Mistry, Natasha (MTO)

From: Papafotis, George (MTO)
Sent: March-22-18 11:30 AM
To: Weiss, Lee (MTO)
Cc: Rudra, Malvika (MTO)
Subject: FW: Description of HSR Operating Speeds Requested by CEA Agency
Attachments: Overview of HSR Operating Requirements KW to LON - Draft - Mr 20 18.docx; RE: 250 Scenario; RE: 250 Scenario

Hey Lee,

As discussed, please see attached the inputs required on a note that was developed by Nicole on the CEAA requirements for an EA and the average train speed of 200 kph. For context, have a look at the email string below. I have attached here some additional information which was provided to me by SDG after my email response below on March 13th for further clarification of speed profiles on a segment by segment basis (we were given the 250kph speed-time graphs which we never had in the past). Also, have a look at the appendices provided in the June business case (or any other documents in SP) for specific information on things such as curvatures of existing/new tracks (200kph vs 300kph Business Case – 250kph has same alignment at 200kph so similar constraints would be present).

Once you have drafted responses to the attached, let's all sit down and go over the details. Can you have a draft ready for review by Tuesday of next week. Let me know if you need more time.

Thanks,
gp

From: Zdero, Nicole (MTO)
Sent: Wednesday, March 21, 2018 4:26 PM
To: Papafotis, George (MTO); Rudra, Malvika (MTO)
Subject: RE: Description of HSR Operating Speeds Requested by CEA Agency

Hi George, Hi Malvika,

Can you please review the draft overview document I prepared to assist the Canadian Environmental Assessment Agency with assessing the application of the Regulations Designating Physical Activities, particularly the provision regarding average train speeds (average train speeds of 200 km/hr or more are designated under the Act as requiring federal EA).

I have marked in red where I would like input if possible.

Thank you,
Nicole

From: Papafotis, George (MTO)
Sent: Tuesday, March 13, 2018 8:52 AM
To: Zdero, Nicole (MTO)
Cc: Rudra, Malvika (MTO); Ampleford, Susan (MTO); Kutisker-Jacobson, Laura (MTO); Slobodzian, John (MTO)
Subject: RE: Description of HSR Operating Speeds Requested by CEA Agency

Sorry, issues with attaching. Will send in a separate email.

From: Papafotis, George (MTO)
Sent: Tuesday, March 13, 2018 8:51 AM
To: Nicole Zdero (MTO) (Nicole.Zdero@ontario.ca)
Cc: Rudra, Malvika (MTO); Susan Ampleford (MTO) (Susan.Ampleford@ontario.ca); Kutisker-Jacobson, Laura (MTO); John Slobodzian (MTO) (John.Slobodzian@ontario.ca)
Subject: RE: Description of HSR Operating Speeds Requested by CEA Agency

This time with the appendices.

From: Papafotis, George (MTO)
Sent: Monday, March 12, 2018 4:18 PM
To: Nicole Zdero (MTO) (Nicole.Zdero@ontario.ca)
Cc: Rudra, Malvika (MTO); Susan Ampleford (MTO) (Susan.Ampleford@ontario.ca); Kutisker-Jacobson, Laura (MTO); John Slobodzian (MTO) (John.Slobodzian@ontario.ca)
Subject: RE: Description of HSR Operating Speeds Requested by CEA Agency

Hey Nicole,

Further to our conversation last week, I have provided a brief bullet point summary below on factors that will impact operating speeds based on the segments you had included below. There has been some additional work that was performed however these were not made public and therefore only included below for your reference. Please also refer to the appendix C document that was developed for the 200km/hr scenario which would also apply to the 250km/hr scenario (same route) if you want some additional information.

