Bayers Road / Highway 102 Corridor Study
Component 3 - Highway 107
Final Report
March 2010

Department of Transportation and Infrastructure Renewal and The Halifax Regional Municipality

Completed By:

Stantec Consulting Ltd.

in association with

delphi MRC

Stantec #: 20639

Final Report

Executive Summary

E-1 INTRODUCTION

The Nova Scotia Department of Transportation and Infrastructure Renewal (NSTIR) and Halifax Regional Municipality (HRM) have contracted the Stantec, Delphi-MRC team to undertake a study of the Bayers Road / Highway 102 Corridor and the proposed extension of Highway 107 to Highway 102. The team has undertaken transportation planning, traffic analysis, functional design and overall project management for the corridor study.

The purpose of the study is to determine the ultimate capacity and best use of the Highway 102 corridor and to study the alignment and connection options for the future Highway 107. The primary objectives of the Project are to determine:

- Traffic Projections (Component 1)
- Highway 102 Upgrades (Component 2)
- Highway 107 Extension (Component 3)

This report (the third of three) provides an overview of **Component 3.** The following is a description of the study objectives for Component 3.

- Review of the Study Area – to establish constraints, property ownership and environmental issues.
- Develop a Functional Design for the Highway 107 Alignment – to determine the right of way required for the alignment.
- Present the Highway 107 Functional Plan at a Public Information Session – to present the results of the study and obtain feedback on the conceptual plans.
- Costing and Implementation – to determine approximate costs for the work and a concept schedule for implementation.
- Perform Benefit Cost Analysis of the Highway 107 project – to examine the merits of the project relative to the base case (status quo).

E-2 EVALUATION

The Terms of Reference ***(Appendix A, Figure 1)*** show the initially considered two options for the Highway 107 alignments connecting to the two locations on Highway 102. At the outset of the project, NSTIR requested that the Exit 4 connection option be revised to show an alignment to the south of Anderson Lake and an interchange with Windmill Road. The two resulting alignments are show in ***Appendix B***, labeled as ***Option 1 and Option 2***. The Exit 4 connection

option was carried forward in the Study as “Scenario C” and the connection was studied in a Value Engineering Session.

While the VE session presented many alternative connection configurations, it was apparent that a connection at Exit 4 which met the entire NSTIR criterion was not identified. A compromised solution would be required. With this in mind the two basic alignments for Highway 107 were reviewed and two key factors resulted in the selection of the preferred alternative:

- The lack of an acceptable design for a direct connection to Exit 4 as studied in the VE session (Component 2).

- The ability to phase the construction of the connection to Exit 4C. The suggested phasing is described in Section 3.0.

As a result, the Highway 107 alignment to the north of Lake Anderson and connection to Highway 102 at Exit 4C was determined to be the preferred and only feasible alignment which would be carried forward to functional design. It was also determined by NSTIR that the cost benefit analysis would compare this preferred alignment with the “do nothing” or status quo alternative.

Based on the preferred alignment, a review of background material was done in order to characterize the site and identify key constraints to extension of the highway. Background material reviewed included aerial photography, right-of-way plans, topographic and property mapping. A design criteria was established for the functional design of Highway 107 which is consistent with provincial standards for NSTIR 100 series highways.

E-3 FUNCTIONAL DESIGN

NSTIR prepared a plan showing the preferred alignment and three phased approach to construction. The resulting plan is shown in ***Appendix C***, titled ***Highway 107 Extension - Option 1A.*** The plans show a suggested phasing of the highway development that would involve the facility operating as an arterial roadway prior to making the connections to the highways. The purpose of the phasing is to allow for funding of the project over a number of years.

- Phase 1: A 4-lane arterial road connection between Duke Street and Burnside Drive

- Phase 2: An interchange providing land access just to the west of Anderson Lake

- Phase 3: Westerly extension of Highway 107 to connect with Highway 102 and easterly extension of Highway 107 and connection to Akerley Boulevard

Profiles were developed for each of the phases and associated ramps. Grading limits were generated using Civil 3D and based on the typical design section to determine the right-of-way that would be required.

E-6 SUPPLEMENTARY TRAFFIC EVALUATION

The study team carried out a supplementary evaluation to determine the feasibility of implementing a Burnside Drive extension (Phase 1, Arterial Road) concept, as opposed to constructing a 100-Series Freeway, and to determine approximately how far out into the future such a facility could accommodate traffic.

The roadway concept is to extend Burnside Drive from its current terminus at Akerley Boulevard and connect to Duke Street at Rocky Lake Road. It was assumed that there would be major intersections with the arterial at Akerley and Rocky Lake Road and no other connection points. Evaluations were carried out for the 2016 and 2026 planning horizons for both the morning and afternoon peak hours.

The general findings of the review indicate that:

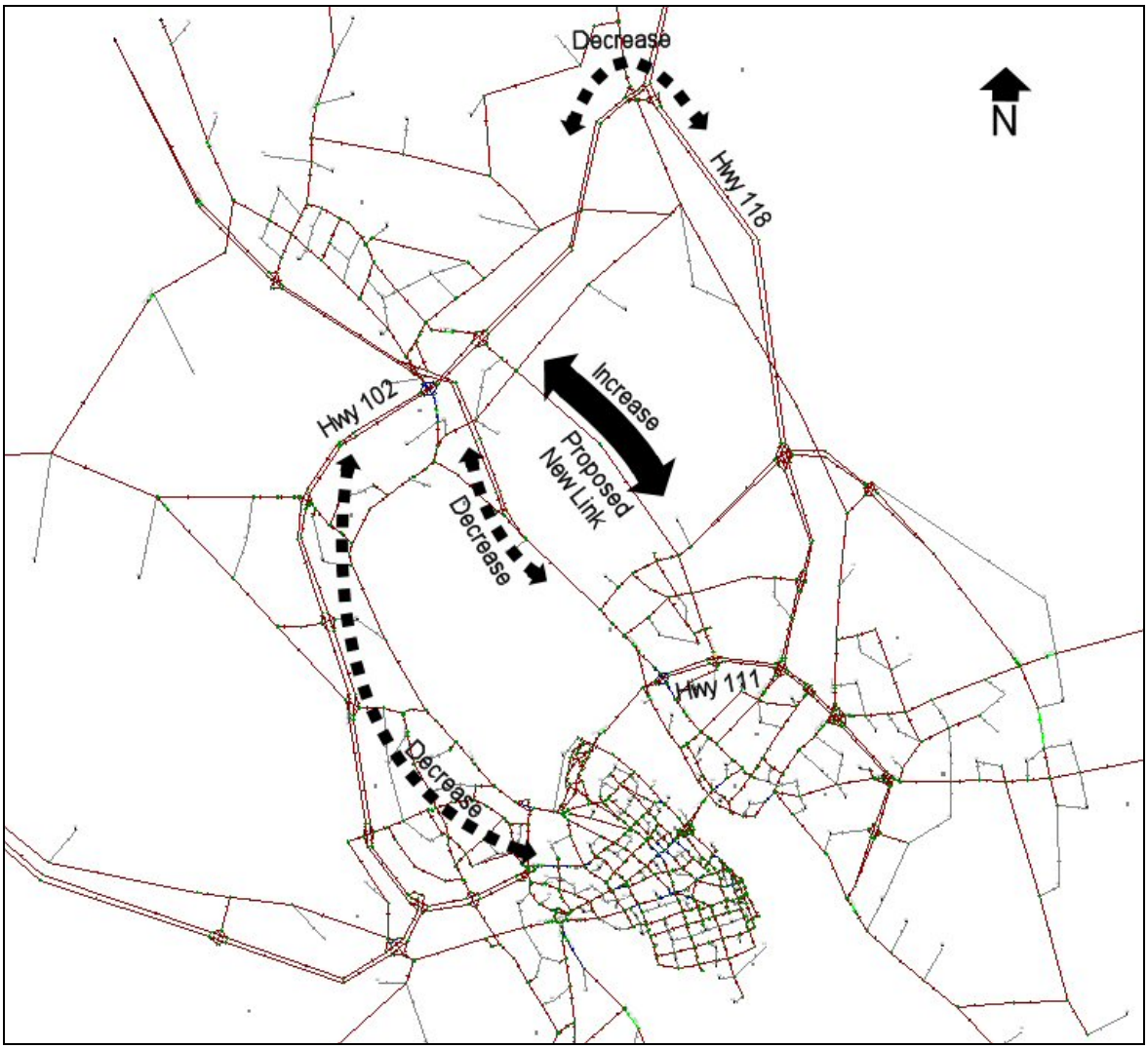
- There is a strong desire for commuters to use this facility;
- It could likely function as a 4-lane roadway (2 lanes in each direction) out to the 2026 planning horizon – the time about when it is forecast to reach capacity;
- Two key constraint locations were identified as part of this analysis:
    - Currently, The Highway 111/Burnside Drive interchange is approaching capacity. Given the potential for environmental and land use impacts in the immediate area, any upgrades may be difficult to undertake;
    - The other constraint location is Akerley Boulevard where additional turning lanes may be required by the 2026 planning horizon;
- NSTIR expects the implementation of modern roundabouts will help address some of the challenges.

The second part of the supplemental evaluation of the Burnside Drive extension concept was to determine the impact to travel behaviour on parallel corridors. The roadways that are expected to experience a reduction in traffic volume as a result of a Burnside Drive extension include:

- Windmill Road / Magazine Hill;
- Highway 118 /Highway 102 through Fall River; and
- Highway 102 / Bedford Highway

The results identify and support the notion that there is a strong demand for a new roadway connection between Burnside Park and Highway 102 in the Bedford/Sackville area.
The general travel behaviour changes that are expected to result from implementing the proposed Burnside Drive extension are illustrated in ***Exhibit E.1***

Exhibit E.1 Network Level Travel Behaviour Implications



E-7 SUMMARY AND CONCLUSIONS

The functional plans in ***Appendix C*** show the approximate right-of-way required for the construction of Highway 107 and the resulting properties which will be impacted by construction. An estimated 60 properties (see sketch with properties indicated) and 35 different property owners along the Highway 107 Corridor would be directly impacted by the construction.

Public Information Sessions were held to explain the study and obtain information and feedback from local residents, businesses, and landowners. **Chapter 8.0 of the Component 2 report** describes the sessions. From the questionnaires and comments received, it may be inferred that the majority of those who provided comments regarding the highway 107 project agree with

the project. However, it was determined that careful consideration of the Highway 107 phase 1 is required. This phase would direct traffic directly to Glendale from the new Highway 107 and this has been identified as a primary concern.

Based on the functional design, the team prepared an opinion of capital costs for the major components of construction. ***Exhibit E.2*** is an overall summary of the approximate costs for the proposed Highway 107 Extension.

Exhibit E.2 – Highway 107 Cost Summary Table – by Phase

Item	HIGHWAY 107 - SUMMARY No 1 - By Phase	Approximate Cost
14.1	Phase 1 Highway 107 (Duke Street Extension)	$47,000,000
14.2	Phase 2 New Interchange on Highway 107	$0
14.3	Phase 3A - Highway 107 from Exit 4C to New Interchange (Westerly Connections)	$28,000,000
14.4	Phase 3B - Highway 107 from Burnside Drive Interchange to Existing Hwy 107	$21,000,000
14.5	Phase 3C - Akerley Interchange	$12,000,000
12.3	Interchange: Highway 107 at Exit 4C (Option 1 Costing)	$13,000,000
	Total (excludes taxes, engineering, and contingencies)	$121,000,000

The costs have been developed based on the limited information available as well as historical information. This is an order of magnitude estimate.

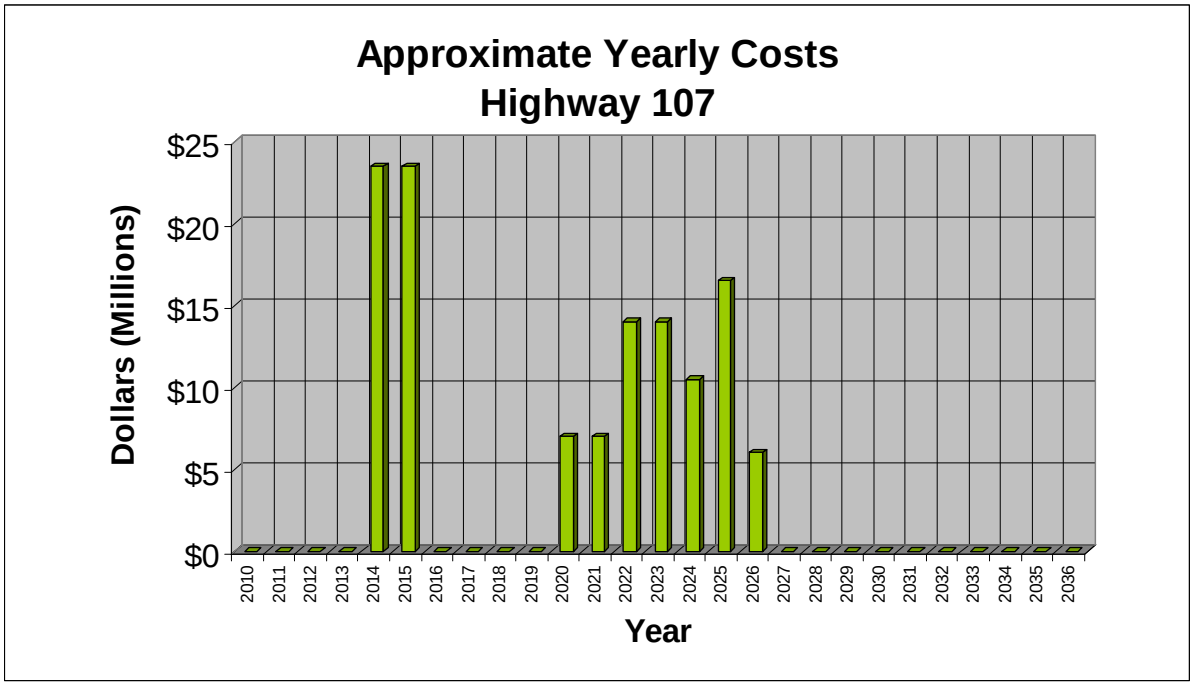
A conceptual timeline for the expansions has been determined and shown in ***Exhibit E.3.*** This approximate timeline shows the roadway phases as noted in ***Exhibit E.2***. An approximate 2 year time frame is assumed for each component of the work.

Exhibit E.3 Timelines

		Horizon Year 2016							Horizon Year 2026									Horizon Year 2036									
No.	Location	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
	HIGHWAY 107																											
14.1	Phase 1 Highway 107 (Duke Street Extension)																											
14.2	Phase 2 New Interchange on Highway 107																											
14.3	Phase 3A - Highway 107 from Exit 4C to New Interchange -																											
14.4	Phase 3B - Highway 107 from B Drive Int to Exis Hwy 107																											
14.5	Phase 3C - Akerley Interchange																											
12.3	Interchange: 107 at Exit 4C																											

Based on the approximate costs for each component of the project and the projected timeline, the following ***Exhibit E.4*** shows the resulting yearly costs.

Exhibit E.4 Approximate Yearly Costs – Highway 107



A Benefit / Cost Assessment of the Highway 107 Extension was undertaken by Canmac Economics Limited. The full report is included in ***Appendix E***. The assessment compares the Base Case (the status quo) and the preferred option as described in this report.

The benefits associated with the new highway include:

- Travel time savings
- Social cost savings
    - o Decreased accidents
    - o Greenhouse gas emissions

The costs associated with the new highway include:

- Construction Costs
- Operating and Maintenance Costs
- Resurfacing Costs

The resulting Benefit / Cost ratio varies from 1.8 to 2.4, concluding that the project makes a positive contribution to society.

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1.0 Introduction

The purpose of this study is to determine the ultimate capacity and best use of the Highway 102 corridor and to study the alignment and connection options for Highway 107. The primary objectives of the Project are to:

- Complete Traffic Projections for Highway 102 and 107 (Component 1)
- Identify Highway 102 Upgrades Requirements based on Component 1 (Component 2)
- Review the Highway 107 Extension to Highway 102 (Component 3)

The project is divided into three main components and specific objectives are discussed in Section 1.2. All three components are inter-related and portions of each component occurred concurrently. Component 1, the traffic projection component of the project provides the data required to complete Component 2 and 3 respectively. Traffic Projections have been determined using the QRSII model to the horizon years 2016, 2026, and 2036. The results of this work are summarized in "***Component 1 – Traffic Projections Final Report***", February 20, 2008 and "***Component 2 – Highway 102 Upgrades",*** October, 2009.

The following report presents the results of ***Component 3*** of the project – to identify a preferred alignment for the extension of Highway 107.

1.1 BACKGROUND INFORMATION

Previous work done over several years has identified the need for a 100 series highway connection from the existing Highway 107 connecting to Highway 102. The existing Highway 107 extends from Musquodoboit Harbour to the Westphal area of Dartmouth (Forest Hills Parkway) to Highway 118 and then to Akerley Boulevard in Burnside Park. The Akerley connection to the existing Highway 107 and Highway 118 was constructed with further extension in mind. The extension from Burnside Park to Highway 102 was originally planned and designed to connect to Exit 4C (Glendale / Duke Street) on Highway 102 and continue as the Second Lake Collector to connect to Highway 101 at an interchange to be located west of Sackville. Functional design work for the extension was done as far back as the 1970's. Detailed design of the Exit 4C connection was completed in the 1990's when the Glendale / Duke Street Interchange was constructed to allow for the Highway 107 Connection.

However, The Second Lake Collector route has since been abandoned as a viable option. As a result, the planned alignment of Highway 107 between Burnside and Highway 102 is being re-examined to see if there is an opportunity to connect to Highway 102 at the Exit 4 (Bedford) interchange as an alternative to the Exit 4C connection. This would allow direct flow from Highway 107 to Highway 102 and Highway 101.

