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Acknowledgements:

The strategic assessment conducted by the Panel over the past year presented an opportunity to explore the relationships between provincial policy, transportation planning, and the environmental assessment process. The views, conclusions, and recommendations reflected in this strategic assessment are those of the Panel.

The Panel wishes to acknowledge many individuals who worked hard to help us in collecting, using, and interpreting information in this process.

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We are grateful to Vijay Gill for his thorough and thoughtful technical review of our draft material and to Steve Gray and Peter Overton for their knowledgeable and timely copy editing.

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GTAW Advisory Panel's Letter

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May 29, 2017

The Honourable Steven Del Duca
 Minister of Transportation
 77 Wellesley Street West
 3rd Floor, Ferguson Block
 Toronto, Ontario
 M7A 1Z8

Dear Minister:

The members of the GTA West Advisory Panel are pleased to submit our strategic assessment of the GTA West Corridor Environmental Assessment, including our recommendations for next steps and advice on a path forward for the EA process. The advice in our report represents the consensus of the Panel. The GTAW EA recommended a suite of actions, including a new 48-kilometre highway corridor. This proposed corridor would be one element of a complex transportation system in and through the Greater Golden Horseshoe.

Since our appointment in Spring 2016, we have undertaken a careful investigation of future transportation demand in the study area and the alternatives for meeting it. Our investigation also reviewed trends, emerging technologies and provincial policy. Our assessment included travel demand forecasting, policy analysis and detailed review of the EA.

We relied on consultation and advice from experts. We are grateful to those individuals, community groups, municipalities, Indigenous communities, environmental groups, development interests, agricultural organizations, and representatives of the transportation sector who provided input. A key point of stakeholder consensus was ending the current uncertainty. Our task benefited from the excellent support we received, and we would like to extend our appreciation to ministry staff for their tireless work.

We are honoured to have had the opportunity to carry out this strategic review.

Sincerely,

Gail Beggs, Chair
 Rodney Northey
 Matthias Sweet

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Introduction

Growth is occurring across the Greater Golden Horseshoe, but the area immediately northwest of Toronto in particular is currently experiencing significant increases in population and employment. This area includes portions of York, Peel and Halton regions, as well as Wellington County and the City of Guelph. According to forecasts in the Growth Plan for the Greater Golden Horseshoe (2006), by 2041, more than five million people are expected to call these municipalities home, which will more than double their 2001 populations.

The Growth Plan (2006) also anticipates employment growth in the area of more than one million jobs between 2001 and 2041. Significantly more people and more jobs will lead to significantly more travel, and concerns have been raised that increasing travel demand and congestion in the area will have an adverse impact on quality of life. Over the past 20 years, a number of plans and studies envisaged a new highway corridor as a possible solution for transportation problems anticipated in the area.

In 2008, the Ministry of Transportation began the Greater Toronto Area West Corridor Environmental Assessment (GTAW EA). Stage 1 of the GTAW EA was completed in 2012, with the release of a Transportation Development Strategy (TDS). The strategy recommended a suite of transportation actions in four areas (these actions are referred to as the GTAW Recommended Actions in this report):

- Transportation Demand Management (TDM) and Transportation System Management (TSM)
- Transit improvements;
- Highway/road expansions and extensions; and
- A new corridor of approximately 48 km from Hwy 400 to Hwy 401, where it meets Hwy 407.

These actions are depicted on the following map — Figure E-1.

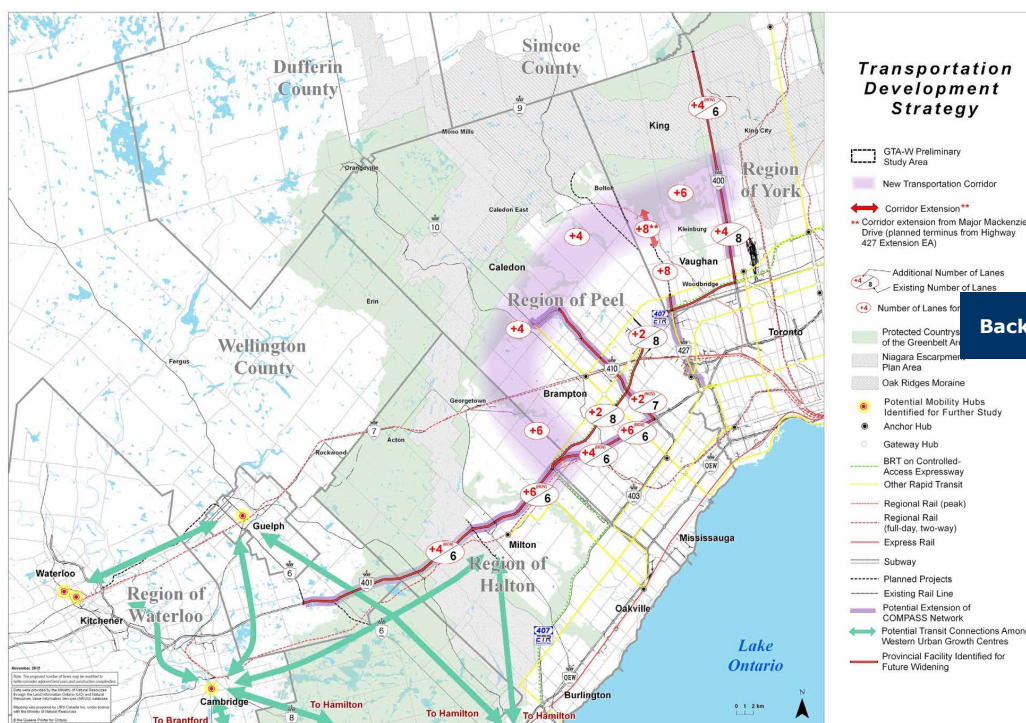


Figure E-1: The Recommended Actions from Stage 1 of the EA (TDS, 2012)

The image presents the Transportation Development Strategy which traverses the regions of York, Peel, Halton, and Waterloo. The transit improvements include potential rapid transit lines, highway

road expansions/extensions, and new corridors. Potential transit connections among the Western Urban Growth Centres are depicted (between Guelph, Waterloo, Cambridge, Hamilton and Milton), in addition to highway extensions along highways 400, 401, 407, and 410.

The specific recommendation of a new corridor was carried forward to Stage 2 of the EA for detailed route planning. The rest of the recommended actions from Stage 1 were referred to the appropriate ministries, departments, agencies and municipalities for their further consideration and action.

Review of the GTAW EA

In December 2015, the Ministry of Transportation temporarily suspended the GTAW EA, in order to review the work undertaken to date, and the EA's alignment with emerging transportation issues, technological trends and current government policies, including the government's commitments to addressing climate change. To assist the ministry with the review, the Minister of Transportation appointed an Advisory Panel to conduct a strategic assessment of the GTAW project. The Panel was asked to make recommendations on next steps and provide advice on a path forward for the EA process. The Minister also asked that the Panel address five topics (see Appendix 1 for the full terms of reference):

- Assess the extent to which emerging technologies, trends and policy objectives may impact future travel demand for goods and passenger movement in the GTA West corridor (2031 time horizon).
- Examine the potential alternative approaches to meeting future transportation demand and infrastructure needs in the corridor using specific emerging technologies and service solutions. For example, examine the potential for enhancing/expanding existing infrastructure (both provincial and lower-tier) to address any localized network pressures, such as goods movement.
- Assess the extent to which existing technical studies completed can inform the future infrastructure needs of partner ministries in the corridor (e.g., rail, hydro and other purposes).
- Assess the need for protecting the GTA West corridor for other transportation needs.
- Assess options for the existing EA process, as informed by the analyses above.

As the basis of its strategic assessment, the Panel reviewed material dating back more than a decade, and benefited from the input of internal and external experts. Although its original terms of reference did not include any new opportunities for public input, in the fall of 2016, the Panel conducted consultations at the Minister's request (see Appendix A2-1 for the bulletin).

The Panel also commissioned a number of travel demand forecasts to re-examine the anticipated benefits of the GTAW Recommended Actions, in light of emerging trends and technologies (such as self-driving vehicles), to explore potential alternative approaches to meeting future transportation demand, and to test these potential alternatives as well as the GTAW Recommended Actions for alignment with current government policy. The results of this assessment process informed the Panel's recommendations for next steps and advice on a path forward for the EA.

Consultation

In the fall of 2016, the Panel invited the public and key stakeholders to share their concerns about the GTAW EA. Those consulted included municipalities, the development industry, the passenger and freight transportation sector, the agricultural sector, conservation authorities, environmental non-governmental organizations and indigenous communities. Submissions were also solicited on the GTAW Website and via e-mail. A number of themes recurred in the concerns that were raised:

- **Integrated Planning:** Concern was expressed that the GTAW corridor was being considered in isolation. Adopting more of a whole-system approach tied to long-range provincial plans was advised.
- **Certainty:** Municipal, development and agricultural stakeholders in particular emphasized the need for greater certainty about the future of the proposed new corridor.
- **Congestion and Movement of Goods:** Congestion was raised as a serious concern, and the efficient movement of goods was seen as crucial to making the region prosperous and attractive to investment.
- **Environment:** Concern was expressed over the new corridor's potential impacts on the Greenbelt and how these impacts had been treated in the EA process. Concerns about additional greenhouse gas emissions were also raised, in light of the province's 2016 action plan on climate change.
- **Emerging Technologies:** Organizations and municipalities noted that they were beginning to consider technologies such as self-driving vehicles and shared mobility in their planning. Many saw the new corridor as an opportunity to incorporate innovative approaches.

Innovation, Change and Uncertainty

The Panel was asked to assess emerging technologies, trends and policy objectives for their impact on future travel demand in the GTAW area. The Panel looked at the potential implications and the relative certainty of new developments in three areas: technology, the economy and demographics.

On the technology side, e-commerce is expected to change travel patterns, but may not have a significant impact on total travel demand. Shared mobility is currently proving to be transformative for a subset of travelers, but it remains to be seen whether, when and how these services will extend to the broader population. Self-driving vehicles may induce people to travel more, but may also increase the road system's capacity.

On the economic front, freight distribution patterns are shifting in response to growth in different

manufacturing centres and the widening of the Panama Canal. Locally, employment is becoming more flexible, as it moves away from manufacturing and towards the service sector. Ontario's economy is growing more slowly than in the past, as is its population. As baby boomers age and retire, their travel needs and patterns will change. Millennials are already displaying different travel patterns than previous generations.

Many of these technologies and trends have only developed over the last 10 years, creating major uncertainty about their individual and cumulative impact on society over the long term. This societal uncertainty translates into transportation uncertainty about the future.

Alternative Approaches and Transportation Benefits

The Panel assessed a number of alternative approaches for their potential to affect future transportation demand in the GTAW study area and beyond. To assess transportation demand, the Panel relied on modeling developed by MTO that focused on transportation benefits, particularly travel time savings.

Using this modeling, the Panel assessed different scenarios related to the GTAW EA's Recommended Actions and also considered seven alternative future scenarios as follows:

- The GTAW Recommended Actions;
- The GTAW Recommended Actions Without the Proposed new Corridor;
- Alternative Land Uses;
- Public Transit;
- Self-Driving Vehicles;
- Congestion Pricing; and
- Hwy 407 Truck Priority Lanes.

After testing these scenarios, the Panel drew the general conclusions outlined below.

Transportation Benefits from the Recommended Actions

The Panel's modeling results suggested that the GTAW Recommended Actions would deliver transportation benefits in the form of travel time savings across a range of future scenarios. In some scenarios, such as the self-driving vehicle scenarios, the results suggested higher travel time savings. In others, such as the slower-growth, "compact" land use scenarios, modeling results suggested lower travel time savings. Translating these model results into practical findings, the Panel concluded that the GTAW Recommended Actions would deliver approximately one minute of travel time savings per vehicular trip across the Greater Golden Horseshoe. On its own, the proposed new GTAW highway corridor would deliver approximately half of those savings, or about 30 seconds per vehicle trip.

Overstatement of Benefits

The GTAW EA's Recommended Actions included four groups of actions: travel demand management (TDM) and transportation system management (TSM) actions, transit actions, highway expansions and extensions and a new highway corridor. The Panel had two concerns about the actions contained in these groups:

- The third group of actions, highway expansions and extensions, included actions that are now already completed, under way or being assessed under separate EAs. Their ongoing progress indicates that they are separate infrastructure projects, independent of the GTAW EA's conclusions. Altogether, these highway extensions and expansions represented approximately half of the travel time savings that would result from the EA's Recommended Actions.
- The transportation benefits ascribed to the first and second group of actions, TDM and TSM and transit-related reductions in vehicular travel demand, were based on unsupported assumptions. Moreover, these Recommended Actions were vague, making them difficult to implement in the event that the GTAW EA were approved.

Based on these concerns, the Panel has concluded that the proposal for a new highway corridor is the only action that hinges on the outcome of the GTAW EA. The Panel also concluded that the EA's evaluation should have been limited to assessing this action in comparison with other alternatives.

Benefits from Unexplored Alternatives

The Panel was asked to examine potential alternative approaches to meeting future transportation demand beyond those set out in the EA. A number of these alternative scenarios showed considerable promise to deliver travel time savings in the same order of magnitude as the proposed GTAW corridor, although often the benefits accrued on a broader regional scale. The scenarios include:

- Congestion Pricing: Various lane configurations were tested, and they delivered travel time savings ranging from about equal to the proposed GTAW highway to more than 10 times greater.
- Hwy 407 Truck Lanes: Adding dedicated truck lanes to Hwy 407 and reducing truck tolls would likely deliver travel time savings similar to the proposed GTAW highway for all users, and for goods movement in particular.
- Land Use Management: A slower-growth and more compact land use scenario modeled by the Panel resulted in shorter travel times than those delivered by the proposed GTAW highway.

All of these scenarios would require further exploration to determine their feasibility and public desirability, but the Panel found them to be worthy of consideration, certainly before making a commitment to build a new highway. To best determine the preferred suite of actions, a broader systems approach would be advisable, but this would be beyond the scope of a typical project EA.

The Panel noted that while the planned Regional Express Rail project offers significant travel time savings through the study area and from the study area to Toronto, no new public transit scenario delivered comparable travel time savings or congestion alleviation in the study area.

Policy Congruence and Performance Objectives

Transportation planning has conventionally focused on performance indicators such as travel time savings and reduced congestion. New directions in provincial policy require transportation investments to fulfill a wider range of social, economic and environmental policy goals. The Panel tested the GTAW Recommended Actions and each alternative scenario against the policies favouring complete communities, shorter trip distances and modal split, which were drawn from the Growth Plan (2006). These are further supported by the Performance Indicators for the Growth Plan for the Greater Golden Horseshoe (2015).

A number of the alternative scenarios tested by the Panel appeared to deliver both economic and complete community benefits, namely the congestion pricing scenarios and the slower-growth, compact land use scenarios. These scenarios were also more consistent with the direction in the Provincial Policy Statement (2005) and the Growth Plan (2006) to optimize existing infrastructure. In its modeling re-assessment, the Panel found that the GTAW Recommended Actions provided economic-oriented transportation benefits, but that they did not provide complete community benefits.ⁱ Overall, the Panel found the EA's consideration of these complete community policies to be secondary. In addition, the Panel was concerned that adding highway capacity could induce more vehicular travel, and potentially further undermine complete community policy goals and provincial commitments to reduce greenhouse gas emissions.

Implications of Land Use Forecasts

The Panel explored two alternative land use scenarios: one that was consistent with the updated 2013 provincial forecast in the Growth Plan and one that relied on recently observed trends of slower, more compact growth. The slower, more compact growth scenario was found to result in shorter travel times than those projected from the new GTAW corridor. Moreover, under this slower, more compact growth scenario, adding the GTAW Recommended Actions delivered fewer benefits than it did under the EA's assumed forecasts (which were based on the 2006 Growth Plan forecasts). These findings indicated that exploring the interaction between alternate land use scenarios and different transportation outcomes could lead to a different long-term travel demand management strategy, and could defer or even offset the need for major new transportation investments.

Policy Context

Following World War II, Ontario's transportation system saw several decades of rapid expansion, motivated primarily by economic considerations such as more efficient travel times. Facing pressure to curb urban sprawl, the province subsequently reoriented its approach, first through the requirement for environmental assessment in 1975, and second through the introduction of a new policy framework between 2004 and 2006. These changes embraced a suite of broader economic, social and environmental goals for provincial transportation infrastructure.

Key to this new policy framework was the requirement, introduced in 2004, that decisions affecting planning matters, including those made by a Minister or a ministry, must be consistent with policy statements (Planning Act, s.3(5)), rather than only having "regard for" such statements, as had previously been the case. In 2006, a second obligation was added: decisions must also "conform with" provincial plans. In the space of two years, two provincial plans, the Greenbelt Plan (2005) and the Growth Plan for the Greater Golden Horseshoe (2006), were released, along with a new PPS (2005). These documents forged a new framework for policy-led planning in Ontario.

The Government of Ontario also provided guidance on the interaction between these policies. In the event of a conflict, provincial plans should take precedence over policies in the PPS, except in matters relating to human health and the natural environment, in which case the policy that provides more protection was to prevail. The Greenbelt Plan (2005), Growth Plan (2006), and PPS (2005) all reference Ontario's requirements for environmental assessment, and make it clear that while infrastructure projects may require approvals under the Environmental Assessment Act, they are also subject to these policies and plans (e.g., Greenbelt Plan s.4.2.1.1; Growth Plan s.3.2.4.6 and 3.2.3.4; PPS s.4.8).

The GTAW EA's Policy Framework

The GTAW EA laid out a policy framework of nine documents in its terms of reference, from which it distilled a number of lists of principles that would guide the identification of transportation problems, opportunities and potential solutions. Each of the five Stage 1 reports that followed identified its own list of applicable documents, interpreted the pertinent policies in varying degrees of detail, and at times created new lists of goals and objectives. In the Panel's view, this approach of grouping policies may have satisfied earlier tests, namely having "regard for" such policies, but the Panel believes the new tests of "consistency" and "conformity" required that the EA use a more detailed approach to specific policies and their relevance to environmental assessment requirements.

Growth Plan (2006)

In reviewing the GTAW EA's application of the Growth Plan (2006), the Panel had concerns regarding

the stated Purpose of the EA and the application of policy direction regarding complete communities.

The GTAW EA sets out as part of its purpose, “to provide better linkages between Urban Growth Centres” (Terms of Reference, p. 11). The Panel is concerned that the Growth Plan (2006) provides general support for linking urban growth centres only in its non-policy, contextual commentary. The policies themselves specifically describe transit links between growth centres (3.2.4). The Panel found that the GTAW EA’s evaluation of alternatives focused primarily on different highway corridors, and reserved the decision to include a transitway for Stage 2. The Panel is thus concerned that the EA’s purpose rested on Growth Plan (2006) context statements, and not on policy.

Schedule 6 of the Growth Plan (2006) provides direction on future transportation corridors, including one within the GTAW EA’s study area. However, the relevant policies state that this map “provides the strategic framework for future goods movement investment decisions in the GGH” (3.2.4.6), and that the first priority of highway investment is the efficient movement of goods (3.2.4.1). The Panel would thus have expected the GTAW EA to have aligned the purpose of the EA with assessing corridors for goods movement, rather than emphasizing improved connections between urban growth centres.

Finally, one of the guiding principles of the Growth Plan (2006) is to “Build compact, vibrant and complete communities” (1.2.2), and numerous policies within the plan offer support for a pattern, density and mix of land uses that enable more people to fulfill their everyday needs within their own neighbourhoods, using modes other than personal automobiles to travel. As discussed above under Policy Congruence and Performance Objectives, the Panel found that the GTAW EA only partially incorporated this new policy direction in its evaluation.

Greenbelt Plan (2005)

The GTAW study area includes some of the most productive farmland in Ontario, environmentally valuable wetlands, headwaters, tributaries and significant forest ecosystems – areas which have received protection under the Greenbelt Plan (2005). That plan anticipated that new infrastructure would be built within the Greenbelt if it: a) supported permitted activities within the Greenbelt (e.g., agriculture, recreation, tourism, resource use), or b) served significant growth beyond the Greenbelt by linking urban growth centres and provincial borders. A further five conditions are provided that require optimizing existing infrastructure, minimizing the amount of the Greenbelt (and particularly the Natural Heritage System) crossed, minimizing specific impacts, and avoiding key natural heritage and hydrological features, unless it has been demonstrated that there is a) need and b) no reasonable alternative.

The GTAW EA’s process partially considered the minimization requirements in Stage 1, but deferred much of this analysis to Stage 2. For example, the number of kilometres of Greenbelt that would be traversed by each alternative was recorded, but the amount of Natural Heritage System that would be affected was not documented.

Moreover, while Stage 1 listed key natural and hydrological features across the whole study area, the EA did not identify which of these were located within the Greenbelt until Stage 2. As a result, the EA made the decision to propose a new corridor and to determine its location without conforming to the Greenbelt Plan (2005) policy requirements to avoid key natural heritage and key hydrological features unless need had been demonstrated and no reasonable alternative was available.

Provincial Policy Statement (2005)

Similar to the Greenbelt Plan (2005), the agricultural policies of the PPS (2005) contain a test for the removal of prime agricultural lands for “limited non-residential uses” (2.3.5.1). Again, there must be a demonstrated need, and there must be no reasonable alternative location that avoids the prime agricultural area entirely, or that has prime agricultural lands of a lower-priority classification. The GTAW EA process did provide some consideration of prime agricultural lands. For example, it measured the linear distance of Class 1-3 agricultural lands that would be potentially impacted and ranked alternative corridors from lowest potential impact through to highest potential impact. However, the Panel concluded that this assessment did not replace the four-part test described above, and particularly the tests to demonstrate “need” and “no reasonable alternative locations”.

These provincial plans and policy statements also contain guidance on the optimization of infrastructure. The PPS (2005) in particular directs that existing infrastructure should be optimized, wherever feasible, before consideration is given to developing new infrastructure (1.6.2). The Panel found that the GTAW EA did not adequately address this guidance, for reasons discussed below, under Environmental Assessment Process.

Ontario’s Changing Policy Framework

Since the commencement of the GTAW EA, there have been several updates to provincial policy and several new initiatives that are now relevant to this EA. The overall trend in these updates and new initiatives is towards greater protection for the environment, greater emphasis on compact, complete communities, and greater choice for travel in a connected, multi-modal transportation system.

In particular, the creation of Metrolinx in 2006, and the release of the Regional Transportation Plan (RTP) two years later, changed the face of transportation planning in the Greater Golden Horseshoe. The RTP laid out a mixture of actions and policy objectives which were supported by the province through an initial commitment of \$11.5-billion in funding for key transit projects. In its modeling, the RTP assumed the existence of a future transportation corridor in the GTAW EA study area, as depicted in the Growth Plan (2006). Likewise, the GTAW EA included assumptions about actions from the RTP (2008). These practices illustrate how the existing institutional framework separates decisions related to different modes (MTO for highways, Metrolinx for transit).

As well, in 2016, Ontario passed the Climate Change Mitigation and Low-carbon Economy Act, which legislated progressively more stringent emission reduction targets for Ontario. The new legislation was

followed by Ontario's Climate Change Action Plan (2016), which laid out actions to be undertaken over the next five years to meet these goals. In the Panel's consultation, several of the submissions received expressed concern that a new highway appeared to be out of alignment with the province's commitment to these targets. The Panel believes that it is important to assess how each project will contribute to reducing greenhouse gas emissions.

In the Panel's view, with respect to policies on climate change and complete communities, the best route to progress is through a regional approach to planning and managing the transportation system, to better achieve climate change objectives (i.e., greenhouse gas emission reductions) as well as economic objectives (i.e., travel time reductions) and social objectives (i.e., complete communities).

Environmental Assessment Process

As part of its strategic assessment, and to make recommendations on next steps and offer advice on a path forward for the GTAW EA, the Panel reviewed the work done in the EA over the past decade. The following sections highlight some areas of the Panel's concerns.

In creating alternatives to the undertaking, the EA began with a list of 297ⁱⁱ individual actions. It proceeded to categorize these actions into four groups for assessment:

- Group #1: Optimize existing networks;
- Group #2: New/expanded non-road infrastructure;
- Group #3: Widen/improve roads; and
- Group #4: New transportation corridor.

The EA framed these groups as "additive". This meant that Group #2 included all the individual actions in Group #1, Group #3 included all the actions within both Groups #1 and #2, and so on.

The Panel had a number of concerns with this framework. First, the additive approach to bundling groups undermined the GTAW EA as a mechanism for assessing alternatives. Particularly in areas with high growth in the Greater Golden Horseshoe, adding any group of actions to any other group of actions would very mechanically lead to an expectation of more benefits. It is unclear how this approach to environmental assessment could ever lead to any conclusion other than that the most comprehensive list of actions assessed would also be the list of actions that the process recommended.