Toronto – Kitchener (brownfield)

- Interoperations and having to share tracks between GO Service, HSR, UPExpress, VIA etc….
- Proximity of the proposed station stops. Close distances do not allow for higher speeds travel for long distances.
- Train technology and being able to get up to speed and brake at stations. Note, crashworthiness requirements has an impact on the performance characteristics of a vehicle (standards have yet to be established in Canada. MTO will work with Transport Canada to develop vehicle requirements).
- Physical constraints as a result of trying to build within an urbanized environment.
- Environmental Contraints- (Greenbelt, Niagara Escarpement etc…)
- Track Alignment

Kitchener – London (greenfield)

- Proximity of the proposed station stops (88km stretch between two the two proposed stops).
- Train technology and being able to get up to speed and brake at stations (less of an impact in this segment). Note, crashworthiness requirements has an impact on the performance characteristics of a vehicle (standards have yet to be established in Canada. MTO will work with Transport Canada to develop vehicle requirements).
- Track alignment and minimizing impacts on existing infrastructure (hydro corridor)

Refer to Figure 4 below which was included in the Public facing business case which outlines the various travel times and distances between stops which will give you a good understanding of some achievable speeds between the various segments. Also included a corridor travel time performance and speed/time graph (200kph scenario). Note these last two items were not made public.

Public Facing Document:

FIGURE 4: HSR ALIGNMENT AND RUNTIMES

Scenario A	Travel time on segment (min)	Distance (km)	Description
TO ▶ PE	14	22.8	Use of existing rail a Humber River. Tunn
PE ▶ GU	18	53.9	Tunnel through to w greenfield alignmen
GU ▶ KI	9	21.8	Use of Greenfield al
KI ▶ LO	25	87.1	Guelph subdivision t allow high speed tra
LO ▶ WI	49	190.7	CN Talbot line exitin curve to new track a
Total	115	376.3	

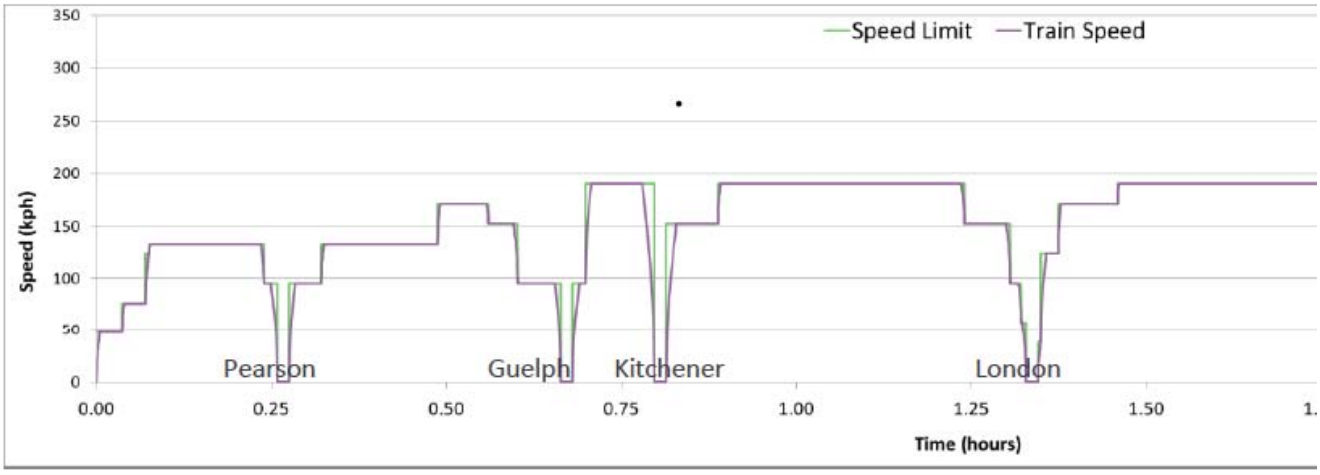
Scenario B	Travel time on segment (min)	Distance (km)	Description
TO ▶ PE	16	27.8	Use of existing rail a Station Shared oper
PE ▶ GU	23	49.9	Use of upgraded Kit
GU ▶ KI	9	18.1	Use of upgraded Kit
KI ▶ LO	25	88.3	Guelph subdivision t allow high speed tra
LO ▶ CH	29	105.6	Development adjac
CH ▶ WI	22	75.6	Cross over to a new

**********DRAFT and not made public – This was a draft Corridor Travel Time Performance used to develop the 250km/hr scenario public document – Updated prior to finalizing public facing work. This is all we have and may not be 100% accurate as we had not received the final table.**

