4.0 TRUCKWAY OPTIONS AND ALTERNATIVES

Concepts have been developed that could potentially accommodate the use of trucks and/or commuter buses in the rail corridor. The basic premise in the development of these options was to maintain the existing rail operations of the corridor. The options have been defined in terms of typical sections that are presented in **Appendix A**.

4.1 Descriptions of TruckWay Alternatives: Typical Sections and Operations

The following describes the development of the typical sections and the details of the cross-sections and potential operations in the corridor.

Option 1

The first option explored the idea of constructing a one-way roadway beside the existing rail line, separated by a concrete barrier. This option consists of an exclusive rail line with a 3.7 metre travel lane to accommodate directional one-way traffic and a 2.5 metre shoulder on each side of the travel lane to provide sufficient space for a truck or bus to manoeuvre around the disabled vehicle. The shoulders are beneficial in terms of making the one-way TruckWay attractive to the industry by ensuring reliability.

This option would operate as a one-way roadway, with the rail service unaffected by trucks and/or buses in the corridor. The directional scheduling of vehicles in the corridor would be required in the day to day operation. In the morning peak period, the roadway could be opened for eastbound commuter buses and trucks accessing the Ocean Terminals and Halterm port facilities. In the evening peak period, the roadway could be opened for westbound commuter buses and trucks leaving the Ocean Terminals and Halterm facilities. This option could operate on a half-hour or an hourly basis. This option would require staging facilities at each terminus to accommodate vehicles that want to access the corridor but have to wait for their respective direction to open. Similar to the Whittier Access Tunnel, special signal systems and access control measures would also be required with this option to ensure access for one direction only.

Option 2

This option consists of embedding the existing rail line in a new roadway. The typical section was developed as an urban cross section with curb and gutter treatment at the edge of pavement. This cross-section has a width of approximately 8 metres. A disabled vehicle would be required to mount the curb in order for another vehicle or tow truck to manoeuvre around it in the corridor. This may not always be possible, depending on the nature of the vehicle breakdown, and would obstruct corridor operations.

This option would only allow truck and/or buses to use the roadway when there are no trains occupying in the corridor. Similar to Option 1, the roadway would also function as a one-way operation for vehicles. Staging areas and special signal systems would be required at each terminus of the corridor to accommodate vehicles that are waiting to access the roadway when there is a train in the corridor, or when the TruckWay is operating in the opposite direction.

It is recognized that the Option 2 drawing does not reflect the existing track locations in the corridor. Option 2 was discarded through the evolution of the alternatives, and thus the drawing was not adjusted to reflect the track locations.

Option 3

Option 3 builds upon Option 2 in that an additional travel lane is added to accommodate two-way truck and/or bus traffic. The width of this cross-section is approximately 12 metres, and includes typical curb and gutter treatment at the edge of pavement. A disabled vehicle would be required to mount the curb in order for another vehicle or tow truck to manoeuvre around it in the corridor. This may not always be possible, depending on the nature of the vehicle breakdown, and would obstruct corridor operations.

There is no physical separation between rail and road with this option. Therefore, when there is a train in the corridor, no vehicles could be accommodated on the roadway. Staging areas at each end would accommodate vehicles until a train exits the corridor and it could be opened up for two-way operation.

Option 4

Option 4 includes one vehicular lane per direction. The NB/WB lane would be located where the active rail line is currently. The SB/EB lane would be adjacent to this lane. One lane would have the rail track embedded in the road. Option 4 was developed to provide for a barrier separation between rail traffic and vehicle traffic, so that the roadway could operate in one direction when there is a train in the corridor. This section provides a cross-section width of approximately 12.5 metres, and includes curb and gutter treatment at the edge of pavement. As with Option 2 and 3, a disabled vehicle would be required to mount the curb in order for another vehicle or tow truck to manoeuvre around it in the corridor. This may not always be possible, depending on the nature of the vehicle breakdown, and would obstruct corridor operations.

When there is no train in the corridor, the roadway could operate as a two-way facility. When a train enters the corridor, the travel lane with the rail embedded in the road would be closed to vehicle traffic in this direction. Special signal systems and traffic control devices

would be required to ensure that vehicles could not enter into the travel lane that contains the rail line.

