

Mistry, Natasha (MTO)

From: Kutisker-Jacobson, Laura (MTO)
Sent: September-29-16 4:09 PM
To: Amirali, Abid (MTO)
Cc: Lively, Jacqueline (MTO)
Subject: RE: re: SDG Change Order - updates to reflect 250 km/h top speed
Attachments: Change Order Work Plan September 29 2016 HSR Team Edits Clean copy.docx

Hi,
 Suggested edits attached. For the first section, I was a little unclear as to why we were focusing just on Georgetown to Guelph. I've changed the wording so that the speeds we want studying are consistent throughout, but kept in the reference for Georgetown to Guelph in case it is needed (see yellow highlights). If it is not needed, we can remove the yellow highlighted section. Also, the dates SDG have given will probably need revision. They indicate getting a draft next week which seems ambitious. Let me know if you have any questions.

Thanks,
 Laura

From: Amirali, Abid (MTO)
Sent: September 29, 2016 3:30 PM
To: Kutisker-Jacobson, Laura (MTO)
Cc: Lively, Jacqueline (MTO)
Subject: re: SDG Change Order - updates to reflect 250 km/h top speed

Hi Laura,

As discussed, please find attached the latest version of the Change Order document.

Based on Steven's feedback on the 250 km/h definition for HSR between KW and London, could you please review and update the attached document to ensure that we are consistent with his recommendation?

We expect that the language/top speed of the Toronto – Kitchener segment will remain as is. However, changes may be required to the type of selected vehicle (point #6) and references to the top speed under Task 3. We may also need to update references to the new scenario overall to 250 km/h.

Please let us know your thoughts.

Our timelines are very urgent so if you could please review the document and send it back to us including your changes this afternoon, it would be much appreciated.

Thank you,
 Abid

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To Neil Levesque
Cc Les Buckman; Jim Richards
From Patrick Miller
Date 16 September 2016
Project Preliminary Business Case for HSR on the Toronto to Windsor Corridor Change Order

Project No. 22897601

Work Plan for Change Order

Overview

1. This document provides a proposed work plan and budget for Steer Davies Gleave and Hatch to conduct additional assignments for ‘Preliminary Business Case for High Speed Rail on the Toronto to Windsor Corridor’ for the Ministry of Transportation – Ontario (MTO). These tasks require a change order as they exceed the contract and scope of the original preliminary business case contract. This work plan has been developed based on the task scoping note provided by MTO in June 2016 and subsequent conversations with the project team. Two tasks have been scoped:
 1. **Development of 2540 km/h Scenario**
 2. **Analysis of HSR phasing**
 3. **Development of a HSR Business Case Technical Paper**
2. The remainder of this document outlines the approach to be used by Steer Davies Gleave and Hatch to deliver upon these tasks as well as their associated budget and timelines. This work plan reflects our understanding of the tasks required to complete the HSR project – it may be amended over the course of the project based on budget availability and emergent considerations, as confirmed with Ewa Downarowicz.

Task 1 – Development of 2540 km/h HSR Scenario

Understanding

3. This task involves the creation of a new scenario that can reach ~~speeds of 240 km/h between Georgetown and Guelph~~, operational speeds of up to 250 km/h between Toronto and Kitchener Waterloo (KW) and minimum operational speeds of 250km/h between KW and Windsor, with a specific focus on the infrastructure requirements between Georgetown and Guelph. Upgrades could include:
 - -Straightening of curves
 - New build-
4. The upgrades required to support ~~speeds of up to 250~~240 km/h are impacted by the service pattern for HSR and RER – this analysis must also consider the impacts of different service plans on speed and cost of infrastructure.
5. The Objective of this analysis is to:
 - Demonstrate feasibility of 2540 km/h top speed within this segment.

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Comment [KL(1)]: I'm not sure about this –we can discuss.

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- Reduce travel times to Kitchener.

Approach

6. This task will be completed with three sub tasks that will determine the expected benefits and costs of providing 2540 km/h service based on service plans:
 - **Runtime review:** a review of runtimes developed for Scenario B will be conducted using 2540 km/h vehicles. This review will identify high potential portions of the alignment that should be reviewed for potential upgrade.
 - **Engineering review and design:** the Georgetown to Guelph segment will be analyzed based on runtime model results to identify potential solutions. Cost estimates and runtime benefits will be estimated.
 - **Business Case Analysis:** the resulting costs and runtimes will be fed into the demand/benefits model to calculate changes to the preliminary business case for Scenario B. These changes will be summarized in a technical paper outlining key differences between Scenario B and the new 2540 km/h scenario.
7. This work will make use of the existing demand and benefits models and will not conduct additional engineering analysis for portions of the HSR alignment outside of the Georgetown to Guelph segment.
8. Up to three options will be used in the runtime review and engineering review and design section to determine the expected costs of providing 2540 km/h HSR. The result of this analysis will select a single option to be used in subsequent phasing analysis and technical report development. These options are:
 - **Option No. 1: HSR/RER – total frequency of four trains per hour**

This option evaluates a total of four trains (two HSR and two RER trains) per hour between Union and Kitchener.