As described in the ***Component 1 report (Section 2.4)***, Scenario B and Scenario C represented two options for the connection of Highway 107 to Highway 102 at Exit 4 and Exit 4C respectively. These options were evaluated with respect to Highway 102 traffic. Further, Component 2 of this project included a detailed review of the potential for a Highway 107 connection at Exit 4 through a Value Engineering (VE) process. The full report for the VE session is identified as ***Appendix J of the Component 2 Report***. As well, ***Chapter 7 of the Component 2 Report*** provides a summary of the session and results.

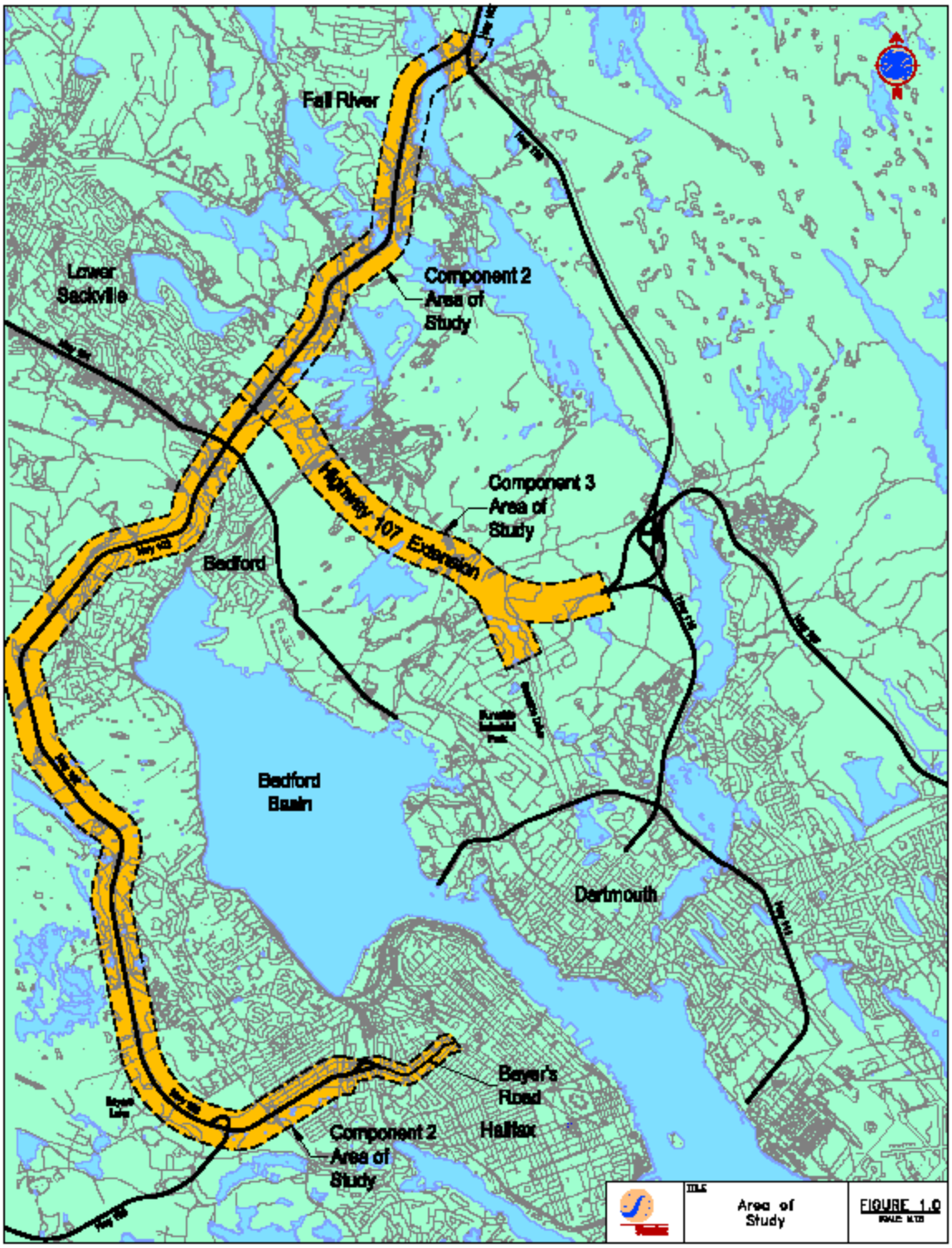
Given the two potential connection points, there are also two basic alignment options, to the north and to the south of Anderson Lake that were reviewed. Over recent years various plans have been developed for NSTIR as well as for private land owners. However, a consensus on the ultimate recommended location had not been achieved between the stakeholders.

1.2 OBJECTIVES FOR COMPONENT 3 – HIGHWAY 107

This report (the third of three) provides an overview of **Component 3.** The following is a description of the study objectives for Component 3.

- Review of the Study Area – to establish constraints, property ownership and environmental issues.
- Develop a Functional Design for the Highway 107 Alignment – to determine the right of way required for the alignment.
- Present the Highway 107 Functional Plan at a Public Information Session – to present the results of the study and obtain feedback on the conceptual plans.
- Costing and Implementation – to determine approximate costs for the work and a concept schedule for implementation.
- Perform Benefit Cost Analysis of the Highway 107 project – to examine the merits of the project relative to the base case (status quo).

The full project study area is shown on ***Figure 1.0.***


Fall River
Lower Sackville
Component 2 Area of Study
Highway 107 Extension
Component 3 Area of Study
Bedford
Bedford Basin
Dartmouth
Halifax
Bayer's Road
Component 2 Area of Study
Area of Study
FIGURE 1.0

2.0 Evaluation

2.1 ALIGNMENT EVALUATION

The Terms of Reference ***(Appendix A, Figure 1)*** show the initially considered two options for the Highway 107 alignments connecting to the two locations on Highway 102. Both options involved a corridor that was located to the north of Anderson Lake. The option connecting to Exit 4 would re-direct the Windmill Road traffic to Duke Street with a grade separated crossing of the new Highway 107.

At the outset of the project, NSTIR requested that the Exit 4 connection option be revised to show an alignment to the south of Anderson Lake and an interchange with Windmill Road. The two resulting alignments are show in ***Appendix B***, labeled as ***Option 1 and Option 2***. The Exit 4 connection option was carried forward in the Study as "Scenario C" and the connection was studied in a Value Engineering Session.

This VE study developed and evaluated a series of potential interchange configurations to be carried forward to the functional design stage of this project. As noted in the Component 2 report, "the VE study findings were intended to provide decision makers with information on a group of candidate design alternatives and specific design elements that appeared to the independent specialists of the VE Panel to offer significant value based on the evaluation criteria and weightings established for the study. The results also identify advantages and limitations associated with all of the scenarios examined".

While the VE session presented many alternative connection configurations, it was apparent that a connection at Exit 4 which met the entire NSTIR criterion was not identified. A compromised solution would be required. With this in mind the two basic alignments for Highway 107 were reviewed.

A meeting was held to look at the alignments and to establish a plan that could be advanced to functional design. Various alternatives were presented for each basic option and two preferred alignments were chosen. The following is a summary of the options considered. The minutes of the meeting (March 7, 2008 Progress Meeting) which included sketches of the options is included in ***Appendix B***.

- Option 1: Stantec presented an alternative to the Exit 4C connection option which recommended that the arterial road system be separate from the highway system. This is shown as "Option 1 Modified" in the ***March 7, 2008 Progress Meeting Minutes Appendix C.*** Three additional options were developed at the meeting and a preferred option, Option 1, Modified – (d) was selected as preferred by NSTIR and HRM.

- Option 2: Stantec presented two alternatives to the Exit 4 connection option. These are shown as "Option 2 Modified (a) and (b)" in the Meeting Minutes in ***Appendix C.*** Three additional options were developed at the meeting and a preferred option (Option 2, Modified – (e) was selected as preferred by NSTIR and HRM.

Macro level costing was undertaken to compare the two selected alignments. The costing showed that while the cost of the Exit 4C connection alignment was less, it was only marginally less. The main reason being that each alignment would require a full reconstruction of the Bedford Interchange based on the projected traffic volumes. In effect the connection of Highway 107 to the Exit 4C location did not negate the need to reconstruct the Bedford interchange.

However, two key factors resulted in the selection of the preferred alternative:

- The lack of an acceptable design for a direct connection to Exit 4 as studied in the VE session (Component 2). This was a common problem for all of the Option 2 alternatives

- The ability to phase the construction of the connection to Exit 4C. The suggested phasing is described in Section 3.0

As a result, the Highway 107 alignment to the north of Lake Anderson and connection to Highway 102 at Exit 4C was determined to be the preferred and only feasible alignment which would be carried forward to functional design. It was also determined by NSTIR that the cost benefit analysis would compare this preferred alignment with the "do nothing" or status quo alternative.

2.2 HIGHWAY 107 MAPPING

Based on the preferred alignment, a review of background material was done in order to characterize the site and identify key constraints to extension of the highway. Background material reviewed included aerial photography, right-of-way plans, topographic and property mapping. A digital terrain model (DTM) was developed using the available information. This material was obtained from HRM as well as from the Department of Transportation and Infrastructure Renewal.

An overall site plan and profile, showing constraints (in ***Appendix C***) has been prepared showing:

- The current transportation corridor and right-of-way limits at either end of the proposed Highway 107 alignment
- Adjacent property owned by HRM
- Adjacent property that is currently developed
- Water bodies and water courses
- Power Transmission lines

- Trunk municipal infrastructure
- Horizontal and vertical road geometry
- Bridge structures
- Rock outcrops and quarries
- Active Transportation paths / bikeways

The constraints plan shows key municipal infrastructure as well as power transmission lines. Significant impact most likely will occur at interchange areas, where relocation of water lines or power lines will be required. The HRM Active Transportation Plan outlines a number of facilities required along the Highway 102 corridor including pedestrian, cyclists and multi-use trails. At Exit 4C a bikeway is suggested for the Glendale / Duke corridor which would extend across the top of Lake Anderson to connect with a proposed bikeway on Burnside Drive.

2.3 HIGHWAY 107 DESIGN CRITERIA

The design criteria used for the functional design of Highway 107 is consistent with provincial standards for 100 series highways.

Highway 107 will be classified as UFD – Urban Freeway Divided. It is expected that the roadway will be posted at 100km/h. The Nova Scotia Transportation and Infrastructure Renewal (NSTIR) Category “Freeway” is applicable to this facility.

The following criterion is provided:

Table 2.1 Cross-Section Design Criteria

	TAC UFD 120	**NSTIR Freeway**
Design Speed	**120 km/hr**	**120-90 km / hr**
Lane Width (m)	3.7 m	3.7 m
Shoulder Width (usable)	3.0 m	2.8 m (2.5 m paved)
Shoulder Rounding Width		0.8 m (1.8 m with GR)
Sideslope Rates Fill height < 3.0m Fill height > 3.0m	 3:1 2:1	 6:1 2:1
Backslope	2:1	2:1
Normal Crossfall	2%	2%
Superelevation Rate	6%	6%
Depth of Ditch from Gravel Shoulder		1.0 m
Minimum Width of Ditch		2.5 m

Table 2.2 Alignment Design Criteria

Roadway Classification	TAC UFD 120	NSTIR Freeway
Minimum Radius (m) based on maximum superelevation of 6% (TAC Table 2.1.2.6)	750 m	750 m
Minimum Crest K (TAC Table 2.1.3.2) Minimum Sag K (TAC Table 2.1.3.4) (headlight Control)	K (crest) = 150 K (sag) = 73	K (crest) = 105 K (sag) = 60
Minimum Longitudinal Grade Maximum Longitudinal Grade	0.5% 3% (TAC Table 2.1.3.1) for UFD120, Rolling Topography	6% (NSTIR for Freeway)
Minimum Stopping Sight Distance (TAC Table 1.2.5.3)	290 m	290 m

The typical design section for Highway 107 is included in ***Appendix C***. The typical section is used to establish property impacts. Grading limits have been developed at the conceptual level to determine property impacts.

2.4 GRADE SEPARATIONS AND INTERCHANGES

The Access Controlled Highway within the study area, from Exit 4C to Akerley Boulevard is approximately 7 km in total length with a total of six grade separations with arterial or local roadways. The following is a list of the crossings within the Highway 107 study area.

- Highway 107 / Highway 102
- Highway 107 / Existing Local Access Road
- Highway 107 / Mann Street
- Highway 107 / Rocky Lake Road
- Highway 107 / New Arterial Roadway
- Highway 107 / Burnside Drive
- Highway 107 / Akerley Boulevard

3.0 CONCEPTUAL PLANS

3.1 CORRIDOR PLANNING

NSTIR prepared a plan showing the preferred alignment and three phased approach to construction. Initially the alignment cut across the top of Anderson Lake which required a causeway and infill of a section of the Lake. This scheme was explored in order to avoid the Municipal Dexter Quarry area. However, the alignment was revised (moved to the north) to avoid any impact to Anderson Lake. This was done in consultation with NSTIR Environmental staff. Meetings were held between NSTIR and Municipal Dexter to discuss the alignment. An Environmental Assessment (EA) was undertaken in the past (approximately 10 years ago). While the alignment is similar, there are some changes and a new EA may be required. The resulting plan is shown in ***Appendix C***, titled ***Highway 107 Extension - Option 1A.***

3.2 PHASING

There is a suggested phasing of the highway development that would involve the facility operating as an arterial roadway prior to making the connections to the highways. Highway 102. The purpose of the phasing is to allow for funding of the project over a number of years.

- Phase 1: A 4-lane arterial road connection between Duke Street and Burnside Drive
- Phase 2: An interchange providing land access just to the west of Anderson Lake
- Phase 3: Westerly extension of Highway 107 to connect with Highway 102 and easterly extension of Highway 107 and connection to Akerley Boulevard.

3.3 FUNCTIONAL PLAN

Appendix C includes 1:5000 scale functional design plans for preferred Highway 107 alignment. Background mapping of existing conditions has been prepared using available provincial topographic mapping as well as digitizing the existing lane work based on 2003 and 2006 aerial photos. There is some distortion and therefore horizontal accuracy is limited. As a result the existing ground surface is based on available aerial mapping, which can be, approximately plus or minus 2.5 m in vertical accuracy and is, in some areas, out of date with respect to existing developments. It is important to note that the accuracy of the mapping has a direct impact on the accuracy of determining property impacts and costing of reconstruction. These impacts are key objectives for the study and will be evaluated at a conceptual level consistent with the data used.

Profiles were developed for each of the phases and associated ramps. Grading limits were generated using Civil 3D and based on the typical design section. The following is a description of the functional plan:

- Phase 1: The four lane arterial would be constructed with a roundabout at Rocky Lake Road and then a grade separation over the CN Rail just to the east of Rocky Lake Road. A second CN rail crossing is required to the west of Anderson Lake. The arterial would provide the fourth leg of the intersection at Akerley and Burnside Drive.

- Phase 2: The interchange providing land access just to the west of Anderson Lake is shown as a diamond interchange with ramp connections both to Duke Street and Highway 107.

- Phase 3(a) Westerly Exit 4C Connection: The existing Glendale / Duke Street Interchange is a full movement diamond interchange. The interchange structure has been constructed to allow for additional auxiliary lanes on the freeway in anticipation of the future Highway 107 connection at this location. The addition of the Highway 107 ramps results in a three leg directional interchange that lies within the area of the Duke Street diamond interchange. From Exit 4C, grade separation structures would be provided at (i) an existing roadway just east of the 102, (ii) Mann Street and (iii) three level structure at Rocky Lake Road and CNR crossing. Ramps to / from the new Phase 1 and Phase 2 work would require 3 additional structures.

- Phase 3(b) Easterly extension to Akerley Boulevard: The Burnside Drive interchange ramps would be constructed as well as a Parclo interchange at Akerley Boulevard.

4.0 Supplementary Traffic Evaluation

4.1 INTRODUCTION

This section presents the findings from the travel demand modeling of the proposed arterial roadway (phase1) which is the extension of Burnside Drive between Akerley Boulevard and Rocky Lake Road. This work is a supplementary analysis to the Highway 102/Bayers Road Corridor Study. The intent is to determine the longer-term impacts on the study area links and intersections as a direct result of implementing the proposed roadway, assuming that the Highway 113 and a third harbour crossing are not built within the planning horizon.

At the request of the NSTIR we carried out the following tasks:

- Applied the QRS II travel demand model developed for the Highway 102/Bayers Rd Corridor Study to test the proposed new roadway for the 2016 and 2026 AM and PM peak hours. The Scenario A road network was used as a baseline condition for this work.
- The NSTIR requested that peak hour link volumes be provided on 16 pre-defined study area links in the vicinity of the proposed new roadway. We have documented these volumes for the 2016 and 2026 AM and PM peak hours.
- The NSTIR requested that the following seven intersections be evaluated to determine the impacts at the 2016 and 2026 planning horizons as a result of the implementation of the proposed new roadway.
    - Cobequid Road / Glendale Drive
    - Rocky Lake Road / Duke Street
    - Highway 102 SB ramps / Glendale-Duke
    - Highway 102 NB ramps / Glendale-Duke
    - Akerley Boulevard / Burnside Drive
    - Highway 111 SB ramps / Burnside Drive
    - Highway 111 NB ramps / Burnside Drive

For the purposes of this exercise, Glendale Drive, Duke Street, and Burnside Drive are assumed to have a general east-west alignment, and all intersecting roads and highway ramps are assumed to have a general north-south alignment.

4.2 LINK VOLUME RESULTS

4.2.1 Link Volume Results

At the request of the NSTIR, peak hour link volume results have been documented for 16 pre-defined study area roadway links presumed to be impacted as a direct result of implementing the proposed Burnside Drive extension. The results indicate that there is a strong desire to use this facility and the forecast volumes are contained in ***Table 4.1***.

Table 4.1: 2016 and 2026 Proposed Burnside Drive Extension Peak Hour Volumes

	Proposed Burnside Dr Extension	2016 Horizon	2026 Horizon
AM Peak	Westbound (to Sackville)	280 vph	310 vph
	Eastbound (to Burnside)	1,730 vph	2,010 vph
PM Peak	Westbound (to Sackville)	1,620 vph	1,820 vph
	Eastbound (to Burnside)	570 vph	630 vph

All of the link volume results were collated and compared to the AM and PM peak hour 2001 baseline model results produced as part of the Highway 102/Bayers Road Corridor Study. The peak hour link volume results are documented in ***Tables 4.2 and 4.3*** on the following page.