	HSR – 200km/h (Scenario B – No RER operating)	HSR – 250km/h only	RER only	HSR – 250km/h operating with RER	RER operating with HSR
Runtime (hh:mm) Toronto to Kitchener Waterloo	**00:51**	**00:44**	**00:58**	**00:48**	**01:12**
Achievable top speed	200 km/h	250 km/h	160 km/h	250 km/h	160 km/h
Average Speed	114 km/h	130KM/H	100 km/h	124 kp/h	83 km/h
Runtime (hh:mm) Toronto to London	**1:19**	**01:10**	**-**	**1:14**	**-**
Achievable top speed	200 km/h	250 km/h	-	250 km/h	-
Average Speed	140 kph	158 km/h	-	150 km/h	-
Runtime (hh:mm) Toronto to Windsor	**2:14**	**2:02**	**-**	**2:06**	**-**
Achievable top speed	200 km/h	250 km/h	-	250 km/h	-
Average Speed	163 kph	180 km/h	-	174 km/h	-

**********DRAFT and not made public – Speed/Time Graph for the 200km/hr scenario. The 250km/hr would have a similar type of profile except with a higher speed.**

Figure 3.3: Option B Speed / Time Graph



3.23 The route makes greater use of GO Transit infrastructure through to the west of Brampton, at which po dedicated HSR corridor. The option also uses a lower top speed of 200 kph. Speed limits are also impose mitigate noise from the trains and to allow for the potential interaction of the alignment with the existi overpasses, curvature, no direct interaction is assumed).

From: Papafotis, George (MTO)
Sent: Thursday, March 8, 2018 3:55 PM
To: Nicole Zdero (MTO) (Nicole.Zdero@ontario.ca)
Subject: RE: Description of HSR Operating Speeds Requested by CEA Agency

Hey Nicole,

I know your off today however give me a call on Friday when you are back.

Thanks,
George.

From: Papafotis, George (MTO)
Sent: Wednesday, March 7, 2018 8:46 AM
To: Zdero, Nicole (MTO); Rudra, Malvika (MTO)
Cc: Ampleford, Susan (MTO); Slobodzian, John (MTO)
Subject: RE: Description of HSR Operating Speeds Requested by CEA Agency

Hey Nicole,

I will look for additional information used to support the public facing documents (PBC and SA reports). Just as a note, any additional information we may have had would not have been made public and as such we should be conscious of what is released to ensure confidentiality.

gp

From: Zdero, Nicole (MTO)
Sent: Tuesday, March 6, 2018 2:57 PM
To: Papafotis, George (MTO); Rudra, Malvika (MTO)
Cc: Ampleford, Susan (MTO); Slobodzian, John (MTO)
Subject: Description of HSR Operating Speeds Requested by CEA Agency

Good afternoon,

Please see attached for a summary of the discussion that occurred between MTO and the Canadian Environmental Assessment (CEA) Agency regarding HSR, and the applicability of the CEA Act (2012) to the project.

To better understand the application of the Regulations Designating Physical Activities (the 'project list' of subject undertakings), the CEA Agency has requested a 1-2 pager description regarding the intended operating speeds on each of the HSR segments of phase 1 (Toronto to Kitchener-Waterloo, and Kitchener-Waterloo to London). Section 25 (d) of the Regulations designate a 'railway line designed for trains that have an average speed of 200 km/hr or more' to CEA Act requirements.

The CEA Agency is not requesting an EA or policy based interpretation for each of the HSR segments, but is rather looking for design and operating requirements for HSR. I can access general descriptions of operating speeds from the Special Advisor's report, but I would like to know if a more detailed assessment exists that can be shared with the CEA Agency.

As we have formally initiated the EA Terms of Reference for the Kitchener-Waterloo to London segment and pressure begins to mount for a decision on the EA process to be applied from Toronto

to Kitchener-Waterloo, we should provide this information to the CEA Agency asap. As such, a response and any information is appreciated by Monday March 12 end of day. Let me know if this is a possible deadline.

Thank you,
Nicole

Nicole Zdero, Policy Analyst
MTO Environmental Policy Office
2nd Floor Garden City Tower, 301 St. Paul Street
St. Catharines, ON, L2R 7R4
Nicole.Zdero@Ontario.ca

Office: 905-704-2213
Mobile: 289-208-6619

MTO ONE

A Strong Transportation Future Together

HIGH SPEED RAIL: OVERVIEW OF OPERATING SPEEDS TORONTO TO LONDON

This document has been prepared for the Canadian Environmental Assessment Agency for informational purposes and is provided in follow-up to the internal discussion regarding potential federal environmental assessment applicability.

