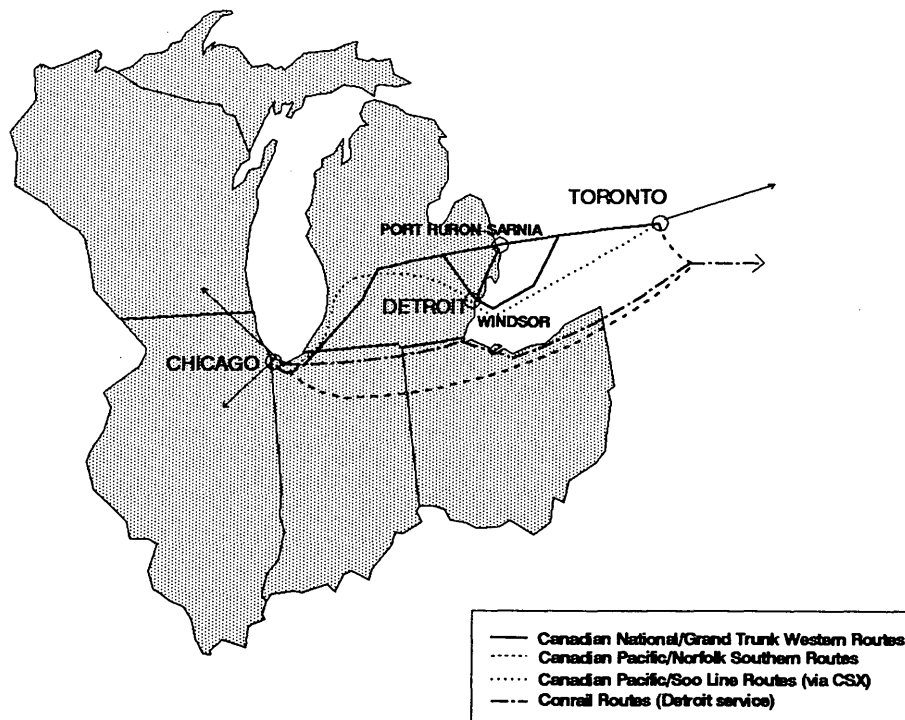


FIGURE 1 Principal intermodal railroad services: Chicago to Toronto.

carrier facility that would help relieve transborder highway congestion on the Ambassador Bridge. Although it adds \$65 million to the project's overall cost, DeWin considers the motor tunnel an important ancillary component of the proposal (3).

## IMPLICATIONS FOR THE DETROIT-WINDSOR ECONOMY

Unfortunately, the debate over the tunnel's implications for the Detroit-Windsor economy is proceeding without the benefit of detailed economic analysis. This section explores the limitations of previous studies and outlines an approach to assess the benefits and costs of the alternative tunnel locations for the Detroit-Windsor area.

### Limitations of Previous Research

An MDOT-sponsored study released in December 1991 (1) explores in detail the project's implications for Michigan. The study's author concludes after extensive research that "without double-stack service, Michigan will sit at the northern terminus of a rail system which increasingly relies on auto industry volume to absorb costs." The study's financial analysis indicates that the Port Huron-Sarnia site offers a much faster payback for both Michigan and the United States. Still, it outlines unique advantages associated with each location. For example, although the study concludes that CN-North America has a strong interest in the more direct northern facility, it notes that the Chrysler Corporation, which ships trilevel automobile rack cars from its plants in Ontario, would benefit most from a tunnel in the immediate Detroit area. The following analysis presented relies extensively on this earlier investigation.

Because of the MDOT study's exclusive focus on the project's statewide implications, it has done little to lessen the specific concerns of Detroit officials about the planned Port Huron-Sarnia tunnel. Detroit officials maintain that the study contradicts MDOT's earlier position—a position that MDOT publicized in the form of an informational brochure—that Detroit urgently needs its own double-stack tunnel.