Table 4.2: AM Peak hour Mid-block Volume Forecasts

	2016 Horizon Results (vph)			2026 Horizon Results (vph)		
Mid-Block Section	**2001 Model**	**2016 with new link**	**Change in Volume**	**2001 Model**	**2026 with new link**	**Change in Volume**
Proposed Burnside Dr Extension (WB)	~	280	~	~	310	~
Proposed Burnside Dr Extension (EB)	~	1,730	~	~	2,010	~
Burnside Dr west of Hwy 111 (WB)	980	1,280	300	980	1,470	490
Burnside Dr west of Hwy 111 (EB)	1,010	670	-340	1,010	730	-280
Akerley Dr north of Burnside (NB)	510	580	70	510	660	150
Akerley Dr north of Burnside (SB)	2,080	1,260	-820	2,080	1,410	-670
Akerley Dr south of Burnside (NB)	250	220	-30	250	280	30
Akerley Dr south of Burnside (SB)	1,310	990	-320	1,310	1,220	-90
Rocky Lake Dr south of Duke (NB)	20	240	220	20	360	340
Rocky Lake Dr south of Duke (SB)	40	70	30	40	80	40
Duke St east of Hwy 102 (WB)	50	250	200	50	290	240
Duke St east of Hwy 102 (EB)	140	1,910	1,770	140	2,120	1,980
Glendale Ave east of Cobequid (WB)	90	160	70	90	190	100
Glendale Ave east of Cobequid (EB)	660	800	140	660	820	160
Glendale Ave west of Cobequid (WB)	280	270	-10	280	310	30
Glendale Ave west of Cobequid (EB)	840	980	140	840	1,020	180
Cobequid Rd north of Glendale (NB)	190	220	30	190	250	60
Cobequid Rd north of Glendale (SB)	220	210	-10	220	180	-40
Cobequid Rd south of Glendale (NB)	300	290	-10	300	320	20
Cobequid Rd south of Glendale (SB)	330	340	10	330	320	-10
Hwy 102/101 WB to SB ramp (NW quad)	60	70	10	60	80	20
Hwy 102/101 NB to WB ramp (NE quad)	420	460	40	420	620	200
Hwy 102/101 EB to NB ramp (SE quad)	120	300	180	120	260	140
Hwy 102/101 SB to EB ramp (SW quad)	120	100	-20	120	120	0
Hwy 102/101 SB to WB ramp	120	190	70	120	210	90
Hwy 107 between Hwy 118 and Waverley Rd (WB)	1,630	2,000	370	1,630	2,140	510
Hwy 107 between Hwy 118 and Waverley Rd (EB)	90	110	20	90	120	30

Table 4.3: PM Peak Hour Mid-block Volume Forecasts

	2016 Horizon Results (vph)			2026 Horizon Results (vph)		
Mid-Block Section	2001 Model	2016 with new link	Change in Volume	2001 Model	2026 with new link	Change in Volume
Proposed Burnside Dr Extension (WB)	~	1,620	~	~	1,820	~
Proposed Burnside Dr Extension (EB)	~	570	~	~	630	~
Burnside Dr west of Hwy 111 (WB)	610	690	80	610	760	150
Burnside Dr west of Hwy 111 (EB)	2,320	2,330	10	2,320	2,450	130
Akerley Dr north of Burnside (NB)	920	600	-320	920	670	-250
Akerley Dr north of Burnside (SB)	910	800	-110	910	920	10
Akerley Dr south of Burnside (NB)	1,020	1,140	120	1,020	1,330	310
Akerley Dr south of Burnside (SB)	510	210	-300	510	300	-210
Rocky Lake Dr south of Duke (NB)	20	40	20	20	40	20
Rocky Lake Dr south of Duke (SB)	70	340	270	70	430	360
Duke St east of Hwy 102 (WB)	130	1,650	1,520	130	1,780	1,650
Duke St east of Hwy 102 (EB)	60	770	710	60	890	830
Glendale Ave east of Cobequid (WB)	620	1,080	460	620	990	370
Glendale Ave east of Cobequid (EB)	290	340	50	290	350	60
Glendale Ave west of Cobequid (WB)	970	1,100	130	970	1,220	250
Glendale Ave west of Cobequid (EB)	310	440	130	310	490	180
Cobequid Rd north of Glendale (NB)	440	560	120	440	640	200
Cobequid Rd north of Glendale (SB)	280	230	-50	280	180	-100
Cobequid Rd south of Glendale (NB)	690	480	-210	690	770	80
Cobequid Rd south of Glendale (SB)	190	230	40	190	230	40
Hwy 102/101 WB to SB ramp (NW quad)	170	220	50	170	280	110
Hwy 102/101 NB to WB ramp (NE quad)	1,180	1,060	-120	1,180	1,040	-140
Hwy 102/101 EB to NB ramp (SE quad)	160	190	30	160	200	40
Hwy 102/101 SB to EB ramp (SW quad)	110	170	60	110	250	140
Hwy 102/101 SB to WB ramp	200	320	120	200	510	310
Hwy 107 between Hwy 118 and Waverley Rd (WB)	310	610	300	310	700	390
Hwy 107 between Hwy 118 and Waverley Rd (EB)	810	1,100	290	810	1,300	490

4.2.2 Supplementary Network Level Review

In order to gain an understanding of the broader implications on regional travel behaviour that are expected to result from implementing the proposed Burnside Drive extension, we carried out a supplementary network level review of the model results. This review required a comparison of two sets of 'like' model results. In our opinion, the most appropriate comparison was between the original Scenario A evaluation (from the Highway 102 Corridor Study) and the results of this

study which evaluated the Scenario A road network plus the inclusion of the proposed new roadway link - for the equivalent horizon year.

The findings of the comparative review indicated a similar change in travel behaviour for both the 2016 and 2026 planning horizons. We also observed a general reversal in behaviour when we compared the AM and PM peak hour results at each horizon year. These correlations added a level of confidence and certainty to our model results. The general travel behaviour changes that are expected to result from implementing the proposed Burnside Drive extension are illustrated in ***Figure 4.1***.

Figure 4.1: Network Level Travel Behaviour Implications

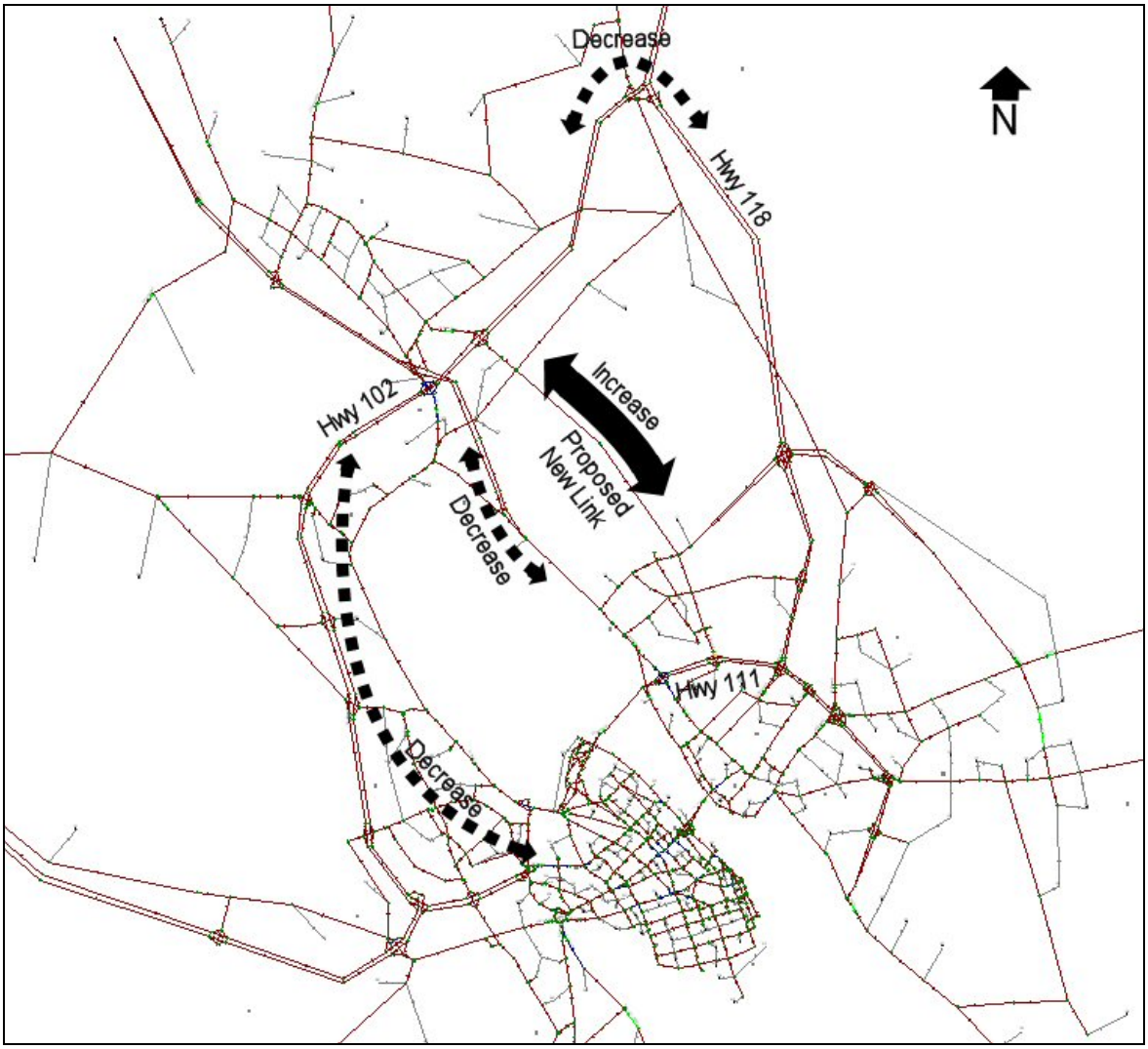


Figure 4.1 demonstrates that the volume attracted to the proposed new facility is comprised of volumes from three parallel corridors. The three corridors that experienced a reduction in volume include:

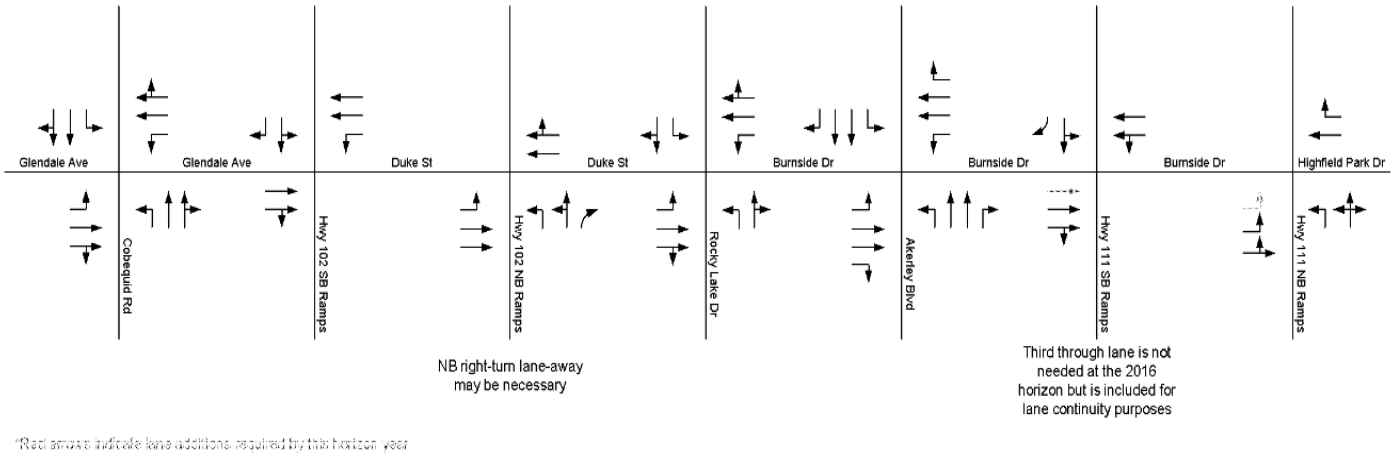
- the Highway 102 / Highway 118 route to the north,
- the Windmill Road corridor, and
- the Highway 102/Bedford Highway corridor to the south.

The reduction of volume in these corridors is of similar magnitude across all horizons and peak hours.

4.3 STUDY AREA INTERSECTION EVALUATION

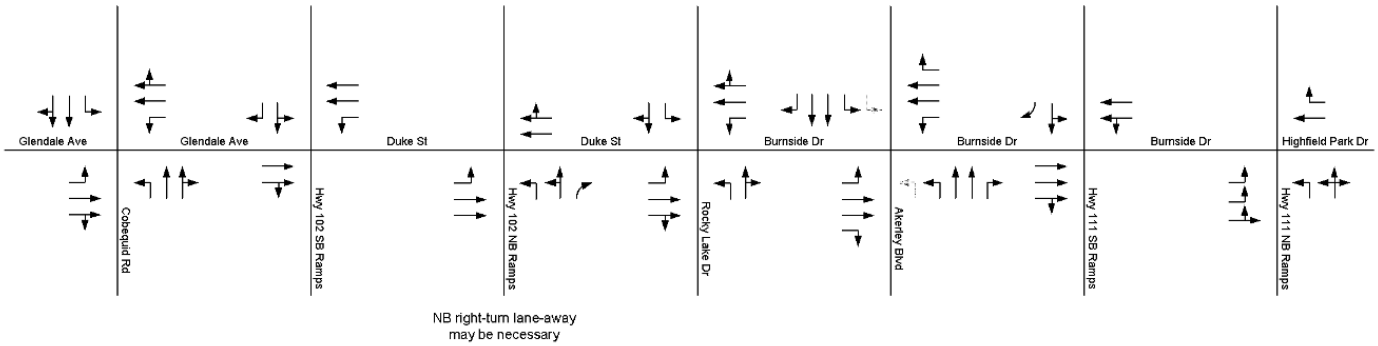
At the request of the NSTIR we carried out intersection evaluations at seven study area locations to determine the impact of implementing a proposed 4-lane arterial facility between Akerley Boulevard and Duke Street. All seven intersection locations are forecast to function as signalized intersections out to the 2026 planning horizon – however the Burnside Drive / Highway 111 intersections and the Akerley Boulevard / Burnside Drive intersection will require infrastructure upgrades. ***Figures 4.2 and 4.3*** as follows illustrate the lane configurations expected for the respective planning horizons.

Figure 2: Expected 2016 Lane Configuration Needs



*Red arrows indicate lane additions required by this horizon year

Figure 3: Expected 2026 Lane Configuration Needs



*Red arrows indicate lane additions required by this horizon year

The intersections of Burnside Drive and the Highway 111 ramp terminals will require some significant infrastructure improvements if the current diamond interchange configuration is to remain. Under the 2016 planning horizon conditions, the diamond interchange configuration is expected to require an additional eastbound through lane on Burnside Drive at the Highway 111 southbound ramp terminal intersection. This additional through lane will need to extend across the structure, and terminate as a third left-turn lane at the Highway 111 northbound ramp terminal intersection. This will require an upgraded bridge structure over Highway 111 - with a minimum 5-lane cross-section – and a 3-lane northbound on-ramp onto Highway 111. Given the perceived environmental and land-use constraints adjacent to this interchange, any upgrades may be difficult to undertake. In light of these results, NSTIR will have to rationalize the feasibility of any proposed upgrades.

It should be noted that baseline results at this interchange suggest that the Burnside Drive / Highway 111 interchange is already at capacity for some of the movements. It is anticipated that other access points to and from the Burnside Business Park (i.e. Commodore Drive and Wright Avenue) may become increasingly utilized and absorb some of the traffic demand on Burnside Drive if capacity upgrades are not undertaken at this interchange.

The other notable location - Akerley Boulevard / Burnside Drive intersection – will require northbound and southbound double left-turn lanes by the 2026 planning horizon. High left-turning volumes are expected to occur during the morning peak hour for the southbound left turn movement from Akerley Boulevard and very high left-turning volumes are expected in the northbound left turn movement from Akerley Boulevard during the afternoon peak hour. It should be noted that the road network and employment centers are generalized in the QRSII model due to the coarse level of representation (as it is a regional planning model) and does not represent the true location of land use accesses along the major thoroughfares. It is our opinion that these turning volumes represent a worst-case scenario for this intersection and it is likely that the turning demand indicated at this location would be partially carried by nearby,

unmodeled streets and intersections. Therefore, we strongly recommend that the need for these additional turning lanes be monitored into the future.

4.4 A NOTE ON THE HIGHWAY 102 CORRIDOR

The findings from the travel demand modeling for the Highway 102 Corridor Study indicated that a 6-lane cross-section would be required on Highway 102 between Hammonds Plains Road and Highway 101 to accommodate the 2026 forecast volumes. This particular finding was based on the assumption that both Highway 113 and the Highway 107 extension facilities were in place (the Scenario B and C road networks).

If we review the findings of the analysis carried out for this supplementary work – using the Scenario A road network plus the Burnside Drive extension (and no Highway 113) – the Highway 102 can function with a 4-lane cross-section at the 2026 planning horizon between Hammond Plains Road and Highway 101. At this particular planning horizon, we expect the volume-to-capacity ratio to be about 0.84 in the peak direction, during the peak hour.

5.0 Summary and Conclusions

5.1 PROPERTY IMPACTS AND PUBLIC INFORMATION SESSIONS

The functional plans in ***Appendix C*** show the approximate right-of-way required for the construction of Highway 107 and the resulting properties which will be impacted by construction. An estimated 60 properties and 35 different property owners along the Highway 107 Corridor would be directly impacted by the construction. The primary land owner is Municipal Dexter. This information along with HRM GIS data base information was used to notify these property owners of the public information sessions which were held as part of Component 2 of the project. The Public Information Sessions were held to explain the study and obtain information and feedback from local residents, businesses, and landowners. **Chapter 8.0 of the Component 2 report** describes the sessions.