Context:

The government of Ontario has made a commitment to pursue the transformative program of high speed rail (HSR) from Toronto to Windsor.

The Special Advisor for HSR confirmed that a positive business case exists between Toronto and Windsor, and recommended implementation of HSR in two phases: Phase 1: Toronto to London, Phase 2: London to Windsor.

Phase 1 (Toronto to London) will be completed in two coordinated segments: Toronto to Kitchener-Waterloo, and Kitchener-Waterloo to London. HSR from Toronto to Kitchener-Waterloo will involve upgrading the existing rail right-of-way to accommodate both high speed rail and the Metrolinx-led Regional Express Rail. HSR from Kitchener-Waterloo to London will require new rail right-of-way and the establishment of a new rail service.

There are a number of engineering and design considerations that affect operating speeds of HSR service between Toronto and Kitchener-Waterloo, and Kitchener-Waterloo and London.

HSR from Toronto to Kitchener-Waterloo:

HSR between Toronto and Kitchener-Waterloo will involve the interoperation of HSR on shared track with other rail services including Metrolinx GO Regional Express Rail.

The proposed four (4) station stops for this segment are Toronto Union Station, Pearson Airport/Malton, Guelph, and Kitchener-Waterloo. The close proximity of station stops and the density of urban development in these areas do not allow for higher speed travel. Additionally, physical and environmental constraints in this segment limit alternative route alignment options and include the Greenbelt and Niagara Escarpment. The existing track alignment (and curvature?) can accommodate maximum operating speeds of XX km/hr?

The proponent of HSR from Toronto to Kitchener-Waterloo is Metrolinx.

Toronto Union Station to Pearson Airport (Malton):

- Approximate 27.8 km segment length
- Possible travel time between stations: 16 minutes
- Maximum operating speed: XX km/hr

Pearson Airport (Malton) to Guelph:

HIGH SPEED RAIL: OVERVIEW OF OPERATING SPEEDS TORONTO TO LONDON

- Approximate 49.9 km segment length
- Possible travel time between stations: 23 minutes
- Maximum operating speed: XX km/hr

Guelph to Kitchener/-Waterloo:

- Approximate 18.1 km segment length
- Possible travel time between stations: 9 minutes
- Maximum operating speed: XX km/hr

HSR from Kitchener-Waterloo to London:

HSR between Kitchener-Waterloo and London will require the establishment of a new rail service on dedicated track.

The two (2) proposed station stops for this segment are Kitchener-Waterloo and London. The longer distance separation between the stations (~88 km) and ability to accommodate HSR track alignment (and curvature?) will allow trains to travel at a maximum operating speed of XX km/hr.

The proponent of HSR from Kitchener-Waterloo to London is MTO.

Kitchener-Waterloo to London:

- Approximate 88.3 km segment length
- Possible travel time between stations: 25 minutes
- Maximum operating speed: XX km/hr

Application of the Canadian Environmental Assessment Act, 2012:

HSR from Toronto to Kitchener-Waterloo will not involve the construction of new railway line or new right-of-way. The railway line that HSR is intended to operate on is designed for trains with an average speed of XXX km/hr, and will be upgraded to accommodate HSR trains with an average speed of XXX km/hr.

HSR from Kitchener-Waterloo to London will involve the construction of new railway line that requires more than 32 km of new right-of-way. This segment of HSR is designed for trains with an average speed of XXX km/hr.

The Regulations Designating Physical Activities designate:

25 The construction, operation, decommissioning and abandonment of a new

(a) railway line that requires a total of 32 km or more of new right of way; and

(d) railway line designed for trains that have an average speed of 200 km/h or more.

Mistry, Natasha (MTO)

From: Patrick Miller <Patrick.Miller@sdgworld.net>
Sent: March-16-18 12:56 PM
To: Papafotis, George (MTO)
Subject: RE: 250 Scenario
Attachments: HSR Speed Graphs v0.1.xlsx

Hi George,
I have attached some speed/time and speed/distance graphs to this email. They include a 250kph run with and without speed limits. Is this what you were looking for?