The existing rail track would be switched to the opposite side of the corridor. This is to maintain rail traffic during construction. During the construction, a new track will be constructed adjacent to the existing track (on the proposed SB/EB lane), with excavation under the bridges to ensure sufficient vertical clearance for double-stacked container cars. Once the track is established on the SB/EB lane, the NB/WB lane will be closed for construction, and rail traffic will be on the new track, on the SB/EB lane. This concept applies to Options 3 as well. The cost of excavation was not reflected in the costing.

Option 4A

A refinement to Option 4, this option provides a boulevard treatment or 'reverse shoulder' treatment at the edge of pavement. This is intended to provide a driveable curb to accommodate a vehicle breakdown for temporary lay-by until emergency vehicles arrive on scene and the vehicle can be removed from the corridor.

4.2 Alternatives to a TruckWay in the Rail Corridor

There are alternatives to use of the entire rail corridor length as a TruckWay. These include:

- Use of the section only between the Ocean Terminals and Robie Street;
- Trailer ferry from Halterm across the harbour to the end of the Circumferential Highway;
- Trailer-on-flatcar (TOFC) technology from the Ocean Terminals to a remote intermodal terminal location; and
- Development of an elevated expressway over the CN rail line.

Each option is discussed below.

Robie Street Connector

The alternative of developing a truck road only to Robie Street is discussed in detail in Section 5.3 below.

Trailer Ferry

The concept of the trailer ferry service from Halterm to the end of the Circumferential Highway would involve shipping entire trailers to a terminal on the Dartmouth side of the harbour. The time issues related to that concept would likely be the determining factor as to whether this would be attractive to the trucking industry. The time to load the barge, cross the

harbour and unload the barge onto trucks via a "drop-trailer" crane or shunter cab could add significantly to overall trip time, depending on the truck's destination and frequency of the ferry service. It is expected that only long-distance truck trips destined to the east or north would find this option attractive.

Trailer-on-Flatcar (TOFC) Technology

The potential use of trailer-on-flatcar technology involves on-site shunter cabs depositing their loads on a flatbed rail car for transport to another intermodal depot in a remote location. This technology is usually used to minimize the cost of transport of the goods. Physical requirements for the technology are minimal; a terminal incorporating a raised accessway so that shunter cabs can drive on and off the railcars is the basic requirement.

To make the technology cost-effective and attractive for the industry, the travel time between terminals has to be such that the time for loading, transport and unloading of the rail cars is less than the time for trucks to carry the load the entire distance. Typically, that distance is in the range of four hundred kilometres, with a corresponding road travel time of four hours or more (that is the case in Michigan/Ontario, where the technology has been considered for the Detroit-Windsor-Toronto corridor). Therefore, based on the nature of the technology and experience in other locations, the TOFC technology is less preferable than the TruckWay alternative.

However, it is understood that HRM may wish to promote this technology for reasons of reducing traffic, noise and vibration impacts to downtown residents. The operational complexity of TOFC would require a detailed operational and economic analysis, which is beyond the scope of this study. Its viability cannot be determined until the operational aspects are fully understood. Costs and benefits relative to the trucking option should then be assessed, taking into consideration the cost of the TruckWay alternative.

Elevated Expressway

The concept of an elevated expressway over the CN rail line has not been analyzed in detail. This option would have very high costs, and would likely have significant community impacts in terms of noise, air quality, visual effects, and traffic congestion. There would also be issues related to the expected lack of accommodation for more single occupant vehicles in downtown Halifax, in terms of parking facilities and municipal road capacity.

4.3 Evaluation of Options

Table 2 provides a comparison of the alternatives.