The following sessions were held:

February Sessions

- Wednesday, February 11, 2009 at the St. Andrew's Centre, 6955 Bayer's Road, Halifax, from 6pm to 9pm with a presentation at 6:30pm
- Thursday, February 12, 2009 at the LeBrun Community Centre, 36 Holland Avenue, Bedford, from 6pm to 9pm with a presentation at 6:30pm.

Following the February sessions, two additional sessions were conducted in response to requests for better coverage of the Sackville and Burnside areas.

March Sessions

- Wednesday, March 25, 2009 at the Sackville High School, 1 Kingfisher Way, Lower Sackville, from 6pm to 9pm with a presentation at 6:30pm
- Thursday, March 26, 2009 at the Park Plaza Hotel and Conference Centre, Ramada Plaza, 240 Brownlow Avenue, Dartmouth, from 4pm to 6pm.

From the questionnaires and comments received, it may be inferred that the majority of those who provided comments regarding the highway 107 project agree with the project.

As a result of the public input received and subsequent discussions with the steering committee, some minor changes were considered appropriate. In addition, it was determined that careful consideration of the Highway 107 phase 1 is required. This phase would direct traffic directly to Glendale from the new Highway 107 and this has been identified as a primary concern.

5.2 OPINION OF PROBABLE COST

5.2.1 Basis for the Costing

Based on the functional design, the team prepared an opinion of capital costs for the major components of construction. Costs are identified for each phase of the project, and identified in present day (2009) dollars. The opinion of capital cost expenditures have been projected based on the following:

- The team developed preliminary quantity estimates for major cost items such as granulars, pavement, structures, and earthworks for the infrastructure expansions in the corridor.
- Historical construction unit costs were used to develop “cost per unit” rates that were applied to major work categories such as kilometers of roadway and square meters of structure.
- Allowances for other major cost items such as intersection signals were included.
- The resulting costs were then increased by an applied percentage to account for miscellaneous items.

We understand that the costing may be used for planning and decision making and the basis of funding and approval processes. However, it must also be understood that, while we use information available to us combined with our judgment and past experience, the specific rationale and conditions forming the basis of contractors' bids, material or equipment pricing, are beyond our knowledge and control. An unknown source stated:

> "*An estimate is an attempt to project what someone else will be willing to contract for in the future to do construction work which has not yet been defined and which is subject to changes in scope, design, and market conditions".*

In addition to scope, design and market conditions, scheduling, phasing, and many other factors will affect the cost of a project. Therefore, the costing in this report is no more than our "opinion" as to what the final costs may be.

Provisional amounts, expressed as a percentage of the construction cost, are added to account for project items that cannot be accurately defined due to insufficient information. The value of the provisional amounts is subject to approval by NSTIR. However, the provisions should not be confused with the accuracy of the estimate. Provisions are expected to be spent. They are to allow for costs for items that will be encountered but are unknown or impossible to accurately estimate at this time. Provisional costs typically include:

- Engineering Costs
- Miscellaneous: Items such as landscaping, signage, culverts and other minor components of construction that have not been determined in the concept design.

- Design Contingency: allowance for unknown factors and changes to the design as the project is better defined.

At this time, engineering costs and design contingencies have not been included in the reported costs. NSTIR is advised to allow for these items in their capital planning as appropriate.

5.2.2 Summary of Highway 107 Costs

Appendix D contains tables which show the unit costs that were used as well as the projected cost for each component of the corridor improvements. ***Table 5.1*** is an overall summary of the approximate costs for the proposed Highway 107 Extension

Table 5.1 – Highway 107 Cost Summary Table – by Phase

Item	HIGHWAY 107 - SUMMARY No 1 - By Phase	Approximate Cost
14.1	Phase 1 Highway 107 (Duke Street Extension)	$47,000,000
14.2	Phase 2 New Interchange on Highway 107	$0
14.3	Phase 3A - Highway 107 from Exit 4C to New Interchange (Westerly Connections)	$28,000,000
14.4	Phase 3B - Highway 107 from Burnside Drive Interchange to Existing Hwy 107	$21,000,000
14.5	Phase 3C - Akerley Interchange	$12,000,000
12.3	Interchange: Highway 107 at Exit 4C (Option 1 Costing)	$13,000,000
	Total (excludes taxes, engineering, and contingencies)	$121,000,000

Table 5.2 – Highway 107 Cost Summary Table – by Item

	HIGHWAY 107 - SUMMARY No 2 - Major Items	
1.0	Roadways - Gravels / Asphalt	$42,000,000
2.0	Mass Excavation	$27,000,000
3.0	Structures	$36,000,000
4.0	Miscellaneous Items (culverts, landscaping, paint, signage, etc.)	$16,000,000
	Total (excludes taxes, engineering, and contingencies)	$121,000,000

The costs have been developed based on the limited information available as well as historical information. This is an order of magnitude estimate. The following items are key limitations in the costs:

- Accuracy of the mapping.
- Potential for design changes based on unknown factors.
- Schedule and phasing of the up-grades.
- Market conditions at the time of tendering.

In addition the following has not been considered in the costing:

- Property acquisition costs
- Utility relocation costs
- Taxes
- Engineering Costs
- Design Contingencies

Stantec does not guarantee the accuracy of this opinion of probable cost. The actual final cost of the project will be determined through the bidding and construction process.

5.3 INFRASTRUCTURE IMPLEMENTATION SCHEDULE

5.3.1 Timeline for Expansions

Component 1 of this study provided the forecast number of mainline lanes required for the Highway 102 corridor. In Component 2, the study area ramps and intersections were analyzed for each of the 2016, 2026 and 2036 planning horizons. The ***Appendix C*** concept drawings are based on the full build-out of the facility to the 2036 horizon. Based on this information, a conceptual timeline for the expansions has been determined and shown in ***Table 5.3***. This approximate timeline shows the roadway phases as noted in ***Table 5.1***. In addition to comments provided in the table, the following is noted. An approximate 2 year time frame is assumed for each component of the work.

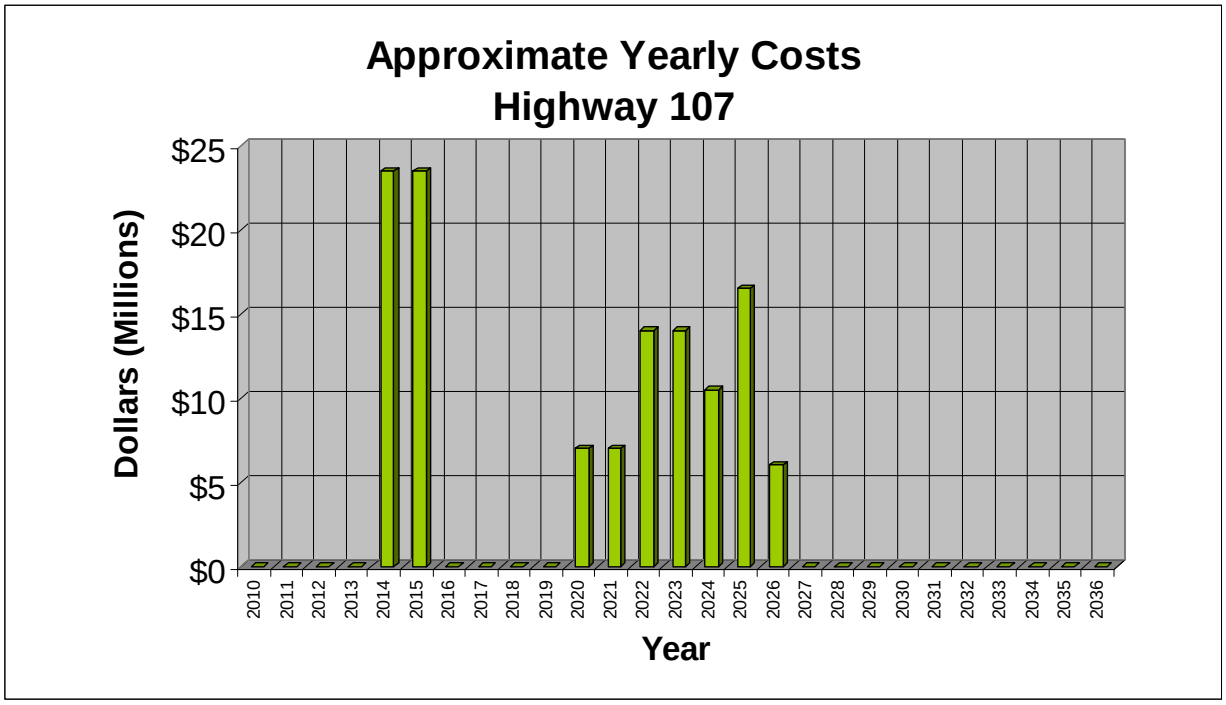
Table 5.3 Timelines

		Horizon Year 2016							Horizon Year 2026										Horizon Year 2036									
No.	Location	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
	HIGHWAY 107																											
14.1	Phase 1 Highway 107 (Duke Street Extension)					■	■																					
14.2	Phase 2 New Interchange on Highway 107																		■	■								
14.3	Phase 3A - Highway 107 from Exit 4C to New Interchange -													■	■													
14.4	Phase 3B - Highway 107 from B Drive Int to Exis Hwy 107															■	■											
14.5	Phase 3C - Akerley Interchange																■	■										
12.3	Interchange: 107 at Exit 4C											■	■															

5.3.2 Approximate Yearly Costs

Based on the approximate costs for each component of the project and the projected timeline, the following ***Figure 5.1*** shows the resulting yearly costs.

Figure 5.1 Approximate Yearly Costs – Highway 107



5.4 BENEFIT / COST ASSESSMENT

A Benefit / Cost Assessment of the Highway 107 Extension was undertaken by Canmac Economics Limited. The full report is included in ***Appendix E***. The assessment compares the Base Case (the status quo) and the preferred option as described in this report.

The benefits associated with the new highway include:

- Travel time savings
- Social cost savings
    - o Decreased accidents
    - o Greenhouse gas emissions

The costs associated with the new highway include:

- Construction Costs
- Operating and Maintenance Costs
- Resurfacing Costs

The analysis follows that outlined by Transport Canada (1994) and the methodology is consistent with the MicroBENCOST Software. A dollar value is assigned to the benefits in accordance with Transport Canada data. The benefits and costs were converted into net present value terms using an 8% discount rate and a project life to 2036. The analysis then looks at the sensitivity of the results to changes in the discount rate and project life. The resulting Benefit / Cost ratio varies from 1.8 to 2.4, concluding that the project makes a positive contribution to society.

APPENDIX A
Terms of Reference

NOVA SCOTIA

Procurement Services - Public Tenders Office
6176 Young Street, Suite 200
Halifax, Nova Scotia B3K 2A6
Telephone: (902) 424-3333

Date: **December 20, 2006**

To: **All Suppliers**

Subject: **Addendum**

ADDENDUM # 1
Tender 60130901
Highway 102 Corridor Transportation Study for the Department of Transportation & Public Works

The following change are to be noted in the document referenced above.

1.The project scope is to be consistent with a project budget of $275,000.00

2. The proposal closing date has been changed. The new date for closing is Tuesday, January 23, 2007

In your bid, please indicate that you have noted these changes by including the words "Includes Addendum # 1". If there is more than one (1) Addendum issued for this tender, please acknowledge each separately.

Yours truly,

Jane MacConnell
Senior Procurement Officer

NOVA SCOTIA

Procurement Services - Public Tenders Office
6176 Young Street, Suite 200
Halifax, Nova Scotia B3K 2A6
Telephone: (902) 424-3333

Date: **January 10, 2007**

To: **All Suppliers**

Subject: **Addendum**

ADDENDUM # 2
Tender # 60130901
for the Department of Transportation & Public Works

The following additional information is provided to clarify the scope of work for the above noted Tender.

1. Section 2.1 - This project is being commissioned to determine the ultimate capacity and best use of the Highway 102 corridor. An estimate for the timing of the need to widen the highway is required but is not the focus of the study.

2. Section 2.1 - Functional designs are expected to identify the number of lanes, auxiliary lane requirements, etc. Field survey is not required for completion of the functional designs.

3. Section 2.1 - The purpose of Component 1, Traffic Projections, is to provide the data required to complete Components 2 and 3.

4. Section 2.3.1.5 - No travel time data is available other than what is already in the existing QRS II model. The consultant is responsible for collecting any additional data required to complete the study.

5. Section 2.3.1.7 - The HRM QRS II model is currently calibrated on the basis of 2001 data. Although the study base year is 2006, the model re-calibration is expected to be done using the existing 2001 data. The re-calibration of the existing model is required to refine the model for the purpose of simulating the 100 series highway network and other major arterials. It does not need to be calibrated for local streets. Separate models, calibrated for AM and PM peak hour traffic counts, are required. The final model deliverables are to be in QRS II file format.

6. Section 2.3.2.9 - The working session for the design of the Highway 102/107 interchange is intended to be an opportunity for the consultant to more efficiently access TPW/HRM staff knowledge and feedback on the proposals. Staff will be participating by providing input to and review of the proposals as they are developed. Approximately 12 TPW/HRM staff are expected to participate and they will not require computer set-ups. TPW meeting space can be made available for the session.

7. Section 2.3.3.4 - Environmental field work is not required as part of the functional design work for the Highway 107 alignment.

8. Section 2.4.2 - The functional design of the Larry Uteck interchange is underway and is expected to be made available to the selected consultant in digital format at the time of project award.

Sincerely,

Janice Harland, M.A.Sc., P.Eng.
(902) 424-4206

Please note that the proposal closing date remains unchanged.

In your bid, please indicate that you have noted these changes by including the words " Included Addendum # 2.

Yours truly,

Terry Peitzsche

Procurement Group Supervisor

NOVA SCOTIA Procurement Services

Request for Proposal (RFP)

Tender Number: 60130901

Date Created:	Nov 29, 2006
Contact Person:	Terry Peitzsche
Telephone:	902-424-8069
Document Reference:	60130901

Tender Source:
TENDERS WEBSITE
WWW.GOV.NS.CA/TENDERS
6176 YOUNG ST
HALIFAX NS B3K 2A6

Bidders are responsible for ensuring that they are aware of and have complied with any Addenda by visiting the Procurement Website or contacting the Public Tenders Office.

Send Quotation To:
Public Tenders Office
6176 Young Street, Suite 200
Halifax, NS B3K 2A6
Ph. 902-424-3333, Fax 424-0622

Important Dates:
Closing Date: Jan 09, 2007
Closing Time: 2:00 pm
Bids are opened one half hour after tender closing

Deliver Goods\Services To:
Transportation & Public Works
Halifax NS

Delivery Requested By: 14/12/2007
(DD/MM/YYYY)

For information on other tenders refer to:
www.gov.ns.ca/tenders

Req`n 10021774

*
REQUEST FOR PROPOSALS:
TRANSPORTATION & PUBLIC WORKS
HIGHWAY 102 CORRIDOR TRANSPORTATION STUDY:
A TRANSPORTATION STUDY OF HIGHWAY 102 (BICENTENIAL HIGHWAY) AND THE PROPOSED EXTENSION OF HIGHWAY 107 TO HIGHWAY 102
CONTACT PERSON: JANICE HARLAND PH: 902-424-4206
DOCUMENTS ATTACHED
*
Pls Note: The pricing fields on page 1 and 2 of 2 (NSRFP) form, is not to be completed. A cost proposal is to be provided separately in a sealed envelope.
*

PRICES TO BE QUOTED TAX OUT ONLY

PLEASE COMPLETE THE UNIT, DELIVERY DATE, UNIT PRICE AND EXTENDED PRICE FIELDS

Item	Qty / Unit	Material / Description	Delivery date	ALL PRICES MUST BE EXTENDED AND TOTALLED: Unit Price	Extended Price
00001	1 Perf. unit	HYW 102- CORRIDOR TRANSPORTATION STUDY:			

PRICES TO BE QUOTED TAX OUT ONLY

PLEASE COMPLETE THE UNIT, DELIVERY DATE, UNIT PRICE AND EXTENDED PRICE FIELDS

Item	Qty / Unit	Material / Description	Delivery date	ALL PRICES MUST BE EXTENDED AND TOTALLED: Unit Price	Extended Price

The item covers the following services:

Item	Quanity	Unit	Description / Price/Unit
10	1	LOT	See Attachments

THE FOLLOWING INFORMATION MUST BE COMPLETED TO ENSURE TENDERACCEPTANCE **TOTAL:**

BIDDING COMPANY:

REPRESENTATIVE OF BIDDING COMPANY:

PRINT NAME:

PHONE#: FAX#: E-MAIL ADDRESS:

PO BOX: CITY: POSTAL CODE:

STREET: CITY: POSTAL CODE:

DELIVERY PROMISED: TERMS: FOB:

SIGNATURE:

All documents listed here can be found on our web site at www.gov.ns.ca/tenders/policy

If you do not have access to these documents via the Internet, please request a copy from Nova Scotia Procurement, 6176 Young St., PO Box 787, Halifax, NS B3J 2V2, phone (902)424-3333, fax (902)424-0622. Please request the document(s) by name.

NEED HELP? Suggestions and hints to help you reply to this tender are available from the above web page by selecting "Tendering Guides" then "Request for Quotations Completion Guide".