Second, the GTAW EA did not specifically define some of the groups that were added together to form the alternatives. Notably, it is unclear what TDM and TSM (Group #1) or transit and non-roadway improvements (Group #2) were being proposed. These actions are therefore difficult to assess, implement or evaluate as insufficient to meet need based on the GTAW EA. Another concern is that the Group #3 alternatives (3-1, 3-2, and 3-3) included expansions to Hwy 407 beyond the 10-lane maximum set out in the Hwy 407 legislation and agreement. Alternative 3-1 was the only alternative to a new corridor that was carried forward. In contrast, the new corridor alternatives (4-1 through 4-5) included highway expansions that did not exceed the 10-lane maximum on Hwy 407, and in this respect the EA partially abandoned the additive approach that it had been using up to that point.

Third, the Panel also identified several issues related to the EA's assessment of the need for a new corridor. Demonstrating the need for an undertaking is an important component of any EA. It was of particular importance for the GTAW, due to policy requirements to optimize existing infrastructure before building more, and to demonstrate both need and the lack of reasonable alternatives for removing prime agricultural lands or crossing key Greenbelt natural heritage or hydrologic features.

The GTAW EA appeared to treat "need" as synonymous with "opportunity." The preference for the recommended alternative (Alternative 4-2, which included a new highway corridor) compared to 3-1 (widening and extending existing highways) rested in part on "opportunities," rather than "need". As well, the Panel was concerned that the GTAW EA did not address the "Do Nothing" alternative, or accurately define the base case scenario as an alternative for consideration. Both need and the capacity to meet need could have been assessed by testing the base case as an alternative to the Do Nothing alternative and existing conditions.

In addition, the Panel found that the GTAW EA's definition and use of the base case to establish need was not appropriate. Specifically, the GTAW Recommended Actions included a suite of highway widenings and extensions, several of which were already being planned, programmed, and (some of which) are already under way. These actions should thus have been included in the base case scenario, rather than in the Recommended Actions. The capacity for these actions to meet need should then have been independently assessed as one of the alternatives to a new corridor. As well, the GTAW Recommended Actions included unspecific TDM and TSM measures which could have been completed independently of the Recommended Actions, as part of the base case or as an alternative. In the Panel's view, the EA's method of assessing these optimization options (Groups #1 and #2) was not appropriate.

Finally, the GTAW EA eliminated or did not carry forward actions and alternatives without a clear rationale. Especially notable examples, particularly in light of the strict reasonable alternative policy test and the policy to prioritize infrastructure optimization over developing new infrastructure, are listed here:

- Alternative 3-1 was not carried forward due to "cost and constructability," with little supporting documentation;
- Alternatives 3-2 and 3-3, which included widening local roads (e.g., Hwy 7 and Hwy 9) were not carried forward;
- Congestion pricing was eliminated as a specific optimization and travel demand management action; and

- The GTAW EA identified 297 actions, none of which was eliminated from consideration, but many of which were nevertheless not carried forward.

Overall, the EA did not demonstrate that a new corridor was the only reasonable alternative.

Conclusions and Recommendations

Future Travel Demand in the GTAW Corridor

Ontario finds itself at the beginning of a potentially significant transformation in transportation due to a number of factors – including economic and social changes, demographic change, policy changes and technological change. Amid much that remains uncertain, one thing was clear to the Panel: the province's new and evolving policy landscape and societal context herald a very different future than the one that was imagined 10 years ago at the outset of the GTAW EA. These changes have far-reaching implications for travel and for transportation planning.

Scenario Planning

The Panel recommends that, in light of future uncertainty, scenario-based methods for testing the robustness of decisions be further integrated into decision-making processes. Sources of uncertainty include growth forecasts, alternate policy actions and travel demand model assumptions, among others.

In the Panel's view, external changes can best be addressed by planning at a regional scale, by examining alternate future scenarios to address transportation and related policy objectives, and by testing plans that are based on such scenarios for robustness.

Self-driving Vehicles

Society is now beginning to embrace self-driving vehicles. The Panel recommends that Ontario take a more active role in facilitating, if not advancing, the transition period. This will require broad policy and program interventions to accommodate the coexistence of both traditional and self-driving vehicles. The Panel strongly recommends that the government ensure that MTO has a centre of expertise to address this transition in relation to broader goals established for multi-modal transportation systems. This centre of expertise should be mandated to work across policy and operational functions, and with other agencies and levels of government and the private sector. The centre should also be tasked with developing new methodologies to ensure robust scenario-testing with respect to self-driving vehicles.

Potential Alternative Approaches

The Panel was asked to examine potential alternative approaches to meeting future transportation demand and infrastructure needs in the GTAW study area, using specific emerging technologies and service solutions. Alternative approaches identified by the Panel extend both to:

- alternative actions that can meet travel needs, and
- alternative processes for identifying how transportation planning can guide the identification of preferred investments and actions.

Alternatives to the GTAW Recommended Actions

The Panel found four specific alternatives that are capable of providing travel benefits comparable to the GTAW EA's proposed new highway.

Highway expansions and extensions

The Panel concluded that the highway extensions and expansions that were part of the suite of GTAW Recommended Actions should be considered separately from the new highway corridor. Many of these highway extensions and expansions can be considered independently of the EA, as they are already being planned, under way or in some cases completed. The Panel found that the travel benefits of these extensions and expansions are approximately equal to those of the proposed new corridor. This alternative is well aligned with provincial policy to improve capacity for goods movement and improve linkages to existing and planned intermodal facilities. Moreover, in so far that this alternative represents expansions of existing infrastructure, it is aligned with provincial policy to optimize existing infrastructure.

Congestion Pricing

The Panel found that congestion pricing scenarios provided travel time savings ranging from approximately equal to more than 10 times greater than those projected from the new GTAW corridor. Provincial policy supports pricing as a TDM strategy and the Panel was unable to determine why this alternative was not further evaluated by the GTAW EA.

Truck Priority on Hwy 407

The Panel's analyses showed that providing truck priority on Hwy 407 through additional highway capacity or subsidy (e.g., trucks pay no toll) would deliver travel time benefits that are similar to those of the proposed GTAW corridor. Such opportunities should be viewed cautiously, however, since the Panel did not examine the physical limitations in the right-of-way available in the Hwy 407 corridor, or barriers to expanding Hwy 407 beyond the 10-lane limit specified in the current Hwy 407 legislation and agreement. However, this truck priority scenario is aligned with the Growth Plan (2006) policy direction that highway investments should facilitate efficient goods movement.

Alternate Land Use and Growth Scenarios

Finally, the Panel observed that alternate land use and growth scenarios appear to have a significant impact on transportation system performance, including travel time savings. For example, a scenario with slower growth and more compact land use patterns than those forecast in the Growth Plan (2006) resulted in shorter travel times. In the Panel's view, these findings suggest that how land uses evolve and are shaped by planning functions can have a significant impact on the performance of the transportation system as a whole, and perhaps defer (or even supplant) the need for some new transportation investments. Forecasts prepared in 2017 by the Ministry of Finance suggest slower population and economic growth in Ontario to 2040. The Panel's results do not separate the independent effects of slower growth from compact land uses in analyses. However, the Panel believes that these alternate land use scenarios merit more attention.

For all four of these scenarios, the Panel observes that, although they are consistent with provincial policy (e.g., optimizing the use of existing infrastructure before developing new infrastructure), they also raise a number of other policy issues that require further investigation.

Alternative Planning Approaches

The Panel observed that many aspects of the GTAW EA suggested an effort to fill a gap between provincial planning policy (Growth Plan, PPS, Greenbelt Plan) and an individual project environmental assessment. At times, the EA appeared to be attempting to create both a transportation plan for the study area and an individual project EA. The Panel believes that this joint objective did not assist the planning process for this EA.

Through this strategic assessment, the Panel has identified several overarching provincial policies that are better addressed through system-wide actions than through project EAs. These include complete communities, climate change action and goods movement. Other jurisdictions have found that long-term multi-modal transportation planning presents an opportunity to better evaluate uncertainty and test the robustness of plans in advancing policy goals.

In the Panel's view, if an individual project EA were established within the context of a single long-term multi-modal transportation plan, there would be opportunities to make its role clearer, its scope narrower, and its process shorter.

The Panel noted that both MTO and Metrolinx are currently engaged in long-term planning in the region: MTO is working on the Greater Golden Horseshoe Multi-modal Transportation Plan, and Metrolinx is reviewing the Regional Transportation Plan for the Greater Toronto and Hamilton Area. Provincial policies from the Ministry of Municipal Affairs serve as the starting point for these initiatives. In the Panel's view, if transit, roads, and other planning initiatives are not fully integrated in the same regional plan, there is virtually no way to demonstrate to the public how compromises are made and how policy objectives are being achieved.

Recommendation

The Panel recommends the development of a single transportation plan for the Greater Golden Horseshoe. Such a plan has the potential to explicitly consider uncertainty and systematically evaluate the robustness of recommendations with respect to alternative possible future scenarios. The plan would also provide the opportunity to consider changing social and economic conditions, as well as technological changes such as connected and self-driving vehicles.

Our strongest recommendation is that any such plan be aligned with provincial policies and the legal standards of conformity and consistency with these policies. The Panel also recommends that the plan set priorities for alternative projects across modes and demand management actions. The plan should also establish performance measures and be regularly reviewed and updated. Ideally, ongoing transportation planning efforts and plans (such as the GGH Multi-modal Plan and the RTP) would be required to meet these important opportunities and standards.

Options for the GTAW EA Process

Stage 1 of the GTAW EA recommended a suite of actions, including a new highway corridor, expansions and extensions of existing highways, transit system improvements, and TSM and TDM measures, to meet the travel demand forecast in the GTAW study area.

The Panel recommends that the GTAW EA be stopped and that the Ministry of Transportation lead the development of a single regional transportation plan for the Greater Golden Horseshoe.

These recommendations are supported by the results of the Panel's strategic assessment, whose key findings are summarized as follows:

- In 2008, when the GTAW EA began, the Ontario policy context required that the EA be consistent with and conform to (rather than simply have regard to) provincial policy. This represented a significant change compared to the policy context of the decade preceding the EA. The Panel finds that the GTAW Recommended Actions did not meet this test, particularly with respect to policies requiring the optimization of existing infrastructure, the protection of valuable lands, the prioritization of highways for goods movement, and the encouragement to increase transit use and shorten commute journeys in support of complete communities.
- The EA did not demonstrate that a new corridor which crosses protected lands (both prime agricultural lands and key natural heritage and hydrologic features) was the only option available to address the study area's future transportation needs.
- The Panel's assessment concluded that planned highway extensions and expansions will deliver benefits equivalent to the proposed new highway, but these actions were not independently assessed

as alternatives in the EA.

- The Panel found that other alternative actions are capable of providing benefits equivalent to or greater than the recommended new corridor, including congestion pricing, priority truck lanes on Hwy 407 and growth management. While these actions are aligned with provincial policies, such as optimization and compact, complete communities, the Panel recognizes that they also raise a number of other policy issues that will need further investigation.
- The Panel has identified several overarching provincial policies that are better addressed through system-wide actions rather than through individual project EAs.

The Panel also recommends against revising this EA. In our view, the problems with the EA's approach to policy, need, and alternatives are fundamental, and would require revisiting the first steps of the EA. Further, the current EA terms of reference are not aligned with provincial standards and policy, and thus do not provide an appropriate foundation on which to begin a new EA.

Recommendations for Existing Technical Studies

The technical information compiled for the GTAW EA included data about land uses, agricultural land classification, status and plans for the study area's road network, cultural heritage in the study area and extensive inventories and mapping of natural systems and water resources. The Panel felt that this information could be of interest to many parties both within and outside government.

Consequently, the Panel recommends that MTO make the GTAW EA data available and easily accessible online, including relevant information about the data sources, collection methods and timing, to ensure that other users can tap the full potential of the data. The Panel also recommends that the Ministry consider this practice for any data that it gathers for future environmental assessments.

Corridor Protection for Other Transportation Needs

The Panel was also asked to assess the need for protecting the corridor for other transportation needs. In keeping with the PPS (2005; 2014), and under the Growth Plan (2006) policy, the identification and protection of corridors is related to need. As outlined above, the Panel found that the GTAW EA did not demonstrate that the proposed highway corridor met the test of need and the lack of reasonable alternatives for crossing valuable and protected lands, as required by the Greenbelt Plan (2005) and PPS (2005). The Panel is thus not recommending that there be continued protection of the corridor identified as preferred in the GTAW EA.

The Panel did not assess the work done by Peel and Halton Regions for the Halton Peel Boundary Area Transportation Study (HPBATS), which include a freeway that is aligned with part of the EA's recommended corridor. It is our understanding that these two regions plan to pursue this freeway if the GTAW EA's preferred corridor does not proceed.

The Panel also understands that there are currently discussions under way between Metrolinx and private rail companies to provide alternative rail routes that would separate freight rail and transit rail to meet the requirements of the Regional Express Rail plans of the government, while also facilitating the efficient movement of freight by rail. The EA process did not assess this initiative, nor did the Panel have sufficient information to assess it or make a recommendation.

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Chapter 1: Introduction

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Growth is occurring across the Greater Golden Horseshoe, but the area immediately northwest of Toronto in particular is currently experiencing significant increases in population and employment. This area includes portions of York, Peel and Halton regions, as well as Wellington County and the City of Guelph. According to forecasts in the Growth Plan for the Greater Golden Horseshoe (2006), the Growth Plan (2006), by 2041, more than five million people are expected to call these municipalities home. This forecasted increase represents nearly half of all expected growth in the Greater Golden Horseshoe and will more than double the total 2001 populations in these municipalities. The Growth Plan also anticipates employment growth in the area of more than one million jobs between 2001 and 2041. Significantly more people and more jobs will lead to significantly more travel.

Over the past 20 years, concerns have been raised that congestion and travel demand in the area will become unmanageable and will have a significant negative impact on quality of life. A number of plans and studies have proposed a new transportation corridor as a possible solution. These efforts culminated in the Greater Toronto Area West Corridor Environmental Assessment (GTAW EA), which was begun in 2008ⁱⁱⁱ. After several years of complex work and study, however, the EA process was suspended by the Ministry of Transportation (MTO) in December 2015. MTO committed to a review of the work undertaken to date in the context of emerging transportation issues, technological trends and government policies.

To assist the Ministry with the review, the Minister appointed an Advisory Panel to conduct a strategic assessment of the GTAW project. The Panel had the opportunity to review material dating back more than a decade, and it also consulted with the public as well as with internal and external experts. This report presents the results of the Panel's assessment, recommendations for next steps and advice on a path forward for the EA process. This introductory chapter outlines the context of the GTAW EA, describes the applicable policy framework and provides an overview of subsequent chapters in the report.

1.1 GTAW EA Project Context

1.1.1 History

The province's plans for new transportation corridors in southern Ontario have a long history. One of the earliest plans was Design for Development: The Toronto-Centered Region (1970). With the goal of encouraging growth north and east of Toronto, this plan laid out an expansive system of new transportation linkages, including one from Barrie to Orangeville, Guelph and Kitchener.

In 1992, MTO completed a Corridor Protection Study that looked at the possibility of an east-west corridor across the north of Toronto, stretching from Georgetown to Whitby. The study found that future demand to 2031 justified a new corridor in only two areas: between Highway 400 and 410, and north of Brampton. It also found that this demand could be addressed through an expanded regional road network, but even so, the study recommended corridor protection in case development moved further north than anticipated. At the same time, the study cautioned that this strategy could become a self-fulfilling prophecy, as the presence of a protected corridor could well encourage development to shift to those areas.

In the early 2000s, two more MTO studies looked at possible highway corridors in and around Toronto: the Central Ontario Transportation Perspective (December 2001) and Central Ontario Strategic Transportation Directions (January 2002). Both studies recommended numerous highway expansions and several new highway corridors, one of which aligns with the corridor proposed at the end of Stage 1 of the GTAW EA. These studies recommended that MTO begin preliminary needs assessment work for these highway corridors, and three of them appear on the Growth Plan's (2006) Schedules 2 and 6, as "Future Transportation Corridors".

1.1.2 GTAW EA: Stages 1 and 2

The GTAW EA's terms of reference were approved by the Minister of the Environment in 2008. The purpose of the EA was to strengthen transportation links between the urban growth centres of Downtown Brampton, Milton and Guelph, and the Vaughan Metropolitan Centre. Work was to be completed in two stages.

Stage 1 began by proposing a broad study area that included parts of York Region, Peel and Halton regions, the County of Wellington and the City of Guelph (see Figure 1-1). Looking forward to the year

2031, the study took an inventory of current and future economic and transportation conditions, considered important environmental features in the study area, created a number of alternatives and evaluated them.

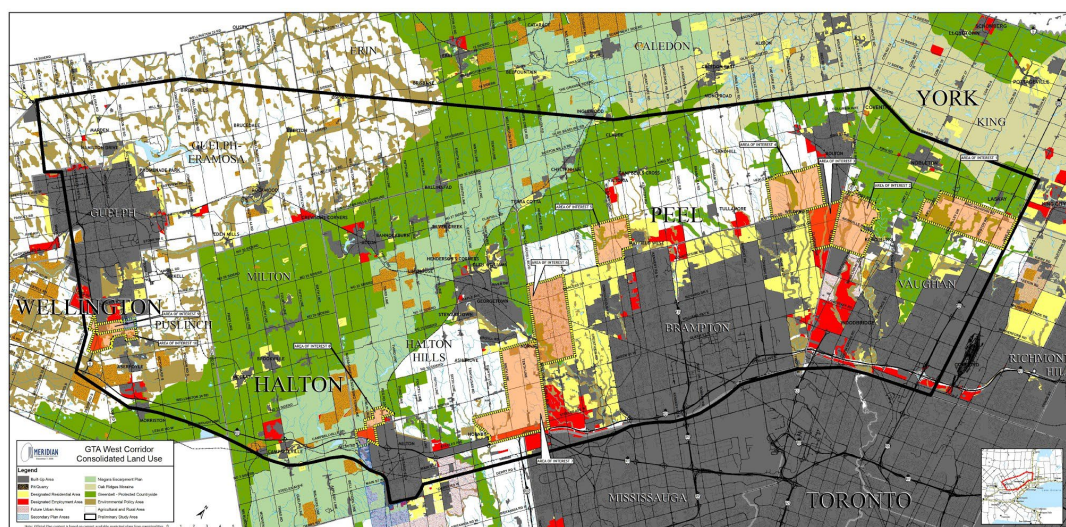


Figure 1-1: Preliminary Study Area

The image presents the preliminary study area for GTA West which includes parts of the York, Peel and Halton regions. The study area is bounded by King City to the North, Richmond Hill to the East, Guelph to the West, and Highway 401 to the south.

Altogether, 297 individual transportation actions were identified and sorted into four groups:^{iv}

- Group #1: Optimize existing networks
- Group #2: New/expanded non-road infrastructure (i.e., transit)
- Group #3: Widen/improve roads
- Group #4: New transportation corridor

Based on policies from the Growth Plan (2006) and the Provincial Policy Statement (PPS; 2005) that called for optimizing existing networks and prioritizing public transit, the GTAW EA approached the evaluation of these four groups as sequential and additive. This meant that Group 1 would be evaluated first, and that Group 2 would be assessed only after Group 1 had been found inadequate to address the transportation problems and opportunities. Group 1 would then be folded into Group 2, and so on for Group 3 and Group 4. Group 4 thus would involve enacting the complete range of suggested actions.

Group 1 included transportation system management (TSM) and transportation demand management (TDM) strategies, as well as improved rail service. A high-level assessment concluded that this Group would provide an important foundation for helping to manage congestion, but found that “they will not address all of the identified transportation problems and opportunities” (Transportation Development Strategy (TDS), 2012, p.31).

Group #2 actions included grade separation of road and rail, improved integration of rail and air transportation, transit-supportive corridors along 400-series highways and improved inter-regional transit hubs, among others. A high-level assessment of these initiatives concluded that they, too, would not address all of the identified transportation problems and opportunities in the study area. Proposed rail improvements, though, were assumed to result in a 10-per-cent shift of long distance truck traffic to rail. Altogether, Groups #1 and #2 were assumed to result in a four-per-cent reduction in travel demand.^v

The EA then turned to alternatives that included adding new roadway capacity. For Group #3, MTO described three options: alternative 3-1 involved only expansions to 400-series highways, while alternatives 3-2 and 3-3 also included a variety of regional road widenings. An evaluation of these options in the Area Transportation System Alternatives (2011) report concluded that while the Group #3 actions (which also incorporated actions from Group #1 and Group #2) addressed many of the transportation problems, a new corridor would provide additional opportunities (p.64).

Based on this conclusion, the EA moved to a detailed analysis of five possible new corridors. All five alternatives had the same eastern end point: Hwy 400 in Vaughan. Alternative 4-1 extended only as far as Hwy 410. Alternatives 4-2 and 4-3 joined Hwy 401 at or near Milton (4-2 at the Hwy 401/Hwy 407 interchange and 4-3 further west). Alternatives 4-4 and 4-5 ended at or near Guelph. All five alternatives also included a unique configuration of highway widenings and extensions. Alternative 3-1 was carried forward to this stage of analysis, while 3-2 and 3-3 were not.

The EA’s analysis, which included additional consultations undertaken in Halton Region, arrived at a preferred option: the corridor from Alternative 4-2 (approximately 48 km long), accompanied by a revised suite of highway expansions^{vi}. This preferred alternative also included actions from Group #1

and Group #2, most of which were not location-specific. This final suite of recommendations is illustrated below in Figure 1-2, it is referred to as the GTAW Recommended Actions

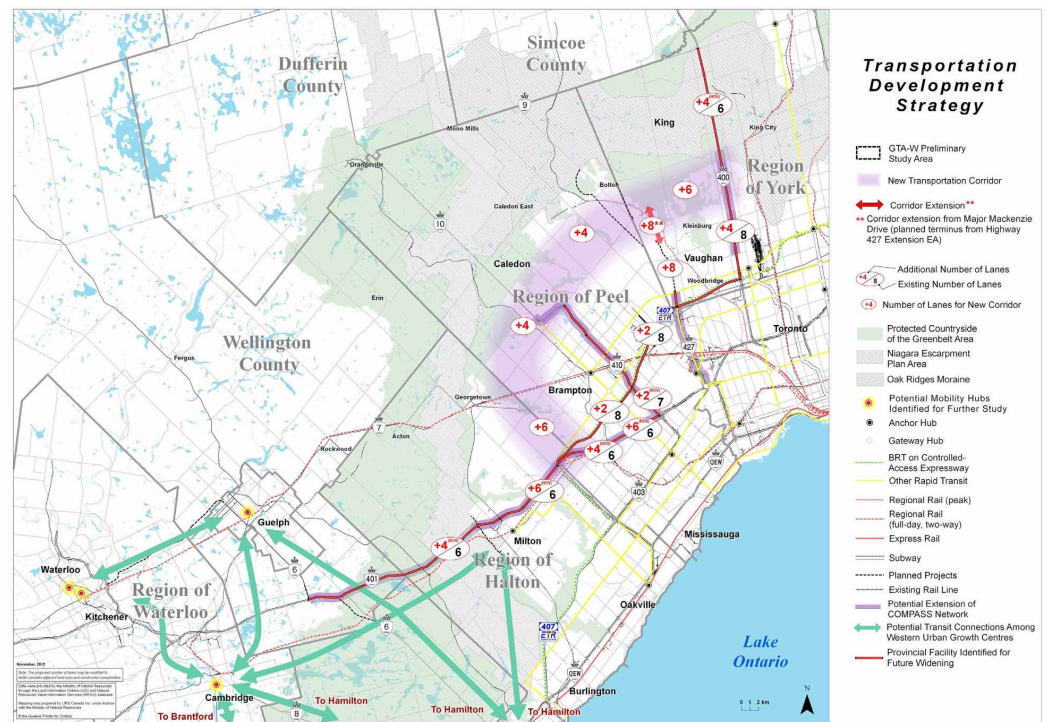


Figure 1-2: The Recommended Actions from Stage 1 of the EA (TDS, 2012)

The image presents the Transportation Development Strategy which traverses the regions of York, Peel, Halton, and Waterloo. The transit improvements include potential rapid transit lines, highway road expansions/extensions, and new corridors. Potential transit connections among the Western Urban Growth Centres are depicted (between Guelph, Waterloo, Cambridge, Hamilton and Milton), in addition to highway extensions along highways 400, 401, 407, and 410.

The specific recommendation of a new corridor was carried forward to Stage 2 of the EA for detailed route planning^{vii}. The EA advised that this highway corridor also included a possible transitway and goods movement priority features. This stage was expected to take a total of five years to complete, at which point the EA would be submitted to the Ministry of the Environment and Climate Change for review and approval. The rest of the recommended actions from Stage 1 were referred to the appropriate ministries, departments, agencies and municipalities for their further consideration and action.