Recognizing the need for additional research, DeWin commissioned a study to measure these local effects of a Port Huron-Sarnia Tunnel. That study concludes that Detroit would suffer significant economic losses if the northern tunnel were built (3). Of primary concern was "the potential migration of existing industries from Detroit-Windsor areas" to Port Huron-Sarnia. The study forecasts that more than 85,000 area jobs in the manufacturing, service, and retail sectors would be lost. As supporting evidence, it cites the availability of 8,100 acres of industrial parks in the Port Huron-Sarnia area. The northern tunnel location, it maintains, would "seriously reduce the economic and social viability of the greater Detroit-Windsor area."

DeWin's study also concludes that the Port Huron-Sarnia tunnel would affect the ability for the Detroit-Windsor region to attract new business by denying local shippers access to double-stack services. The study states: "If Detroit-Windsor

is relegated to the status of 'bridesmaid' while Port Huron-Sarnia becomes the bride, the Detroit-Windsor area will be placed in the arduous position of striving to finance, plan, and construct a double-stack tunnel." However, this conclusion does not agree with MDOT's conclusion that the Port Huron-Sarnia tunnel would be able to handle almost all transborder double-stack freight traveling between metropolitan Detroit and Canada. MDOT finds that most shippers in the Detroit area will be well served by either tunnel. In fact, many shippers using the Detroit area's largest intermodal terminal—Moterm—might prefer a Port Huron-Sarnia route to a Detroit-Windsor route because it offers shorter travel distances to Canadian seaports.

Another point of contention is whether CN-North America will establish competing intermodal terminal facilities in the Port Huron-Sarnia area, encouraging companies to relocate their terminals out of the Detroit vicinity. The carrier denies this claim. Regardless of the ultimate location of the tunnel, CN-North America maintains that the local Moterm facility will remain the region's primary loading area for Canada-bound freight. The carrier points to its recent expansions and financial commitment in support of this claim.

### Analytical Techniques

The validity of these conflicting claims about the expected impact of the tunnel can be addressed using government-approved analytical techniques. FRA has developed a methodology specifically for the evaluation of railroad projects; it weighs a project's effects on local employment, shippers costs, railroad operating costs, and other factors (4). Many state departments of transportation, including MDOT, use this methodology extensively in project analysis.

MDOT uses the FRA methodology as the basis of a public benefits model that measures the effects of rail projects on the state economy across a 20-year planning horizon (5,6). Although this methodological approach has not been applied previously to projects as large as the double-stack tunnel—most of the projects MDOT considers cost only a few million dollars and involve low-density branch lines—it provides a useful framework for understanding the economic effects of the alternative tunnel locations.

The FRA-MDOT approach provides important lessons about the economic effects of rail projects:

1. *The principal beneficiaries of rail projects are shippers and their employees.* Rail projects affect business conditions in a community by changing transportation costs and the quality of rail services available to shippers. By forestalling abandonments, improving services, and lowering prices, rail projects can lower freight costs and mitigate the need for layoffs by on-line shippers. The methodology also suggests that the gains and losses that municipalities experience because of employment changes often are relatively modest. According to the FRA methodology, job losses impose only temporary costs—and job additions provide only temporary gains—for a metropolitan area's economy because affected workers typically can find other employment after sustained job searches. In MDOT's analysis, for example, the length of time required

for workers to find suitable alternate employment is based on Michigan Employment Security Corporation estimates.

2. *Some states, including Michigan, consider regional multiplier effects to be relevant.* MDOT's public benefits model assumes that job losses in primary industries "multiply," resulting in additional losses in secondary industries, thus affecting employment in the service and retail sectors. The department's publications suggest that approximately 1.3 secondary jobs are lost for every primary worker displaced (6). (The opposite relationship holds true for employment gains.) However, Michigan is the only state in the Midwest to consider multiplier effects, rendering its assessments of the employment-related benefits of rail projects higher than average (7,8).