**********INSTRUCTIONS REGARDING THIS PURCHASE**********

By submitting a response to this tender, you acknowledge that you have read and complied with the applicable Nova Scotia Procurement documents. The following documents apply to this tender, and are available from the above web page by selecting "Terms & Conditions" then selecting the following:

Atlantic Standard Terms and Conditions (revised June 30, 2005)
Supplement - Request for Proposals (revised January 2005)

Req`n 10021774

Rev 060125

NOVA SCOTIA

Procurement Services
Public Tenders Office
6176 Young Street, Suite 200
Halifax, Nova Scotia B3K 2A6
Telephone: (902) 424-3333
Facsimile: (902) 424-0608 or 0622

REQUEST FOR PROPOSALS

Tender Number 60130901

Highway 102 Corridor Study

for the

Department of Transportation and Public Works

and the

Halifax Regional Municipality

THESE SPECIFICATIONS ARE NOT A COMPLETE TENDER DOCUMENT. IN ORDER FOR A TENDER RESPONSE TO BE COMPLETE AND ACCEPTABLE, THESE SPECIFICATIONS MUST ACCOMPANY A NOVA SCOTIA REQUEST FOR PROPOSALS (NSRFP) FORM, WHICH MUST BE COMPLETED AND SIGNED.

Facsimile bids **will not** be accepted for this Request for Proposals

At a minimum, the terms & conditions and supplements listed below apply to this procurement. These documents are available from the Tenders website as shown below. By submitting your response to this Request for Proposals, you acknowledge that you have read and complied with these documents. **Other instructions and supplements may also apply; see the NSRFP form for the complete list of applicable documents and how to obtain them.**

Atlantic Standard Terms and Conditions -and- Supplement-Request for Proposals (RFP)
These documents are available from www.gov.ns.ca/tenders - click on "Terms & Conditions"

Request for Proposals prepared by: Department of Transportation and Public Works

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1.0 Background and Situation Overview

Highway 102 is an intra-provincial, National Highway System highway that begins in Halifax as an extension of Bayers Road and ends in Truro at Highway 104. In addition to connecting to Highway 104, it intersects with other primary arterial highways: Highways 101, 103, 118 and 107(future). Accordingly, it connects the northern and eastern parts of the province with the Halifax Regional Municipality (HRM) and the western end of the province. This important link also serves HRM residents commuting between the urban core and suburban areas such as Hammonds Plains, Bedford, Sackville and Fall River. It is one of the busiest highways in the province with average annual daily traffic volumes in excess of 40,000 vehicles per day in some sections. In addition, development is growing in the communities it serves and has extended up to the right-of-way in many areas.

Highway 107 serves the Dartmouth area of HRM and currently extends from Musquodoboit Harbour to Preston and from the Loon Lake area in Westphal to Akerley Boulevard in Burnside Park. Planning is underway to continue the highway westward to Highway 102. The extension of Highway 107 from Burnside Park to Highway 102 is warranted due to existing traffic volumes on Trunk 7 (Magazine Hill) and the Bedford Bypass, which are approximately 30,000 vehicles per day. The Bedford Bypass was originally built as a temporary facility, required until Highway 107 was completed. A major component of the Highway 107 alignment approved in the early 1990s, included the now abandoned Second Lake Collector. In that plan, Highway 107 connected to Highway 102 at Exit 4C (Glendale/Duke) and continued as the Second Lake Collector to an interchange with Highway 101 west of Sackville. The approved Highway 107 alignment/design is being reconsidered due to the abandonment of the Second Lake Collector and the proximity of the Highway 101/102 interchange. It may be desirable to construct a new interchange in the area which would allow for direct flow of traffic between Highways 101, 102 and 107.

The Department of Transportation and Public Works (TPW) and HRM recognize both the importance of Highway 102 and its limited expansion potential and together are commissioning this study to forecast traffic needs and determine the ultimate expansion capacity and best use of the highway corridor. The section to be studied includes a portion of Bayers Road starting at Windsor Street and continuing to the start of Highway 102 and then along Highway 102 to Exit 5 in Fall River, as shown in Figure 1. Studying this section of Highway 102/Bayers Road as a corridor, rather than as individual sections or interchanges, will allow TPW and HRM to make long term planning decisions on how to best use the corridor and to determine what changes may be required to the interchanges and intersections that connect the highway with the rest of the transportation network. HRM has recently adopted a Regional Plan that will serve to focus development in areas where services, such as transportation, can be more efficiently provided and this study will be undertaken in consideration of the plan. A significant part of the corridor planning involves determining the location of the Highway 107 extension and the functional design of its interchange with Highway 102. This evaluation will include a benefit/cost evaluation of the options.

2.0 Requirements

2.1 Basic Requirements

The study has three primary objectives that are addressed by three separate project components.

- Component 1 - Traffic Projections: Create a calibrated model and develop long term (30 year) traffic projections for the Highway 102/Bayers Road corridor from Exit 5 (Fall River/Highway 118) to Windsor Street including the proposed Highway 107 extension and all other major existing and proposed intersecting roads.

- Component 2 - Highway 102 Upgrades: Determine the ultimate capacity of the Highway 102/Bayers Road corridor from north of Exit 4C (Glendale/Duke) to Windsor Street. Develop short and long term functional plans for expansion of the corridor, including interchanges, to full capacity. Develop functional plans to a level of detail that confirms the feasibility of the proposed designs and provides sufficient information to provide conceptual cost estimates for the proposals.

- Component 3 - Highway 107 Extension: Evaluate the two proposed options for extension of Highway 107 from Burnside Park to Highway 102 (see Figure 1). Perform benefit/cost analyses on the alignment and interchange options.

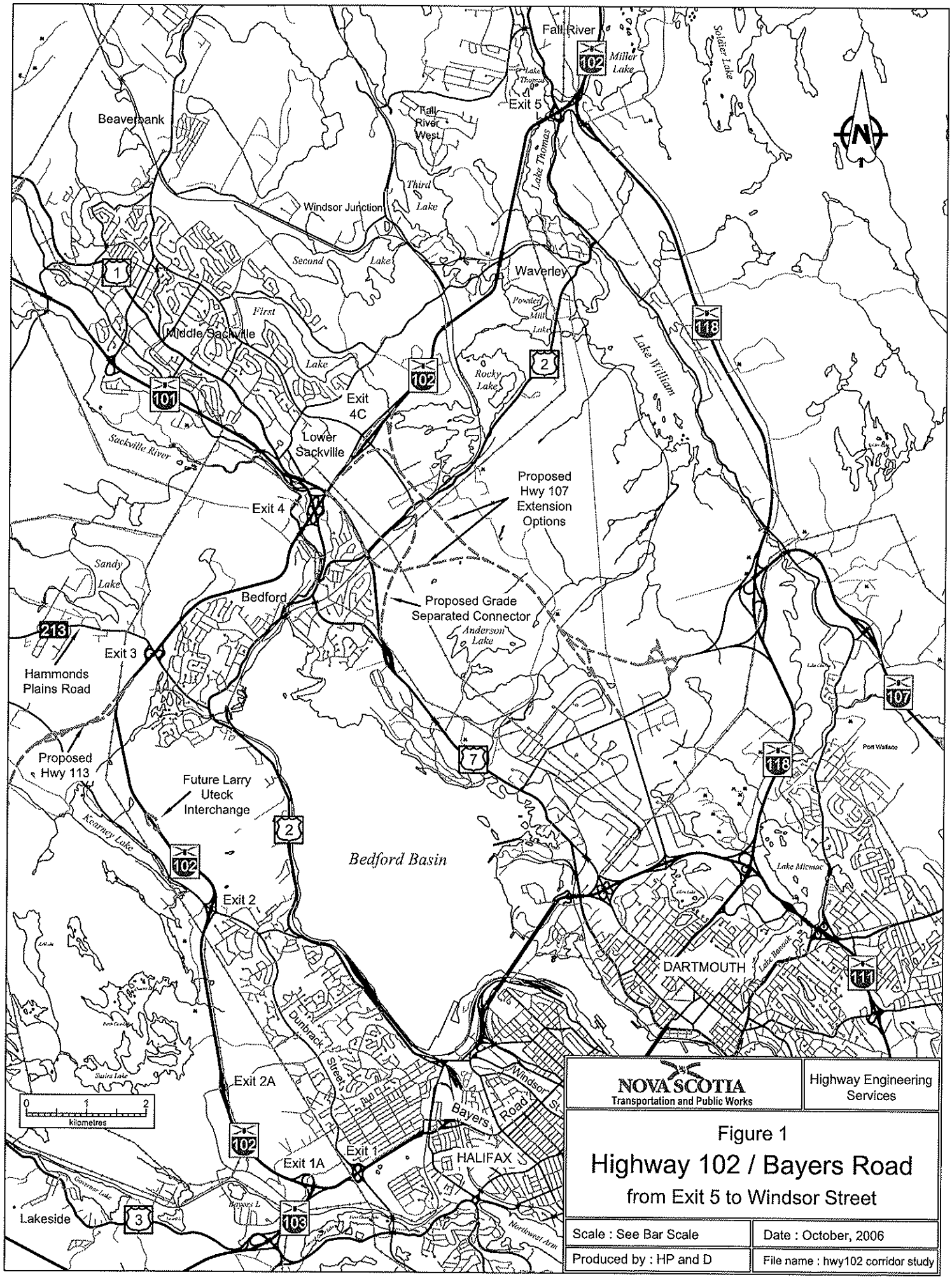
2.2 Project Scope and Time Frames

The general study area is outlined in Figure 1. A broader focus may be required to determine future traffic volumes and patterns. The time frame for all study components is 30 years with 2006 as the base year.

- Component 1 - Traffic Projections includes the Highway 102/ Bayers Road corridor from Exit 5 (Fall River/Highway 118) to Windsor Street and the proposed Highway107 extension from Highway 102 to Highway 118.

- Component 2 - Highway 102 Upgrades includes Highway 102/Bayers Road corridor from north of Exit 4C (Glendale/Duke) to Windsor Street and includes the portions of all major intersecting roads that are within 500 metres of their interchange with the Highway 102/Bayers Road corridor. This includes proposed and potential future connections, such as the Larry Uteck interchange, the connection of Highway 113 and the Highway 107 interchange. The capacity study will consider two options for the connection of Highway 107: at Exit 4C; and at a redesigned Highway 102 Exit 4 interchange. (Two proposals for the redesign of the Highway 102 Exit 4 interchange are included in the consultant's scope of work.)

- Component 3 - Highway 107 Extension includes the two general Highway 107 alignment options and the Highway 102 interchange connections associated with each option.



NOVA SCOTIA
Transportation and Public Works

Highway Engineering Services

Figure 1

Highway 102 / Bayers Road

from Exit 5 to Windsor Street

Scale : See Bar Scale	Date : October, 2006
Produced by : HP and D	File name : hwy102 corridor study

2.3 Detailed Technical Requirements

2.3.1 Objective 1 - Traffic Projections

2.3.1.1 Meet with the Project Steering Committee in accordance with the requirements in Section 2.5 - Reporting Requirements and Procedures.

2.3.1.2 Become familiar with the study area including existing, proposed and potential road infrastructure, existing and proposed developments, historic development trends, traffic and transportation studies, regional development potential and municipal development plans.

2.3.1.3 Consider and incorporate HRM's Regional Plan, Active Transportation Plan and Transportation Demand Management Functional Plan (in progress) as they apply to the corridor and traffic projection assumptions.

2.3.1.4 Develop traffic projections. Base regional population growth predictions for 2016 and 2026 on the Regional Plan. Develop predictions for the time frame beyond the Regional Plan horizon (2026) to the study horizon year of 2036.

2.3.1.5 Obtain any traffic data required in addition to the information provided by TPW and HRM. Obtain all required demographic or other data required to develop population and traffic predictions.

2.3.1.6 Confirm population and traffic growth projections with Project Steering Committee.

2.3.1.7 Develop traffic models for the Highway 102 corridor and the proposed Highway 107 extension options. Calibrate HRM's regional QRSII traffic model to represent the 100 series highway network and expand the models to estimate traffic growth in the 2036 horizon year.

Traffic models are required to represent the base year 2006 for existing infrastructure only and the horizon years 2016, 2026 and 2036 for each of the following scenarios:

A - Existing infrastructure and the future Larry Uteck interchange;
B - Scenario A with Highway 113 and Highway 107 connecting at a point just north of Exit 4C (Duke Street); and
C - Scenario A with Highway 113 and Highway 107 connecting with Highway 101 at Exit 4, with a grade separated connection of Trunk 7 and Duke Street.

The models are to be calibrated to both AM and PM peak hours. It is expected that the calibrated models will represent road and ramp volumes within 15 percent of actual volumes. Traffic projections are to be displayed in both graphical and tabular format.

2.3.1.8 Identify highway system capacity constraints in the study area and estimate the time at which they will occur in each scenario.

2.3.1.9 Prepare a draft final report that includes a description of analyses/prediction methods, model results including calibration results and a description of system constraints for each scenario.

2.3.1.10 Consider feedback from Project Steering Committee and finalize report and models.

2.3.2 Objective 2 - Highway 102 Upgrades

2.3.2.1 Meet with the Project Steering Committee in accordance with the requirements specified in Section 2.5 - Reporting Requirements and Procedures.

2.3.2.2 Become familiar with the study area including, existing, proposed and potential road infrastructure and developments, land ownership, terrain and environmental issues.

2.3.2.3 Consider and incorporate HRM's Regional Plan, Active Transportation Plan and Transportation Demand Management Functional Plan (in progress) as they apply to the corridor.

2.3.2.4 Determine the ultimate physical expansion potential of the Highway 102/Bayers Road corridor given the constraints of roadside development. Consider the need for additional through lanes as well as ramp connections between interchanges.

2.3.2.5 Consider the potential uses of additional through lanes. Estimate the number of years the functionality of the corridor will be extended by implementing alternative uses. Identify any potential issues to be considered in implementing these measures. Recommend the appropriate use of all additional through lanes.

2.3.2.6 Develop functional design plans for the corridor. Allow for potential roadside measures in the cross-section and allow for a trail in areas where it is required as part of the Active Transportation Plan.

2.3.2.7 Determine the required functional design capacity of the interchanges and intersections consistent with the ultimate capacity of the corridor.

2.3.2.8 Develop functional plans for the upgrading of all existing and proposed interchanges and intersections along the corridor from Exit 4C (Glendale/Duke) to Windsor Street, including the Highway 101/102 interchange at Exit 4, that will meet the capacity requirements identified in 2.3.2.7. Provide interchange access management plans for minor roads, existing and future, within 500m of the interchange. Base functional designs on current TPW and HRM design standards and consider topography and grade issues. Present functional designs at 1:5000 or larger scales. [Please note: The functional design and access management plan recommendations for the Highway 102/Hammonds Plains Road interchange must be completed as soon as is possible and no later than August 3, 2007.]

2.3.2.9 Develop draft functional design concepts for the redesign of the Highway 101/102 interchange to accommodate connection of Highway 107 as part of a four-day working session to be held in Halifax with TPW and HRM staff. Provide design and technical staff along with necessary models, mapping, hardware, software, traffic and other data and materials required to lead the session and develop concepts towards completed functional designs. (The outcomes of the working session are expected to be two draft functional design options for the redesign of the Highway 101/102 interchange that include direct connection of Highway 107.)

2.3.2.10 Subsequent to the working session, confirm the feasibility of both draft functional design options and complete the functional designs. Present functional designs at 1:5000 or

larger scales. Present, in person, the completed designs to the participants of the working session held in 2.3.2.9.

2.3.2.11 Prepare an interim report that includes a description of research, analyses, recommendations and proposed functional design plans for review by the Project Steering Committee. Incorporate review comments.

2.3.2.12 Identify any right-of-way that is required for the functional designs.

2.3.2.13 Develop a schedule for upgrading the corridor, including interchanges. Identify the traffic volumes that should trigger the need for the improvements and estimate the year in which they will occur.

2.3.2.14 Provide cost estimates for the upgrading projects.

2.3.2.15 Update the traffic models produced in 2.3.1.7 for scenarios B and C to reflect the proposed corridor upgrades. Describe the changes in level of service and capacity of the corridor.

2.3.2.16 Estimate the year in which the ultimate capacity of the highway will be matched by demand.

2.3.2.17 Organize, staff and conduct a public information session. The purpose of the session will be to present the study findings and the proposed functional designs. The Consultant is responsible for all costs associated with the session, including the venue, advertising and invitations. All elected officials for the study area are to be invited by letter. Any property owner directly affected by the proposals is to be personally contacted prior to the event and invited. As a minimum, newspaper advertisements are to be placed in three separate editions of both the Chronicle Herald and the Daily News. Advertisements are to be of a size that provides for all necessary details including a brief description of the meeting purpose.

2.3.2.18 Prepare a final draft report and functional plans for review by the Project Steering Committee. The final draft report is to include a summary of the public information session. Be prepared to provide a second final draft report, if the Project Steering Committee determines it is required.

2.3.2.19 Provide a final report, functional plans and traffic models.

2.3.3 Objective 3 - Highway 107 Extension

2.3.3.1 Meet with the Project Steering Committee in accordance with the requirements specified in Section 2.5 - Reporting Requirements and Procedures.

2.3.3.2 Become familiar with the study area including, existing, proposed and potential road infrastructure and developments, land ownership, terrain and environmental issues.

2.3.3.3 Consider and incorporate HRM's Regional Plan, Active Transportation Plan and Transportation Demand Management Functional Plan (in progress) as they apply to the potential Highway 107 corridors.

2.3.3.4 Develop a functional design for the proposed Highway 107 alignment option that connects to Highway 102 at Highway 101. (The functional design of the extension option that terminates at Highway 102 Exit 4C has already been established by TPW and is to be used in completing the project.) Allow for potential roadside measures in the cross-section and allow for a trail in areas where it is required as part of the Active Transportation Plan and consider the need for incorporation of HOV/transit lanes in both design options. Base functional designs on current TPW and HRM design standards and consider topography and grade issues. Present functional designs at 1:5000 or larger scales.

2.3.3.5 Identify the right-of-way that is required for each of the functional designs.

2.3.3.6 Prepare an interim report that includes a description of research, analyses, recommendations and proposed functional design plans for review by the Project Steering Committee. Incorporate review comments.

2.3.3.7 Prepare functional plans for the Highway 107 alignment options for inclusion in the public information session to be held in accordance with item 2.3.2.17.

