Project Capital Costs
Summary of Project Assumptions and Phases

SELECTION OF PRIORTY PROJECTS

The final report from the Transit Investment Strategy Advisory Panel (see excerpt in the Appendix) describes the rationale to group Next Wave projects included in *The Big Move* into two phases (see page 2).

The first phase, which covers about three quarters of Next Wave projects, was used for cost modelling in the final report. These projects have a combined assumed total project gross capital spend of $16.75 billion.

This phase of projects is included in the proof of concept and the Panel's recommended approach to leverage debt against a proposed new dedicated revenue stream.

While the resulting model is based on project costs as published by Metrolinx, the model represents the Panel's recommendation on how to proceed with these projects.

METHODOLOGY AND ASSUMPTIONS

Project costs are based on costs as published in the Metrolinx Investment Strategy (costs reported in 2014$) and do not include escalators. As projects advance towards implementation, these costs would be updated. Actual project costing and construction schedules for Next Wave projects would be developed by Metrolinx.

Project costs do not yet include operating, maintenance, and rehabilitation costs, as is standard for costing the construction of transit. The Panel acknowledged the importance of considering all costs in project decisions, and noted in its report that the model would provide some flexibility to cover these costs. The nature of these costs could have an impact on the timing of project implementation using this model and/or on the revenue required over time.

For amortization expense, the life cycle of projects is assumed at 50 years for subway and other rail projects, and 30 years for Light Rapid Transit (LRTs) and Bus Rapid Transit (BRTs) (see "Life Cycle" column in summary table on page 3).

For start dates (see "Start Year" column in summary table on page 3), the schedule for these projects does not conflict with the minimum design period required as described in the Metrolinx Investment Strategy.

Overall construction time for each project is sourced from the Metrolinx Investment Strategy. However, the capacity to deliver these projects as outlined has not been factored into schedule development – the Panel's proof of concept deliberately advances Next Wave projects to begin construction faster than currently anticipated and after the design period is complete.

Project capital costs are spread over the construction time using an s-curve.

For Next Wave projects where a portion of the project is included in the first phase (as described in the final report) and the rest is delayed to a later phase, only 50 per cent of the cost is included (see "% Funded" column in summary table on page 3).

The proof of concept assumed a traditional delivery mechanism for all projects i.e., no Alternative Financing and Procurement (AFP) models. Use of an AFP approach could provide additional value-for-money, and may affect the cost profiles for particular projects. For the purposes of a proof of concept, it was assumed that an AFP approach would not significantly change the proof of what was possible.

Interest is assumed to be paid on the total amounts borrowed during construction. Debt starts to be repaid starting in 2023-24 under both the Panel's Option A and Option B. Interest on debt calculations are simplified for the proof of concept and may vary depending on cash management. Capitalized interest, which is not material in the short-term, is ignored.

Federal support would allow the Province to accelerate construction, reduce borrowing and financing costs, and/or expand the list of funded projects.

Project capital costs were rounded when published in the final report.

TWO PHASES

Using this methodology and these assumptions, the final report from the Transit Investment Strategy Advisory Panel includes cost modelling for a first phase of Next Wave projects.

This first phase includes the following Next Wave projects:

- Relief Line
- GO Two-Way All Day (excluding Lakeshore)
- Hurontario LRT
- Electrification of Union-Pearson Express
- Yonge North Subway (partial extension, delivered after Relief Line is in service)
- Priority portions of other rapid transit – Hamilton, Durham, Dundas, Brampton

The second phase includes the following Next Wave Projects:

- GO Lakeshore Expressrail (long lead-time required)
- GO Lakeshore extensions (not immediately critical to the network)
- GO Kitchener line Electrification (must follow Two-Way All-Day Service)
- The remaining portion of Yonge North Subway extension (must be built after the Relief Line, given capacity constraints)

- Remaining portions of other rapid transit Hamilton, Durham, Dundas, Brampton (next logical step to expand)