1.2 Review of the GTAW EA

1.2.1 Ministry's Suspension

In December 2015, work on the GTAW EA was temporarily suspended by MTO in order to review the work undertaken to date. The Ministry advised that the suspension would allow review of emerging transportation issues, technological trends and government policies, including the government's commitments to addressing climate change.

1.2.2 The Panel's Mandate

To assist the Ministry in reviewing the GTAW project, the Minister appointed an Advisory Panel in 2016. The Panel was to conduct a strategic assessment of the GTAW EA, make recommendations on next steps, and give advice on a path forward for the EA process. The Minister also asked that the Panel address five topics (see Appendix 1 for the full terms of reference):

- Assess the extent to which emerging technologies, trends and policy objectives may impact future travel demand for goods and people in the corridor;
- Examine potential alternative approaches for meeting future transportation demand and infrastructure needs using emerging technologies and service solutions, including enhancements or expansions of existing infrastructure;
- Assess options for the existing EA process;
- Assess the extent to which existing technical studies can inform future infrastructure needs of partner ministries in the corridor (e.g. rail, hydro and other purposes); and
- Assess the need for protecting the GTAW corridor for other transportation uses.

As the basis of its strategic assessment, the Panel reviewed material dating back more than a decade

related to the GTAW EA itself, and to transportation planning in Ontario generally. The Panel also benefited from the input of external experts such as the Mowat Centre and the Munk School of Global Affairs. As well, it heard from MTO, the Ministry of Municipal Affairs, the Ministry of the Environment and Climate Change, and the Ministry of Energy, and from government agencies and public entities such as Metrolinx and the Independent Electricity System Operator (see Appendix 2 for the complete list).

Although its original terms of reference did not include new opportunities for public input, in the fall of 2016, the Panel conducted consultations at the Minister's request (see Appendix 2 for the bulletin). Key stakeholders were invited to share their concerns – including municipalities, the development industry, passenger and freight transportation, the agricultural sector, conservation authorities, environmental non-governmental organizations and Indigenous communities. Submissions were also solicited on the GTAW website and via e-mail. The findings from this consultation process are discussed in Chapter 2, Consultation.

The Panel also commissioned a number of travel demand forecasts to re-examine the anticipated benefits of the GTAW Recommended Actions in light of emerging trends and technologies (such as self-driving vehicles). The forecasts also enabled the Panel to explore potential alternative approaches to meeting future transportation demand and infrastructure needs, and to test these potential alternatives as well as the GTAW Recommended Actions for alignment with current government policy.

1.3 Changing Policy and Institutional Context

The two decades leading up to the start of the GTAW EA were prolific years for Ontario with regard to the release of policy documents and legislation to guide planning across the province. These major changes began with the passage of a new Planning Act in 1983, and culminated in the creation of new provincial plans which provided geographically-specific policy direction for select regions in Ontario. Moreover, the changes required decisions to “conform with” provincial plans, and “be consistent with” policy statements, and these obligations applied to “the council of a municipality, a local board, a planning board, a minister of the Crown and a ministry, board, commission or agency of the government, including the Municipal Board, in respect of the exercise of any authority that affects a planning matter” (s.3).

new Provincial Policy Statement (PPS), released in 2005, marked an important directional shift for the province. The policies in the PPS supported redevelopment, intensification and compact form. Applied to transportation, this planning approach aimed to optimize existing infrastructure, reduce private vehicle use, shorten trips and encourage travellers to choose other modes. The Growth Plan (2006), further articulated this direction for a specific region of the province, with growth forecasts, density and intensification targets, and an emphasis on complete communities.

The Province also released the Greenbelt Plan (2005), which offered protection to the countryside, as well as key natural heritage and hydrological features across several regions of southern Ontario. The Greenbelt Plan included and built upon the ecological protection in two pre-existing plans: the Oak Ridges Moraine Conservation Plan (ORMCP; 2002) and the Niagara Escarpment Plan (NEP; 2005). All three of these plans permitted infrastructure, even in their most highly protected areas. However, they also required that the infrastructure be shown to be needed, and permitted it only in the event that no reasonable alternatives were available.

In addition to these new policies, the Province created the Greater Toronto Transportation Authority (later renamed Metrolinx) in 2006. Metrolinx is a provincial agency with a mandate to lead the coordination, development and implementation of an integrated, multi-modal transportation network within the Greater Toronto and Hamilton Area (GTHA). After two years of work and consultation, the new agency released a Regional Transportation Plan (RTP) called The Big Move (2008). The plan laid out a mixture of actions and policy objectives, which were supported by the province through an initial commitment of \$11.5-billion in funding for key transit projects. The RTP (2008) also offered strategies and actions for increasing highway efficiency. However, highway planning continues to be the responsibility of MTO.

1.4 Report Chapter Overview

The content of the Panel's report is outlined below.

Chapter 1, Introduction, describes the GTAW EA project, the Panel's mandate and process and the policy and institutional context that is relevant to the environmental assessment.

Chapter 2, Consultation, highlights key themes and concerns that emerged through the Panel's public consultation process.

Chapter 3, Innovation, Change and Uncertainty, explores in greater depth the ramifications of some of the large-scale, external trends that make Ontario's future transportation landscape uncertain.

In Chapter 4, Alternative Approaches and Transportation Benefits, the Panel examines the relative benefits of numerous alternative approaches available to policy-makers in the GTAW, and tests the robustness of the GTAW Recommended Actions against alternative future scenarios.

Chapters 5 and 6, Policy Context and Environmental Assessment, consider how the GTAW EA's evaluation has been carried out to date in order to inform the Panel's advice on a path forward.

The final Chapter, Recommendations and Conclusions, contains the Panel's recommendations for next steps and its advice on a path forward for the GTAW EA process

Finally, the report includes appendices for selected chapters. These appendices contain additional background material and in some cases more detailed discussions of issues covered in the text of the report.

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Chapter 2: Panel's Consultation

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2.1 Mandate

The Advisory Panel was appointed to assist MTO with its review of the work undertaken since 2007 on the GTAW EA, and to examine the EA's alignment with current government policy and emerging technologies. The Panel's terms of reference asked for a strategic assessment of the GTAW EA, including alternatives to meeting future transportation demand, as well as recommendations for next steps and advice on a path forward. In the original terms of reference, the Panel was not given any opportunities for additional public input. Instead, the Panel was to rely on the existing record of public consultation regarding the GTAW EA (see Appendix 1 for the full terms of reference). However, at the Minister's request, the Panel conducted its own consultations in the fall of 2016 to help inform its review of the GTAW EA (see Appendix A2-1 for the bulletin).

2.2 Process

The Panel held public consultations from October 7 to November 11, 2016. Key stakeholders were invited to share their views and concerns – including municipalities, the development industry, passenger and freight transportation providers, the agricultural sector, conservation authorities, environmental non-governmental organizations, and Indigenous communities. Submissions were also solicited on the GTAW web site and via e-mail. All told, the Panel received 69 written submissions from individuals, municipalities and organizations.

The stakeholders who provided comments represented diverse views and highlighted for the Panel the range of impacts of the proposed corridor. Some agreement existed surrounding, for example, the need for certainty and for better integration and alignment between provincial policy and project-level transportation planning. However, opinions diverged on the best path forward. The Panel carefully considered the feedback received during its analysis, and all comments helped inform the final recommendations. This chapter provides an overview of key themes across the spectrum of respondents.

2.3 Summary of themes

2.3.1 Integrated Planning

Considerable agreement existed among those responding around the need for local and provincial planning efforts to be better coordinated. A number of stakeholders, and municipalities in particular, expressed concern that the GTAW corridor was being considered in isolation, and recommended a "whole system" approach instead. They suggested that planning for the proposed corridor should be tied to long-range provincial plans, which are able to look at the entire transportation network. While many felt that the proposed corridor would support the economic development goals of the Growth Plan (2006), others held that the new corridor either did not appear to align with current provincial policy directions, including the Climate Change Action Plan (2016), or that at best, it represented an incomplete interpretation of a larger vision. As well, it was generally felt that the corridor should be planned in a coordinated fashion for multiple uses, and include such features as a transitway and HOV lanes, as well as provision for future utilities.

2.3.2 Certainty

Another common thread through most of the submissions was the need for greater certainty. With the final route alignment of the proposed new highway yet to be determined and a broad corridor remaining protected from development, some municipalities have expressed concern with the ongoing uncertainty in the EA process. Employment lands have also been affected, leading to concerns over lost opportunities and competitiveness in attracting investment. The Panel heard that continued uncertainty is also having an impact on farmers and landowners, who may be unable to make decisions about using their property. In many cases, a paramount concern of those who commented was the need to finish the process so that plans can move ahead again.

2.3.3 Congestion and Growth

Stakeholders often voiced support for the corridor in connection with concerns over congestion, which many expected to worsen as the region continues to grow. Municipalities in particular stated that

congestion is a key concern in their respective jurisdictions. Indeed, most municipalities considered a new corridor to be an effective solution to accommodating and, in some cases, stimulating growth. York and Peel Regions noted that the corridor would have significant economic benefits in the City of Vaughan and the Town of Caledon in particular, by helping to spur and service employment development.

Some municipalities, as well as other stakeholders, identified Hwy 401 as a bottleneck for which no alternative exists, and noted that congestion on this route can lead to a spillover of trucks on regional roads. The efficient movement of goods by road was emphasized as a crucial factor in making the region prosperous and attractive to investment. For some of those consulted, the proposed corridor was deemed to be essential in this regard, since it could offer an opportunity for measures to give priority to the movement of goods. Others felt that local initiatives and improvements to the existing network would adequately address this need, through measures such as expansions to Hwy 401, the Halton Peel Boundary Area Transportation Study (HPBATS) or better use of Hwy 407.

2.3.4 Environment

A number of stakeholders expressed concern over the impact of the proposed corridor on natural heritage features in the Greenbelt. Several of these respondents noted that, particularly when a major transportation facility crosses headwaters and forest tracts, the effects would likely be difficult or impossible to mitigate. While animal migration and ecosystem health were highlighted in this regard, the effect on the passage of people was also noted, as trail systems could also be disrupted. In addition, respondents pointed out that prime agricultural land would be lost to the new highway, and that the carbon (i.e., greenhouse gas emission) cost of the highway would be substantial. Some groups questioned the project's alignment with the province's Climate Change Action Plan (2016), given the high level of greenhouse gas emissions anticipated from vehicle travel. Finally, the GTAW EA was criticized for its treatment of the Greenbelt Plan (2005) simply as a part of the weighted criteria, rather than as a hard constraint.

2.3.5 Emerging Technologies

When asked about how emerging technologies may change travel demand in the GTA, many respondents saw an opportunity for a new corridor to incorporate innovative approaches and new kinds of infrastructure. Some felt that these technologies may lessen the need for a highway by lowering travel demand and making travel more efficient. While organizations and municipalities were beginning to investigate the potential impacts of emerging technologies and to include these considerations in their planning, these efforts were, for the most part, in the very early stages.

Overall, the Panel's public consultation process added an important dimension to its assessment of the work done to date on the GTAW EA, and helped to better inform its final recommendations on a way forward.

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Chapter 3: Innovation, Change, and Uncertainty

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3.0 Introduction

The world of transportation is changing rapidly. At the same time, the tools available to transportation planners and policy makers are expanding in new ways, while the range of transportation system users' needs are becoming more complex. Moreover, in an increasingly interconnected global society, there is greater potential for external opportunities or risks to have local impacts. Because there is no single definition of the "best" transportation action, the exercise of public policy-making always involves steering a careful course between how the world changes, what transportation planning and policy can accomplish, and what outcomes are seen to be desirable. Fundamental questions in this regard include:

- What is Ontario's vision?
- What does the changing world mean for that vision?
- How do we get there?

In Ontario, the Province's role will likely continue to be to establish the regulatory context and to nurture initiatives that are outside the domain of public sector action.

3.1 Business as Usual?

Technologies have changed and continue to change, as shared mobility introduces new ways to get around, and self-driving vehicles continue to make progress toward becoming a reality. Ontario's economy is also changing, as the movement of goods in the Greater Golden Horseshoe is increasingly shaped by the internet, by a shift away from manufacturing toward the provision of services, and by global trends in transportation. At the same time, social values are changing, as new growth management priorities are incorporating climate change objectives that are now supported at both the federal and provincial level. Internal policy priorities have also changed, with large-scale transit service expansion being deployed as part of the Regional Express Rail plan, and congestion pricing increasingly becoming a part of the public discourse in the Greater Toronto Area. Amid such change, the role of a new 400-series highway is far from clear.

The goals and techniques of transportation planning are also changing. For generations, the province's transportation system has advanced opportunities by providing access to new lands and by increasing transportation options in highly-congested urban cores. Since techniques for transportation planning have conventionally been based on learning from the past, technically-based decision-making processes tend to reinforce existing trends. However, in the context of the rapidly changing world around us, opportunities for positive, transformational improvements may be lost if transportation planning simply continues to reinforce the status quo. The goal of balancing urban change and adaptation to new challenges, while identifying and preserving social values will remain at the center of progressing toward an uncertain future.

3.2 Trends Affecting Transportation

In this chapter, the Panel examines broad external and global trends, and discusses both their relative certainty and their potential implications for transportation planning and policy making in the GGH. These trends include changes in four key areas:

- technology;
- the economy;
- environmental conditions; and
- demographics.

3.2.1 Technology

Over the last two centuries, many technologies have radically changed transportation services, urban travel and city building. The steam engine, the elevator (enabling today's skyscrapers), electricity, the automobile and the microprocessor have all transformed how we move. A technological revolution of similar magnitude in transportation is being enabled by better information gathering, sharing and use.

Technology-enabled services, such as e-commerce and shared mobility, are already changing how people travel, and an even greater shift can be foreseen with the coming of self-driving vehicles.

While these emerging technologies promise to bring significant change by 2031, the extent to which they will transform mobility in the GGH also rests on Ontario residents' preferences and future government policies. Moreover, their potential benefits and consequences need to be examined along several parameters of change, including, among others:

- changes in how we travel;
- changes in how much we travel;
- lifestyle choices;
- fairness and equity;
- opportunities for individuals with accessibility challenges; and
- environmental outcomes.

E-Commerce

E-commerce, the online purchasing and direct shipment of retail purchases, is a technology-enabled transportation service that has already begun to change how people travel and purchase products. Rather than visiting local music or book stores, restaurants or other retailers, for example, consumers now have the option of purchasing music online, ordering books to be sent by mail, and having their groceries delivered to the front door. While limited data exist on e-commerce rates in Canada, the indications are that as a portion of total retail sales, e-commerce has been growing by 14 to 15 per cent a year since 2012 (Taylor, 2015).

E-commerce clearly represents a qualitative change in how passengers travel and goods move, but it is not clear whether it also represents a quantitative change in total travel demand. For example, increases in goods movement travel may offset decreases in personal travel and, likewise, passengers may opt for qualitatively different types of travel when their retail needs can be met through e-commerce. In short, while the total amount of time, energy, and vehicle-kilometers of travel expended in an e-commerce future may not change on a daily basis, shifts in how the transportation system is used, if such shifts were better understood, could have implications for what types of transportation systems are necessary and how these systems are put in place.

Shared Mobility

Shared mobility refers to a group of technology-enabled behaviours that provide commuters with transportation options beyond traditional public transit and private car ownership. Shared mobility enables public use of for-hire private assets or services through better information provision in a common market (e.g., through a smartphone application). It also facilitates the further pooling of privately provided services already used by the public (e.g., parking, which is privately provided but available to many). Common types of shared mobility include car-sharing, ride-sourcing, bike-sharing and shared parking.

The recent widespread growth of shared mobility services in urban centres provides more choice for many transportation system users. Still, it remains unclear whether this growth in services will be transformative only to a subset of urban transportation system users, or whether, when, and how these services may extend to the broader population (Taylor et al., 2015). Shared mobility has the potential to change the relative role of both private auto ownership and public transit services alike; however, the impacts on overall travel demand are not yet clear. For example, while more convenient travel for more users could induce more travel, shared mobility could also lead to a time when there is an overall drop in private vehicle ownership.

Connected and Self-Driving Vehicles

Connected and self-driving vehicles are already being introduced to North American vehicle fleets and could dramatically change how passengers travel and goods are moved in Ontario. Even today's comparatively low-cost vehicles come with standard options that include automatic lane-keeping, proximity sensors, adaptive cruise control, automatic stability control, and so on. As these technologies continue to advance, they will potentially bring significant opportunities and consequences for transportation. For example, connected and self-driving vehicles could:

- improve safety and reduce collisions;
- change the urban fabric of our cities;
- increase travel by automobile;
- complement or substitute for public transit services; and
- assist in either reducing or increasing Ontario's carbon footprint.

The impact of these technologies will depend on the joint actions of consumers, automobile producers and the public sector. Three possible implications are of particular interest in thinking about how these technologies may influence future infrastructure needs.

First, self-driving vehicles are likely to reduce the burden of travel. Willingness to drive has historically been limited by travel times, congestion levels, the inconvenience of accessing destinations and the relative convenience and competitiveness of alternatives such as public transit. With self-driving vehicles, time spent traveling could be used for tasks other than driving. As well, future travelers may no longer need to find a parking spot, ask for directions or go out of their way to avoid congestion. As a result, the personal burden of traveling in a vehicle could be significantly reduced.

Second, self-driving vehicles are likely to induce significant new travel demand. This technology may make travel easier for people who now have comparatively lower access to motorized vehicles or quality

public transit, thereby generating new auto trips. These new users could include the elderly, the young and those facing accessibility challenges. In addition, since self-driving vehicles are expected to reduce the burden of travel, people may be willing to live further from work and accept a longer commute for the sake of lower-cost housing. In sum, both new and longer auto-based trips may result from self-driving vehicle technology. Beyond the need for public policymakers to decide whether such outcomes may be good or bad, such changes are potentially transformational.

Third, automated vehicles have the potential to increase the capacity of the road transportation system, although the extent, the direction and level of these changes are uncertain. Greater road capacity could result from improved vehicle safety, connected vehicle technology, platooning capabilities, faster speeds, closer following and smoother traffic patterns. In fact, some research suggests these increases could be up to 200 per cent in specific contexts (Shladover et al. 2012; Michael et al. 1998). However, competing evidence suggests that few capacity increases should be expected, that any change will most likely occur when self-driving vehicle adoption rates are very high, and that any increases in capacity may primarily be realized on highways rather than on local road systems (Olia, 2016).

In the Panel's view, this emerging technology has the potential to be transformative. However, there is uncertainty on the timeframe and direction of this transformation. There is also uncertainty regarding what policy objectives self-driving cars can and should contribute to or accomplish.

3.2.2 Climate Change

Globally, there is increasing consensus on the critical need to address climate change. The Paris Agreement (2016) represents a significant international commitment to mitigate greenhouse gas emissions. Its goal is to keep the global temperature rise below two degrees Celsius. The agreement also aims to strengthen climate change adaptation measures, especially in developing countries. Canada ratified the Paris Agreement in October 2016, and has outlined a two-year timeframe for the adoption of carbon pricing by all Canadian jurisdictions.

Despite these global commitments, it is uncertain how climate change action will affect transportation in Ontario. The province has already implemented a cap and trade system of carbon pricing through the Climate Change Mitigation and Low-carbon Economy Act (2016), which legislated ambitious greenhouse gas reduction targets. The Act was followed by the Climate Change Action Plan (2016), a five-year implementation plan that identifies the transportation sector as the single largest producer of Ontario's greenhouse gas emissions, and one that is growing. The Climate Change Action Plan (2016) outlines five action areas to help meet the goal of reducing transportation emissions, including:

- addressing the availability of lower carbon fuel;
- increasing the use of electric vehicles;
- supporting cycling and walking;
- increasing the use of low-carbon trucks and buses; and
- supporting accelerated construction and electrification of GO Regional Express Rail.

The Plan further expands emission reduction actions to include demand management and the encouragement of non-auto modes. However, these action areas have not yet been tied to targets, and thus there is uncertainty regarding how transportation as a whole will be affected.

3.2.3 International and Local Economy

Changes to the international economy are expected to have significant impacts on transportation in the Greater Golden Horseshoe by: 1) slowing economic growth, 2) shifting the economy's composition from goods-producing jobs towards service jobs, and 3) changing global and local freight distribution systems. Although these changes are having major impacts on our society, their impacts on transportation planning and policy and travel are not yet clear.

The Ontario economy, like many other economies, is growing more slowly than in the past, and this shift will likely have implications for future changes in both the magnitude and quality of travel demand. Recent reporting by the Ministry of Finance (2017) indicates that economic growth in Ontario was 2.6 per cent annually between 1982 and 2016, but that it has declined and is forecast to continue at 2.1 per cent annually to 2040. Population growth is likewise expected to decrease: from 1.2 per cent annually to 0.8 per cent annually until 2040 (Ministry of Finance, 2017).

At the same time, the structure of Ontario's economy is evolving. There has been a decline in the goods-producing sector's share of employment, paralleled by growth in the services-producing sector's share of employment. Of particular note is the fact that the manufacturing sector's employment share has declined from 17.5 per cent in 1996 to 10.7 per cent in 2016 (Ministry of Finance 2017).

This shift in sectors affects not only goods movement patterns, but also commuting patterns as places of work change. Businesses are realizing that there are clear cost advantages when employees work remotely and share office facilities, and employees themselves find options that reduce commuting time attractive. As more employers adopt teleworking (working from home rather than commuting to the office), the relationship between homes and workplaces is also being redefined.

A final significant economic trend is that goods movement systems serving Ontario residents are evolving as a result of a number of external changes. In response to the expansion of the Panama Canal, goods movement firms, particularly those connected to American manufacturers and producers, are shifting from ports in the west (e.g., Los Angeles) to ports in the east (e.g., New York/New Jersey). Moreover, global shifts in manufacturing production from western to eastern Asia will likely increase the role of the Suez Canal and Atlantic crossings into eastern North American ports. The increased use of eastern seaports may lead to more long-haul truck movements, rather than transportation by train across North America combined with local truck connections, as is currently the norm. These changes

would have an impact on transportation and goods movement in the western GTA, which is a key goods distribution hub connecting intermodal rail freight (CN Rail and CP Rail) with various private sector distribution facilities that depend on existing supply chains.

3.2.4 Demographics

The Greater Golden Horseshoe is under the influence of two major demographic groups that are likely to have a significant impact on future travel needs and transportation planning and policy: the baby boomers and the millennials. By 2041, the baby boomers will be between the ages of 65 and 85, and will represent 25 per cent of Ontario's population, up from approximately 16 per cent today (see Figure 3-1). Although the period of productive work is expected to extend longer in individuals' lives, people are also expected to live longer, due to improvements in health. This shift in demographics is expected to have implications for travel demand as the over-65 demographic group in 2040 is likely to be more active, travel more, travel differently and be more numerous than at present.

Age Distribution Trends

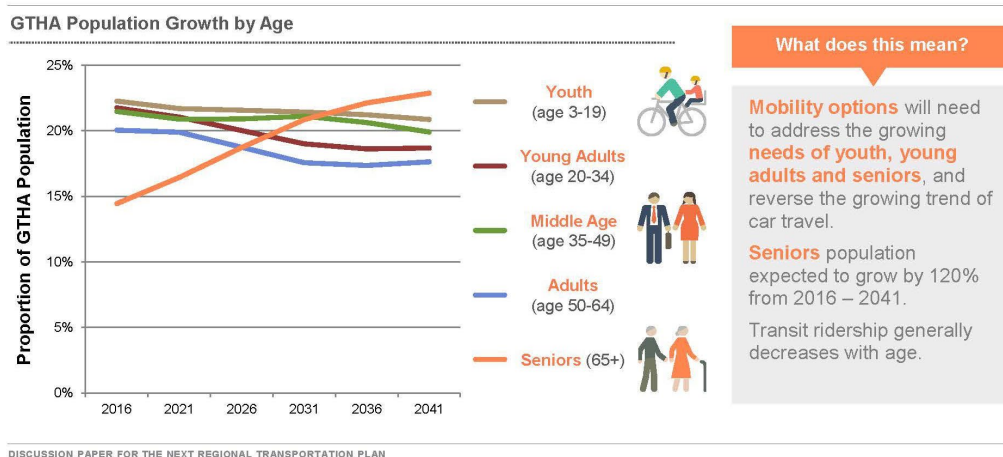


Figure 3-1: Metrolinx (2016) - Discussion Paper for the Next Regional Transportation Plan, June 2016.

The graph presents age distribution trends in the Greater Toronto Hamilton Area from 2016 forecasted to 2041. As a proportion of the GTHA population: youth are forecasted to decrease from representing 22% of the population in 2016 to 21% in 2041, young adults will decrease from 22% to representing 18% of the population in 2041, middle age individuals will decline slightly from representing 22% to 20% in 2041, adults (consisting of individuals aged 50 to 64) will decrease from representing 20% of the population in 2016 to approximately 17% in 2041, and seniors are forecasted to increase, from representing 15% of the population to approximately 23% in 2041.