3. *Growth in transportation-related employment is not a likely benefit associated with rail projects.* Railroad projects rarely lead to significant gains through expanded job opportunities for transportation workers. In the current environment, in which railroad jobs are rapidly being eliminated through work rule changes and technological innovation, large-scale job growth in railroading is an improbable project benefit, particularly for intermodal services in which two-person crews are becoming the industry standard. Moreover, new railroad jobs often are offset by lost employment opportunities in the trucking and waterway sectors. For example, officials in Kansas found that each new railroad job eliminated almost three trucking jobs, leading to temporary unemployment in that state (8).

4. *"Bridge traffic" is of little economic benefit to a municipality.* Additional bridge traffic, consisting of freight that originates or terminates on other rail lines, has obvious benefits to a railroad, allowing fixed costs to be apportioned over a larger traffic base (1). However, most state officials concede that municipalities receive no direct benefit from bridge traffic that passes through their borders. Despite this, officials in Detroit contend that their city has much to gain if transborder double-stack trains were routed through a Detroit-Windsor tunnel. This optimism stems from their assumption that Detroit would become a major national classification facility for double-stack trains after the tunnel's completion. Although this possibility cannot be ruled out definitively, it is more likely that intermodal trains will simply pass through Detroit with only changes of crew—just as they do in Cleveland, Port Huron, Fort Wayne, and other intermediate points on the Chicago-to-Canada route. Only 235 mi from the Canadian border, Chicago remains America's premier hub for east-west intermodal freight and is expected to retain this status well into the next century. Large and capital-intensive terminal additions in either Detroit or Port Huron are unlikely outcomes of the tunnel project.

The benign effects of bridge traffic on local economies are documented in earlier governmental analyses of rail projects. For example, when MDOT analyzed a \$3 million trackage and bridge rehabilitation project between Marion and Ashley, Michigan, the department identified no local benefits associated with freight passing through the affected communities. Municipalities reaped no significant benefits through property tax growth, employment growth, or industrial expansion from this traffic. In fact, the analysis of 55 railroad infrastructure projects recently undertaken in Illinois, Indiana, Iowa, Kan-

sas, Michigan, North Dakota, and Ohio—leaders in benefit-cost analysis—shows that no municipalities were expected to benefit from increased bridge traffic. Local communities were affected primarily by changes in the quality of transportation service provided to their shippers (8).

Bearing in mind these lessons from earlier projects, the following section measures the implications of the tunnel's location for the Detroit-Windsor economy.

## ASSESSMENT OF BENEFITS AND COSTS

The benefits and costs to the Detroit-Windsor area as a result of either tunnel's construction can be divided into three categories. Transportation efficiency benefits are the reduced transportation costs realized by shippers and carriers that will use the tunnel. Secondary benefits are the benefits associated with improved employment opportunities, property tax revenues, and other ancillary effects. Finally, direct project costs for the Detroit-Windsor area are the expenditures necessary to build the tunnel and rebuild the right-of-way in the vicinity of the tunnel. (Because private companies would finance the tunnel project, area shippers would pay for these costs only indirectly through rail service fees.)

### Transportation Efficiency Benefits

Transportation efficiency benefits associated with the tunnel are calculated separately for existing and newly generated rail freight.

#### *Benefits for Existing Freight*

Most existing shippers in the Detroit-Windsor area would realize immediate benefits from a tunnel in either location, because it would allow the initiation of double-stack service between Detroit and eastern Canada and accommodate oversized rail cars that now must be transported by ferries. However, as stated earlier, their use of the tunnel will not be cost-free: shippers will help pay for the tunnel's construction indirectly through the transportation fees they pay.