HSR and RER trains operate on an alternating pattern. Trains run at intervals of 15 minutes.

- HSR frequency: two trains per hour to KW – 1 train departs Union every 30 minutes.
- GO RER frequency: two trains per hour stopping service on the corridor to KW – 1 train departs Union every 30 minutes.
- VIA to terminate its Toronto to KW service; broader corridor assumptions to be discussed and confirmed with MTO.
- **Option No. 2: HSR/RER – two HSR trains per hour, RER frequencies to be determined through the analysis**
 - HSR frequency: two trains per hour to KW – 1 train departs Union every 30 minutes.
 - GO RER frequency: number of trains to be determined based on optimization of HSR/GO RER. GO RER to offer stopping service on the corridor;
 - VIA to terminate its Toronto to KW service; broader corridor assumptions to be discussed and confirmed with MTO.
- **Option No. 3**
 - Further analysis may be conducted, pending the results of options 1 and 2, that allows for a higher frequency of HSR service on the corridor

9. This work will use additional resource (Gilbert Peverini) to support additional technical analysis to deliver a comprehensive review of the above options. This additional analysis would include: further refinement of service planning in the context of expanded RER service to Kitchener Waterloo and a review of planned rail infrastructure for RER scenario 5 and 6 to align with the requirements of HSR under the service planning options.

Deliverable

10. This task will result in one technical paper that includes the following deliverables for both Option 1 and Option 2:
 - Scenario B runtimes as developed for the preliminary business case
 - Opportunities to improve runtimes for HSR
 - Service plan review
 - Engineering and technical (e.g. tilting trains) solutions aligned with selected service plan
 - Abbreviated four chapter business case for 2540 km/h scenario:
 - Strategic, Economic, Financial, and Deliverability Cases
11. Following the submission of the Task 1 technical paper, the MTO and SDG project teams will meet to discuss the findings and agree on a selected service option to carry forward for Task 2.

Task 2 - Analysis of HSR phasing

Understanding

12. The preliminary business case noted that there is potential to phase the delivery of HSR in order to:
 - Realize benefits early for some portions of the system
 - Develop the market for HSR service in Southwestern Ontario before implementing the entire service
13. An analysis of the benefits that can be realized by conducting a phased approach to implementing HSR service is required. This analysis should develop a scenario with operational speeds of up to 2540 km/h between Toronto and Kitchener Waterloo (KW) and minimum operational speeds of 250km/h between KW and Windsor - top speed and in two phases:
 - Phase 1: Toronto-KW-London: capital works in this segment assumed to commence in 2018 conditional on Environmental Assessment approval; service to KW to roll-out in 2024, followed by service to London by 2025.
 - Phase 2: London-Windsor: development to proceed following completion of phase 1.
14. This scenario will be planned based on the selected service option from task 1.
15. The objectives of this analysis is to update the business case with respect to:
 - HSR Revenues, and capital and operating costs.
 - Run-times, ridership estimates.
 - Mode-share impacts.

Approach

16. Scenario planning will be used to develop an analysis of phasing. This technical analysis will incorporate the following:

- A single service plan that specifies frequencies on RER and HSR will be used for both scenarios (developed in section 1)
- Summarized benefits and costs of phasing for the 2540 km/h scenario based on four delivery paths
 - (1) Toronto to London with indirect access at Pearson (2025)
 - (2) Toronto to London with direct access at Pearson (2031)
 - (3) Toronto to Windsor with indirect access at Pearson (2031)
 - (4) Toronto to Windsor with direct access at Pearson (2031)
- Summarized benefits and costs of phasing for the 300 km/h scenario based on two delivery paths
 - (1) Toronto to London with direct access at Pearson (2025)
 - (2) Toronto to Windsor with direct access at Pearson(2031)
- All scenarios will only use the incremental costs above and beyond RER for the Toronto-Waterloo portion of the alignment

17. A three step approach will be undertaken, with opportunity for MTO to comment and confirm analysis at each step:

- **Confirm costs and runtimes:** runtimes and costs of the scenario will be estimated and confirmed based on an approximately 2540 km/h service running the length of the corridor. 250km/h serves as the maximum operational speed between Toronto and Kitchener and the minimum operational speed between London and Windsor. The alignment from Toronto to Waterloo will use changes noted in Task 1, while the Waterloo to Windsor alignment will be unchanged from Scenario B, based on its ability to support 2540 km/h service. A revised operating plan and fleet requirements will be developed for the 2540 km/h scenario, which will be used to set out a revised set of operating costs. Operating costs will be ~~calculated~~oncalculated on Toronto-London service as well as the corridor as a whole.
- **Estimate demand/benefits:** the demand model will be used to calculate demand for HSR service beginning in 2024 from Toronto to London. Up to two service start dates for the London to Windsor service will be modelled based on dates agreed with MTO.
- **HSR Business Case Technical Paper:** a technical paper will be developed for the 2540 km/h scenario and its phased approach. This paper will be developed using an abbreviated four chapter approach for business case analysis. All key components of the four chapters will be revisited with relevant objectives and indicators (example:BCR, NPV) being recalculated as needed. Where the analysis for 2540 km/hr **does not** vary from Scenario B in the preliminary business case, the previous analyses will be used as source material.