More recent generations, and especially the millennials (those born between about 1984 and 2004) are using non-automobile modes of transportation more than their predecessors (Blumenberg et al., 2016; Kuhnimhof et al., 2013). Lower rates of automobile use appear to be related to both different preferences (Fajarindra Belgiawan et al., 2014) and the fact that most millennials entered the job market during a global recession and therefore have less wealth and own fewer automobiles (Blumenberg et al., 2016; Klein & Smart, 2016).

The longer-term implications of these travel behaviour changes, however, remain unclear. Some research suggests that millennials increase auto use when taking on additional jobs or responsibilities related to care for children or others. Other researchers note that some elements of these less car-intensive lifestyles persist over time and could change assumptions about travel behaviour into the future.

Because these demographic groups are so large, both baby boomers and millennials are expected to significantly shape travel demand and the fundamental travel needs at which transportation planning and policy efforts are directed. With more numerous and more active people over 65 years of age, and with millennials who adopt persistently different travel patterns than previous generations, both travel demand and the fundamental "transportation problem" are being reshaped. For example, while existing transportation planning efforts are often directed at accommodating new travel demand, changes by these two demographic groups both qualitatively and quantitatively change travel demand, and may well lead to different transportation issues – ranging from improving multi-modalism, enabling healthy lifestyles for active demographics with time, improving mobility for individuals with significant financial constraints, or improving accessibility for individuals with mobility challenges.

In sum, while the existing transportation planning and policy-making profession has developed from a history of accommodating travel demand, the new challenges in the public policy arena that are emerging from significant demographic change suggest that the traditional reasons for policy intervention may need to be re-examined.

3.3 Planning for Uncertainty

Transportation decision-making in the 21st-century needs to acknowledge the climate of uncertainty

discussed above. Emerging technologies, economic trends, environmental conditions and economic and demographic shifts all demonstrate the potential to spark major changes in the way people and goods move around the province. While it is clear that future travel demand and travel patterns will differ from the past, at this point the measure and direction of change are difficult to predict.

The GTAW EA did not test its Recommended Actions against sources of uncertainty. In fact, many of the changes and future trends discussed here have only developed over the last 10 years. In the next chapter, the Panel tests the transportation-related benefits of the GTAW EA's Recommended Actions, and explores whether a number of alternative future scenarios strengthen or weaken the case for moving forward with the EA and its proposed new highway.

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Chapter 4: Alternative Approaches and Transportation Benefits

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4.1 Transportation Benefits: Past, Present and Future

Traditionally, Ontario's transportation planning has focused on delivering transportation-related services and benefits, which have normally been measured in terms of shorter travel times and reduced highway congestion. Not surprisingly, then, the forecasting processes used to plan Ontario's highway system have generally sought to achieve these readily measurable transportation objectives.

In recent years, however, Ontario's policy landscape has evolved to embrace some new directions, with significant implications for the transportation planning and decision-making process. Today, we expect transportation infrastructure investments and service improvements to do more than move people and goods between different points (see Figure 4-1). We now expect our transportation investments to help support a range of broader economic, social, and environmental goals – such as achieving more compact and complete communities, protecting the environment by reducing greenhouse gas emissions, protecting our natural and heritage resources for future generations – in addition to providing efficient movement of goods and people. Transportation planning has also expanded its scope to address new impacts, including induced travel demand, changes in travel behavior and changes in the real estate market.

For several decades, transportation planning in Ontario has also included the province's environmental assessment process. Through the careful examination of alternatives, EA proponents have been able to identify the best possible option. However, while many EAs choose to narrow the scope of their projects in their terms of reference, the scope of the GTAW EA was broad. The EA's stated approach was to engage in a comprehensive exploration of a broad range of multi-modal options.

A more complete description of the background, issues and process of the GTAW EA is provided in Chapters 5 and 6 of this report. This chapter outlines the Panel's assessment of the GTAW EA's Recommended Actions with respect to their likely robustness, the potential of other alternatives to deliver similar benefits and the overall consistency of the Recommended Actions with provincial policy.

In its re-assessment, the Panel chose to focus primarily on transportation benefits (economic, social and environmental) and to include relatively little discussion of costs. This focus reflects the inherent challenges in generating reasonable cost estimates for specific actions, many of which have both public and private monetary and non-monetary costs, as well as benefits. At the same time, this report does offer some discussion of a number of secondary benefits or impacts that could result from a range of transportation actions.

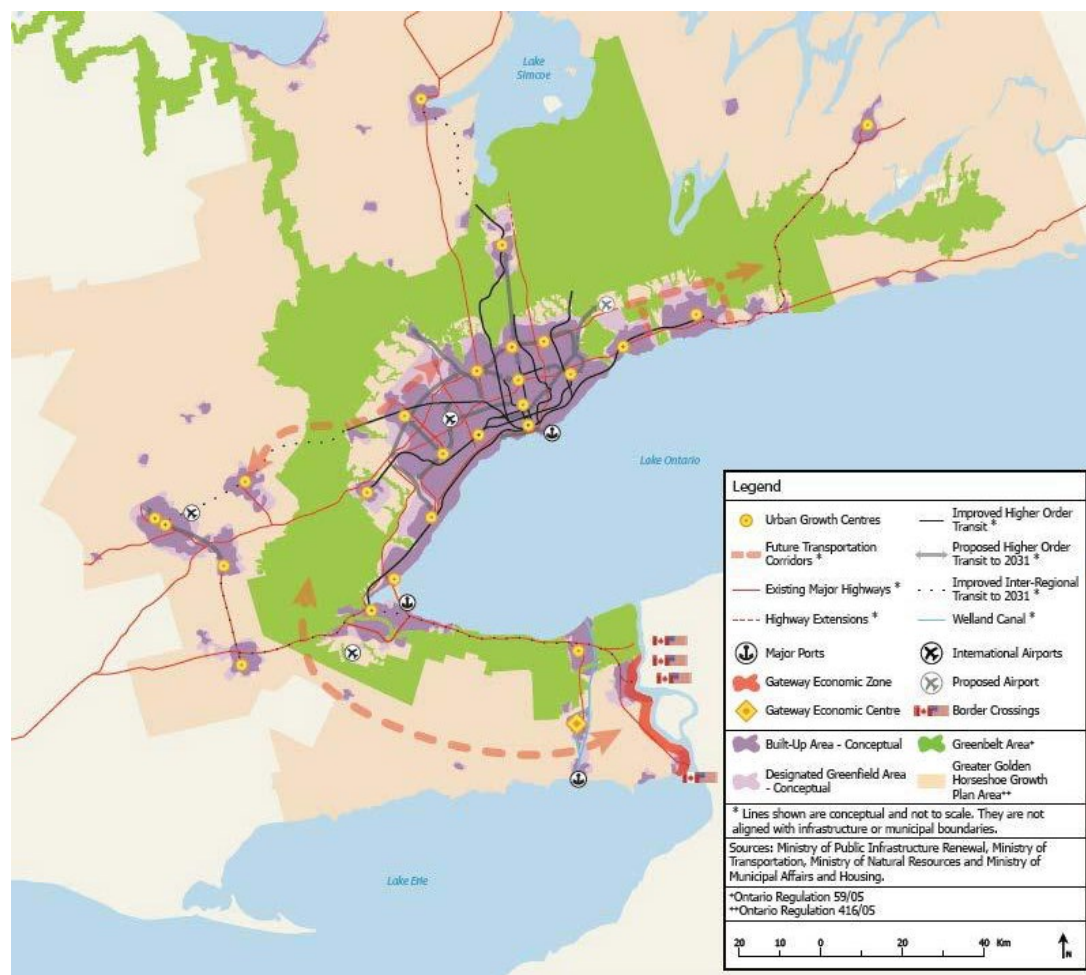


Figure 4-1: Schedule 2 Places to Grow Concept, Growth Plan for the Greater Golden Horseshoe (2006)
The image presents the conceptual future transportation corridors identified in the Growth Plan for the Greater Golden Horseshoe (2006). Three future corridors are identified: one stemming from the region of Niagara (border crossing to the U.S.) towards the regions of Waterloo and Guelph; another stemming from the southern region of York towards Guelph; and another within the region of Durham.

4.1.1 Considerations for Assessing Transportation Benefits

To assess the GTAW Recommended Actions for their expected travel demand benefits, the Panel applied new travel demand forecasts to a number of alternative scenarios and approaches. Such forecasts rely on computer models that start with a defined set of variables and assumptions related to how individuals travel, based on data. In the context of this report, based on variables related to population and job growth and transportation service levels, the modeling forecasts outcomes that include both behavioural changes and transportation performance measures.

Travel demand forecasting is one of the traditional tools used in transportation planning. While it is not necessarily definitive, transportation planners use it as a guide that suggests probable outcomes of a given set of circumstances and actions. Travel demand forecasting plays several important roles in transportation planning, including:

- providing credible documentation to improve accountability;
- providing a reliable estimate of specific transportation benefits;
- exploring the reasonableness of alternative actions; and
- evaluating and selecting from a number of alternative actions.

4.1.2 Why Re-Assess GTAW EA Transportation Benefits?

The GTAW EA used transportation demand forecasts to evaluate a number of alternatives for their transportation benefits. These forecasts prompted the Panel to commission its own forecasts. There were three main reasons for commissioning this supplementary forecasting work:

- to re-examine the benefits anticipated by the GTAW Recommended Actions in light of new sources of future uncertainty (e.g., the emergence of self-driving vehicles);
- to assess the reasonableness of alternatives that were not explored by the EA; and
- to evaluate the consistency of the GTAW Recommended Actions and unexplored alternatives in the

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context of evolving provincial policy objectives.

Travel demand forecasts can help identify the relative transportation benefits delivered by alternative policy actions, but their focus on benefits means that they represent a narrow evaluation of alternatives. For example, they are not designed to balance costs and benefits. Equally, they do not encompass two key secondary impacts of transportation infrastructure: induced travel demand and transportation-induced land use changes.

Building new transportation infrastructure, including highways, arterials and public transit, induces additional travel. Thus, the immediate social benefits of faster or more convenient travel are followed by the secondary consequence of more travel. Depending on context, constructing additional highway capacity can lead to similar increases in overall vehicular travel by encouraging commuters to live in more distant locations, to travel by car instead of by transit or to make more trips (Duranton & Turner, 2011). In fact, it is now recognized that induced demand represents an individual user benefit but a collective disbenefit due to congestion and more vehicle emissions. Over the last 20 years, the issue of induced demand and other secondary impacts has challenged the traditional limited focus on congestion and transportation benefits and resulted in transportation policy reform in jurisdictions such as the United Kingdom (see SACTRA, 1994 or Jones, 2010) and California (see Brown, 2008 or State Smart Transportation Initiative, 2014).

With respect to transportation-induced land use changes, it is well documented that transportation investment shapes where growth occurs (Banister & Berechman, 2003). Notably, additional highways can induce significant suburban expansion (Baum-Snow, 2006). Since compact and complete communities are a policy objective in Ontario's Growth Plan (2006), understanding the relationship between transportation infrastructure investment, urban growth and suburban sprawl is critically important. In the Greater Golden Horseshoe, population and job forecasts are currently mandated by the Growth Plan (2006) and are independent of alternate transportation infrastructure investment strategies.

4.2 The Panel's Approach and Alternate Scenarios

The Panel sought to focus on the extent to which the transportation benefits ascribed by the GTAW EA to its Recommended Actions were established robustly, and the extent to which these proposed actions would be consistent with provincial policy, in the context of a range of possible futures. Accordingly, the Panel designed additional analyses to assess alternative scenarios and approaches that it felt might have an important bearing on the effectiveness of the GTAW Recommended Actions.

4.2.1. Alternate Scenarios

The alternate scenarios were developed based on the Panel's review of relevant provincial policy, municipal and regional policy, relevant trends in travel behavior and transportation planning and the Panel's terms of reference. It should be noted that MTO also conducted numerous travel demand forecasts on behalf of the Panel that are not reviewed in this report. The summary presented here includes only those scenarios that the Panel considered to be of greatest interest in its assessment of alternate approaches. That assessment focuses on transportation benefits relevant to the GTAW EA. Each scenario offers only a brief discussion of the related costs.

All told, seven types of scenarios merit attention:

1. The GTAW Recommended Actions – This scenario included a new highway corridor and other highway extensions and expansions, as recommended by the GTAW EA. None of the scenarios assessed by the Panel included the assumption that TDM, TSM, or transit improvements (several additional components of the GTAW EA's recommendation referred to as Group #1 and Group #2) would reduce vehicular travel demand, because the Panel felt that such assumptions needed to be tested more rigorously.
2. The GTAW Recommended Actions without the new highway – This scenario included other highway extensions and expansions (many of which were already being planned, permitted, or under way) but not the proposed GTAW highway.^{viii}
3. Alternate Land Use Scenarios – Several alternate job and population forecasts were developed and tested, with and without the GTAW Recommended Actions, including:
 - A. GTAW EA Forecasts;
 - B. Updated Provincial Forecasts; and
 - C. A slower-growth, "compact" forecast based on an assumption mirroring the existing distribution of jobs and population and therefore leading to relatively more growth in urban areas.

The GTAW EA used job and population growth forecasts that are set out in the Growth Plan (2006) (GTAW EA Forecasts). The Province has since updated these forecasts through Amendment 2 to the Growth Plan, which was issued in 2013 (Updated Provincial Forecasts). The Panel was provided with alternative, slower-growth forecasts based on observed growth (Slower Growth Forecast)^{ix}. Of these three, the GTAW EA only had the GTAW EA forecasts from 2006 available. The Panel felt that re-examining travel demand model results in light of these additional forecasts was important because it would enable testing of the robustness of the proposed project's benefits. It should be noted that the independent effects of slower-growth or more compact land uses on transportation performance cannot be determined from these results.

4. Public Transit Scenarios – Alternative public transit scenarios were tested, including:
 - A. The Regional Express Rail (2017) System (with and without the GTAW Recommended Actions);

- B. GTAW Corridor Rapid Transit, which explored transit feasibility between the study area's population and job centres; and
 - C. High Speed Rail, a scenario which explored the implications of the proposed High Speed Rail corridor between Toronto and Windsor, focusing on Toronto to Kitchener (where most of the ridership is expected).
5. Self-driving Vehicle Scenarios – The Panel reviewed several stylistic scenarios in which self-driving vehicles become a reality, both with and without the GTAW EA's Recommended Actions. Self-driving vehicles may both increase travel demand (people could travel more because it is more convenient) and may also increase road capacity (capacity could increase due to more efficient driving). Scenarios included:
- A. Rapid Self-driving Vehicle Adoption Scenario: an assumed 20-per-cent increase in trips with no capacity increase;
 - B. Very Rapid Self-driving Vehicle Adoption Scenario: an assumed 40-per-cent increase in trips and a 50-per-cent capacity increase on all roads; and
 - C. Very Rapid Self-driving Vehicle Adoption Scenario: an assumed 40-per-cent increase in trips, and a 100-per-cent capacity increase, only on highways.
6. Congestion Pricing Scenarios – Several forecasts were tested where congestion pricing was used as an explicit travel demand management tool, as follows:
- A. Congestion pricing on one lane on all highways in the GGH;
 - B. Congestion pricing on all highway lanes in the GGH;
 - C. Congestion pricing on Hwy 401 Express lanes in the GGH;
 - D. Congestion pricing on all of Hwy 401 in the GGH; and
 - E. Congestion pricing for passenger vehicles on the new GTAW corridor, but free travel for trucks.
7. Hwy 407 Truck Lane Scenarios – Forecasts that gave priority to trucks on Hwy 407 were also tested, based on the proximity of goods movement trip generators along Hwy 407, as follows:
- A. Two new, tolled lanes on all of Hwy 407 that are dedicated for trucks (one in each direction);
 - B. Two new, unpriced lanes on all of Hwy 407 that are dedicated for use by trucks; and
 - C. Two new, unpriced lanes on Hwy 407 that are dedicated for use by trucks, from Hwy 401 to HWY 400 only.

These Hwy 407 Truck Lane Scenarios were designed to explore opportunities to use Hwy 407 differently, rather than undertake a comprehensive assessment of benefits, costs and engineering feasibility. The Panel also notes that are currently limits in the Hwy 407 legislation and agreement that would affect options (such as the scenarios examined here) to use Hwy 407 in different ways, due to current legislation limits on widening Hwy 407 up to 10-lanes.

4.2.2 Assessment Framework

More details on each of the modeling scenarios outlined above are provided in Appendix 4. All the scenarios and approaches were developed using a combination of travel demand modeling, sketch planning, and discussions. To evaluate the recommendations in the GTAW EA, the Panel used a framework that involved three fundamental questions. These questions acted as a kind of filter on the modeling results, and the Panel applied them to each relevant scenario. The three questions were as follows:

- Question 1 — Based on transportation performance measures, does an alternative scenario deliver benefits that are similar to the GTAW Recommended Actions?
- Question 2 — Does an alternative scenario change the benefits from the GTAW EA's Recommended Actions?
- Question 3 — What provincial policy goals are advanced (or undermined) by the GTAW EA's Recommended Actions?

For the third question, rather than focusing strictly on transportation benefits from the twin perspectives of travel time savings and congestion alleviation, the Panel opted to explore two broader types of transportation-related benefits:

- Economic Objectives: those that involve creating economic value by saving time or money and reducing traffic congestion; and
- Complete Community Objectives^x: those that involve policy priorities such as reducing greenhouse gas emissions (e.g., by reducing auto travel and encouraging mode-switching to public transit and carpooling) and supporting complete communities (e.g., by promoting more local travel and shorter trips).

4.3 Results of the Panel's Assessment

The results of the Panel's assessment are discussed below, first by focusing on scenario-specific conclusions, and second by highlighting general conclusions on transportation benefits and alternate scenarios and approaches. The Panel reached two types of conclusions — conclusions that were specifically related to the scenario discussions, and more general conclusions about alternate approaches. The Panel's scenario-specific conclusions are presented here first.

4.3.1 Scenario-specific Conclusions

1. GTAW Recommended Actions

The Panel found that the GTAW Recommended Actions would, as Stage 1 of the EA suggested, deliver significant economic-oriented transportation benefits, but that they would not likely deliver benefits related to the provincial policy objective of complete communities.

The Panel's scenario results supported travel time savings in a magnitude similar to those suggested in the GTAW EA. This is an economic-oriented transportation benefit. The GTAW EA suggests that transportation benefits from the GTAW Recommended Actions are expected to be \$2.2-billion in annual benefits and that the cost would be approximately \$5-billion. However, this economic value includes highway widenings and expansions that were already planned (many of which are currently under way). Moreover, the suggested economic value is based on an aggregate economic model in the EA (the TREDIS model), which does not account for the study area opportunities (e.g., many goods movement facilities are located in the study area) or constraints (e.g., land availability in the Greenbelt).

The precise economic value delivered by the project would need to be further refined using a detailed benefit-cost analysis. Moreover, given that the GTAW EA recommends a suite of actions rather than an individual action, exploring the cost-benefit value delivered through alternative phasing methodologies would be important (e.g., when would costs be incurred to provide different components of the system, and how quickly would the project-related benefits accrue?).

These findings led the Panel to reach different conclusions than the GTAW EA assumptions regarding complete community-oriented performance measures. While the GTAW EA assumptions led to an assumption that transit mode shares would increase by 2.5 per cent and active travel mode shares would increase by 1.5 per cent, the Panel could find no rationale for these assumptions. Instead, the Panel's assessment suggested that the GTAW Recommended Actions would either have a negligible impact on mode share (based on model results) or be likely to induce more auto travel (when considering long-term potential for induced demand).

2. The GTAW Recommended Actions With/Without the New Highway

The Panel's modeling results suggested that half of the GTAW Recommended Actions' travel time savings would be delivered by the expansions and extensions of existing highways. Although those actions were proposed as part of the GTAW Recommended Actions, many of these were already permitted by other EAs or Class EAs at the time of the TDS. Since then, they have been added to MTO's Capital Plan and in some cases have been completed or are under way. In any case, the Panel concluded that these actions should not have been rolled into the anticipated benefits of the proposed new highway in the GTAW Recommended Actions. Rather, the actions and their anticipated benefits should have been included as part of the base case scenario at the start of the EA.

3. Land Use Forecasts

Since the GTAW EA used population and job forecasts that were provincially mandated, the benefits of the GTAW Recommended Actions are closely tied to the land uses assumed in those forecasts. However, the Panel's forecasts based on alternative land uses and growth patterns showed significant changes to the benefits that would be delivered by the GTAW project — changes that could warrant either accelerating, postponing or offsetting the need for building new highway capacity. Recent data suggest that provincial growth has slowed (Ministry of Finance, 2017; Mathew, 2017). Moreover, travel times in the slower-growth, compact scenario and in the GTAW Recommended Actions are similar.

While the effects of slower growth and more compact land uses cannot be separated in these results, these alternative land use and growth scenarios raise important questions. Some questions relate to which land use scenario is most likely (particularly under different transportation infrastructure investment strategies) and which scenario is most desirable. Another important question is whether land use patterns can be sufficiently aligned to postpone or offset the need to build new transportation system capacity.

4. Public Transit

The Panel's modeling results suggested that various public transit scenarios would have no impact on level of benefits expected from the GTAW Recommended Actions. This is largely because the GTAW Recommended Actions and public transit actions serve different travel markets. Without significant changes to land use forecasts beyond those assumed in the Growth Plan, our models indicated that public transit is not a viable alternative for linking urban growth centres in the study area, essentially because the travel demand is so low. However, the Panel found that Regional Express Rail, which was assumed to occur under the EA's 2031 base case scenario, will deliver travel time savings for trips through the GTAW study area and from the study area to Toronto. These travel time savings are approximately three times as high as those of the proposed GTAW highway alone.

5. Self-driving Vehicle Technology

While there is still much uncertainty about self-driving vehicles and the whole new range of transportation-related, internet-based technologies, the Panel's modeling suggested that self-driving vehicles could have a significant impact on average travel times. Importantly, the widespread adoption of such vehicles could either reduce or increase average travel times. While self-driving vehicles are likely to increase road capacity and thus travel speeds, they are also likely to increase the total number of vehicles on the road and the total number of trips taken. The Panel's modeling results also suggested that with the self-driving scenarios, the GTAW Recommended Actions would be expected to generate more travel time savings.

6. Congestion Pricing

In all the scenarios, congestion pricing delivered significant travel time savings and reduced vehicular travel. Travel time savings from congestion pricing accrued right across the GGH, but in some congestion pricing scenarios even the savings within the GTAW study area approached or exceeded those expected from the GTAW Recommended Actions. The results from the Panel's congestion pricing scenarios suggested that this alternative may well have the greatest policy consistency with both economic-oriented and complete community-oriented transportation performance measures. However, while the potential travel time savings of these scenarios could be high, these scenarios could lead to issues around public acceptance and equity that would need to be explored using a system-wide approach.

7. Hwy 407 Goods Priority

The Panel's modeling suggested that there could be significant potential travel time savings from providing freight priority to the existing highway network. These scenarios assessed adding truck-only lanes on Hwy 407 and subsidizing these lanes for the use of goods-moving vehicles. However, while economic-oriented transportation benefits are potentially significant, the costs of such an alternative action would also likely be high, as this action would exceed the 10-lane limit that exists in the Hwy 407 legislation and operating agreement.

4.3.2 Panel's General Conclusions

The goal of the work outlined in this chapter was to test the robustness of the GTAW Recommended Actions, using travel demand modeling and sketch planning, to discuss a number of approaches and scenarios devised by the Panel. The findings of this work—which are suggestive, but not necessarily definitive—resulted in five general conclusions.

1. Transportation Benefits from the Recommended Actions

The Panel's modeling results suggested that travel time savings delivered by the GTAW Recommended Actions would be broadly stable across a range of future scenarios. But some scenarios, such as the self-driving vehicle scenarios, suggested greater travel time savings, while others, such as the slower-growth, "compact" land use scenarios, suggested lower travel time savings from the GTAW Recommended Actions. Translating these model results into practical findings, all of the GTAW Recommended Actions would deliver approximately a minute of travel time savings per vehicular trip across the Greater Golden Horseshoe. On its own, the proposed new highway corridor would deliver approximately half of those savings, or about 30 seconds per vehicle trip.

2. Overstating Benefits

The scenarios developed in the GTAW EA contained unspecific actions (e.g., TDM, TSM, and transit) and actions that were already permitted and in some cases under way (e.g., highway widenings and extensions), in addition to the new highway corridor. In effect, this overstated the benefits that would flow from the Recommended Actions. Benefits that did not relate to the proposed new highway corridor should either have been assumed in the base case scenario or enumerated separately, to allow for a clear evaluation of the proposed corridor on its own merits. This issue is particularly important because some of these additional actions were or are being assessed in independent EAs (i.e., benefits that are being counted in multiple environmental review processes) and because different benefits from the GTAW Recommended Actions were subject to different policy requirements (discussed further in Chapter 5), and therefore should have been assessed independently. More specifically:

- The GTAW EA included already programmed highway expansions and extensions (some of which are now already completed or under way) as benefits that were specific to the GTAW Recommended Actions. In fact, those expansions and extensions are separate infrastructure improvements and represented approximately half of the travel time savings that would result from the EA's proposed actions.
- Assumptions in the GTAW EA about TDM, TSM and transit-related vehicular demand reductions were unsupported, and these EA recommendations were sufficiently vague that there is no apparent mechanism to ensure that such measures are followed in the event that the EA is approved.