Please let me know if we can provide anything else.

Patrick

Patrick Miller
Principal Consultant

direct 1-416-360-0227
mobile +1 647 381 9215
switchboard +1 (647) 260 4860
-----Original Message-----
From: Papafotis, George (MTO) [mailto:George.Papafotis@ontario.ca]
Sent: March 12, 2018 5:16 PM
To: Patrick Miller <Patrick.Miller@sdgworld.net>
Subject: Re: 250 Scenario

Yup no problems

George Papafotis, P.Eng
(416) 949-1634

On Mar 12, 2018, at 5:11 PM, Patrick Miller <Patrick.Miller@sdgworld.net<mailto:Patrick.Miller@sdgworld.net>> wrote:

Hi George,
Thanks for the email - we had multiple versions of the model and analysis so it may take some time to assemble this information. If I get it to you by Wednesday is that soon enough?

Cheers,
Patrick

Patrick Miller
Principal Consultant, PhD

Steer Davies Gleave
direct 1-416-360-0227
switchboard +1 (647) 260 4860

From: Papafotis, George (MTO) [mailto:George.Papafotis@ontario.ca]
Sent: 12 March 2018 15:47
To: Patrick Miller <Patrick.Miller@sdgworld.net<mailto:Patrick.Miller@sdgworld.net>>

Subject: 250 Scenario

Hi Patrick

Thanks for offering to look into this for us. As discussed, can you please send me the speed/time graph for the 250kph scenario (there were ones included in the appendices for the 200kph and 300kph scenarios as part of the June business case), as well as any other information that was developed showing the corridor travel time performance (runtime, achievable top speed, average top speed) on a segment by segment section (snippet below from a draft technical note for your reference). I need to get an understanding of the overall speed profile for the proposed 250 route.