2.3.3.8 Perform MicroBENCOST or simlar benefit/cost analyses of the Highway 107 alignment/interchange options. This will entail consideration of three different scenarios: Highway 107 connecting to Highways 101 and 102 with two interchange configuration options; and Highway 107 connecting to a potentially redesigned Highway 102 Exit 4C.

2.3.3.9 Prepare a final draft report and functional plans for review by the Project Steering Committee. The final draft report is to include a report on the benefit/cost analyses. Be prepared to provide a second final draft report, if the Project Steering Committee determines it is required.

2.3.3.10 Provide a final report and functional plans.

2.3.3.11 Present the project findings (all three project components) to the project steering committee and other senior TPW and HRM staff.

2.4 TPW and HRM Responsibilities

2.4.1 Meet with the Consultant on an arranged schedule.

2.4.2 Provide the Consultant with the documentation listed below and any other available information that may assist in the completion of the project.

- Provincial ROW plans for Highway 102 corridor (hard copy)
- HRM ROW plans for Bayers Road
- Provincial topographic and property mapping (digital)
- HRM QRSII model
- HRM GIS mapping

- Regional Municipal Planning Strategy

- Active Transportation Plan (SGE Acres, 2006)

- As-built drawings for Highway 102 Corridor from beginning at Bayer's Road to Kearney Lake Road (hard copy, mid 1980s)

- Design Drawings (hard copy only)
  - Highway 107/Akerley interchange
  - Lacewood Drive - Chain Lake Drive to Highway 102, Proposed Traffic Improvements Phase 2 (HRM; 2003)
  - Highway 102 Interchange to Lacewood Drive, Upgrading of Lacewood Drive (TPW; 2002)
  - Highway 102/Route 213 Interchange (widening on Route 213 in approach to ramp terminals) (TPW; 2003)
  - Kearney Lake at Highway 102, Intersection Geometry Plan (intersection widening NB ramp terminals) (TPW; 2006)
  - Highway 102 at Kearney Lake Road, Geometry Layout and Road Signs (improvements to N-E/W ramp terminal and provision of turning lanes for E/W-S ramp) (TPW; 2003)
  - Highway 102 - Intersection of SB Ramps at Kearney Lake Road (TPW; 1991)

- HRM functional sketches: Bayers Road Six-Lane (End of Hwy 102 to Connaught) and Bayers Road Five-Lane (with Median Transit Lane)

- Highway 113 functional design plans (AutoCAD)

- Highway 107 extension (option connecting to Highway 102 at Exit 4C) functional design plans (AutoCAD)

- Other Studies
  - Governor Lake Area Transportation Plan (SGE Acres; 2003)
  - Highway 102 Interchanges Operational Assessment (Dillon; 2006)
  - Bayers Lake Interchange Traffic Study (ARTM; 1999)
  - Highway 113: A Demand and Strategic Context Focus Study (Delphi-MRC; 2006)
  - Final Report Traffic Impact Study, Prince's Lodge/Bedford South Master Plan (ARTM; 2000)
  - Wright Avenue Extension and Highway 118 Interchange Traffic and Functional Design Review (BA Group; 2004)
  - Bedford West Master Plan: Transportation Study (Delphi-MRC; 2004)
  - The Courtyards at Paper Mill Lake Traffic Impact Study (O'Halloran Campbell Consultants; 2004)
  - Northgate Development Traffic Impact Study (Terrain Group; 2006)
  - Butler Property Final Report Traffic Impact Study (Atlantic Road and Traffic Management; 2003)

- Traffic count information described in Attachment A which includes screenline data counted in 2006 for HRM's QRS II model.

2.4.3 Provide review comments and respond to questions in a timely manner.

2.5 Reporting Requirements and Procedures

The activities, schedules and outcomes of all three components of the study are interrelated and, where appropriate, certain activities should be combined for efficiency. However, the three project components (Traffic Projections, Highway 102 Upgrades and Highway 107 Extension) are to be reported separately. Each of the three final reports will be uniform in appearance, referenced as a set but each stand alone.

In person meetings will be required at the initiation of each study component, following the submission of each interim report and following the submission of each draft final report. For Component 1 - Traffic Projections, there will also be a meeting to confirm the traffic and population projections to be used in the models. For Component 2 - Highway 102 Upgrades, a four-day functional planning working session with TPW and HRM staff is to be scheduled along with two additional meetings: (1) post working session; and (2) pre-public consultation. Not including the four-day working session, this amounts to 11 (eleven) in person meetings throughout the course of the project although the schedule may allow for some meetings to be combined. All in person meetings will be held in HRM. The Consultant shall meet with the project Steering Committee within two weeks of notification of project award. The purpose of this initial meeting is to finalize the study requirements, data requirements, study methodologies, etc. It is expected to also serve as the Traffic Projections study component initiation meeting.

Written, biweekly progress updates are to be submitted to the Project Steering Committee Chair. These reports will review progress of the previous reporting period, forecast the work of the upcoming period, identify any changes to the schedule and highlight any issues that may have arisen during the period or are expected to arise.

The Consultant shall provide six (6) copies of each interim and draft final reports including drawings and sixteen (16) bound copies and one (1) unbound copy of each final report including drawings. All copies of the interim and final reports shall be on letter size paper and appropriately titled. The draft final reports must be submitted for comment and possible amendments before the final versions are submitted. The consultant must be prepared to submit second draft final reports if required. The Consultant shall provide two (2) electronic copies of each final report on CD compatible with WordPerfect 11 including all plans (compatible with AutoCAD 2000), tables, diagrams, figures, modelling data files and pictures. All interim, draft final and final reports, including tables, drawings, figures, pictures and diagrams, are to be submitted in PDF in addition to the above requirements.

Required copies of the interim and draft final reports shall be submitted 5 working days prior to the interim and final draft meetings. The final reports shall include executive summaries and reference lists. All reports shall contain copies of functional design plans as specified in Section 2.3 Detailed Technical Requirements. The Terms of Reference shall be attached as an appendix to the final reports.

2.6 Project Management

A Project Steering Committee will administer the technical and analytical work of the Consultant. The team will consist of representatives from TPW and HRM. The Consultant will report to the Project Steering Committee Chair, who will be responsible for overall administration of the study.

Acceptance and approval of the work will take place after the Project Steering Committee has been satisfied that the requirements, as specified in the contract, have been met.

2.7 Project Schedule

The Consultant shall meet with the Project Steering Committee within two (2) weeks of notification of contract award. The overall study shall be completed and the required copies of the final reports presented within twelve (12) months of contract award. Please note: The functional design and access management plan recommendations for the Highway 102/Hammonds Plains Road interchange must be completed as soon as is possible and no later than August 3, 2007.

2.8 Enquiry Contacts

All enquiries related to this Request for Proposal are to be directed to the following person. Information obtained from any other source is not official and may be inaccurate. Enquiries and responses may be recorded and may be distributed to all proponents at the Province's option.

Department Contact:
Janice Harland, P.Eng.
1672 Granville Street
Halifax, NS B3J 3Z8
Telephone: 902-424-4206
Fax: 902-424-0571
Email: harlanja@gov.ns.ca

Procurement Contact:
Terry Peitzsche, Procurement Group Supervisor
6176 Young Street, Suite 200
Halifax, NS B3K 2A6
Telephone: 902-424-8069
Fax: 902-424-0780
Email: peitzsct@gov.ns.ca

2.9 Contract

The standard legal contract that applies to services is available at: http://www.gov.ns.ca/tenders/policy/htm_files/contract.htm. This document will be updated (as a part of the award process) to include the vendor name, contact information, maximum amount payable, dates, etc. Schedule A will be updated to reference the tender documents (including addenda) and the Proposal submitted by the successful supplier, and may be expanded to reference any correspondence or clarifications. Schedule B will be updated to describe the payment/invoicing schedule and the project work plan (if any).

In addition to the above, the following changes will also apply to this standard contract.

Payment Schedule: Payments for professional services rendered will be made monthly in arrears upon receipt of invoices detailing work completed, and subject to the following conditions.
(a) Monthly payments will be issued for up to 90 percent of the amount invoiced. The remaining amount will be paid upon completion and acceptance of the work.
(b) Receipts shall be provided for all expenses if requested.

Insurance: The Consultant shall at his cost maintain such insurance and pay such assessments as will protect the Consultant and the Minister from any claims under the Worker's Compensation Act and from any other claims for damages for bodily injury, personal injury, sickness or disease, including death, or property damage which may arise from operations under the Agreement. The limits of such insurance shall not be less than $2,000,000.00 on an occurrence (not claims made) basis except where noted below. Coverages to be in form and content acceptable to the Minister. Insurance coverage shall include Commercial General Liability insurance covering premises and operations liability, with extensions of coverage to include:

- The Minister as an Additional Named Insured;
- Cross Liability Clause;
- Contractual Liability;
- Employers Liability;
- Completed Operations Liability maintained for a period of not less than twelve (12) months after the completion of the term of the Agreement;
- Non-owned Motor Vehicle Liability;
- Certification of coverage being applicable to the specific Work;
- Broad Form Property Damage;
- Contractors Protective Liability;
- Professional Liability Insurance in an amount not less than $2,000,000.00 insuring his liability for errors and omissions in the performance of his professional services including all Sub-consultant services (This may be on a claims-made basis.); and
- Automobile Liability insurance insuring all licensed vehicles owned, leased or operated by the Consultant in an amount not less than $1,000,000.00.

All insurance policies shall be endorsed to provide a minimum advance written notice of not less than 30 days, in the event of cancellation, termination or reduction in coverage or limits, such notice to be made by the Insurer to the Minister.

The Consultant shall not do or omit to do or suffer anything to be done or omitted to be done which will in any way impair or invalidate such policies or insurance.

Proponents who require any alteration to this standard agreement must indicate the specific changes required in their response, and the extent of the deviations from the standard contract will be taken into account when evaluating proposals. Proponents requesting multiple, major changes to the proposed contract risk having their score reduced, or even disqualification, so amendment requests should reflect vital changes only.

2.10 Consultant Expertise/Eligibility

The project team shall have considerable experience and knowledge in planning, transportation planning, traffic engineering, highway design (particularly interchange design experience) and benefit/cost analysis. The engineering principal shall be registered with the Association of Professional Engineers of Nova Scotia (APENS).

Prospective proponents are not eligible to submit a proposal if current or past corporate or other interests may, in the Province's opinion, give rise to a conflict of interest in connection with this project.

The successful proponent may be required to demonstrate financial stability and may be required to register to conduct business in Nova Scotia.

The Consultant must hold a Letter of Good Standing from an occupational health and safety organization which meets the requirements of the Nova Scotia Environment and Labour (NSEL) or the Workers' Compensation Board of Nova Scotia (WCB), regarding participation in the Occupational Health and Safety External Audit Program, leading to the issuance of a Certificate of Recognition jointly by the occupational health and safety organization and the NSEL or WCB.

The Letter of Good Standing must have a clear expiry date and must be signed by an official of the occupational health and safety organization. If the Letter of Good Standing expires before the completion of the Agreement, a further letter will be required before the time of expiration which indicates that the contracted party continues to actively participate in the occupational health and safety organization's Certificate of Recognition or Safety System Accreditation Program. If a further letter is not provided, this may be regarded as sufficient cause for voiding the Agreement.

The successful Proponent will be expected to develop a safety plan for the project, to be reviewed by the Project Management Team. This plan must deal with hazard recognition, assessment and control, provision of first aid services, and handling of emergencies and it must meet all requirements prescribed by the Occupational Health and Safety Act and regulations. The safety plan is to be reviewed and accepted by the Project Steering Committee prior to any field work commencing.

Prior to award, the selected consultant shall provide insurance documentation for review by the Department. Confirmation of acceptable coverage is required prior to award of the work.

2.11 Liability for Errors

While considerable effort to ensure the accuracy of the information in this Request for Proposal has been made, the information contained in this Request for Proposal is supplied solely as a guideline to Proponents. The information is not guaranteed or warranted, nor is it necessarily comprehensive or exhaustive.

2.12 Extra Work

The Consultant may be required to undertake additional work not specified in the contract. Prior to starting this additional work, the Consultant shall submit a detailed breakdown of the costs, including all expenses, to complete the extra work and obtain written approval from the project Steering Committee.

2.13 Addenda and Amendments

Amendments to the submitted offer will be permitted if received in writing prior to bid closing and if endorsed by the same party or parties who signed the original offer.

Addenda may be issued during the bidding period. All addenda become part of the contract documents. Proponents are responsible for receiving all addenda and including them in the submitted tender documents. All addenda are to accompany each proposal. Proposals that do not contain all the addenda may be immediately returned and the proponent eliminated from further consideration.

Any required addenda will be issued no later than five (5) working days before the date set for receipt of proposals. Verbal answers are only binding when confirmed by written addenda.

2.14 Post Performance Evaluation

The Department will be evaluating the performance of the selected consultant. The evaluation methodology and criteria will be provided to the selected consultant prior to project award.

3.0 Evaluation Criteria

Proposals shall be evaluated based on the "Government Procurement Process: Architects and Professional Services".

The criteria for evaluating proposals, based on technical and managerial merit, will be made based on the following categories and weights.

Qualification and Experience of Corporate Proponent and Individual Team Members on Similar Projects	40 points
Understanding of Objectives/Proposed Methodology	40 points
Project Management	5 points

Accepted proposals will first be evaluated on the basis of their technical and managerial merit and then on the basis of price. The technical submission shall be rated as shown above, out of 85 points, and the remaining 15 points shall be allotted based on price. Only those proposals achieving an aggregate score of 68/85 (80%) or greater will have their sealed cost envelopes opened. The lowest price shall be awarded 15 points (all prices within 5% will receive the same price points). The next lowest price (beyond 5%) will receive 12 points. Points for other submissions will be assigned with 3 fewer points for each successively higher priced price proposal. But again, each time the same score will be awarded if successive prices are within 5% of the last highest price. The proposal with the highest total points will be awarded the contract. Proposals not meeting the required 68/85 will have their unopened cost envelopes returned.

Notwithstanding the technical/managerial and price scores, the Department of Transportation and Public Works reserves the right to reject any proposal where prices are deemed unreasonable relative to other prices bid, typically a 25% variance from the average qualified bid (excluding the bid in question).

TPW reserves the right to negotiate any or all conditions of the Consultant's proposed work plan and reject all submitted proposals. Unsuccessful proponents may request a debriefing meeting following execution of a contract with the successful proponent.

4.0 Proposal Content and Response Guidelines

Failure to provide information outlined in this section may result in disqualification.

Six (6) copies of your proposal (fax copies are not acceptable) are to be delivered by 2:00 pm local time, Tuesday, January 9, 2007 to:

Public Tenders Office
6176 Young Street, Suite 200
Halifax NS B3K 2A6
Tender: 60130901

Proposals and their envelopes should be clearly marked with the name and address of the proponent, the Tender number, the project title and the closing date and time. A public opening will be held on, Tuesday, January 9, 2007 at 2:30 pm local time at the Public Tenders Office. Late proposals will not be accepted and will be returned to the proponent.

Proponents are solely responsible for their own expenses in preparing, delivering and presenting a proposal and for subsequent negotiations with the Province, if any. Proposals must be open for acceptance for at least 90 days after the closing date. Upon acceptance, prices will be firm for the entire contract period unless otherwise specified.

To facilitate efficient review of the proposals, proponents are requested to use the following format. The proposal shall be organized into four chapters and such chapters limited where indicated.

Chapter 1 - Introduction/Project Understanding

This chapter shall include a demonstration of project understanding and insight into its objectives, including potential issues and challenges.

Chapter 2 - Methodology

This chapter is to include the following information.

- List of all information and data sources available to the Consultant and expected to be used in the Study.
- Detailed work plans that identify proposed methodologies including field work. Each of the three project components (Traffic Projections, Highway 102 Upgrades and Highway 107 Extension) are to addressed separately and the interaction/coordination among the activities of the three components are to be identified.
- A single overall project schedule that incorporates the schedules for each of the three project components. The schedule for each component should be easily identifiable within the overall project schedule.
- A project team organization chart with the role of each team member in the study clearly described.

- Time commitment (based on an eight hour day) for each team member for each component of the project.

- Draft tables of contents for the final reports.

Chapter 3 - Project Management

This chapter is to include a discussion of the project management measures and practices that will be used in carrying out the project addressing items such as quality assurance/quality control, cost control and scheduling.

Chapter 4 - Qualifications

This chapter is to include the following information.

- Corporate profile(s) and client references. This shall be a maximum of five pages.

- A summary of relevant corporate (including sub-consultant) experience including project dates. This shall be a maximum of ten pages.

- A summary of project team members' (including sub-consultants') experience in areas related to these terms of reference. This summary shall be a maximum of four pages per team member, and focus on the team member's relevant education and experience. Education and experience descriptions must be supported with dates and a clear description of the person's role in the project experience. Curricula vitae of team members, may be included in an appendix but the proposal evaluation team is not obligated to review or consider this information.

- A brief statement (maximum of 4 pages) explaining why the Proponent is uniquely qualified for this project.

Copies of insurance and safety certification certificates are not required as part of the proposal, but shall be provided by the selected Consultant prior to award of the contract.

One copy of the cost proposal shall be provided, separately sealed in an envelope. The cost proposal shall separately identify the cost (labour and expenses) of each of the three project components as part of the total study cost. The costs for each of the three components shall be upset limit prices and include labour costs, related expenses, printing costs and professional services obtained outside of the firm. In order to assess level of effort and staff roles, time commitments for all team members (excluding labour costs) shall be included in the main body of the proposal. Prices quoted are to be in Canadian dollars and exclusive of federal and provincial taxes. Expenses shall not exceed Nova Scotia provincial rates ($0.3885/km, breakfast $6.00, lunch $12.00, supper $20.00, incidentals $5.00 per night).

By submitting a proposal, the proponent warrants that all components required to deliver the services requested have been identified in the proposal or will be provided by the Consultant at no additional charge. The technical proposal must be signed by the person(s) authorized to sign on behalf of the proponent and to bind the proponent to statements made in response to this Request for Proposal.

5.0 Proponent Checklist

This checklist has been provided solely for the convenience of the proponent. Its use is not mandatory and it does not have to be returned with the proposal.