The Port Huron-Sarnia tunnel is expected to cost \$128 million (U.S. dollars) from summit to summit, inclusive of modifications to the approach infrastructure and track realignment costs. The Detroit-Sarnia tunnel is expected to cost \$172 million (U.S. dollars) from portal to portal. Conservatively estimated, an additional \$20 million will be needed for the approach infrastructure and trackage work on supporting rail lines. For example, CN-North America will be required to undertake extensive work on its 110-mi single-track line between Windsor and London, Ontario, because it lacks the signal equipment and right-of-way enhancements necessary for high-density double-stack railroading. Additional work also may be necessary on CSX and CP lines radiating from Detroit.

At either location, the tunnel would handle approximately 180,000 fully loaded, oversized rail cars a year. The Detroit-Windsor tunnel would serve more railroad companies, but it

would handle much less CN-North America freight, offsetting this numerical advantage. On the basis of a 20-year planning horizon and an 8 percent discount rate, the fully allocated cost of the tunnel for each oversized rail car, including articulated double-stack cars, would be about \$72.43 at Port Huron-Sarnia and \$108.64 at Detroit-Windsor. (These estimates are based on total construction costs for the northern and southern tunnel alternatives of \$128 million and \$192 million, respectively.) As a result of the high costs, shippers in Detroit probably would pay slightly higher rates if the southern alternative were selected.

Of these 180,000 loaded, oversized cars, about 40,000 would originate or terminate in Detroit and another 4,000 would originate or terminate in Windsor. For freight shipped to and from Detroit, the new double-stack tunnel would reduce operating costs by approximately 10 percent—about \$200/carload (or \$100/container). [This estimate is based on the MDOT study (1).] Thus, after construction costs, Detroit shippers would save approximately \$127.57/carload (i.e., \$200.00 minus \$72.43 for capital cost of the tunnel) from a Port Huron-Sarnia tunnel and approximately \$91.36/carload (i.e., \$200.00 minus \$108.64 for capital cost of the tunnel) from a Detroit-Windsor tunnel. [This approach is similar to that used by MDOT (1).] Cumulatively, shippers would save an estimated \$5.1 million a year by using a Port Huron-Sarnia tunnel and \$3.7 million a year by using a Detroit-Windsor tunnel (Table 1).

For shippers of freight originating or terminating in Windsor, however, the location of the tunnel is a more pivotal issue. Although freight that originated in Detroit would travel economically through either tunnel, freight that originated in

Windsor would not be able to use the Port Huron-Sarnia tunnel in a cost-effective manner. If the northern tunnel were built, Windsor shippers would continue to transport their freight via motor carrier to terminals in Detroit at an estimated additional cost of \$200/carload (1). Altogether, Windsor shippers would benefit by \$0.4 million annually from a Detroit-Windsor tunnel but probably would not benefit directly from a Port Huron-Sarnia tunnel.

Of course, regardless of the location of the tunnel, neither Windsor- nor Detroit-area shippers would benefit measurably from the estimated 140,000 annual carloads of bridge traffic. The benefits associated with this traffic, ranging from \$11 million to \$14 million a year, would be captured by out-of-town consumers and businesses.

#### *Benefits from Newly Generated Traffic*

The tunnel also will generate new intermodal rail business in the Detroit-Windsor area, providing transportation savings to shippers who otherwise would ship their freight via motor carrier—or not ship it at all. These benefits also are considered.

Although double-stack services typically reduce operating costs by as much as 10 percent, these cost estimates suggest that intermodal freight rates in the Detroit-Windsor area are likely to fall by only about 4.6 percent if a Detroit-Windsor tunnel is built and 6.4 percent if a Port Huron-Sarnia tunnel. Moreover, as discussed earlier, Windsor shippers will realize no savings if the northern tunnel is built.