PANEL'S ASSUMED TOTAL PROJECT GROSS CAPITAL SPEND

				Capital Costs ($ Millions)											
	Project	**% of Project Recommended**	**Life Cycle**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**
PHASE 1	GO 2WAD - Milton	100%	50	20	73	144	216	230	153	35	-	-	-	-	-
	GO 2WAD - Barrie	100%	50	29	110	206	196	58	-	-	-	-	-	-	-
	GO 2WAD - Richmond Hill	100%	50	303	477	-	-	-	-	-	-	-	-	-	-
	GO 2WAD - Stouffville	100%	50	69	270	391	141	-	-	-	-	-	-	-	-
	Hurontario-Main LRT	100%	30	-	127	499	723	261	-	-	-	-	-	-	-
	UP Express Electrification	100%	50	-	179	281	-	-	-	-	-	-	-	-	-
	GO 2WAD - Kitchener	100%	50	-	-	37	136	267	354	269	68	-	-	-	-
	Dundas Street BRT	50%	30	-	-	24	93	135	49	-	-	-	-	-	-
	Durham-Scarborough BRT	50%	30	-	-	20	78	112	41	-	-	-	-	-	-
	Hamilton LRT	50%	30	-	-	38	149	216	78	-	-	-	-	-	-
	Relief Line	100%	50	-	-	-	244	888	1,746	2,316	1,761	444	-	-	-
	Brampton Queen Street RT	50%	30	-	-	-	45	162	88	-	-	-	-	-	-
	Yonge North Subway Ext.	50%	50	-	-	-	-	-	-	84	312	587	558	165	-
	GO 2WAD - Lakeshore Ext.	0%	50	-	-	-	-	-	-	-	-	-	-	-	-
	Lakeshore Exp. Rail, Phase 1	0%	50	-	-	-	-	-	-	-	-	-	-	-	-
	GO KW line Electrification	0%	50	-	-	-	-	-	-	-	-	-	-	-	-
	TOTAL: Shown as "*Assumed Total Project Gross Capital Spend*" on p. 57, 58 of Panel Report			**422**	**1,235**	**1,639**	**2,020**	**2,328**	**2,508**	**2,703**	**2,141**	**1,031**	**558**	**165**	**-**

APPENDIX

Section 3.2 of the Final Report from the Transit Investment Strategy Advisory Panel, *Making the Move: Choices and Consequences.* Endnotes are re-produced as included in the final report.

We have included the projects below – representing three-quarters of the Next Wave[16] – in our funding model, which is intended to demonstrate how our proposed dedicated revenue stream can pay for an integrated regional system.[17] Based on our proposed selection criteria, the case for beginning with this portfolio is compelling. Of course, as recommended in Section 5.3, every project must be preceded by a published, comprehensive, up-to-date business case analysis.

- *Relief Line*
- *GO Two-Way All Day (excluding Lakeshore)[18]*
- *Hurontario LRT*
- *Electrification of Union-Pearson Express*
- *Yonge North Subway (partial extension, delivered after Relief Line is in service)[19]*
- *Priority portions of other rapid transit – Hamilton, Durham, Dundas, Brampton*

Three of these projects – the Relief Line, Hurontario LRT, and GO Two-Way All-Day Service – are expected to deliver the highest ridership, provide the most congestion relief, create connections to employment in the region, and establish the needed backbone of a region-wide rapid transit network. Although these projects will take time to implement, it is important to advance them as soon as is practical.

Electrification of the region's rail network is widely considered to be an essential evolution in our system, which will take many years to fully implement.[20] It is important to begin this evolution. The Panel supports this thinking. UP Express has been identified by Metrolinx as the first line to be electrified; it will connect the two busiest transportation hubs in Canada.

In addition to these projects, the Panel's funding model includes rapid transit projects in disconnected parts of the region, namely Hamilton, Durham, Dundas, and Brampton. We have also factored in the initial stage of the Yonge North Subway extension. These projects will start to knit together all parts of our region.

Not included as part of Phase One but still on the Next Wave list are:

- *GO Lakeshore Expressrail (long lead-time required)*
- *GO Lakeshore extensions (not immediately critical to the network)*
- *GO Kitchener line Electrification (must follow Two-Way All-Day Service)*
- *The remaining portion of Yonge North Subway extension (must be built after the Relief Line, given capacity constraints)*
- *Remaining portions of other rapid transit – Hamilton, Durham, Dundas, Brampton (next logical step to expand)*

There will be some who would have preferred that the Panel create an even more ambitious plan to implement all of the Next Wave. However, this would require more tax increases. The Panel is very aware that public willingness to accept new taxes is limited. In our view, our plan does not slow down progress. Rather, the opposite: it advances The Big Move by creating the capacity to build three-quarters of the Next Wave sooner than

expected and by demonstrating early benefits so as to build support for the entire program. Further, Metrolinx will now have the opportunity to refine these projects in light of the improved business case analysis that we are recommending and that Metrolinx is developing.

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[16] Calculated based on costs.

[17] Project capital costs and construction timing for individual projects may differ from those used in the Panel's model. In development of a proof of concept, the Panel made several assumptions on timing for construction for projects in consultation with Metrolinx. Project cost estimates will be refined as projects are implemented. Coordination of the actual construction schedule would be implemented by Metrolinx.

[18] Service will be introduced in sections with some more construction-ready than others. In addition, Two-Way All-Day service is not planned to serve the full length of GO Rail corridors. Metrolinx indicates that this service is planned to reach Mount Pleasant (Kitchener corridor), Meadowvale (Milton corridor), Mount Joy (Stouffville corridor), Richmond Hill, and East Gwillimbury (Barrie corridor).

[19] Yonge North BCA, three project versions were modeled. The proof of concept has used the phased extension (Option 2 – to Steeles), which envisages the subway being built only after the Relief Line is in service.

[20] Metrolinx, *GO Electrification Study – Appendix 10 Implementation of Electrification Options*, 2010.