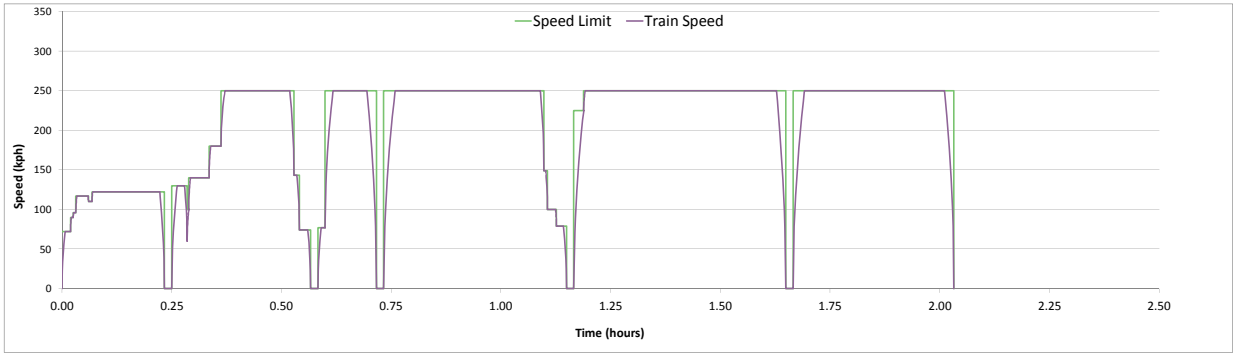
<image001.jpg>

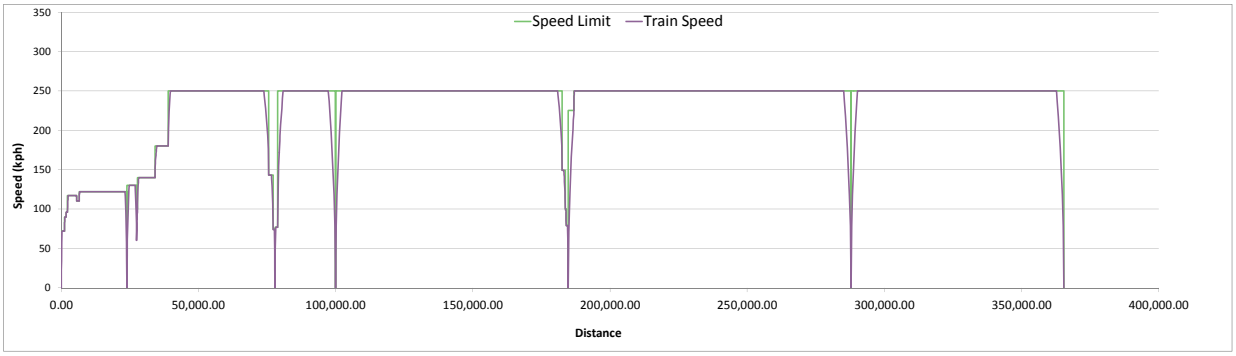
Thank you,

George Papafotis, P.Eng | Senior Advisor - Rail Engineer High Speed Rail Office, Ministry of Transportation
T: 416-212-3716 | C: 416-949-1634
900 Bay St., Macdonald Block, Room M1-21 Toronto, ON, M7A 2A2 <image003.png>

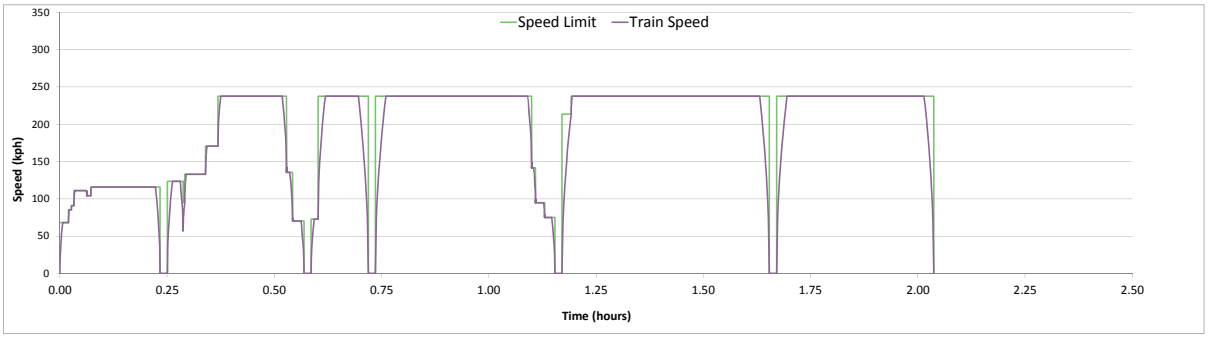
HSR Runtime Assumptions

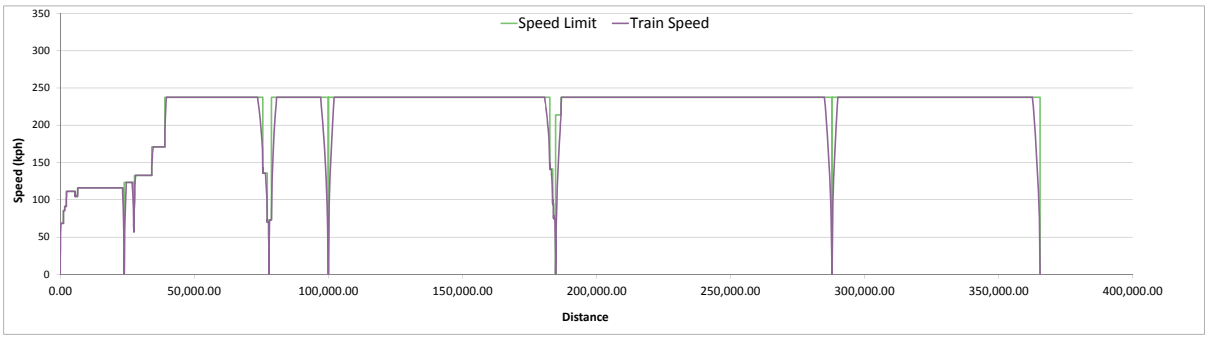
No Speed Limit





Speed Limit





Mistry, Natasha (MTO)

From: Patrick Miller <Patrick.Miller@sdgworld.net>
Sent: March-20-18 3:48 PM
To: Papafotis, George (MTO)
Subject: RE: 250 Scenario