3. Unexplored Alternatives

The Panel was asked to examine potential alternative approaches to meeting future transportation demand beyond those set out in the EA. This work resulted in the Panel identifying scenarios that would appear to deliver travel time savings in the same order of magnitude as the GTAW Recommended Actions. That said, the travel time savings of many of these alternatives appear to apply more widely across the Greater Golden Horseshoe, rather than primarily within the GTAW study area. The Panel also observes that, although these scenarios are consistent with provincial policy to optimize the use of existing infrastructure before developing new infrastructure, these scenarios raise a number of other policy issues.

- Congestion pricing: A range of congestion pricing scenarios indicated that this TDM tool could deliver travel time savings ranging from savings that are equal to the proposed new GTAW highway to savings that are more than 10 times greater than those delivered by the new highway (altogether, more than five times greater than all of the GTAW Recommended Actions). The impacts and benefits of these scenarios would also extend beyond the GTAW area. Notably,

some congestion pricing scenarios delivered higher travel time savings for the study area (but a lower share of the Greater Golden Horseshoe total) than the GTAW Recommended Actions. However, these travel time savings need to be interpreted carefully, since they represent a trade-off between higher travel times and a policy that requires users to pay a toll for the use of congestion-free highways.

- **Hwy 407 Truck Lanes:** The Panel's modeling forecasts indicated that adding dedicated truck lanes to Hwy 407 would deliver significant travel time savings, especially for the goods movement sector. It is notable that the Panel's Hwy 407 scenarios are similar to Alternative 3-1 in the GTAW EA, which was rejected on the basis of cost and constructability^{xi}, in that the Panel's Hwy 407 scenarios propose additional lanes on Hwy 407. But while Alternative 3-1 in the EA proposed up to six additional lanes on Hwy 407, the Panel's scenarios added only one lane in each direction, extending them along a much longer stretch in two of the three scenarios.
- **Land Use Management:** The difference between the provincially-mandated planned growth targets and a slower-growth, compact land use scenario exceeds the travel time savings delivered by the full suite of GTAW Recommended Actions (including all widenings and extensions). In the slower-growth, compact scenario, growth is forecasted based on the recent past, rather than the higher target forecasts mandated in the Growth Plan (2006). In short, how land uses are managed appears to impact travel conditions. However, the desirability and likelihood of slower growth or more compact land uses remain unknown.

4. Policy Congruence and Performance Objectives

Provincial transportation policy is moving toward accommodating a wider range of social, economic and environmental policy objectives than in the past, including making the optimization of existing infrastructure a priority. This evolution is evident in documents such as the Growth Plan (2006), the Big Move (2008), the Greenbelt Plan (2005), Climate Change Action Plan (2016), and other key policy initiatives. The Panel's review focused on several provincial policy objectives relating to transportation (i.e., economic objectives, including travel time savings and reduced congestion, and complete community objectives, including greater transit use, more ride-sharing, and shorter trips per vehicle).

With this focus, the Panel sought to explore the consistency of the GTAW EA's Recommended Actions with respect to broader, and in some cases, more recent provincial policy goals. A broad set of performance measures has recently been developed by the province for the Growth Plan (2006), and these support the performance measures used by the Panel in its scenario modeling. On their own, some of the scenarios modeled by the Panel appeared to be more robust with respect to accommodating a broader range of provincial policy objectives than the GTAW Recommended Actions.

The range of congestion pricing scenarios and the slower-growth, compact land use scenarios appear to be most consistent with both economic and complete community-oriented performance measures. These scenarios are also more consistent with the emphasis in the PPS (2005) and Growth Plan (2006) on optimizing existing infrastructure.

The GTAW EA Recommended Actions appear certain to provide economic and travel time-related benefits, many of which would apply to the study area. But the Panel also found that the EA's consideration of complete community objectives was secondary. While induced demand was not directly estimated by models, alternatives that provide additional highway capacity could be expected to induce more traffic. As noted earlier in the report, the need to understand induced demand as one of several secondary impacts of transportation investment has led to transportation policy reform in the U.K. If objectives such as curbing congestion, supporting complete communities or reducing greenhouse gas emissions are important in the GGH, the potential for induced demand to undermine these objectives needs to be better understood.

The GTAW EA's policy alignment could have been further clarified by understanding how the project—in concert with other provincial projects, policies, programs, and initiatives—would play its individual role. This assumes the existence of a provincial vision for transportation investment and an overarching regional transportation plan that would shape the directions and help define the role of individual projects.

Without a long-term transportation vision and a multi-modal plan designed to realize it, the Panel concluded that it will continue to be a major challenge to assess the relative merit and effectiveness of single projects, or even groups of infrastructure investments, in advancing Ontario's progress toward its broader policy objectives. This conclusion was echoed in comments received during the Panel's consultations (see Chapter 2), in which the lack of an integrated transportation plan was noted by many participants.

5. Implications of Land Use Forecasts

On May 18, 2017, the province released the updated Greenbelt Plan (2017) and Growth Plan for the Greater Golden Horseshoe (2017). The Panel found that one policy of particular relevance to its work is the direction in the Growth Plan (2017) that planning for new or expanded infrastructure "will occur in an integrated manner, including evaluation of long-range scenario-based land use planning ..." (3.2.1.2). This new guidance adds support to the approach used by the Panel in Chapter 4 of exploring possible future scenarios as a strategy for considering the robustness of the GTAW EA transportation benefits.

Models using job and population forecasts that are different from those in the EA were commissioned by MTO and used by the Panel, one of which was consistent with the Updated

Provincial Forecast prepared for the Growth Plan (2017) and one of which relied on observed trends (a slower-growth, compact scenario).

Over time, if the current observed trends are more accurate, this will have implications for the GTAW EA's project-related benefits. First, differences between the Updated Provincial Forecast and slower-growth, compact land use scenarios deliver travel time savings that are similar to those of the GTAW Recommended Actions. Second, the GTAW Recommended Actions deliver fewer benefits under a slower-growth compact scenario. The Panel's results did not independently assess the role of compactness from slower growth in this scenario. While the Panel looked at a scenario with slower growth, its evaluation of this scenario should not be construed as an endorsement of slower growth.

As outlined above, the Panel's consideration of alternative land use patterns suggested that exploring the interaction between these scenarios and different transportation outcomes could lead to a different long-term travel demand management strategy. Accordingly, developing a better understanding of whether transportation infrastructure investment promotes or undermines more travel-efficient land use arrangements could be significant in helping support more effective transportation planning.

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Chapter 5: Policy Context

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For two decades following the end of World War II, Ontario's growing population and economy spurred the rapid expansion of its transportation system, including provincial highways. Provincial policies affecting transportation focused on building the most efficient and cost-effective network possible. Transportation planners were asked to direct their efforts primarily towards achieving economic goals, such as increasing highway capacity, reducing travel times and moving people and goods more efficiently. By the late 1960s and early 1970s, however, transportation planning was required to expand its scope. For example, in 1975, environmental assessment became an important requirement for new provincial transportation infrastructure. Similarly, during the 1990s, Ontario began to integrate infrastructure planning with land use planning and provincial policy.

The arrival of a new millennium coincided with renewed provincial interest in curbing urban sprawl in favour of smarter growth, and the embracing of broader economic, social and environmental goals for provincial transportation infrastructure. This resulted in the passage of a suite of legislative and policy reforms between 2004 and 2006. From today's perspective, it is clear that the GTAW EA was launched at a transformative moment in Ontario's policy history, with impacts for both transportation planning and the environmental assessment process

5.1 A New Planning Framework for EA

In 1983, the passage of the Planning Act laid the groundwork for a planning system that was directed by the provincial government, by requiring planners to have "regard for" policies approved by the Province. Twenty years later, the government initiated a second round of key reforms to strengthen provincial direction and policy. First, the requirement that decisions "have regard to" provincial policy statements was replaced by the stronger obligation that decisions "be consistent with" such statements (subsection 3(5)). Second, the province passed legislation and issued plans to set higher policy standards for specific regions of the province—including a new permanent greenbelt across several regions of southern Ontario and growth management across the Greater Golden Horseshoe. Decisions relating to planning matters were required to "conform with" these plans.

By the end of 2006, subsection 3(5) of the Planning Act required:

Policy statements and provincial plans

(5) A decision of the council of a municipality, a local board, a planning board, a minister of the Crown and a ministry, board, commission or agency of the government, including the Municipal Board, in respect of the exercise of any authority that affects a planning matter,

- a. shall be consistent with the policy statements issued under subsection (1) that are in effect on the date of the decision; and
- b. shall conform with the provincial plans that are in effect on that date, or shall not conflict with them, as the case may be. 2006, c. 23, s. 5.

As a provincial ministry, the Ministry of Transportation (MTO), the proponent of the GTAW EA, was thus obliged to conform with these plans and be consistent with the province's policy statements.

The provincial government also provided guidance on the interaction between these new policy requirements. The PPS (2005), which provided policy direction for provincial interests, and provincial plans, which provided geographic-specific policies on planning matters, were intended to work in conjunction with one another. However, in the event of a conflict, provincial guidance stated that the provincial plans should take precedence over policies in the PPS (4.9). Another source of provincial guidance was the Places to Grow Act, 2005, which advised that in matters relating to human health and the natural environment, in the case of a conflict between the Growth Plan and either another provincial plan or the PPS, the policy that provides the strongest protection for human health or the natural environment must prevail. With this new planning policy framework, Ontario established a new foundation for land use planning, new requirements for adherence, and new guidance on resolving conflicts between policies.

Though guided by its own distinct legislation, Ontario's environmental assessment process is referenced in and is part of the new policy-led foundation for planning. In its Implementation and Interpretation section, the PPS clarifies that, "In addition to land use approvals under the Planning Act, infrastructure may also require approval under other legislation and regulations, including the Environmental Assessment Act; the Canadian Environmental Assessment Act, 1992..." (4.8). The Greenbelt Plan (2005) states that existing, expanded or new infrastructure that is subject to and

approved under the Canadian Environmental Assessment Act, the Environmental Assessment Act, or the Planning Act (among others) is permitted in the Protected Countryside, provided it meets the General Infrastructure policies and objectives of the Plan (4.2.1.1). Finally, with respect to moving people and goods, the Growth Plan (2006) states that Schedules 5 and 6 provide strategic frameworks for future investment decisions, and that timing, phasing and alignment are subject to the environmental assessment process where applicable (3.2.3.4 and 3.2.4.6).

These policies demonstrate that environmental assessments do not take place outside the provincial policy framework. Rather, they are subject to and informed by the policies contained in the provincial plans and the PPS.

In the past, EAs in Ontario have echoed the traditional approach to provincial policy, having “regard” for many policy topics, but also having regard for a range of other considerations — technical, financial, etc. — that were not addressed by provincial policies. Under the new planning framework, however, the purpose of an EA undertaking, and the evaluation of alternatives and alternative methods, were required to conform with and be consistent with provincial policy set out in the PPS or specified provincial plans. To deliver policy outcomes through the EA requirements to describe, evaluate and compare alternatives, an EA thus had to focus on criteria that would give provincial policy priority over other criteria. Similarly, EA criteria would now need to screen out alternatives that are contrary to provincial policy and assign greater weight to effects and benefits that address provincial policy. In other words, a preferred project and the process for identifying such a preferred project were now required to conform with all applicable provincial plans and be consistent with the provincial policy statement.

To provide better insight into the new provincial policy framework that was applicable to the GTAW EA, the Panel has categorized the documents listed in the EA’s terms of reference in three tiers (Figure 5-1). First-tier policies include those that were implemented through statutory processes, and to which the requirements for conformity and consistency apply. Five documents provide policies that are included in this category: the Growth Plan (2006), the Greenbelt Plan (2005), the Niagara Escarpment Plan (NEP; 2005), the Oak Ridges Moraine Conservation Plan (ORMCP; 2002), and the Provincial Policy Statement (2005).

Second-tier policies are those that are specific to MTO or Metrolinx, and are policies that the ministry and Metrolinx should follow, according to internal direction and the Metrolinx Act (2006), respectively. The third tier includes relevant policies from other ministries and planning bodies. In the diagram below, the Panel has illustrated this framework and highlighted policies that have been updated, replaced or released since the start of the GTAW EA.

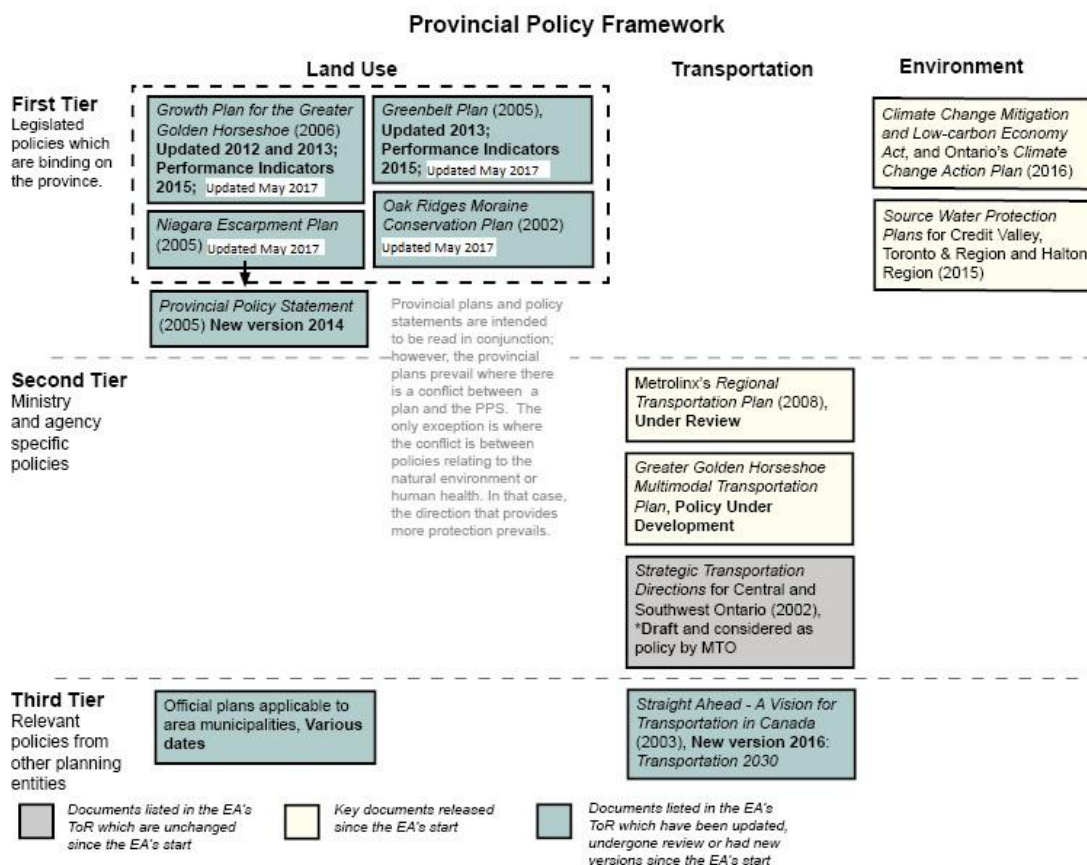


Figure 5-1: Provincial Policy Framework

The diagram presents a conceptualization prepared by the GTA West Advisory Panel of how the provincial policy framework could apply to infrastructure planning. The framework is presented in three tiers. The first tier comprises of land use policies which are binding on the province (such as the Growth Plan, the Greenbelt Plan, the Niagara Escarpment Plan, the Oak Ridges Moraine Conservation

Plan, and the Provincial Policy Statement) in addition to environmental policies such as Ontario's Climate Change Action Plan, and the Climate Change Mitigation and Low-carbon Economy Act. The second tier consists of ministry and agency-specific transportation policies such as Metrolinx's Regional Transportation Plan, and the Province's Greater Golden Horseshoe Transportation Plan in addition to Strategic Transportation Directions for Central and Southwest Ontario. The third tier is comprised of relevant policies from other planning entities, including land-use policies such as official plans applicable to municipalities, and transportation policies from other governments, such as the federal government's Straight Ahead – A Vision for Transportation in Canada.

5.2 New Policy Directions

In addition to introducing new requirements for adherence, Ontario's new policy framework also marked a directional shift for the province, as the government embraced a more active role in managing growth and protecting valuable natural resources and cultural heritage. Three of the first-tier policy documents encapsulate this new approach and are particularly relevant to the GTAW EA: a new Provincial Policy Statement (PPS; 2005) and two major regional plans, the Greenbelt Plan (2005) and the Growth Plan (2006). This section highlights several key policy shifts which the Panel found to have a bearing on the GTAW EA.

Both the Growth Plan (2006) and the PPS (2005) introduced policies to encourage intensification and compact growth. For example, the PPS directed that "appropriate development standards should be promoted which facilitate intensification, redevelopment and compact form" (1.1.3.4). The Growth Plan (2006) further developed this approach to managing growth for the Greater Golden Horseshoe, with requirements for municipalities to meet intensification and density targets. The plan also introduced the term "complete communities" to describe a pattern, density and mix of land uses that enable more people to fulfill their everyday needs within their own neighbourhoods.

With respect to the transportation system, the PPS (2005) and the Growth Plan (2006) emphasized the need to optimize existing and planned infrastructure.^{xii} The PPS (2005) in particular directed that "The use of existing infrastructure and public service facilities should be optimized, wherever feasible, before consideration is given to developing new infrastructure and public service facilities" (1.6.2). Both the PPS (2005) and the Growth Plan (2006) also directed that the transportation system should be multi-modal (PPS 1.7.1; Growth Plan 3.2.2.1), and the Growth Plan (2006) further introduced requirements to prioritize certain modes over others.

For example, in planning for the development of new and expanded corridors, the Growth Plan (2006) states that the Ministers of Infrastructure and Transportation will "support opportunities for multi-modal use where feasible, in particular prioritizing transit and goods movement needs over those of single occupant automobiles" (3.2.2.3b). In addition, the plan emphasized that for moving people, "public transit will be the first priority for transportation infrastructure planning and investment" (3.2.3.1). For moving goods, "the first priority for highway investment is to facilitate efficient goods movement by linking intermodal facilities, international gateways, and communities within the GGH" (3.2.4.1).

Regarding the environment, the Greenbelt Plan (2005) is intended to provide permanent protection to agricultural land and natural heritage and water resource systems in a broad belt across southern Ontario. The plan also supports strong rural communities, including their social fabric and economies, through policies that address the provision of infrastructure and the use of resources within the Greenbelt area.

This chapter focuses on how this new provincial policy landscape affects the GTAW EA. In the following sections, the Panel first addresses the policy framework in place at the time the EA was initiated in 2008. It then reviews policies that have emerged since that time. As part of its strategic assessment, these findings help inform the Panel's advice on a path forward for the GTAW EA.

5.3 GTAW EA Approach to Existing Provincial Policy

5.3.1 EA Policy Framework

The GTAW EA's terms of reference set out a policy framework that included nine documents, within which transportation problems and opportunities and potential solutions would be identified. Five reports followed, to make up the core of the Stage 1 assessment. Each report contained a different list of policy documents, with different descriptions of the relevant sections of policy. Overall, 19 different policy documents are listed in different places as relevant to the EA (see Appendix 5 for the full list).

The EA's terms of reference distilled the policy framework into 14 policy principles, and stated that this list would be used to guide the assessment process and the selection of Alternatives to the Undertaking. Later in the document, both in its framework for "alternatives to the undertaking" and for "alternative methods of carrying out the undertaking", the policy principles are summarized into two different lists of six principles each. Similarly, during Stage 1, the EA released a working paper titled, Area Transportation System Problems and Opportunities Report (July 2009, amended January 2011). After establishing an expanded policy framework, this report derived 10 "goals" for the EA, which it then related to 17 "study objectives".

The Panel has a number of concerns with the EA policy framework that was summarized in multiple reports through "policy principles", "goals" and "study objectives". First, the EA did not give priority to the five first-tier documents whose legislated policies require conformity (provincial plans) and consistency (provincial policy statement). These five documents have greater importance than the other 14 documents identified by the EA.

Second, the EA did not refer to provincial guidance on which policy should take precedence in the case of a conflict. The EA's terms of reference stated that the most recent policy direction would be used. However, as explained above, the province has provided guidance that, in most cases, the provincial plans should take priority. The one exception is that in the case of a conflict between any policy in a growth plan and policies in other provincial plans or the PPS, the conflict should be resolved in favour of the policy that provides the greatest protection to human health or the natural environment (Places to Grow Act 2005). The Panel is concerned that the EA did not address this priority or explain how it would resolve competing policies such as Schedule 6 in the Growth Plan (2006) and the "reasonable alternative" policy test to crossing protected lands in the Greenbelt Plan (2005) or PPS (2005).

Finally, in the Panel's view, the GTAW EA's practice of grouping policies into principles may have satisfied earlier policy tests of having "regard for" the policies, but the new requirements of consistency and conformity demanded that the EA use a more detailed approach to specific policies and their relevance to environmental assessment requirements.

5.3.2 Growth Plan for the Greater Golden Horseshoe (2006)

In reviewing the GTAW EA's application of the Growth Plan (2006), the Panel had concerns regarding the Purpose of the EA, the application of Schedule 6 of the Growth Plan (2006) and the application of policy direction regarding complete communities.

Connecting Urban Growth Centres

Describing the purpose of an undertaking is a critical step in every EA and in ensuring consistency with the existing policy framework. An EA's purpose provides key direction on what alternatives are relevant and how best to evaluate them. The GTAW EA sets its purpose within the context of supporting policies in the Growth Plan (2006), stating that:

"The purpose of this study is to examine long-term transportation problems and opportunities and consider alternative solutions to provide better linkages between Urban Growth Centres in the GTA West Corridor Preliminary Study Area. The focus will be on developing an integrated, multi-modal transportation system that offers choices for the efficient movement of people and goods." (p. 11).

The Growth Plan (2006) features two sections that address transportation linkages between urban growth centres.^{xiii} The first reference is in the Plan's non-policy contextual commentary (1.4) in the introduction, which provides background and describes policy intent, but is not itself a statement of policy. A second reference to linking urban growth centres is found in the plan's policy about Moving People. Specifically, Policy 3.2.4 states: "Schedule 5 provides the strategic framework for future transit investment decisions, including capacity improvements to existing transit systems to support intensification, and proposed higher order transit and inter-regional transit links between urban growth centres, in the GGH." This policy clearly relates linking urban growth centres to higher order and inter-regional transit and the priorities for transit investment decisions.

Other transportation policies of the Growth Plan (2006) for the movement of people address the improvement of transit linkages from nearby neighbourhoods to urban growth centres (3.2.3). By contrast, policies for the movement of goods address improved linkages among intermodal facilities, international gateways and communities. In summary, with the exception of policy about higher-order transit and inter-regional transit, Growth Plan policy does not direct linking urban growth centres.

The Panel found that the GTAW EA's evaluation of alternatives focused on different highway corridors. The Stage 1 assessment of transit alternatives was based on undocumented assumptions, and the decision as to whether the new corridor would include a transitway was reserved for Stage 2.^{xiv} Given that linking urban growth centres through transit was not the focus of the GTAW EA, the Panel is thus concerned that the EA's purpose rests on contextual statements in the Growth Plan (2006), and not on policy.

Schedule 6

A key Growth Plan (2006) policy for infrastructure directs that "Transportation system planning, land use planning, and transportation investment, will be coordinated to implement this Plan" (3.2.1.2). This policy then states that "The Ministers of Transportation and Infrastructure, other appropriate Ministers of the Crown, and municipalities will work with agencies and service providers to... improve corridors for moving goods across the GGH consistent with Schedule 6 of this Plan" (3.2.4.2b). It concludes by stating that "Schedule 6 provides the strategic framework for future goods movement investment decisions in the GGH" (3.2.4.6), and elsewhere that the first priority of highway investment is "to facilitate efficient goods movement by linking intermodal facilities, international gateways and communities ..." (3.2.4.1).

Schedule 6 of the Growth Plan (2006) depicts a total of three corridors, including one in the northwest GTA that appears to connect the urban growth centre in Guelph to the Canadian Pacific (CP) Intermodal facility in Vaughan. The relevant policy states that the proposed corridors' alignments, timing and phasing are subject to further study and, where applicable, the environmental assessment process.^{xv}

Given that Schedule 6 and the policy direction in the Growth Plan state that the priority for highway investment is goods movement, the Panel expected that the GTAW EA would have aligned the purpose of the EA with assessing corridors for goods movement, rather than emphasizing improved connections between urban growth centres.