Research by Winston (9) allows estimation of the volume of additional rail freight likely to be generated as a result of

**TABLE 1 Annual Transportation Efficiency Benefits (thousands of dollars)**

	<u>PORT HURON - SARNIA TUNNEL</u>			<u>DETROIT - WINDSOR TUNNEL</u>		
	Approx. Carloads*	Benefit per Carload	Total Benefit	Approx. Carloads*	Benefit per Carload	Total Benefit
<i>Existing Rail Freight</i>						
Detroit-area freight	40,000	\$127.6	\$5,103	40,000	\$91.4	\$3,654
Windsor-area freight	-	-	-	4,000	\$91.4	\$365
<i>Newly Generated Rail Freight</i>						
Detroit-area freight	6,838	\$63.8	\$436	4,897	\$45.7	\$224
Windsor-area freight	-	-	-	490	\$45.7	\$22
<b>Total</b>	<b>46,838</b>		<b>\$5,539</b>	<b>49,386</b>		<b>\$4,265</b>
<b>Net Present Value - 20 year period</b>			<b>\$54,383</b>			<b>\$41,882</b>

\* Based on carload and market share data provided by CN-North America

Rows or columns may not add due to rounding.

these rate reductions. Winston finds that for every 1 percent drop in railroad rates for truck-competitive freight, traffic increases by 2.8 percent. (He estimates that the cross-price elasticity of demand for truck-competitive rail freight with respect to rail prices is  $-2.8$ .) On the basis of Winston's estimate, the Port Huron-Sarnia tunnel could be expected to generate about 6,838 additional carloads of local freight; the Detroit-Windsor tunnel could be expected to generate an additional 5,386 carloads. If the demand curve for this intermodal freight is assumed to be linear, the average benefit will be exactly half of the rail price reduction, averaging \$45.70/carload for the Detroit-Windsor tunnel to \$63.80/carload for the Port Huron-Sarnia tunnel. Therefore, the annual gain for local shippers using the tunnels would be \$436,000 and \$246,000, respectively.

Altogether, considering both newly generated and existing freight, metropolitan Detroit would enjoy total transportation efficiency benefits of \$5.5 million as a result of the Port-Sarnia tunnel and \$4.3 million as a result of the Detroit-Windsor tunnel. Clearly, these are upper-bound estimates because some of these benefits will be passed on to out-of-town manufacturers or consumers through lower prices for intermediate and finished goods.

### Secondary Benefits

The double-stack tunnel also might produce secondary benefits through employment growth in the Detroit-Windsor area. The potential job growth among shippers and railroads is measured below.

#### *Shipper Employment*

The tunnel project is likely to stimulate a limited number of new jobs among Detroit-area shippers. However, because tunnel-related savings to the average shipper represents only about 0.3 percent of total production costs, the associated employment growth is not likely to be large. (Virtually all of the growth in rail traffic volume will represent merely a shifting of modes.) Moreover, considering that either tunnel will offer similar rate reductions to shippers, retailers, small businesses, and consumers, these employment-related benefits should flow to the metropolitan Detroit area regardless of where the tunnel is built. Because these benefits will not affect the relative attractiveness of the alternatives, no attempt is made to quantify them.

#### *Transportation Employment*

Local employment by railroad companies, however, is likely to increase marginally if a tunnel is built between Detroit and Windsor. This tunnel would handle approximately three additional CN-North America intermodal trains in each direction daily. Considering railroad work rules, and assuming that three employees are needed to operate each train (most intermodal trains have only two-person crews), about 18 CN-North America jobs would be relocated to Detroit. Admin-

istrative personnel and facilities already are available to handle these employee relocations.

It is also likely that CP and NS would reroute double-stack trains (eight per week) that currently use the Buffalo gateway through Detroit if the Detroit-Windsor tunnel were built. Similarly, a local tunnel also might help forestall the possible relocation to other gateways of CP/Soo Line intermodal trains (15 per week) that currently use CSX trackage through Michigan. This suggests that a local tunnel would preserve or produce an additional 36 jobs for metropolitan Detroit. Other local railroads, such as Conrail, are unlikely to relocate any personnel to the area because their crews already originate in Detroit.