Hi George,
No problem – see below for some follow up.
Cheers,
Patrick

Patrick Miller
Principal Consultant

Steer Davies Gleave
direct 1-416-360-0227
switchboard +1 (647) 260 4860

From: Papafotis, George (MTO) [mailto:George.Papafotis@ontario.ca]
Sent: March 19, 2018 9:50 AM
To: Patrick Miller <Patrick.Miller@sdgworld.net>
Subject: RE: 250 Scenario

Sorry, hit send accidently prior to finalizing my email. I only have two questions;

1. Was the spreadsheet you sent used to derive the values in the table below? if so, which one (speed limit or without speed limit)
   Our spreadsheet runtime model was used to derive the information for the HSR Study. The runtimes were used to develop an outline timetable, which provided for interoperation of HSR with the future RER services. The runtime model was used in conjunction with the interoperability requirements and the track geometry restrictions to identify the maximum speeds station to station. The average speed is based on the timetabled time not the runtime from the runtime model. (So the speed limited or full speed runtimes, do not effect the values in the table, they remain the same, i.e. the runtime provide about 5 minutes of recovery/ operability time, even when the train speed was limited, it is assumed to be capable of operating up to 250 kph)

2. What is the nature of the speed limits? Is it a result of interoperations?
   The speed limits as above are governed by interoperability between Union Station and west of Brampton, within this there are also track geometry limits.
   Between the west of Brampton and Windsor, there are a number of track geometry limits that reduce the speeds in places, but the train still runs in places at 250kph

Thanks,
George.

Option Runtimes

2.9 Runtime modelling was conducted to determine the range of travel time performances that services and HSR services can achieve along the corridor. Corridor run times, top speeds, an average speeds are noted Table 2.1.

Table 2.1: Corridor Travel Time Performance

	HSR – 200km/h (Scenario B – No RER operating)	HSR – 250km/h only	RER only	HSR – 250km/h operating with RER	RER with
Runtime (hh:mm) Toronto to Kitchener Waterloo	**00:51**	**00:44**	**00:58**	**00:48**	
Achievable top speed	200 km/h	250 km/h	160 km/h	250 km/h	1
Average Speed	114 km/h	130KM/H	100 km/h	124 kp/h	
Runtime (hh:mm) Toronto to London	**1:19**	**01:10**	-	**1:14**	
Achievable top speed	200 km/h	250 km/h	-	250 km/h	
Average Speed	140 kph	158 km/h	-	150 km/h	
Runtime (hh:mm) Toronto to Windsor	**2:14**	**2:02**	-	**2:06**	
Achievable top speed	200 km/h	250 km/h	-	250 km/h	
Average Speed	163 kph	180 km/h	-	174 km/h	

-----Original Message-----
From: Papafotis, George (MTO)
Sent: Monday, March 19, 2018 9:44 AM
To: 'Patrick Miller'
Subject: RE: 250 Scenario

Thanks Patrick, this is perfect.

-----Original Message-----
From: Patrick Miller [mailto:Patrick.Miller@sdgworld.net]
Sent: Friday, March 16, 2018 12:56 PM
To: Papafotis, George (MTO)
Subject: RE: 250 Scenario

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Please let me know if we can provide anything else.

Patrick

Patrick Miller
Principal Consultant

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From: Papafotis, George (MTO) [mailto:George.Papafotis@ontario.ca]
Sent: March 12, 2018 5:16 PM
To: Patrick Miller <Patrick.Miller@sdgworld.net>
Subject: Re: 250 Scenario

Yup no problems

George Papafotis, P.Eng
(416) 949-1634

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Patrick

Patrick Miller
Principal Consultant, PhD

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From: Papafotis, George (MTO) [mailto:George.Papafotis@ontario.ca]
Sent: 12 March 2018 15:47
To: Patrick Miller <Patrick.Miller@sdgworld.net<mailto:Patrick.Miller@sdgworld.net>>
Subject: 250 Scenario

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<image001.jpg>

Thank you,

George Papafotis, P.Eng | Senior Advisor - Rail Engineer High Speed Rail Office, Ministry of Transportation
T: 416-212-3716 | C: 416-949-1634
900 Bay St., Macdonald Block, Room M1-21 Toronto, ON, M7A 2A2 <image003.png>

A Strong Transportation Future Together