Complete Communities

The vision in the Growth Plan (2006) for the Greater Golden Horseshoe as "a great place to live in 2041," (1.2.1) is supported by a suite of principles, one of which is to "Build compact, vibrant and complete communities" (1.2.2). The definition of "complete communities" states: "Complete

communities meet people's needs for daily living throughout an entire lifetime by providing convenient access to an appropriate mix of jobs, local services, a full range of housing, and community infrastructure including affordable housing, schools, recreation and open space for their residents. Convenient access to public transportation and options for safe, non-motorized travel is also provided,"(Growth Plan, 2006).

The policies in the Growth Plan (2006) provide support for "encouraging cities and towns to develop as complete communities with a diverse mix of land uses, a range and mix of employment and housing types, high quality public open space and easy access to local stores and services" (2.2.2.1h). The connection between a mix of land uses and transportation is also made explicit:

Population and employment growth will be accommodated by:

- c. building compact, transit-supportive communities in designated greenfield areas;
- d. reducing dependence on the automobile through the development of mixed-use, transit-supportive, pedestrian friendly urban environments; and
- e. planning and investing for a balance of jobs and housing in communities across the GGH to reduce the need for long distance commuting and to increase the modal share for transit, walking and cycling (2.2.2.1).

The transportation sections of the Growth Plan (2006) provide guidance that the transportation system will be planned and managed to "offer a balance of transportation choices that reduces reliance upon any single mode and promotes transit, cycling and walking" (3.2.2.1). Moreover, the plan states that, "Transportation system planning, land use planning, and transportation investment will be coordinated to implement this Plan" (3.2.2.2), indicating that transportation planning has a role to play in accomplishing the complete community policy goals of the plan.^{xvi}

The GTAW EA focused its evaluation of alternatives on transportation performance indicators that are related to reduced congestion (i.e., capacity over volume ratios and travel times). These measures are important indicators of transportation benefits. However, as the Panel noted earlier, other indicators, such as reduced trip distance and mode share for transit, car-pooling and non-vehicle modes, are essential to assessing how the alternatives performed with respect to the Growth Plan (2006) policies on supporting complete communities. The GTAW EA makes reference to some of the measures set out in the Growth Plan policies, but does not make these central to its assessment of alternatives. The Panel is therefore concerned that GTAW EA does not make clear whether and how the preferred alternative conforms with provincial policy for cities and towns to develop as "complete communities".

5.3.3 Greenbelt Plan (2005)

Portions of the GTAW study area form part of the Protected Countryside and Natural Heritage System, as outlined in the Greenbelt Plan (2005). These areas include some of the most productive farmland in Ontario, environmentally valuable wetlands, the headwaters of the Humber River and tributaries of the Credit River, and significant forest ecosystems, necessitating a careful application of policy to ensure these values are protected and sustained.

The Greenbelt Plan (2005) recognized the importance of infrastructure for economic well-being, human health and quality of life. It also anticipated that new infrastructure would be built within the Greenbelt area to serve local and regional needs. The plan thus permitted new infrastructure in the "Protected Countryside," but required it to meet one of two objectives: a) supporting permitted activities within the Greenbelt (e.g., agriculture, recreation, tourism, resource use), or b) serving significant growth and economic development in Southern Ontario beyond the Greenbelt by providing connections among urban growth centres, and between these centres and the provincial borders (4.2.1).^{xvii}

A second policy in the Greenbelt Plan (2005) governed the location, construction, expansion, extension, operation and maintenance of infrastructure, with five conditions. These conditions required that:

- existing infrastructure be optimized where practicable;
- key natural heritage features or key hydrologic features be avoided unless need has been demonstrated and it has been established that there is no reasonable alternative;
- the amount of the Greenbelt, particularly the Natural Heritage System, crossed or occupied be minimized;
- the disturbance to the existing landscape caused by light, noise or salt be minimized; and
- disturbance and impacts on key natural heritage or hydrologic features and related functions be minimized.

The GTAW EA gave some consideration in its evaluation process to the three conditions in the Greenbelt Plan that require that the impacts of infrastructure be minimized. For example, the EA sought to minimize the amount of Greenbelt traversed by recording the total number of kilometres in the Greenbelt that each of the proposed alternatives would cross. However, the Stage 1 process did not document the extent and/or amount of Natural Heritage System that would have been affected. Moreover, while the EA listed key natural heritage and hydrologic features, it did not identify those that are located within the Greenbelt, which would be subject to the test of demonstrating that there is need and that no reasonable alternatives exist.

Specific considerations for minimizing impacts on the Natural Heritage System, including key natural and hydrologic features, were catalogued in Stage 2 reports for the EA. However, by that time a preferred corridor (4-2) had already been identified. As a result, the EA made the decision to propose a new corridor and to determine the location of this corridor without conforming to the policy requirements in the Greenbelt Plan (2005) to avoid key natural heritage and key hydrologic features

unless need had been demonstrated and no reasonable alternative was available. In the previous chapter, the Panel identified alternative approaches that would provide travel time benefits that are equivalent to or greater than those of a new corridor. In the next chapter, the Panel will discuss whether the EA met the tests to establish the need for the project and to demonstrate that there was no reasonable alternative.

5.3.4 The Provincial Policy Statement (2005)

In reviewing the GTAW EA's application of policies from the PPS (2005), the Panel had concerns in two areas: the optimization of existing infrastructure and the protection of prime agricultural lands. As noted above, the PPS (2005) directs that existing infrastructure should be optimized, wherever feasible, before consideration is given to developing new infrastructure (1.6.2). The Panel's conclusions regarding how this EA addressed the first policy (optimization of existing infrastructure) are discussed in detail in Chapters 4 and 6 of this report.

With respect to the protection of prime agricultural lands, the PPS (2005) set out its overall policy clearly: "Prime agricultural areas shall be protected for long-term use for agriculture" (2.3.1). The PPS also stated that "Prime agricultural areas are areas where prime agricultural lands predominate" (2.3.1), and defined "prime agricultural lands" to mean lands that include specialty crop areas and lands that have Canada Land Inventory Class 1, 2 and 3 soils.

Where a prime agricultural area is involved, the provisions in the PPS are quite strict regarding the grounds for excluding such lands from long-term use for agriculture (2.3.5). Three grounds were included for the exclusion of these lands. However, two of those are not applicable in the case of the GTAW EA, since they address settlement area boundary expansions and mineral aggregate extraction. The PPS's third permissible reason for excluding prime agricultural lands to provide "limited non-residential uses" require compliance with four specific conditions (2.3.5.1), as follows:

- the land does not comprise a specialty crop area;
- there is a demonstrated need within the planning horizon provided for in policy 1.1.2 for additional land to be designated to accommodate the proposed use;
- there are no reasonable alternative locations that avoid prime agricultural areas; and
- there are no reasonable alternative locations in prime agricultural areas with lower priority agricultural lands.

This four-part test is similar to the test for building new infrastructure that would cross the Greenbelt under the Greenbelt Plan (2005). The TDS (2012) prepared for the GTAW EA contains some assessment of potential impacts to prime agricultural areas. For example, it measures the linear distance of Class 1-3 agricultural lands that would be potentially impacted, and ranks alternative corridors from lowest potential impact through to highest potential impact. However, the Panel concluded that this assessment does not replace the four-part test described above, particularly a "demonstrated need" and "no reasonable alternative locations".

5.4 Ontario's Changing Policy Framework

The policy framework established by the provincial government is constantly evolving, and the GTAW EA's terms of reference acknowledged that evolution. After describing the current policy framework, the EA provided that the ultimate decisions made would occur under the framework in place at that time:

"The specific need for any proposed undertaking(s) and a description of the proposed undertaking(s) will be determined during initial phases of the EA study and will be based on the approved government policies and planning objectives that are in place at that time" (p.19).

Since the commencement of the EA, there have been several updates to important provincial policy and several new initiatives that are now relevant to this EA. The Panel has identified three policy areas that merit consideration: transportation, environment and climate change mitigation.

5.4.1 Transportation

The Metrolinx Act (2006), led to the creation of the Greater Toronto Transportation Authority (GTTA — now Metrolinx), an agency accountable to the Minister of Transportation. The Metrolinx Act required the work of the authority to conform with transportation policies of growth plans under the Places to Grow Act. After two years, the new authority produced a regional transportation plan for the Greater Toronto and Hamilton Area called The Big Move (2008).

This regional transportation plan (RTP) assumed the existence of a future highway corridor in the GTAW EA study area, just as the GTAW EA included assumed transit improvements from the RTP (2008). These practices illustrate how the existing institutional framework separates decisions related to different modes. In the Panel's view, this institutional separation of responsibility hampers an integrated assessment of different modes and different scales of intervention (large capital projects or multiple operational actions or system-wide actions). This challenge of comparing multi-modal options in a broad policy context without a fully integrated approach to planning was also highlighted in the feedback from the Panel's public consultations.

Also in the realm of transportation, policy updates continued to articulate the goals of transportation planning and the suite of tools available to planners. As mentioned earlier, Indicators for the Growth Plan for the Greater Golden Horseshoe, were released in 2015. As well, a new PPS (2014) placed special emphasis on planning for goods movement by protecting associated facilities, corridors and the employment lands around them (1.3.2.3 and 1.6.8.2). The policies also directed that transportation demand management (TDM) strategies be part of making efficient use of existing and planned

infrastructure (1.6.7.2). These policies confirm and expand upon similar guidance already provided in the Growth Plan (2006). The new policies thus support the Panel's concern that the GTAW EA did not fully address these important priorities.

On May 18, 2017, the province released the updated Greenbelt Plan (2017) and Growth Plan for the Greater Golden Horseshoe (2017). The Panel found that one policy of particular relevance to its work is the direction in the Growth Plan (2017) that planning for new or expanded infrastructure "will occur in an integrated manner, including evaluation of long-range scenario-based land use planning ..." (3.2.1.2). This new guidance adds support to the approach used by the Panel in Chapter 4 of exploring possible future scenarios, such as alternative land uses and self-driving vehicles, as a strategy for considering the robustness of the GTAW EA transportation benefits.

5.4.2 Environment

Since the GTAW EA began, a number of policies have been implemented or proposed which extend existing and introduce new environmental protections. In 2006, the Province passed the Clean Water Act, (CWA; 2006) to protect municipal drinking water drawn from surface and groundwater sources from contamination. Transportation corridors can be an issue for source water protection because they can result in the deposit of contaminants such as road salt and waste oil on corridor lands. Source Protection Plans prepared under the CWA for Credit Valley, Toronto Region and Halton-Hamilton Region were approved in 2015. Thus, in the event that the GTAW EA were to go forward to finalize a new transportation route from among alternatives, it would need to incorporate the relevant direction provided in these plans.

In addition, direction in the Growth Plan (2017) provides greater protection for agricultural systems, natural heritage systems and water resource systems. For example, new policy directs that in planning for corridors, planning authorities will need to demonstrate that impacts to the agricultural system and impacts to key natural heritage features and key hydrologic features and areas have been avoided or, if that is not possible, that any impacts will be minimized and mitigated to the extent feasible. These changes to the Growth Plan (2006) reinforce several of the Panel's concerns with the EA's application of policy.

5.4.3 Climate Change

In 2016, Ontario passed the Climate Change Mitigation and Low-carbon Economy Act. The Act legislated progressively more stringent emission reduction targets from a range of sectors over time, and also required the government to draft five-year action plans that lay out how Ontario will meet these targets.

The first of these five-year plans to address climate change, Ontario's Climate Change Action Plan (2016), examined emission trends by sector, and identified the transportation sector as the single largest producer of greenhouse gas emissions, at 35 per cent of the provincial total.

Specifically, the province outlined five actions for transportation to meet these goals:

- increasing the availability and use of lower-carbon fuel;
- increasing the use of electric vehicles;
- supporting cycling and walking;
- increasing the use of low-carbon trucks and buses; and
- supporting the accelerated construction of GO Regional Express Rail.

The plan also included actions in support of the planning and development of low carbon communities: managing congestion by piloting congestion management plans and low emission zones, and implementing TDM by providing grants to help reduce single passenger trips.

While the Climate Change Action Plan (2016) did not provide direction on land use and infrastructure planning, the Panel noted policies in the new PPS (2014) that required planning authorities to support greenhouse gas emission reduction and climate change adaptation through transportation and land use planning strategies (1.8.1). As well, the Growth Plan (2017) directs that the transportation system be planned in a way that reduces greenhouse gas emissions (3.2.2.2c).

Several of the submissions received during the Panel's consultation process expressed the concern that a new highway corridor would induce more vehicle trips, more greenhouse gas emissions and hence appeared to be out of alignment with the provincial commitment to meet ambitious greenhouse gas emissions targets. In the Panel's view, it is important to assess how each project will contribute to reducing greenhouse gas emissions. However, it is also likely that the best route to progress is through a regional approach to planning and managing the transportation system, to better achieve climate change objectives (i.e., greenhouse gas emission reductions) as well as economic objectives (i.e., travel time reductions) and social objectives (i.e., more compact, complete communities).

5.5 Conclusions

The Panel concluded that the GTAW EA and Recommended Actions were not sufficiently aligned with the full suite of relevant provincial policies.

The Panel offers the following specific conclusions:

1. From 2004 to 2006, changes to planning legislation and the introduction of new policy required transportation planning decisions to be consistent with the PPS (2005) and to conform with the policies of the Growth Plan (2006) and the Greenbelt Plan (2005).
 - In the Panel's view, the GTAW EA considered but did not apply the complete policy test requiring the demonstration of need and no reasonable alternative/alternative location in order

to cross key natural heritage and key hydrological features (Greenbelt 2005), and in order to exclude prime agricultural areas from long-term agricultural use (PPS 2005).

- The EA did not address the relationship among provincial policies in provincial plans and policy statements, specifically Greenbelt Plan (2005) policies on natural heritage, PPS policies on agricultural lands, and Growth Plan (2006) transportation policies and schedules. Moreover, the Places to Grow Act (2005) directed that in matters relating to human health or the natural environment, in the case of a conflict between a growth plan and either another provincial plan or the PPS, the policy that provides more protection for human health or the natural environment prevails.
 - The GTAW EA examined these policies by grouping policies into multiple lists and a suite of principles and goals. In the view of the Panel, the approach of grouping policies may have satisfied earlier tests for applying provincial policy, namely having “regard for” such policy, but the new tests of consistency and conformity with provincial policy statements and plans required a more detailed, policy-by-policy assessment of alternatives.
 - The Growth Plan (2006) contains policies on supporting complete communities. The GTAW EA referenced some of the measures set out in the Growth Plan (2006) policies, but did not make these central to its assessment of alternatives. It is also unclear whether the EA’s preferred alternative conforms with provincial policy for cities and towns to develop as complete communities.
2. Although the policy landscape that existed at the outset of the GTAW EA continued to change, new provincial policies have strengthened the existing provincial policy direction that applies to the GTAW EA. As a result, the new policies do not alleviate the Panel’s concern with the GTAW EA’s approach to policy consistency and conformity.
 3. The GTAW EA process and recommendations should be consistent with and conform with provincial policy. However, the effectiveness of some policies, such as those directed at optimizing existing infrastructure and mitigating climate change, would be enhanced if they were applied at a broad scale in a regional transportation plan, instead of on a project-by-project basis.

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Chapter 6: Environmental Assessment Review

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6.0 Overview

To assist the Ministry of Transportation (MTO) with its review of the work undertaken on the GTAW EA to date, the Panel was asked to conduct a strategic assessment, making recommendations for next steps, and giving advice on a path forward for the EA process. To fulfill these tasks, the Panel reviewed the work done over the past decade. This chapter presents an overview of that review, within the framework of the Environmental Assessment Act. Appendix 6 provides the complete details and discussion of our review, which focused on two broad requirements — the commitments made by the GTAW EA in the terms of reference approval it obtained from the Minister of the Environment, and the requirements of the Environmental Assessment Act to describe and evaluate alternatives to the undertaking.

Two topics were central to this review:

1. the identification and evaluation of alternatives to the undertaking; and
2. the EA's assessment of need for the undertaking.

6.1 The EA Terms of Reference

The Environmental Assessment Act requires that an EA describe and evaluate alternatives to an undertaking. Since 1996, proponents have had two options: 1) obtain approval for a terms of reference for a full EA, and start that EA with a review of alternatives based on what addresses the purpose of the undertaking or, 2) obtain a terms of reference that starts with the undertaking and avoids reviewing alternatives to the undertaking. For the GTAW EA, MTO chose the first option, and sought a terms of reference approval that committed it to carrying out an EA that included a full review of alternatives to the undertaking.

The terms of reference document that was approved by the Minister of the Environment included two commitments that specified the GTAW EA's approach to address "alternatives to the undertaking." One commitment was to assess the need for the undertaking. The terms of reference stated that "The specific need for any proposed undertaking(s) and a description of the proposed undertaking(s) will be determined during the EA study..."(p.19). Related to this commitment, the terms of reference also committed to releasing a "Transportation Planning Needs Report" as part of the EA (p.19).

A second commitment was to carry out a multi-step process to assess alternatives to the undertaking. The process outlined in the terms of reference began with a screening step to eliminate individual transportation alternatives that did not contribute to identified problems and opportunities. It also proposed further steps to describe and evaluate "groups" of transportation alternatives, including groups of new and existing road and highway corridors, in order to identify a preferred undertaking. The final step involved reviewing the preferred undertaking so that MTO could decide on the appropriate next steps. In the event that MTO decided to continue the EA process, the next phase of the environmental assessment would be to assess alternative methods of carrying out the undertaking.

6.2 Alternatives to the Undertaking

6.2.1 Alternative Actions

The first step in the EA process to address alternatives to the undertaking was a screening test to narrow down a long list of possible individual transportation options. A screening test is an acknowledged method of assessment under the Ontario EA process.^{xviii} Its purpose is to use a Yes/No question to screen in or out the identified options. Based on a preliminary list of eight broadly-cast transportation options,^{xix} the GTAW EA identified a total of 297 individual alternatives (hereby termed "actions"). These actions were often quite specific.

According to the EA, MTO assessed each action against a single criterion: its ability to provide a meaningful contribution to the identified inter-regional transportation problems and opportunities. Documentation of this assessment was provided in Table B-2 of the report, Area Transportation System Alternatives Report (Revised, January 2011) (the "Alternatives Report"). In that table, the EA provided three tests, rather than just one (see Table B-2).

The EA is not clear about how the three tests collectively were to inform decisions on whether to

further eliminate or pursue particular actions as part of the subsequent groups. For example, under the heading of Transportation Demand Management (TDM)/ Transportation Systems Management (TSM), Table B-2 considers numerous actions related to road tolling.^{xx} This is consistent with provincial policy on TDM and "Optimizing" existing infrastructure.^{xxii} Further, Table B-2 concludes that at least two actions had "Potential to Substantively Contribute to Addressing the Identified Transportation Problems & Opportunities," and that another of these actions "Should be Further Considered as Part of the GTA West Study."^{xxiii} However, with no explanation in the EA reports on Table B-2, the EA does not pursue any of these three actions as part of Stage 1. Later, in response to public comment, the EA describes road tolling as being "beyond the scope of this study." Given the open scope of the GTAW EA's terms of reference, and the provincial policies in place at that time regarding TDM and optimizing use of existing infrastructure over construction of new infrastructure, the rationale for this decision in the EA was not clear to the Panel.

6.2.2 Alternative Groups

MTO's second step in the assessment of alternatives to the undertaking was to combine individual actions into groups of alternatives. Within Ontario EA practice, the rationale for grouping individual actions is that some individual actions may be more advantageous to the environment than others, but may not be fully capable on their own of addressing either the purpose of an undertaking or the need for the undertaking.^{xxiv} The practice of combining individual actions is thus intended to group individual actions that have different environmental impacts in order to identify a number of groups that together address the purpose of the undertaking or its need, and then evaluate and compare the groups to identify the group with the most favourable overall environmental impact.

The 2009 Alternatives Report was the first EA document to address how the GTAW EA would combine individual actions into groups of actions that it would assess as alternatives. The report identified four groups for assessment:

- Group #1: Optimize existing networks;
- Group #2: New/expanded non-road infrastructure;
- Group #3: Widen/improve roads; and
- Group #4: New transportation corridor.

Three years later, the 2012 Transportation Development Strategy Report (TDS) also began with the same list of four groups of alternatives.

One important aspect of these groupings is that MTO framed the groups as being additive, rather than discrete alternatives for the purposes of the assessment process. Specifically, Group #2 included all the individual actions listed in Group #1; Group #3 included all the actions listed in both Groups #1 and #2; and Group #4 included all of the actions in Group #1, Group #2 and Group #3. The additive approach to bundling groups thus established the foundation for the GTAW EA's assessment of alternatives.^{xxv}

Turning to the four groups of alternatives that the GTAW EA did assess, the Panel has identified two concerns: first, the group descriptions are not adequate to understand what specific actions make up each group; second, their assessment as additive groups came at the expense of any assessment of each of the groups in relation to each other.

Group #1

The Panel's concerns with the adequacy of the group descriptions can be demonstrated by focusing on Group #1 (Optimize existing networks). Because of the additive nature of the groups, all of the Group #1 actions were included in all of the four Groups identified that the EA evaluated. As a result, any issue with Group #1 would affect the evaluation of all alternatives. The Panel found two issues with the Group #1 alternatives: there are three different definitions (Table B-2 of the Alternatives Report, Table B-3 of the Alternatives Report, and the TDS) of the alternatives, and there is no rationale for how they are assessed in the GTAW EA.

These inconsistent descriptions of the actions that make up the Group #1 alternative are particularly problematic, given that the PPS (2005) placed a high policy priority on optimizing existing infrastructure before developing new infrastructure.

The Panel could not identify specific analyses of the adequacy or inadequacy of Group #1 actions (either alone or combined with Group #2 actions) in meeting the project need. Instead, these groups were simply assumed to generate a four-per-cent reduction in vehicular travel and a 10-per-cent reduction in long-haul truck trips.^{xxvi} The GTAW EA's further conclusion that these groups were inadequate to fully address need is therefore based on an assumption without rationale; the EA provided no evidence to demonstrate their impacts or inadequacy.

The Panel therefore concludes that the GTAW EA did not adequately or reasonably assess the potential of Group #1 to optimize existing infrastructure. For example, as discussed earlier in Chapter 4, the Panel found that, in contrast to the EA, a single travel demand management action (congestion pricing) had the potential to exceed the anticipated travel time savings from the GTAW Recommended Actions.

Group #2

The Panel found similar issues in the TDS description of Group #2 (New/expanded non-road infrastructure). As with Group #1, the Panel found several inconsistencies in how the EA defined Group #2. Written descriptions of this Group included some aspects of projects already under way, which should have been included in the base case (e.g., the Metrolinx RTP and the GO 2020 Strategic Plan).

Moreover, the assessment of Group #2 alternatives relied on assuming that, together, Groups #1 and #2 would lead to the four-per-cent vehicular reduction and 10-per-cent long-haul truck trip reduction. The EA's assumption of a four-per-cent vehicular travel reduction assumed that 2.5 per cent of trips would be diverted to transit and that 1.5 per cent would be diverted to walking, cycling, and other active travel modes. Although this assumption suggests that the GTAW Recommended Actions are aligned with more transit and "complete community" policies (i.e., to reduce long auto commutes and encourage transit mode share, discussed above in Chapters 4 and 5), the Panel is concerned that the EA provided no assessment or evidence in support of this assumption. It is also concerned that the EA made this assumption applicable to all alternatives, with the result that the EA provided no differentiation of transit and non-road benefits across different alternatives.

Group #3

Group #3 (new/expanded roads) is important, given the PPS (2005) priority to optimize existing Infrastructure before developing new infrastructure. The Panel believes that this policy imposed a responsibility on the GTAW EA to assess opportunities to optimize existing road infrastructure before proposing a new road corridor.

The EA assessment of Group #3 was problematic for several reasons. First, because of the additive approach, the problems set out above regarding Groups #1 and #2 also apply to Group #3. Additionally, the EA's treatment of Group #3 raised additional concerns for the Panel.

A first concern is that Group #3 alternatives included a mixture of approved and proposed changes to existing provincial highways and upper and lower tier municipal roads.^{xxvii} This resulted in an overstatement of the transportation benefits of these alternatives.

A second concern is that all Group #3 alternatives (Alternatives 3-1, 3-2, and 3-3) included expansions to Hwy 407 that would exceed the 10-lane limit set out in the legislation that governs this highway. It is unclear whether this was an oversight in the GTAW EA or whether the inclusion of this action represented a reasonable consideration to revisit the Hwy 407 legislation.