- ❑ The requirements of the Request for Proposal have been read and understood by everyone involved in putting together the proposal.
- ❑ The Nova Scotia Request for Proposals (RFP) form that is a part of the Request for Proposals has been signed and included with the Proposal documents.
- ❑ The proposal explicitly addresses everything asked for in the Request for Proposal.
- ❑ The proposal meets all the mandatory requirements of the Request for Proposal.
- ❑ Qualified Nova Scotia based products and services have been identified as an element of the proposal offering.
- ❑ The proposal clearly identifies the proponent, the project, and the Request for Proposal number.
- ❑ The proponent's name and the Request for Proposal number appear on the proposal envelope.
- ❑ The appropriate number of copies of the proposal have been made. (Proposals without the correct number of copies may be rejected.)
- ❑ Every care has been taken to make sure the proposals are at the closing location in plenty of time, as late proposals will be rejected.

APPENDIX B
Alignment Options

Topographic Planning Map

Highway 107 Extension

Designed by: HP&D					NOVA SCOTIA	Scale: 1:10 000	Highway 107 Extension
Surveyed by:					Transportation and Infrastructure Renewal	Date: November, 2007	Option 1
Drawn by: RBM						File No. :	Hwy 107 Halifax Co.
Checked by:						Sheet No. : 1 of 2	Topographic Planning Map
Approved by:			MK.	DATE	REVISION		

Topographic Planning Map

Highway 107 Extension

Designed by: HP&D					NOVA SCOTIA Transportation and Infrastructure Renewal	Scale: 1:10 000	Highway 107 Extension Option 2
Surveyed by:						Date: November, 2007	Topographic Planning Map
Drawn by: RBM						File No. :	
Checked by:						Sheet No. : 2 of 2	Hwy 107 Halifax Co.
Approved by:			MK.	DATE	REVISION		

Meeting Notes

Progress Meeting No. 7 of the Steering Committee

Bayers Road / Highway 102 Corridor Study / FILE 20639 / 3

Date of Minutes: Tuesday, March 11, 2008

Date of Meeting: Friday, March 7, 2008

Place/Time: Stantec offices / 10 am to 1:30 pm

Next Meeting: TBD

Attendees:

Name	Group	Contact Information
Dwayne Cross	NSTIR	424-2940, crossdw@gov.ns.ca
Mike Croft	NSTIR	424-3548, mcroft@gov.ns.ca
Brian Ward	NSTIR	424-5328, wardbr@gov.ns.ca
Phil Corkum	NSTIR	424-3508
Dave McCusker	HRM	490-6696, mccuskd@halifax.ca
B.Landry	Stantec	434-7331, bernadette.landry @stantec.com
P. Chouinard	Stantec	434-7331, pat.chouinard@stantec.com

Absentees:

Name	Group	Contact Information
J. Copeland	Delphi	

Distribution: Attendees, absentees and others as required. B. Landry to distribute to consulting team. D. Cross to distribute to Steering Committee.

Item: **Action:**

1.0 Introduction

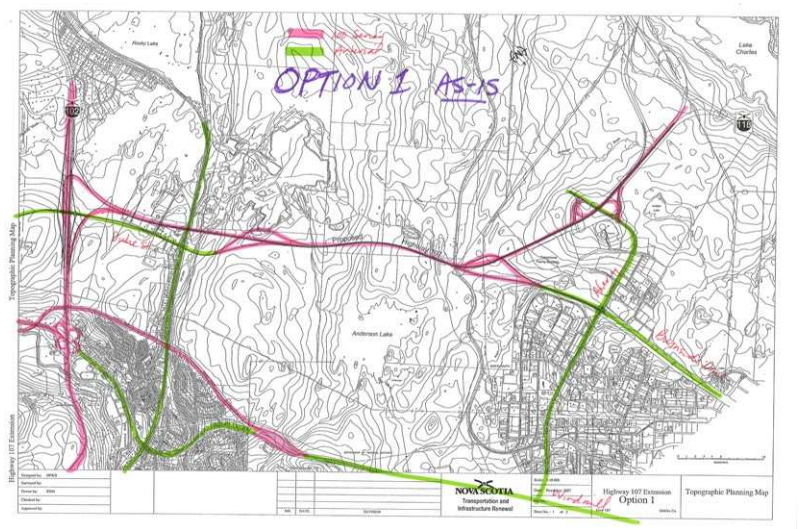
Purpose of this meeting:

- To review and establish alternative alignments for Highway 107.

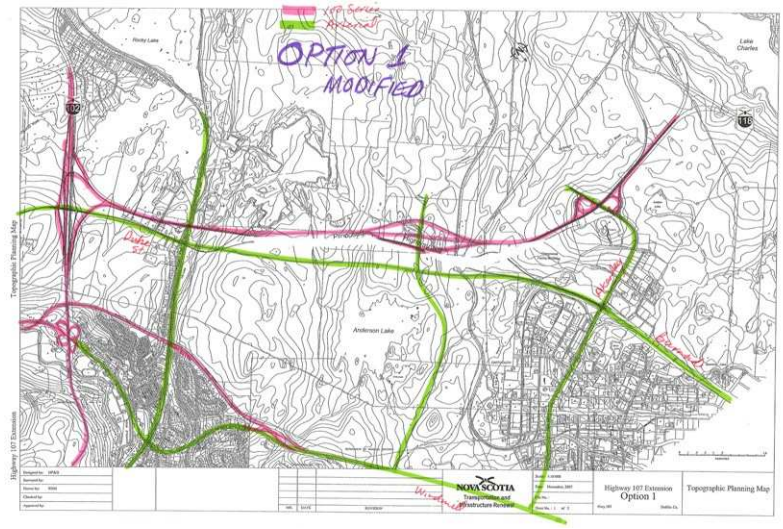
2.0 Highway 107 Alignments

Sketches as prepared by Stantec and submitted on Thursday February 28, 2008 were distributed and reviewed. Bernadette summarized the sketches and noted that they are meant for consideration along with other possible configurations. One of the main factors for consideration is the connection to Windmill Road. As previously advised by Delphi, the volumes through the dual roundabout will be a problem. The sketches showing the 100 series (pink) and the Arterial roads (green). The arterial network and future land development / access needs to be considered. and that this will influence the location and design of connection points These and possibly other scenarios should be tested in the model

OPTION 1 – 107 CONNECTION TO EXIT 4C

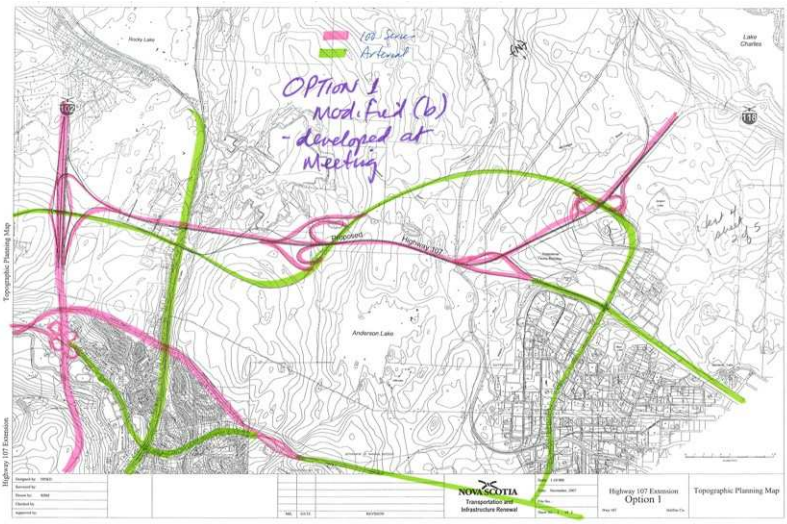


Option 1 as-is: Arterial roads that end in ramps to highways is poor practice and doesn't show consideration for future land access. Arterial roads should be continuous.

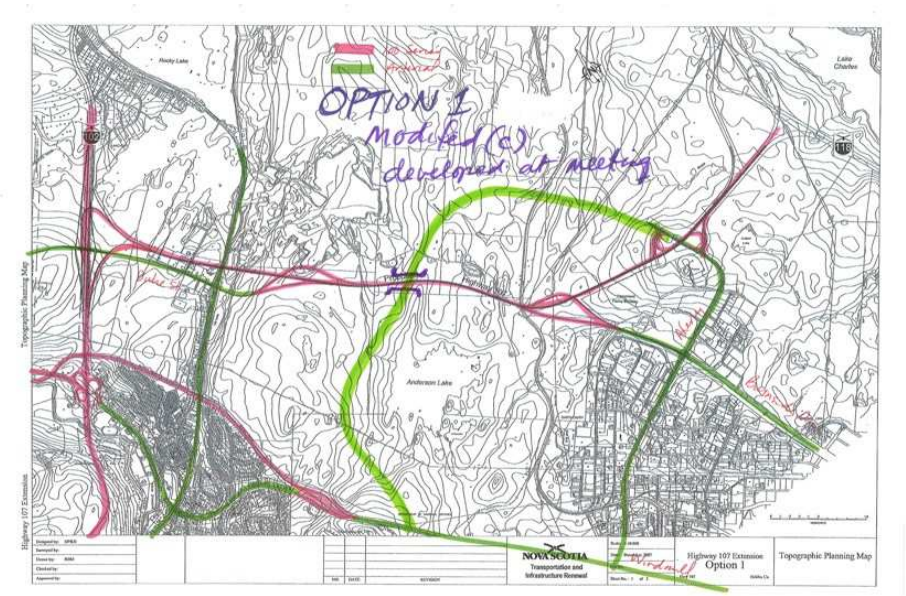


Option 1 modified: New continuous arterial road system with link between Duke Street and Burnside Drive. This option results in a lot of extra road network to be constructed, but it may be able to be phased in. Arterial Roads are separate from the highway.

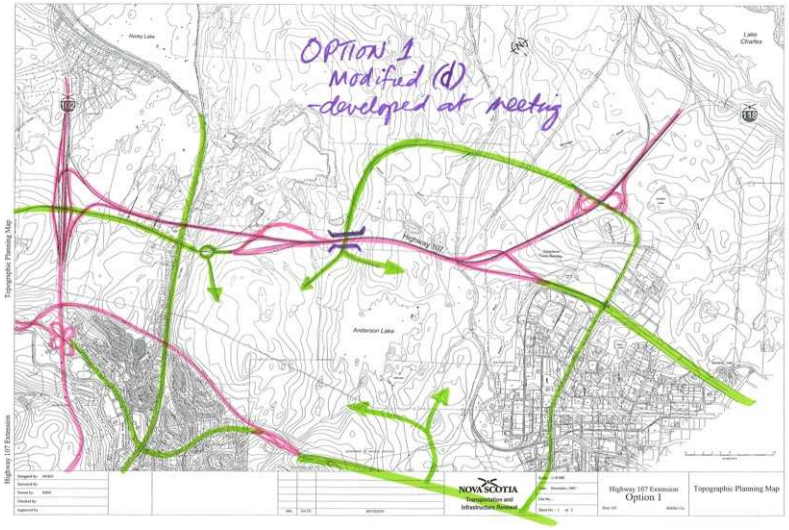
Option 1 alternatives above were reviewed were reviewed and it was noted that the Akerley extension is the proposed land access point to new development and the parclo needs to stay as shown. Three additional options were developed as follows:



Option 1 modified (b) was suggested. Duke Street to Akerley would be continuous as arterial.



Option 1 modified (c) was suggested. The grade separation allows for future land access from Akerley.

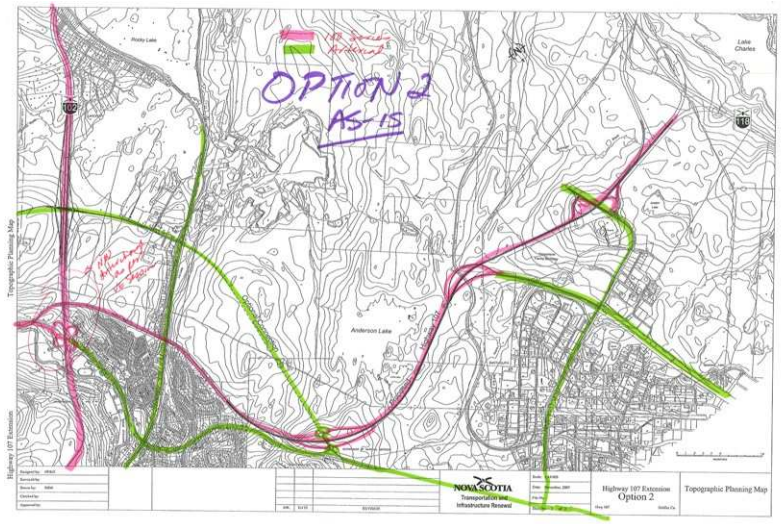


Option 1 modified (d) was selected as the preferred alternative to proceed. The grade separation allows for future land access from Akerley. An intersection (possibly a roundabout) allows for a future connection from Duke to Windmill.

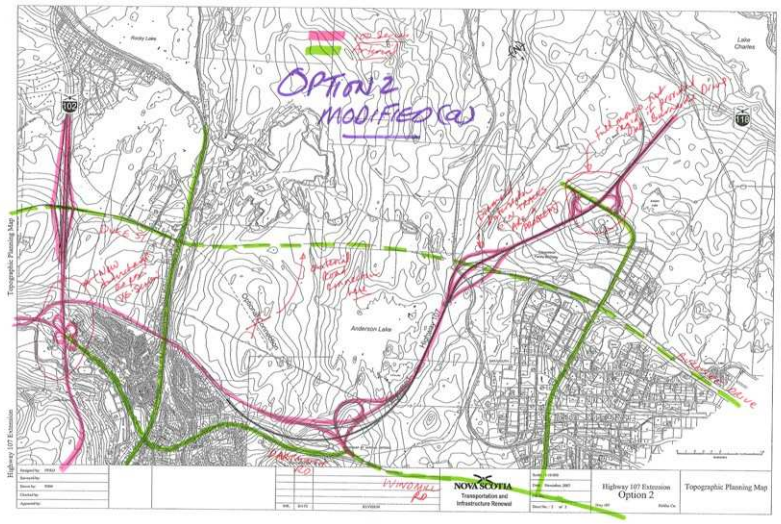
OPTION 2 – DIRECT CONNECTION TO 101 / 102

Some general comments made regarding the option 2 connections

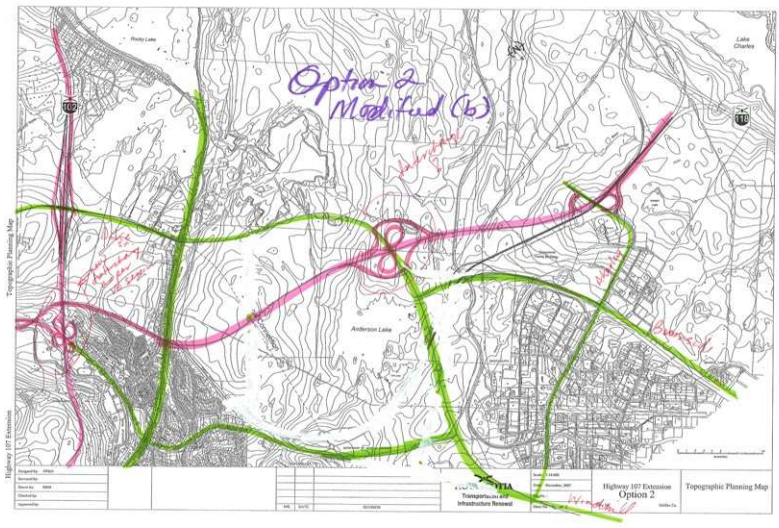
- The common problem for option 2 alternatives is the complex connection at 101 / 102 / 107 as studied in the VE session.
- Traffic suggests that free-flow from Windmill to 107 is required. Stantec to confirm with Delphi if the optional connection was modeled in this analysis. If not, perhaps the optional connection would relieve the heavy left turns at the diamond interchange.
- Since the original option shows that Burnside would have directional ramps, does this mean that free-flow movement is also essential for this interchange? Stantec to confirm with Delphi.



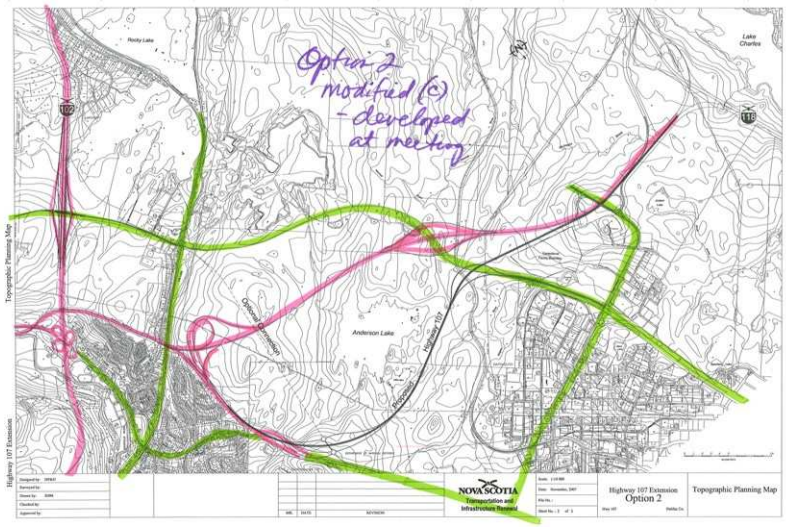
Option 2 as-is: Windmill road traffic through two roundabouts will be difficult to accommodate.