How much would the Detroit-Windsor area benefit from these 54 jobs? Using FRA's methodology, MDOT publications suggest that a reasonable estimate of the social value of each new job created (or each layoff averted) is \$40,000 (8). (This estimate is inclusive of a regional multiplier.) This suggests a total, one-time secondary benefit of \$2.2 million to Detroit-Windsor if the tunnel were to be built locally.

Four factors suggest that this estimate overstates the actual secondary gains associated with the Detroit-Windsor tunnel:

1. New railroad jobs are likely to be filled by employees transferring from other locations instead of by Detroit-area residents. Therefore, they would alleviate local unemployment problems less than MDOT's estimates suggest.
2. MDOT's estimate of the social benefits of job creation is relatively high by Midwestern standards. Illinois uses a higher benefit estimate in its analysis, but Indiana and Iowa assume that cities derive no local employment benefits as a result of a rail project.
3. The estimate is based on the supposition that CN-North America would reroute all its intermodal trains through the Detroit-Windsor tunnel. Considering the difficult and circuitous nature of the Detroit routing, the company has a strong incentive to continue using more northern lines.
4. The estimates ignore probable losses in employment by local barge operations and trucking companies from improved rail services.

The tunnel's construction may produce other ancillary benefits, such as improved safety and reduced pollution. Most important, the tunnel will greatly lessen highway maintenance costs and improve traffic flows on local expressways (10). However, these benefits are not considered because they would be realized under either tunnel scenario; they do not affect the relative attractiveness of either alternative. Also ignored are the possible benefits from DeWin's proposal to convert the existing Detroit-Windsor rail tunnel for trucking use; MDOT-sponsored research indicates that this project may not be worth its \$65 million cost (1).

The cumulative value of transportation efficiency and secondary benefits for the Detroit-Windsor metropolitan area are \$5.5 million annually from the Port Huron-Sarnia tunnel and \$4.5 million annually from the Detroit-Windsor tunnel (Table 2). The difference is small, attributable primarily to the higher transportation benefits to local shippers from the lower-cost Port Huron-Sarnia tunnel. These benefits outweigh the benefits associated with additional employment from the Detroit-Windsor tunnel.

TABLE 2 Net Present Value of Project Benefits (thousands of dollars)

	Port Huron - Sarnia	Detroit - Windsor
Transportation Efficiency	\$54,383	\$41,882
Secondary Benefits	\$0	\$2,160
Total Gain -- 20 years	\$54,383	\$44,042
Annualized Gain	\$5,539	\$4,486

\* based on 20-year planning horizon @ 8 percent interest

## CONCLUSIONS AND POLICY IMPLICATIONS

As the analysis shows, the location of the tunnel is not nearly as important for the Detroit-Windsor area as its prompt completion. Considering that the Detroit-Windsor metropolitan area stands to lose more than \$5 million a year from delays in the completion of the Port Huron-Sarnia tunnel, the state should pursue a fast-track regulatory approval process, which will involve 55 U.S. and Canadian regulatory agencies. Regulatory issues are likely to delay needlessly the project's completion, adversely affecting trade volume of \$21.6 billion between Michigan and Ontario.

Although the lower-cost double-stack tunnel between Port Huron and Sarnia is the best alternative for metropolitan Detroit, the region's deteriorating rail system remains a growing problem for state transportation officials. Congestion and antiquated rail facilities are serious obstacles to expanded rail service in Detroit, and recent funding decisions have largely focused on rural facilities. Thus, MDOT should consider allocating a larger portion of its discretionary rail funds as part of the Michigan Rail Plan (5,6). This will improve southeastern Michigan's access to transborder double-stack services, which will be available as early as 1994, and enhance shippers' use of the existing Detroit-Windsor tunnel, which will be enlarged by 1993. These efforts, together with CN-North America's tunnel investment, will provide a much-needed catalyst for private-sector investments in the metropolitan Detroit area.

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