A third concern is that, although the GTAW EA grouping approach is characterized as being strictly additive between demand management (Group #1), non-roadway (Group #2), expansion and extensions (Group #3) and new corridors (Group #4), this was not completed. Instead, Alternatives 4-1 through 4-5, which included new corridors, did not include the Group #3 expansions to Hwy 407 beyond the 10-lane limit.^{xxviii}

The result of these latter two concerns is that the EA did not demonstrate consistency with the provincial policy to optimize the use of existing infrastructure before constructing new infrastructure. Recalling that all Group #3 alternatives represented options to expand existing infrastructure, it is troubling that the EA identified only three alternatives and provided that all such alternatives included an expansion to Hwy 407 that was inconsistent with existing provincial legislation. By contrast, the EA identified five Group #4 alternatives, and each Group #4 alternative included new corridors as well as expansions to Hwy 407 that were consistent with the existing legislation.

The Panel could find no explanation in the EA documentation regarding why the GTAW EA proposed one approach for Alternatives 3-1 through 3-3 and a different approach for Alternatives 4-1 through 4-5, particularly when the first approach was inconsistent with the Hwy 407 legislation and the second approach was not.

Group #4

The Group #4 alternatives included five different corridors between Hwy 400 and points to the west (Alternatives 4-1 through 4-5).

The Panel identified several issues with how the EA described and evaluated each of the Group #4 alternatives. The most important issue is that, like the Group #3 alternatives, the Group #4 alternatives included a mixture of approved and proposed changes to existing provincial highways and upper and lower-tier municipal roads.^{xxix} For example, part of preferred corridor (4-2) aligns directly with the Halton-Peel Border Area Transportation Study (HPBATS) corridor, a regional planning initiative. This approach means that the EA overstated the benefits associated with each alternative within each Group, including the benefits of the Recommended Actions associated with the preferred alternative.

Overall, the partial application of the additive approach and the overlap between planned and newly proposed actions within each alternative complicated the comparison of the four alternative groups. The Panel is particularly concerned with the lack of transparency in the EA on the actions making up each group and their respective attributes. This is because it is unclear to the Panel what alternative would emerge as preferred, if the Group #3 and Group #4 alternatives had included only new actions (and not also actions approved elsewhere).

The EA could have mitigated this problem for the Group #3 and Group #4 alternatives in two ways. First, the EA needed to separate Group benefits from one another (i.e., how many more benefits could be delivered by each Group #3 alternative in comparison with each Group #4 alternative?). This would allow assessment of the incremental benefits/costs of the actions within each group independently of actions approved elsewhere.

Additionally, the Panel believes that the EA needed to better specify the base case scenario to reflect other planned and programmed actions that were known at the time of the GTAW EA. According to the TDS, "other planned improvements to the provincial highway network, beyond those noted above were not included for consideration in the Base Case." It is unclear to the Panel why the base case scenario did not include all then-planned provincial road improvements beyond those in the Southern Ontario Highways Program, 2006-2010.

The Panel is concerned that, without clarity on the base case scenario and the actions within Groups

#3 and #4, the EA did not address the provincial policy to optimize existing infrastructure before constructing new infrastructure, or the policy to demonstrate that there was both need for, and no reasonable alternative to, a new road corridor that would cross provincially protected lands.

Beyond overstating benefits, an additional problem is the use of the additive method to evaluate alternatives. Group #4 alternatives were framed as additive to the other three groups (with the exception of widenings to Hwy 407 beyond the 10-lane limit). The most fundamental problem with this approach is that it undermined the assessment of alternatives. Instead of comparing groups of alternatives, the GTAW EA bundled each of these groups to produce alternative packages with unclear individual contributions by each component group. Based on high growth forecasts in the GGH, adding any group of actions to any other group of actions (without comparing them as alternatives) would necessarily increase the benefits. Thus, the additive approach pre-determined that Group #4 alternatives would have the greatest benefits compared to all other group alternatives.

6.3 Consideration of "Need"

Through its terms of reference, the GTAW EA made "need" an essential requirement of this EA. Though need is not a stated requirement of the EAA^{xxx}, need does arise in provincial policy: both the Greenbelt Plan and the Provincial Policy Statement make need and the lack of reasonable alternatives an explicit requirement of proposed new land uses that either cross the key natural heritage or hydrologic features or result in the exclusion of prime agricultural lands.

The GTAW EA used an inconsistent approach that was relevant and related to need, but not synonymous with need. This inconsistency was most evident in the GTAW EA's mixture of need with "opportunities", such that the TDS rationale for its recommended actions was based primarily on opportunity, not need. This imprecision regarding need and opportunity complicated the assessment of alternatives. It also left the Panel with uncertainty on whether the EA evaluation of alternatives aligned with provincial policy (i.e., the Greenbelt Plan and the PPS). Other inconsistencies in assessing need relate to the mixture of quantitative and qualitative approaches, without clear priority.

MTO conducted travel demand modeling to evaluate alternatives in the GTAW EA. In its quantitative work, the EA used two different approaches. The first quantitative approach was to measure the relationship of traffic volumes to roadway capacity, distinguishing different levels of service (LOS) across alternatives. In this approach, an LOS above 0.90 (i.e., when volume is at 90 per cent of capacity) is considered to be congested, and thus to demonstrate the need for improvements. The EA used this approach to evaluate and choose from among some, but not all of the grouped alternatives. The Panel observes that, had the EA used LOS as the measure of need, the preferred alternative would not have adequately addressed transportation need, as it did not deliver a level of service below 0.90 across the study area.

The second quantitative approach used in the EA was to focus on the quantitative measurement of transportation demand benefits. One example of such benefits is reduced travel time across the transportation system. With this approach, the best option according to this criterion is the option that delivers the greatest transportation demand benefits (i.e., the greatest savings in travel times). The GTAW EA did not make clear how this kind of transportation benefit is related to need. For example, is there a maximum average travel time, such that any time above this maximum would demonstrate the need for improvements?

Regarding its qualitative approach to need, the EA used a number of different terms, without explaining if or how these terms were related to need. While two of these terms are related to the quantitative approaches described above, the GTAW EA's preferred qualitative approach to need also involved new terms describing transportation "problems and opportunities." Considering these terms, the Panel was inclined to regard the transportation problems as "what is needed", and the transportation opportunities as "what are additional benefits beyond what is needed."

For example, in the Alternatives Report, the GTAW EA compared the Group #3 and Group #4 alternatives and concluded that, "While many of the transportation problems could be addressed by Group #3 (incorporating Groups #1 and #2)," the provision of a new transportation corridor presents the "opportunity" to improve linkages, accommodate development, provide economic opportunities, and support tourism (Alternatives Report, p. 64). This statement suggests that Group #3 would address the problems (and thus the need). If so, this is a major point.

The TDS also used this qualitative approach for several of its key conclusions regarding the elimination of alternatives from consideration, making these qualitative assessments important for the process of establishing need and confirming that there were no reasonable alternatives, in light of the strict provincial policy tests.

Had the EA clearly described the existing conditions, and evaluated the Do Nothing and base case alternatives, it would have been possible to understand the differences between need and opportunities. This is particularly important for this EA because the rationale for the GTAW Recommended Actions rested on opportunity, rather than meeting need. Yet the EA did not describe how this opportunity relates to need.

Furthermore, resting the alternative selection on an "opportunity" did not address policy requirements to demonstrate that other alternatives did not meet future needs. According to the GTAW EA, the recommended actions provided the opportunity to unlock lands for new development.^{xxxi} While other alternatives may not have provided this opportunity, they may have been consistent with provincial policy objectives to avoid protected lands (Greenbelt Plan and PPS) and to prioritize optimization of existing infrastructure over developing new infrastructure (see Chapter 4).

Provincial policy required this EA to demonstrate that a new corridor crossing provincially protected lands was the only reasonable option capable of addressing future needs. The focus of the EA on opportunity was not aligned with any of these provincial policy priorities or tests.

6.4 Conclusions

The Panel believes that environmental assessment is a practical tool to improve decision-making. To fulfill this role, an EA must be comprehensible: it should use concise, simple, and clear language so that it can be understood. An EA should not have different conclusions, results, and emphases in different sections about the same topics and issues; it should follow a clear logic. While there is no perfect EA which avoids all risk and uncertainty, the GTAW EA challenges these practical tests.

The Panel's review of the GTAW EA identified several fundamental concerns:

1. The GTAW EA eliminated or did not carry forward actions and alternatives without a clear rationale. Especially notable examples, particularly in light of the strict reasonable alternative policy test and the policy to prioritize infrastructure optimization over developing new infrastructure, include:
 - a. Alternative 3-1 was not carried forward due to "cost and constructability," with little supporting documentation;
 - b. Alternatives 3-2 and 3-3, included widening local roads (e.g., Hwy 7 and Hwy 9), but were not carried forward;
 - c. Congestion pricing was eliminated as a specific optimization and travel demand management action; and
 - d. The GTAW EA identified 297 actions which it did not eliminate from consideration, even though many of them were not carried forward.
2. The Panel also identified several issues relating to the need for a new corridor:
 - a. The GTAW EA did not define the relationship between need and opportunity. The preference for the recommended alternative (Alternative 4-2, which included a new highway corridor) compared to Alternative 3-1 (widening and extending existing highways) rested primarily on opportunity.
 - b. The GTAW EA did not evaluate the Do Nothing alternative or accurately specify the base case scenario. In the Panel's view, need and capacity to meet need could have been better assessed by testing the base case as an alternative to the Do Nothing alternative and to existing conditions, relative to GTAW EA alternatives.
 - c. The GTAW EA's definition and use of the base case was not appropriate. Specifically:
 - i. The GTAW Recommended Actions included numerous highway widenings and extensions, several of which were already planned or programmed, and some of which are already under way. These actions should have been included in the base case scenario rather than in the EA's Recommended Actions. As well, the capacity for these actions to meet need should have been independently assessed as an alternative to a new corridor.
 - ii. The GTAW Recommended Actions included unspecified TDM and TSM measures that could have been completed independently of the Recommended Actions, as part of the base case or an alternative on their own. In the Panel's view, the EA's method of assessing these optimization options (Groups #1 and #2) was inappropriate.
3. The additive method of evaluating groups and alternatives was also problematic, for a number of reasons:
 - a. The additive approach to bundling groups undermined the GTAW EA as a mechanism for assessing alternatives. Based on high growth forecasts in the GGH, adding any group of actions to any other group of actions would very mechanically lead to an expectation of more benefits. Without a strict definition of need, it is unclear how this approach to environmental assessments could ever lead to any conclusion other than that the most comprehensive list of actions assessed would generate the highest benefits.^{xxxii}
 - b. The GTAW EA did not specifically define some of the groups which additively formed the alternatives. Notably, it is unclear what TDM and TSM (Group #1) or transit and non-roadway improvements (Group #2) were proposed. Therefore, these actions are difficult to assess, implement, or evaluate as insufficient to meet need based on the GTAW EA.
4. The evaluation of alternatives to a new corridor was also problematic because Group #3 alternatives (3-1, 3-2, and 3-3) included expansions to Hwy 407 beyond the 10-lane maximum defined by the Hwy 407 legislation. This problem thus affected Alternative 3-1, which was the only alternative to a new corridor that the TDS subjected to comparative evaluation with the new corridor alternatives. The EA did not explain why, in contrast to all Group #3 alternatives, all of the new corridor alternatives (4-1 through 4-5) included highway expansions that did not exceed the 10-lane maximum on Hwy 407.

Overall, the EA did not demonstrate that a new corridor that crosses protected lands was the only reasonable option to address future transportation needs in the study area.

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Chapter 7: Conclusions and Recommendations

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7.0 The Panel's Mandate

In December 2015, MTO temporarily suspended work on the GTAW EA in order to review the work undertaken to date and its alignment with emerging transportation issues, technological trends and current government policies, including the government's commitments to addressing climate change. To assist the Ministry with the review, the Minister of Transportation appointed an Advisory Panel to conduct a strategic assessment of the GTAW project. The Panel was asked to report on the results of the strategic assessment, make recommendations on next steps and provide advice on a path forward for the EA process.

The Panel's terms of reference set out several specific components of the strategic assessment:

- Assess the extent to which emerging technologies, trends and policy objectives may impact future travel demand for goods and passenger movement in the GTA West corridor (2031 time horizon).
- Examine the potential alternative approaches to meeting future transportation demand and infrastructure needs in the corridor using specific emerging technologies and service solutions. For example, potentially enhancing/expanding existing infrastructure (both provincial and lower-tier) to address any localized network pressures, such as goods movement.
- Assess the extent to which existing completed technical studies can inform the future infrastructure needs of partner ministries in the corridor (e.g., rail, hydro and other purposes).
- Assess the need for protecting the GTA West corridor for other transportation needs.
- Assess options for the existing EA process, as informed by the analyses above.

Later, the Panel was also asked to conduct public consultations, and it reached out to obtain the views of municipalities, the development industry, the passenger and freight transportation sector, the agricultural sector, conservation authorities, environmental non-governmental organizations and Indigenous communities.

7.1 GTAW EA Strategic Assessment

According to the provincial forecasts in the Growth Plan (2006), population and total employment in the municipalities of York, Peel, Halton, Wellington and Guelph are expected to more than double between 2001 and 2041. This growth is expected to lead to substantial increases in travel both through and within the EA study area. The GTAW EA was initiated to address how the transportation system in the northwest GGH would address this future growth.

The GTAW EA got under way in 2008, at a point in which Ontario's policy-led planning environment had recently undergone significant change. In 2004, for example, the provincial government had strengthened the requirements for planning by making changes to the Planning Act. These legislative changes required that decisions affecting planning matters, including those made by a Minister of the Crown or a ministry, must be consistent with policy statements. Previously, such decisions were only required to have "regard for" provincial policy statements.

In 2006, a second new legislated obligation was added with respect to planning decisions, requiring them to "conform with" provincial plans. In the space of two years, the Province released a new PPS (2005) and two major plans, the Greenbelt Plan (2005) and the Growth Plan (2006). These documents laid out the new framework for policy-led planning in Ontario.

In cases of conflict, provincial plans for specific geographical areas were to prevail over the provincial policy statement. In addition, the Places to Grow Act (2005) established that the highest priority must be given to the policy that provides "more protection to the natural environment or human health." All three of these planning documents make reference to the environmental assessment process, and make it clear that while infrastructure projects may require approvals under the Environmental Assessment Act, they are also subject to these provincial policies and plans.

These changes in provincial policy broadened the province's goals for transportation planning beyond its traditional focus on improving services. From this point on, transportation investment decisions would be expected to advance a broader range of provincial policy objectives, including social, economic and environmental goals such as intensification and compact growth, building complete communities, improving goods movement, and protecting significant cultural heritage, natural features

and agricultural lands. More recently, Ontario has also passed new legislation and mandated a province-wide action plan with targets for the reduction of greenhouse gas emissions.

As noted above, significant changes in the policy and planning environment, along with broader goals for transportation planning and infrastructure investment, occurred around the same time as the GTAW EA began. The EA's terms of reference, approved by the Minister of the Environment in 2008, state that the EA process was initiated to "examine long-term transportation problems and opportunities and consider alternative solutions to provide better linkages between urban growth centres in the GTA West Corridor Preliminary Study Area. The focus will be on developing an integrated multi-modal transportation system that offers choices for the efficient movement of people and goods" (p.11).

This final chapter of the Panel's report presents the results of our strategic assessment of the GTAW EA. We begin by summarizing our findings from Chapter 3, to highlight relevant changes in the economy, society at large and technology that have happened since the EA began, along with trends that are forecast for the future and are likely to affect travel demand. This is followed by a summary of our findings from Chapter 4, with a presentation of the results of our assessment of alternative approaches that could both meet future travel demand and also be consistent with provincial policy. The third part of this chapter highlights findings from Chapters 5 and 6 regarding the GTAW EA process and provincial policy, including our recommended option for the future of this EA.

Building on the results of our strategic assessment, we also recommend a path forward that includes an approach to transportation planning that better enables the consideration of future uncertainty and adherence with broad provincial policy goals. The chapter concludes with our review of the GTAW EA in relation to additional aspects of our mandate: the use of existing EA studies for other provincial ministries and the need to protect the current GTAW corridor in the future.

1. Future travel demand in the GTAW corridor

Ontario finds itself at the beginning of a potentially significant transformation in transportation due to a number of factors, including economic and social changes, demographic change, policy changes and technological change. Amid much that remains uncertain, one thing was clear to the Panel: the province's new and evolving policy landscape and societal context herald a very different future than the one that was imagined 10 years ago at the outset of the GTAW EA. These changes have far-reaching implications for travel and for transportation planning.

The worldwide and local economies are changing, including the structure of the economy and global freight distribution. Employment in the goods production sector is declining in Ontario, and while there has been some recovery from a low in 2008, goods production GDP has not yet returned to pre-recession levels (CANSIM). The province's overall economic and population growth have also declined in recent years and are forecast to continue at their current, slower rate into the future (Ministry of Finance, 2017). Within the GTAW study area, goods movement near Pearson International Airport and north Peel Region systems serve the GGH, and are increasingly dispersing their activities.

Demographics in Ontario are also shifting. The biggest change is that people over the age of 65 will represent one-quarter of Ontario residents by the year 2040, leading to changes in commuting and to individuals continuing to work later in their lives. The Millennials, born after the Baby Boomers between 1984 and 2004, are also displaying different travel patterns than their parents, although it is not clear whether these differences will continue over time.

New types of travel are emerging and changing both passenger and goods travel. There is significant growth in e-commerce and the sharing economy, including the adoption of ride- and car-sharing services, such as Uber. These trends point to reduced need for ownership of a personal automobile.

Vehicle technology is also rapidly changing, leading to "connected" vehicles (connected both to each other and to the internet) and self-driving vehicles. These technologies have the potential to significantly transform road travel by making it safer, more convenient and more efficient. At the same time, easier travel may lead to more vehicular trips, and offset some or all of the increased efficiency of traffic flow.

Recommendations

Scenario Planning

The Panel recommends that, in light of future uncertainty, scenario-based methods for testing the robustness of decisions be further integrated into decision-making processes. Sources of uncertainty range from growth forecasts to alternative policy actions and travel demand model assumptions, among others.

Considering uncertainty through scenario planning when engaging in long-term transportation planning has been supported in new policy. On May 18, 2017, the province released the updated Growth Plan for the Greater Golden Horseshoe (2017). The Panel found that one policy of particular relevance to its work is the direction in the Growth Plan (2017) that planning for new or expanded infrastructure "will occur in an integrated manner, including evaluation of long-range scenario-based land use planning ..." (3.2.1.2). This new guidance adds support to the approach used by the Panel in Chapter 4 of exploring possible future scenarios, such as alternative land uses and self-driving vehicles, as a strategy for considering the robustness of the GTAW EA transportation benefits.

In the Panel's view, the numerous external changes discussed above can best be addressed by planning at a regional scale, by examining alternate future scenarios to address transportation and broader policy objectives, and by testing plans that are based on such scenarios for robustness.

Self-driving Vehicles

There is significant uncertainty concerning self-driving vehicles. The Panel's research suggested that the adoption of self-driving vehicles may lead to significant changes in transportation accessibility, transportation safety, transportation behavior and the capacity of transportation systems. Self-driving cars are likely to influence all elements of the transportation system, including automobile ownership, transit service delivery, parking, vehicle design and traffic flow. Transportation system planners and operators will need to revise their assumptions and models for planning, designing and operating transportation systems. Policy makers need to work diligently on the issues associated with this technological innovation, such as data security, travel behaviour, infrastructure capacity, and integrating planning and design for connected and self-driving vehicles.

As society is now beginning to embrace self-driving vehicles, the Panel recommends that Ontario take a more active role in facilitating, if not advancing, the transition period. This will require broad policy and program interventions to accommodate the coexistence of both traditional and self-driving vehicles. The Panel strongly recommends that the government ensure that MTO has a centre of expertise to address this transition in relation to broader goals established for multi-modal transportation systems. This centre of expertise should be mandated to work across policy and operational functions, and with other agencies and levels of government and the private sector. The centre should also be tasked with developing new methodologies to ensure robust scenario-testing with respect to self-driving vehicles.

2. Potential Alternative Approaches

The Panel was asked to conduct a strategic assessment and examine potential alternative approaches to meeting future transportation demand and infrastructure needs in the GTAW study area, using specific emerging technologies and service solutions. Alternative approaches identified by the Panel extend both to:

- a. alternative actions that can meet travel needs; and
- b. alternative processes for identifying how transportation planning can guide the identification of preferred investments and actions.

These aspects of our assessment are discussed below.

2.1. Alternatives to the GTAW Recommended Actions

The Panel was asked to examine specific alternative scenarios that are capable of providing travel benefits that are comparable to the building of a new highway.

First, the Panel concluded that highway expansions and extensions that are completed, planned or under way will provide travel time benefits that are approximately equal to those anticipated from the EA's recommended new highway corridor.^{xxxiii} They will also provide improved capacity for goods movement and improved linkages to existing and planned intermodal facilities. These actions are well aligned with provincial policy to improve capacity for goods movement and improve linkages to existing and planned intermodal facilities. Moreover, insofar that they represent expansions of existing infrastructure, they are aligned with provincial policy to optimize existing infrastructure before building new facilities.

Second, consistent with provincial policy that requires the optimization of existing infrastructure, the Panel found that congestion pricing as a demand management tool on the existing highway system appears capable of delivering travel time benefits that are equal to or greater than the proposed new GTAW corridor. Using current MTO modelling, the Panel's forecasts predict travel time savings associated with tolling either Hwy 401 or all GGH multi-lane highways that are, respectively, from three times greater to more than 10 times greater than those of the new GTAW corridor.

The Panel recognizes that these two tolling scenarios will have significant equity implications. More intermediate scenarios, with fewer equity implications, include: a) tolling one lane on all GGH multi-lane highways, or b) tolling only Hwy 401's express lanes. These scenarios would also provide travel time savings, approximately equal to those anticipated from the new GTAW corridor. The Growth Plan (2006) definition of transportation demand management includes strategies to use driver-pay measures to modify travel behaviour. Tolling was also included in the definition of demand management in the GTAW EA's terms of reference, and was an alternative considered early on in the environmental assessment process. The Panel was unable to determine why this alternative was not further evaluated in the EA.

Third, providing truck priority on Hwy 407 through additional highway capacity or subsidy (e.g., trucks would pay no toll) would deliver travel time benefits that are similar to the new GTAW corridor. Such opportunities, however, should be viewed cautiously, given that the Panel did not examine the physical limitations in the right-of-way available in the Hwy 407 corridor, or barriers to expanding Hwy 407 beyond the 10-lane limit specified in the current 407 ETR legislation and agreement. Since the Growth Plan (2006) provides policy direction that highway investments should facilitate efficient goods movement, this alternative aligns with that policy objective.

Fourth, alternate land use and growth scenarios appear to impact transportation system performance, including travel time savings. For example, the Panel modeled a scenario with slower growth and more compact land use patterns than those forecast in the Growth Plan (2006), and the scenario resulted in shorter travel times. These findings suggest that how land uses evolve and are shaped by planning functions can have significant impact on the performance of the transportation system as a whole. As noted earlier, forecasts prepared in

2017 by the Ministry of Finance suggest slower population and economic growth in Ontario to 2040. The Panel's results do not separate the independent effects of slower growth from compact land uses in analyses, but the Panel believes that these findings merit more attention.

The Panel observes that, although these scenarios are consistent with provincial policy (e.g., optimizing the use of existing infrastructure before developing new infrastructure), the scenarios also raise a number of other policy issues that would require further investigation.

In addition, the government is currently making major investments in improved transit services throughout the GGH. While many of these projects were identified in the EA, their contribution to addressing future travel demand was not independently assessed. The Panel explored the potential of regional express rail (RER), high speed rail (HSR) and inter-regional transit to meet study area travel demand. The Panel found that the planned RER system would appear to deliver material travel benefits, although these benefits would be distributed both in the study area and more broadly across the Greater Golden Horseshoe.

The Panel concludes that there is value in further exploring the potential of these alternative actions.

2.2. Alternative Planning Approaches

The Panel observed that many aspects of the GTAW EA suggest an effort to fill a gap between provincial planning policy (Growth Plan, PPS, Greenbelt Plan) and an individual project environmental assessment being undertaken under the EA Act. At times, the GTAW EA appeared to be attempting to create both a transportation plan for the study area and an individual project EA.

In other jurisdictions, project EAs are often "tiered" with higher-order policy and planning EAs. In the Panel's view, if an individual project EA were established within the context of a single long-term multi-modal transportation plan, its role would be clearer, its scope narrower and its process shorter. Based on the experience of other jurisdictions, long-term multi-modal transportation planning also presents an opportunity for agencies to better evaluate uncertainty and test the robustness of plans in advancing a broad range of policy goals.

In Ontario, different elements of transportation planning are currently occurring in different organizations, without a comprehensive single approach to prioritize from among a range of potential investments across the Greater Golden Horseshoe. This is important because different actions must compete for the limited public funds available. Moreover, some investments may work towards certain policy objectives but not others (perhaps even undermining them in the process).