Deliverable

18. An abbreviated business case will be prepared for the phased 2540 km/h scenario. This will include:

- Framing for the scenario and key assumptions on cost and modelling
- Strategic, Economic, Financial, and Deliverability Cases
- Key insights/conclusions

Task 3 - Development of a Public Facing HSR Business Case Report

Understanding

19. Develop a standalone technical paper that provides a detailed, but concise, summary of a HSR business case analysis for 254 km/h and 300 km/h as conducted in task 1 and 2. This document will be prepared to support the Special Advisor's final report on HSR in the Toronto to Windsor Corridor and it is understood that this document will be made publically available. As a result, this document must be clear, concise, and readily understood by diverse audiences.

Approach

20. This technical paper will cover:
- **Context** - summary of travel in the Toronto to Windsor corridor and project goals/objectives
 - **Scenarios** - summary of the scenario costs, ridership, revenue, stations, alignment, and service/fare/design assumptions
 - **Strategic Case summary** – review of all project objectives
 - **Economic Case** – summary of user benefits, external benefits, costs, and wider economic benefits
 - **Financial Case** – summary of preliminary financial analysis
 - **Deliverability Case** – summary of key delivery and operations risks
 - **Key conclusions** - summary of analysis findings
21. It is anticipated this technical paper will be on the order of 40 pages and will be written to provide a readily understandable summary of the comparative performance for the 254 km/h and 300 km/h HSR services in the Toronto to Windsor corridor. This document will also highlight key lessons and findings that inform the Special Advisor's report.

Optional – Desktop Publishing

22. Steer Davies Gleave has an in house design team, and this capability can be included in the scope of work in order to further enhance the document for wider distribution. This team has worked on a number of public facing documents and is able to develop a fit for purpose template along with high quality info graphics. For example, see [TransLink's Transit Oriented Community Design Guidelines](#)¹.
23. This task would include a collaborative approach between MTO and Steer Davies Gleave to align the document with MTO's communication needs and standards.

Deliverables

24. This task will develop a HSR business case technical paper:
- A draft will be submitted to MTO the week of October 3, 2016.
 - A draft final, incorporating initial MTO comments, will be submitted during the week of October 24, 2016

Comment [KL(2)]: Do these timelines need revision? 03 October is next week.

¹ [http://www.translink.ca/-/media/Documents/plans_and_projects/transit_oriented_communities/Transit_Oriented_Communities_Design_Guidelines.pdf#search=%22service design guidelines%22](http://www.translink.ca/-/media/Documents/plans_and_projects/transit_oriented_communities/Transit_Oriented_Communities_Design_Guidelines.pdf#search=%22service%20design%20guidelines%22)

- A final version, incorporating follow-up MTO comments, will be submitted during the week of November 7, 2016

Budget and Timeline

14. A proposed indicative budget and timeline has been set out in Table 1. This timeline may be amended based on discussions with the Steer Davies Gleave and MTO management teams. Given the emergent nature of these tasks, this budget is anticipated as a ceiling for time and materials work.



Table 1: Proposed Timeline and Budget

Task	19-Sep	26-Sep	03-Oct	10-Oct	17-Oct	24-Oct	31-Oct	07-Nov	14-Nov
Task 1 - 240 km/h									
Task 2 - Phasing									
Task 3 - Development of a Public Facing HSR Business Case Summary									
<i>Option - Desktop Publishing</i>									

Final Deliverable	
Draft Deliverable	
Meeting	

Task	PD		PM		Forecasting		Operations		Evaluation		Finance/P3		Report Design	Engineering			Total Hours	Total Cost
	Richards	Buckman	Feather	Bull	Sproul	Miller	LeGrain	Jennings	Analyst	Scott	Cone	Junkin	Cole	Peverini				
Project Management and Meetings	3.75	15							15								33.75	\$7,087.50
Task 1 - 240 km/h	2.5	20	5	17.5	20	22.5	15						8	24	2		136.5	\$24,325.00
Task 2 - Phasing	1.5	15	10	17.5	10	22.5	22.5	3.75	7.5				16	25	4		155.25	\$28,140.00
Task 3 - Development of a Public Facing HSR Business Case Summary	7.5	15				37.5	42.5			15	7.5	15					140	\$22,862.50
Sub Total																		\$82,415.00
<i>Option - Desktop Publishing</i>						4.5				75							79.5	\$10,845.00
Expanded Service Planning		4.5				4.5										52	61	\$10,052.50
Total																		\$103,312.50