TABLE 2 - EVALUATION OF OPTIONS

OPTION (width)	Operation	Pros	Cons
Option 1 (23 m)	• One-way roadway • Exclusive rail line	• separation between rail and road increasing safety • shoulders provided for vehicle breakdowns, increasing safety • no change to existing rail line during construction • roadway can operate if train in corridor • lower cost	• large cross-section width • one-way road system, limiting capacity for growth in truck traffic
Option 2 (8 m)	• One-way roadway • Rail embedded in roadway	• narrow cross-section • lower cost	• one-way road system, limiting capacity for growth in truck traffic • roadway can't operate if train in corridor • no shoulders provided for vehicle breakdowns • rail embedded in road, adding to cost and complexity of staging
Option 3 (12 m)	• Two-way roadway • Rail embedded in roadway	• narrow cross-section • two-way road system	• roadway can't operate if train in corridor • no shoulders provided for vehicle breakdowns • rail embedded in road • higher cost • rail relocation during construction
Option 4 (12.5 m, curb and gutter)	• Two-way roadway • Rail embedded in roadway	• two-way road system • roadway can operate in one direction if train in corridor	• no shoulders provided for vehicle breakdowns • rail embedded in road • higher cost • rail relocation during construction
Option 4A (12.5 m, reverse shoulder)	• Two-way roadway • Rail embedded in roadway	• two-way road system • roadway can operate in one direction if train in corridor • shoulders provided for vehicle breakdowns, increasing safety	• rail embedded in road • higher cost • rail relocation and limited excavation during construction

All of the options identified in Table 2 are feasible geometrically for implementation in the corridor. Option 4A was identified as the preferred cross section alternative because it provides for two-way travel separated by a barrier in the corridor for truck and/or buses, when no trains are present. It permits and one-way travel when there is a train in the corridor. The physical separation between the travel lanes provides for safe operation of the roadway when in use by truck and/or buses on both directions, or if there is a train occupying one lane in the corridor. By providing two-way truck and/or bus travel, Option 4A provides maximum operational efficiency of the corridor and would reduce the delay and storage requirements at the connection points in the South and North End.

Option 1 is also ranked high in the evaluation, as it would not require changes to the existing rail line or impact existing rail operations. A one-way road could be constructed beside the rail line with a physical separation implemented between the rail line the new roadway to allow for dual operation in the corridor. There are significant cost savings for not requiring rail relocation during construction, which make this option more appealing from a cost perspective.

4.3.1 Staging Considerations

In order to maintain existing rail operations during construction Option 4A, the construction phasing scheme could require the relocation of the existing rail line to ensure that the roadbed structure is adequate. Under this plan, staging would be as follows:

- A new rail line embedded in the new road would be constructed next to the existing rail line;
- Once the rail line is constructed and operational, trains would be switched to the new track;
- Construction could be completed on the second vehicle lane of the system. This would result in a final cross section that consists of the rail line relocated to the west side of the corridor. If rail operations could be compromised during the construction stage, then there would be no need to relocate the existing track. The implications of relocating the existing rail line are discussed below, under the development of the cost estimate.

It is our understanding that while the existing track (the east track) has the necessary vertical clearance for the double-stacked container cars, the opposite side (the west track) does not. Additional excavation along the west track at bridge crossings would be required as a preliminary measure of the staging.

4.3.2 Relationship to the Greenway Proposal

The options all use the physical expanse of the rail corridor more extensively. The options would preclude the Greenway trail from passing under the major road bridges, because of the limited horizontal clearance under the bridges. However, it is understood that the Trail is only expected to pass under Quinpool Road. It is also possible that the presence of trucks together with trains in the corridor could be regarded as incompatible with the concept of the Greenway as a "river of greenery" (as described on the Greenway website).

4.3.3 Potential for Commuter/Express Bus Service

The options would permit use of the corridor for commuter and/or express bus service. Options 3, 4 and 4A would be the preferred options in terms of accommodating the bus service, because they provide the opportunity for two-way bus service with fewer delays or limits on service periods.

The bus service could potentially include stops at the following locations:

- St. Mary's University
- Dalhousie University
- West End Mall
- Bayers Road Shopping Centre

Pedestrian connections would be required at these locations, potentially involving some form of grade-separation over the corridor. At the St. Mary's, Dalhousie and Bayers Road Shopping Centre stops, stairs (and ideally an elevator) would be required due to the change in grade between the corridor and destination.

HRM should also consider the form of transit priority upstream of the busway, particularly at the Peninsula Screenline crossing point, where capacity is most constricted.

4.3.4 Effect on Future Rail Operations

Options 1, 4 and 4A all permit some degree of rail and truck operations at the same time. Options 2 and 3 do not permit this co-occupation. It is assumed that the rail company would attempt to define time limits for the truck operation, which would provide flexibility for future rail traffic growth. HRM should be prepared for negotiations with CN over this issue.