In the Greater Golden Horseshoe, the planning landscape is complex. For example, Metrolinx's efforts generally focus on public transit and travel demand management planning and programming. The Ministry of Transportation currently conducts highway planning and also leads some transit and demand management planning initiatives. The Ministry of Municipal Affairs leads the preparation of key planning policy such as the Growth Plan, in which corridor transportation policy is set. The Growth Plan (2006) identifies broad social objectives (e.g., complete communities) and simultaneously prioritizes specific transportation projects to be assessed. But how or whether projects identified in the Growth Plan schedules can advance specific provincial objectives (including greenhouse gas emission reductions, complete communities, compact urban growth, etc.) can best be assessed by exploring them within the context of a regional transportation plan that assesses alternatives empirically.

Other jurisdictions have begun to integrate transportation planning, both across modes and across the project life cycle, including planning, public consultation, financing, construction, system management, maintenance, etc. For example, in the UK, the government has embraced the recommendations of an expert panel and is reforming its approach to transportation policy and planning. Its new approaches are designed to be evidence-based, unbiased with respect to modes and driven by the understanding that the transportation system can be used to deliver broader societal goals, rather than strictly to deliver transportation-related benefits such as lower road congestion (Jones, 2010). Similarly, in the US, Metropolitan Planning Organizations (MPOs) represent a comprehensive regional approach to planning transportation infrastructure, programs and projects for areas with a population of 50,000 or more. These regional planning functions were required by the federal government as a means of publicly planning how transportation funds can best be used to advance a vision.

Currently, there are a number of ongoing transportation planning initiatives in Ontario that require a high degree of integration. Both the Ministry of Transportation and Metrolinx are engaged in long-term planning in the GTA/GGH region, with MTO working on the Greater Golden Horseshoe Multi-modal Transportation Plan and Metrolinx reviewing the Regional Transportation Plan for the Greater Toronto and Hamilton Area. Provincial policies serve as the starting point for these initiatives.

In this context, MTO's Greater Golden Horseshoe Multi-modal Transportation Plan and Metrolinx's Regional Transportation Plan present opportunities to articulate new visions for the region's transportation systems and to provide guidance on how to operationalize each of these visions. However, if transit, roads and other planning initiatives are not fully integrated in the same regional plan, the Panel believes that there is no means of demonstrating to the public either how compromises can be made or how important policy objectives can be achieved.

These many initiatives, both within and outside Ontario, lead the Panel to recommend that the Ministry of Transportation lead the development of a single transportation plan for the Greater Golden Horseshoe.

The Panel believes that a single transportation plan for the GGH has the potential to explicitly

consider uncertainty, while systematically evaluating the robustness of recommendations with respect to different possible future scenarios. The plan would also provide an opportunity to examine changing social and economic conditions, as well as technological changes such as connected and self-driving vehicles. The relationship between the recommended single transportation plan and the provincial policy framework is depicted in Figure 7-1, below.

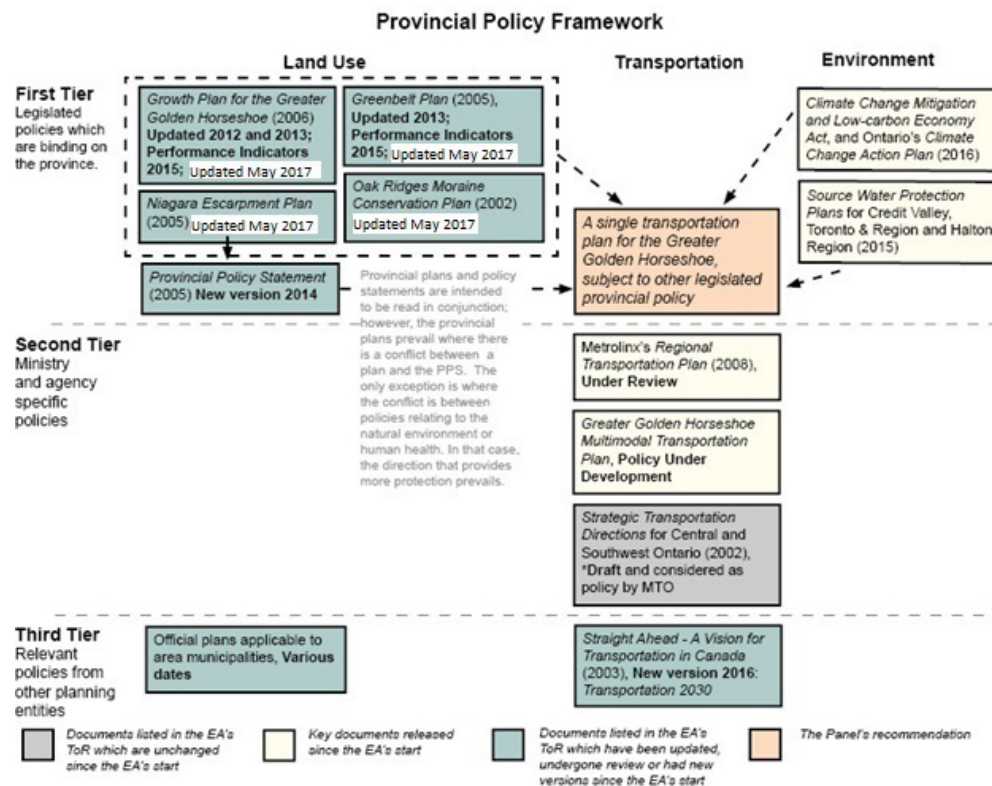


Figure 7-1: Provincial Policy Framework

The diagram presents a conceptualization prepared by the GTA West Advisory Panel of how the provincial policy framework could apply to infrastructure planning, if the panel's recommended single transportation plan for the Greater Golden Horseshoe were in place. The framework is presented in three tiers. The first tier comprises of land use policies which are binding on the province (such as the Growth Plan, the Greenbelt Plan, the Niagara Escarpment Plan, the Oak Ridges Moraine Conservation Plan, and the Provincial Policy Statement) in addition to environmental policies such as Ontario's Climate Change Action Plan, and the Climate Change Mitigation and Low-carbon Economy Act. Furthermore, a single transportation plan for the Greater Golden Horseshoe would also be included in the first tier, but be subject to the acts noted above. The second tier consists of ministry and agency-specific transportation policies such as Metrolinx's Regional Transportation Plan, and the Province's Greater Golden Horseshoe Transportation Plan, in addition to Strategic Transportation Directions for Central and Southwest Ontario. The third tier is comprised of relevant policies from other planning entities, including land-use policies such as official plans applicable to municipalities, and transportation policies from other governments, such as the federal government's Straight Ahead - A Vision for Transportation in Canada.

The Panel recommends that the single transportation plan be aligned with provincial policies and that it meet the legal standards of conformity and consistency with these policies. We also recommend that the plan set priorities for alternative projects across modes and demand management actions. The plan should establish performance measures and be regularly reviewed and updated. Ideally, ongoing transportation planning efforts and plans (GGH Multimodal Plan, RTP) will also meet these important opportunities and standards.

Additional considerations for the single transportation plan for the Greater Golden Horseshoe are discussed in Appendix 7.

3. Recommendations for the GTAW EA Process

The Panel was asked to assess options for the existing EA process and has the following recommendations:

The Panel recommends that the GTAW EA be stopped, and that the Ministry of Transportation lead the development of a single regional transportation plan for the Greater Golden Horseshoe.

This single plan (discussed above and in Appendix 7) would provide a means of implementing legislated provincial policy and priorities across an integrated transportation system, to expedite future environmental assessments and ensure that they are consistent with provincial policy.

To support its recommendation, the Panel summarizes the results of its strategic assessment of the EA. As documented in earlier chapters, the key findings of the Panel's review are as follows:

1. **In 2008, when the GTAW EA began, the Ontario policy context required that the EA be consistent with and conform with (rather than simply have regard to) provincial policy. This represented a significant change from the policy context of the decade preceding the EA. The Panel finds that the GTAW Recommended Actions did not meet this test.**

This change in the policy context established policies that prioritized optimization over new infrastructure development, guided the assessment of alternatives for infrastructure planning, protected valuable lands, prioritized new highway construction for goods movement, and encouraged more transit use and shorter commuting trips in support of "complete communities". In cases of conflict between provincial policies, the Places to Grow Act (2005) gave priority to the direction that provides "more protection to the natural environment or human health."

2. **The EA did not demonstrate that a new corridor that crosses protected lands was the only reasonable option to address future transportation needs.**

In order to proceed with a new corridor that crosses provincially protected lands, including key natural heritage and hydrologic features of the Greenbelt and prime agricultural land, the EA was required to demonstrate first, that there was need for a corridor, and second, that there was no reasonable alternative. The Panel found that the GTAW EA assessment process eliminated a number of alternatives without a clear rationale. Many of these alternatives did not involve new crossing of provincially protected lands. Moreover, several of these alternative actions related to infrastructure optimization, and could have represented a reasonable alternative to a new corridor.

3. **Planned highway extensions and expansions will deliver benefits equivalent to the proposed new highway, but were not independently assessed as alternatives.**

Many extensions and expansions of existing highways recommended in the GTAW EA are already approved, and in some cases are either built or under way. The Panel found that these actions will deliver transportation benefits that are approximately equal to the proposed new highway corridor. Yet these benefits were not independently assessed in the EA as part of or as an alternative to the new corridor. These actions are well aligned with provincial policy to improve capacity for goods movement and improve linkages to existing and planned intermodal facilities. Moreover, insofar that they represent expansions of existing infrastructure, they are aligned with provincial policy to optimize existing infrastructure before building new facilities.

4. **The Panel found that other alternative actions are capable of providing benefits that are equivalent to or greater than the new highway corridor recommended in Stage 1 of the EA.**

The alternative actions explored by the Panel are aligned with required provincial policy (Growth Plan, Greenbelt Plan, and Provincial Policy Statement) to optimize existing infrastructure before developing new infrastructure and to avoid and minimize impacts to provincially protected lands. These alternatives include: travel demand management through congestion pricing, priority truck lanes on Hwy 407, and growth management (slower growth and more compact land use). Moreover, these actions could be implemented in concert with GTAW EA's recommended expansions and extensions to further increase transportation benefits. Several of these alternatives advance other provincial policies related to compact and complete communities, more transit use and shorter auto trips. The Panel recognizes that some of these benefits are distributed broadly in the GGH and that these scenarios raise a number of other policy issues that will need further investigation.

5. **The Panel has identified several overarching provincial policies that are better addressed through system-wide actions rather than through individual project EAs.**

The Panel observed that at times the GTAW EA attempted to create an area-wide multi-modal transportation plan to fill the gap between provincial planning policy (Growth Plan, PPS, Greenbelt Plan) and an individual project environmental assessment. The Panel also recognized that there are several provincial policies (e.g., Climate Change Action Plan, support for complete communities and enhanced goods movement) that are difficult to address in a project EA, but would be better addressed at a regional scale. The Panel recommends the creation of a single transportation plan for the Greater Golden Horseshoe.

Based on the Panel's review of the existing EA, summarized in the findings set out above, the Panel recommends that the present GTAW EA be stopped. The Panel also recommends against revising this EA.

In the Panel's view, the problems with the EA's approach to policy, need and alternatives are fundamental and would require revisiting the first steps of the EA process. In addition, the terms of reference, which are required to guide every EA, set out this EA's purpose as providing "better linkages between urban growth centres". That purpose is not provincial policy, and it is also at odds with provincial policy to reduce the need for long distance commuting and encourage cities and towns to develop as complete communities. ^{xxxiv}

Through comments received during public consultation and a review of the many forward-looking aspects of our mandate, the Panel believes that there is a better way to address transportation issues in the GTAW, and more broadly across the Greater Golden Horseshoe. The Panel concludes that the bigger picture (i.e., the contribution of

transportation projects to broad public policy goals such as mitigating climate change, testing alternatives across modes, and assessing the robustness of actions with respect to uncertainty) can best be addressed through the development of an integrated multi-modal regional transportation plan.

Having regard for the experience in other jurisdictions, the Panel believes that a regional plan can also guide future environmental assessments and, in particular, lead to expedited project EAs for projects that are identified as part of the plan.

4. Recommendations for Existing Technical Studies

In addition to assessing options for the existing EA process, the Panel's terms of reference asked for an assessment of the extent to which existing technical studies can inform future infrastructure needs of partner ministries in the corridor (i.e., in matters relating to rail, hydro and other purposes).

The Ministry of Transportation worked with numerous public agencies and consultants to develop technical information to assist with the evaluation of corridors identified in Stage 1 and the routes identified in Stage 2 of the GTA West EA process. The technical information included data about land uses, agricultural land classification, status and plans for the study area road network, cultural heritage in the study area and extensive inventories and mapping of natural systems and water resources.

These data are potentially useful to the Ministry, other ministries, Crown agencies, municipalities, conservation authorities, federal government departments, the private sector and the public for considering future land development and infrastructure plans. The data may also be of interest to academics. The Panel therefore recommends that MTO make the GTA West EA data available and easily accessible online, including relevant information about the data sources, collection methods and timing, to ensure that other users can tap the full potential of the data. The Panel also recommends that the Ministry consider this practice for any data that it gathers for future environmental assessments.

5. Corridor Protection for Other Transportation Needs

The Panel was also asked to assess the need for protecting the corridor for other transportation needs.

The Provincial Policy Statement (2005) under the Planning Act requires planning authorities to "plan for and protect corridors and rights-of-way for transportation, transit and infrastructure facilities to meet current and projected needs" (1.6.6.1) provided that the "planned corridors" are required to meet "projected needs" and are identified in a provincial plan or are "preferred alignment(s)" in an EA process. The PPS (2014) includes a similar policy (1.6.8.1) and more expansive definition of "planned corridors" to mean not only provincial plans and environmental assessment alignments, but also "planning studies" where the Ministry of Transportation is actively pursuing corridor identification.

Schedules 2, 5, and 6 in the Growth Plan (2006) identify conceptual transportation corridors for the western part of the GGH. The argument could be made that, so long as this provincial plan identifies a conceptual corridor, MTO is obliged to continue to protect the recommended corridor, even if the GTAW EA process is stopped, so long as MTO is actively pursuing the identification of a corridor in the area through a planning study.

The Growth Plan (2017) also elaborated on the power to plan for corridors, stating that "In planning for the development, optimization, or expansion of existing and planned corridors^{xxxv}... the Province, other public agencies and upper- and single-tier municipalities will: ensure that existing and planned corridors are protected to meet current and projected needs in accordance with the transportation and infrastructure corridor protection policies in the PPS;" (3.2.5.1 b.). In keeping with the PPS (2005; 2014) and under the Growth Plan (2017) policy, the identification and protection of corridors is related to "need".

The Panel believes that the GTAW EA did not demonstrate that the preferred corridor meets the PPS (2005) and Greenbelt Plan (2005) tests for avoiding impacts on provincially protected lands, such as key natural heritage and hydrological features and prime agricultural areas. These tests demand that it be demonstrated that a new corridor crossing these protected lands is the only reasonable option to address future transportation needs. As set out earlier in this chapter, the GTAW EA did not demonstrate that the new corridor is the only reasonable option to address future needs. For these reasons, the Panel is not recommending that there be continued protection of the corridor that was identified as preferred in the GTAW EA.

The Panel has not comprehensively assessed all of the transportation needs in the northwest GGH or the relevant EAs or MTO planning studies. For example, we are aware of, but did not assess studies by Peel and Halton Regions and the Halton Peel Area Transportation Study (HPBATS) that recommend a freeway that is aligned with part of the GTAW EA's recommended corridor. It is our understanding that these two regions plan to pursue this freeway if the EA's preferred corridor does not proceed.

The Panel also understands that there are currently discussions under way between Metrolinx and private rail companies to provide alternative rail routes that would separate freight rail and transit rail to meet the requirements of the Regional Express Rail plans of the government, while also facilitating the efficient movement of freight by rail. The EA process did not assess this initiative, nor did the Panel have sufficient information to assess it or make a recommendation.

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ⁱThe Panel is aware that the GTAW EA included expectations of shifts in modal split and reductions of vehicle travel in Group #1: Optimize existing networks and Group #2: New/expanded non-road infrastructure alternatives. However, these expectations were based on unsupported assumptions that impacted the assessment of all alternatives. The Panel did not include these assumptions in its modeling.

ⁱⁱNote that this total reflects the actions referenced in the text of the ATSA report; however, Table B-2 which evaluates each of the actions evaluates 62 transit actions, not 63, and thus evaluates a total of 296 actions, not 297.

ⁱⁱⁱ Stage 1 of the Greater Toronto Area West Environmental Assessment recommended a suite of actions, including travel demand management, transportation system management, transit improvements, highway expansions and extensions, and a new highway corridor. The EA also considered a new transitway, and truck-only lanes are considered for the new highway but are not immediately recommended in the GTAW EA.

^{iv} Full EAs examine two types of alternatives. First, "alternatives to the undertaking" are functionally different ways of addressing the identified problems and opportunities. The undertaking is not identified until the end of this process. Second are "alternative methods of carrying out the undertaking," such as specific design and location alternatives. In Stage 1, the GTAW EA identifies individual alternatives, then creates four Group Alternatives, and then further identifies eight location-specific alternatives within Groups #3 and #4. For clarity in this report, the Panel has adopted the following terminology: individual alternatives are "actions," group alternatives are "Groups," and location-specific alternatives are "alternatives," generally with numbering attached (ie. 3-1, 3-2, 3-3, etc.).

^v The four per cent figure was originally provided in the Area Transportation System Alternatives (2011) report (p.8, A-6). The Transportation Development Strategy (TDS; 2012) supported this conclusion and elaborated that, of the four per cent reduction, 2.5 per cent was a shift from auto driver to transit, one per cent was a shift from auto driver to carpooling, and 0.5 per cent was a trip no longer taken during peak periods, or not taken at all (p.79).

^{vi} The preferred option is similar but not identical to Alternative 4-2 as originally described in the TDS.

^{vii}The 2012 TDS indicated that design and construction of the new corridor would begin no earlier than 15 years from its publication, page 174.

^{viii} The new corridor depended on the recommendations of the GTAW EA, but several highway expansions and extensions proposed as part of the GTAW Recommended Actions are permitted by other EAs or Class EAs. Some are already under construction. Independent actions should be considered as part of the base case scenario against which the value of proposed actions is compared. Therefore, this scenario is designed to estimate the unique benefits delivered by the new GTAW corridor (the +-48 kilometre new highway), independent of other actions permitted by other EAs or Class EAs.

^{ix} Insofar that the slower growth forecast is more closely based on observed data, it may be more likely (at least at the municipal rather than neighborhood levels) than the Growth Plan (2006, amended 2013) forecasts.

^x Based on the Ministry of Municipal Affairs and Housing (2014) document, Performance Indicators for the Growth Plan for the Greater Golden Horseshoe 2006, the province has recommended that several transportation performance objectives be integrated into provincial policy. These include street connectivity (a network design indicator), transportation modal split, trip distance by mode and

greenhouse gas emissions. Generally, one might expect complete communities to enable more local engagement in activities and consequently more local travel (and shorter vehicle trip distances). Thus, transportation system changes that induce longer passenger vehicle trips could be interpreted as being at odds with provincial objectives to advance complete communities.

^{xi} The Panel was unable to find detailed cost estimates for any of the alternative scenarios in the GTAW EA. Therefore, even though Alternative 3-1 was rejected on the basis of cost and constructability, it is unclear precisely what the magnitude of difference is.

^{xii} This policy direction is also found in the Greenbelt Plan 2005 as a condition governing "the location and construction of infrastructure and expansions, extensions, operations and maintenance of infrastructure in the Protected Countryside" (Policy 4.2.1.2).

^{xiii} The Panel notes that the Greenbelt Plan (2005) also references urban growth centres in a policy dealing with infrastructure that is located in the Greenbelt.

^{xiv} As described in Chapter 4, the Panel's own modeling results did not find sufficient travel demand between the urban growth centres in the study area to justify linking them by transit.

^{xv} The Panel is aware that this policy in the Growth Plan needs to be related to policies in the Greenbelt Plan and that there is provincial direction on resolving conflicts in provincial policies (see above).

^{xvi} In 2015, the Ministry of Municipal Affairs and Housing released Performance Indicators for the Growth Plan for the Greater Golden Horseshoe. These indicators include three that are transportation-related. They are: modal split, trip distance by mode, and transportation greenhouse gas emissions.

^{xvii} The Panel notes that, although the application of this policy is limited to infrastructure located in the Greenbelt, this aspect of Greenbelt Plan policy appears to be aligned with the stated purpose of the EA regarding urban growth centres.

^{xviii} See the August 1990 MOE Publication, "Evaluation Methods in Environmental Assessment", p.14.

^{xix} These eight alternatives consisted of the "Do Nothing" alternative, TDM, TSM, improved air transport, improved goods movement by rail, improved passenger service by rail, improved transit services, and improved or new roadways/ transitways.

^{xx} See, for example, Actions 163, 171, 179, and 194

^{xxi} According to the Growth Plan, pricing (road tolling or transit discounts) is listed as a travel demand management tool. Section 1.6.7 of the PPS (2014) includes cost as a transportation demand management strategy.

^{xxii} See policy 1.6.2 of the Provincial Policy Statement, 2005 as well as policy 3.2.2.3 and the Guiding Principles (1.2.2) of the Growth Plan, (2006)

^{xxiii} See, for example, Actions 163 and 194 for the first conclusion and Action 171 for the second conclusion.

^{xxiv} For example, in the waste sector, there is advantage to grouping waste management alternatives into waste management systems because, by themselves, none of the individual alternatives that address the three Rs of "reduce, reuse, and recycle" can address all waste; however, when combined with a waste disposal alternative, the 3R alternatives can better the overall impact of waste management facilities on the environment as compared to sending all waste to a new waste disposal site.

^{xxv} A major concern with the EA use of this additive approach arises when it is combined with a focus on benefits in a growing region. Quite simply, adding the benefits of any group of actions to the benefits of any other group of actions would very mechanically lead to an expectation of more benefits. By this approach, the most comprehensive list of actions assessed would automatically be expected to deliver the most benefits.

^{xxvi} The four per cent figure was originally provided in the Alternatives Report (pp.8, A-6). The TDS supported this conclusion and elaborated that, of the four per cent reduction, 2.5 per cent was a shift from auto driver to transit, one per cent was a shift from auto driver to carpooling, and 0.5 per cent was a trip no longer taken during peak periods, or at all (p.79). The 10 per cent figure is also from the TDS (p.79).

^{xxvii} TDS, page 33.

^{xxviii} The Panel notes that despite the general claim in the EA that each new alternative group includes the previous alternatives, the Group #4 alternatives do not contain all the alternatives described in Group #3. In particular, none of the Group #4 alternatives includes expansions to Hwy 407 that the Panel believes would exceed the limit set in the Hwy 407 legislation. This departure from the GTAW EA's general claim about the group alternatives means that the Group #4 alternatives are not affected by the Group #3 Hwy 407 problem.

^{xxix} TDS, pg. 33.

^{xxx} Ontario tribunals have long viewed need as an implied component of every environmental assessment: see, for example, *Re Steetley Quarry Products* (Joint Board, March 17, 1995), 16 C.E.L.R. (N.S.) 161 at 188-9. This implied requirement comes from several express requirements of the EAA, including requirements to describe the purpose of the undertaking, state the rationale for the undertaking, and describe and evaluate alternatives to the undertaking.

^{xxxi}

There appears to be an inconsistency between the rationale of “unlocking” land for development (see TDS page 69), while simultaneously assuming in travel demand forecasting that population and growth forecasts in the GTAW study area are equivalent with or without the GTAW Recommended Actions.

^{xxxii}In fact, in subjecting an alternatives assessment strictly to a comparison of benefits exclusive of fiscal constraints (benefits relative to finite costs) or outcome constraints (what performance objectives are most desirable?), the additive approach used here would always lead to a recommendation for a new corridor.

^{xxxiii}Although these highway extensions and expansions should either have formed part of the base case scenario or been an alternative unto themselves, they were included as part of the suite of GTAW Recommended Actions.

^{xxxiv}In addition, the Panel has identified other issues with the terms of reference regarding its time frame (i.e., 2031) and its approach to conflict between policies (i.e., most recent policy prevails). This latter issue is at odds with guidance in the PPS, Growth Plan and Places to Grow Act, 2005 related to conflicts.

^{xxxv}Planned corridors are defined in the Growth Plan (2017): “Corridors or future corridors which are required to meet projected needs, and are identified through this Plan, preferred alignment(s) determined through the Environmental Assessment Act process, or identified through planning studies where the Ministry of Transportation, Ministry of Energy, Metrolinx, or Independent Electricity System Operator (IESO) or any successor to those Ministries or entities, is actively pursuing the identification of a corridor.”

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Appendices for the Advisory Panel Report on the GTAW Corridor Environmental Assessment can be provided upon request. For access to the appendices, please contact the Ministry of Transportation at 416-585-7099 or at michael.casey@ontario.ca

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