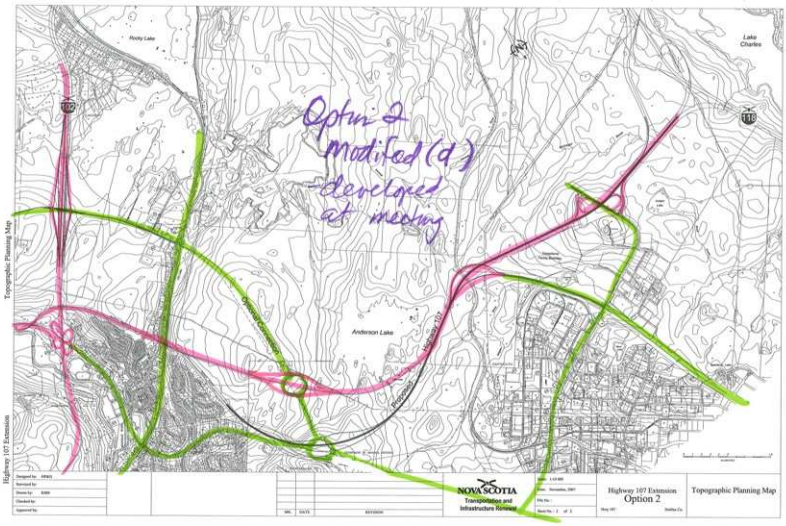
Option 2 modified (a) – this shows a trumpet configuration at Windmill as well as the “optional connection” moved to be a link between Duke and Burnside Drive. The objective is to provide a free-flow movement from Windmill to the 107.



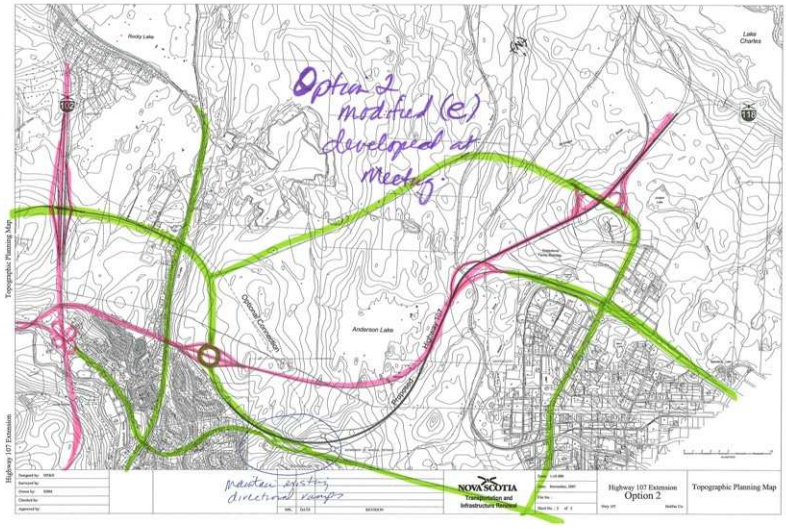
Option 2 modified (b) – this shows a new option with another arterial road network. A lot of road construction would be required to provide key connections.



Option 2 Modified C - developed at the meeting. Provides freeflow from Windmill to 107. Makes use of existing Bedford Bypass infrastructure. Duke Street would connect with Burnside Drive.



Option 2 Modified (d) - developed at the meeting. Provides freeflow from Windmill to 107. Does not make use of existing Bedford Bypass infrastructure which is a significant drawback.



Option 2 Modified (e) - developed at the meeting. This alternative was selected as the preferred alternative at the meeting. Provides freeflow from Windmill to 107, but through roundabout interchange. Stantec to confirm with Delphi how this would be modeled. Makes use of existing Bedford Bypass infrastructure. Initial construction could be limited to 100 series roadway as well as link between Duke Street extension and the roundabout interchange.

3.0 Summary

Option 1, modified (d) was selected as preferred to proceed for the Component 3 analysis

Option 2, modified (e) was the preferred option 2 alternative and selected to proceed to Component 3 analysis.

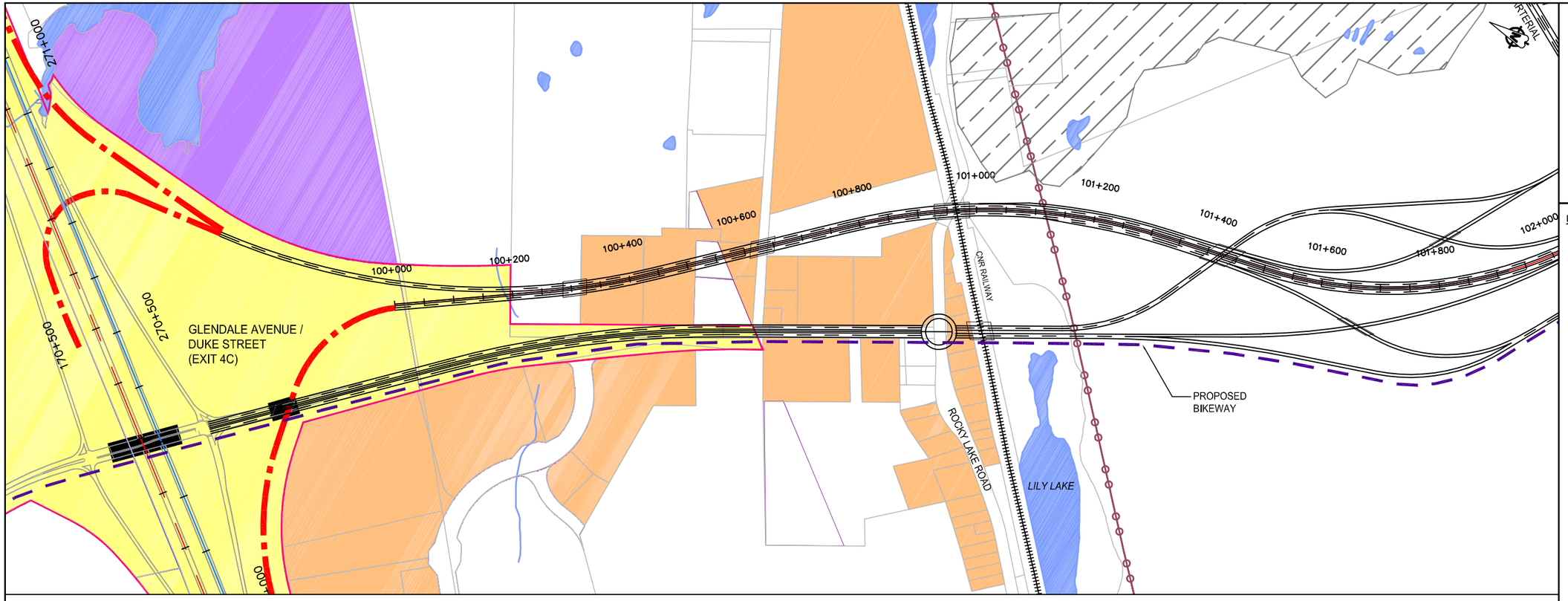
Stantec / Delphi to complete proposal on this basis.

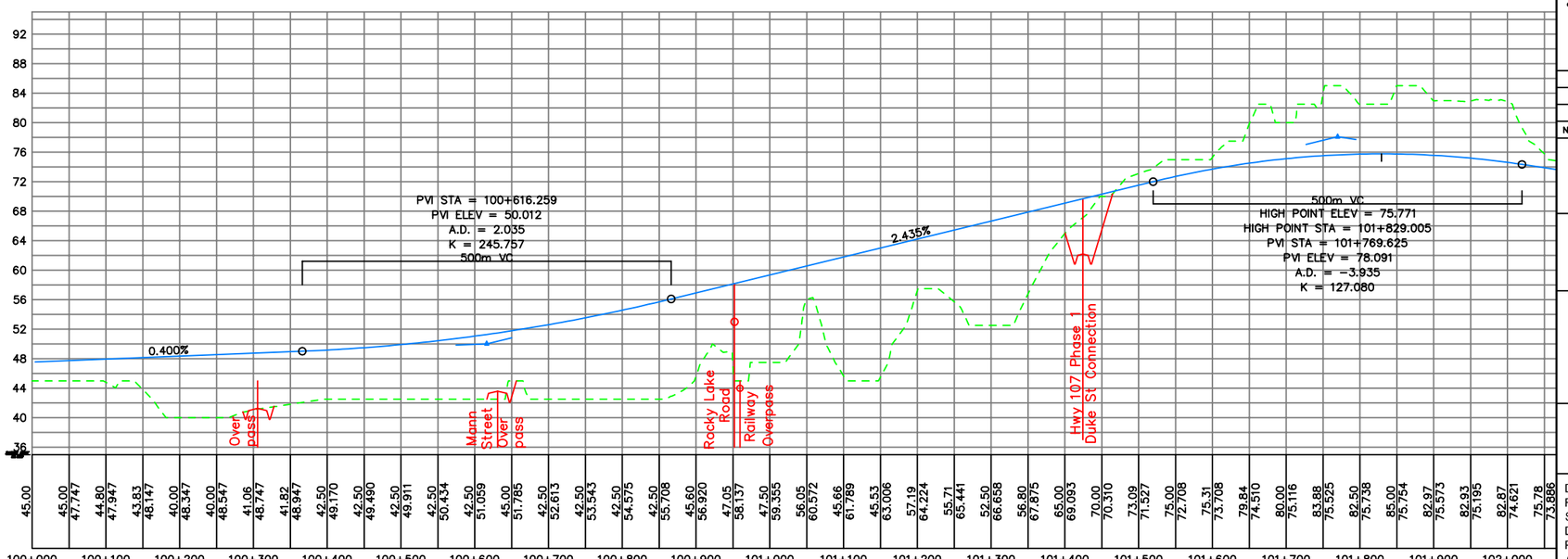
The meeting adjourned at approximately 1:30 pm and meeting regarding 102 commenced (minutes recorded separately).

Bernadette Landry
Project Manager
Stantec (formerly Neill & Gunter)
Ph: (902) 434-7331, ext 1352
Fax: (902) 462-1660
Mailing Address:
130 Eileen Stubbs Avenue, Suite 1 South
Dartmouth, Nova Scotia, B3B 2C4
bernadette.landry@stantec.com
stantec.com

The foregoing is considered to be a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

APPENDIX C
Functional Plans





LEGEND:

- LAYOUT PLANS
- WATER COURSE / WATER BODY
- TRANSMISSION LINE
- CN RAIL
- SEWER LINE
- WATER LINE
- ROW
- STRUCTURES
- BARRIER WALL
- RAISED CURB
- PROPOSED BIKEWAY
- ROCK OUTCROPS
- PITS & QUARRIES
- TPW / HRM TRANSPORTATION CORRIDORS
- HRM PROPERTY
- EXISTING DEVELOPED LAND
- RECREATIONAL
- 3 - BRIDGE NUMBER

SOURCE:

- Mapping Data Received from Service NS, HRM and TPW;
- Bikeway Routing Received from HRM Active Transportation Plan;
- Land Use Information Derived from Aerial Photography Interpretation;

No.	Date	Revision Description	Appr'd

NOVA SCOTIA Transportation and Infrastructure Renewal

HALIFAX REGIONAL MUNICIPALITY

Stantec

Highway 107 Corridor

CONSTRAINTS PLAN PLAN 1

DWG No.	SK-0004
REVISION:	A
SCALE:	1:7500
DATE:	FEB. 6, 2009
PRODUCED BY:	JRC
APPROVED BY:	

Nov 06, 2009 9:53am jclark

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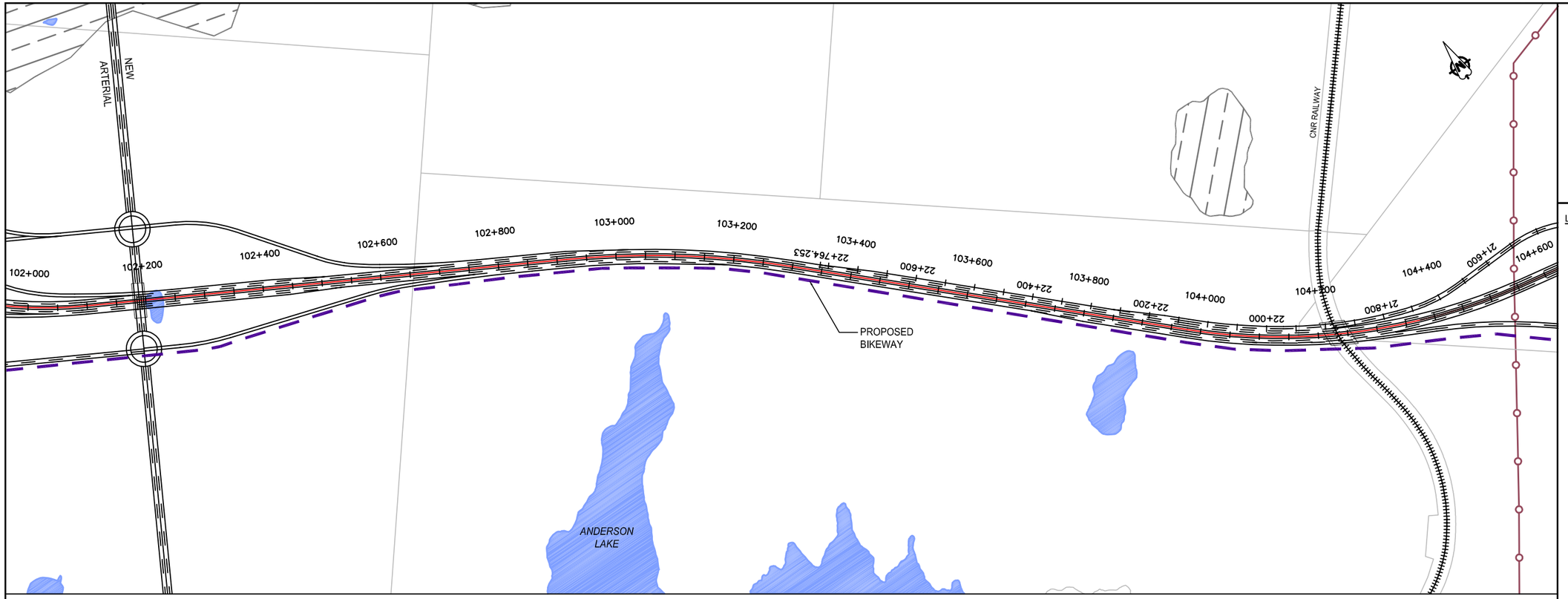

LEGEND:

- LAYOUT PLANS
- WATER COURSE / WATER BODY
- TRANSMISSION LINE
- CN RAIL
- SEWER LINE
- WATER LINE
- ROW
- STRUCTURES
- BARRIER WALL
- RAISED CURB
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- HRM PROPERTY
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- Mapping Data Received from Service NS, HRM and TPW;
- Bikeway Routing Received from HRM Active Transportation Plan;
- Land Use Information Derived from Aerial Photography Interpretation;

No.	Date	Revision Description	Appr'd

NOVA SCOTIA Transportation and Infrastructure Renewal

HALIFAX REGIONAL MUNICIPALITY

Stantec

Highway 107 Corridor

CONSTRAINTS PLAN PLAN 2

DWG No.	SK-0004
REVISION:	A
SCALE:	1:7500
DATE:	FEB. 6, 2009
PRODUCED BY:	JRC
APPROVED BY:	

Nov 06, 2009 9:54am jclark

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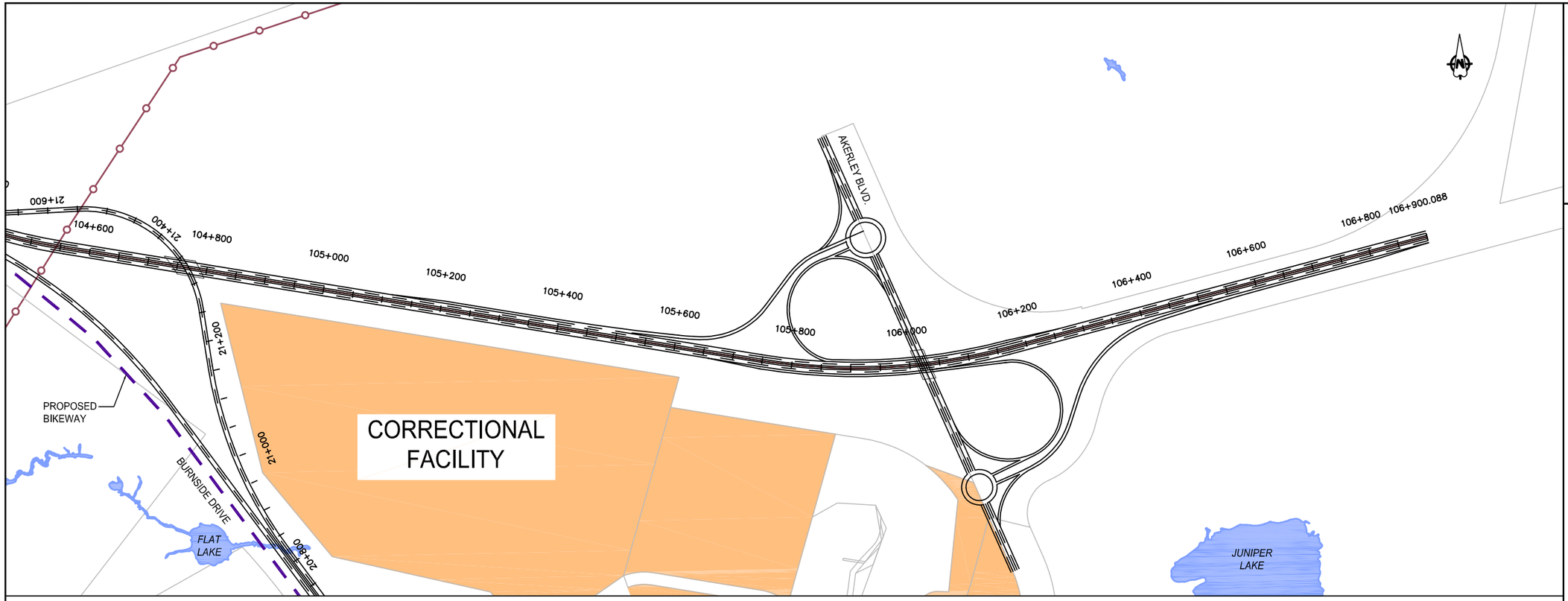

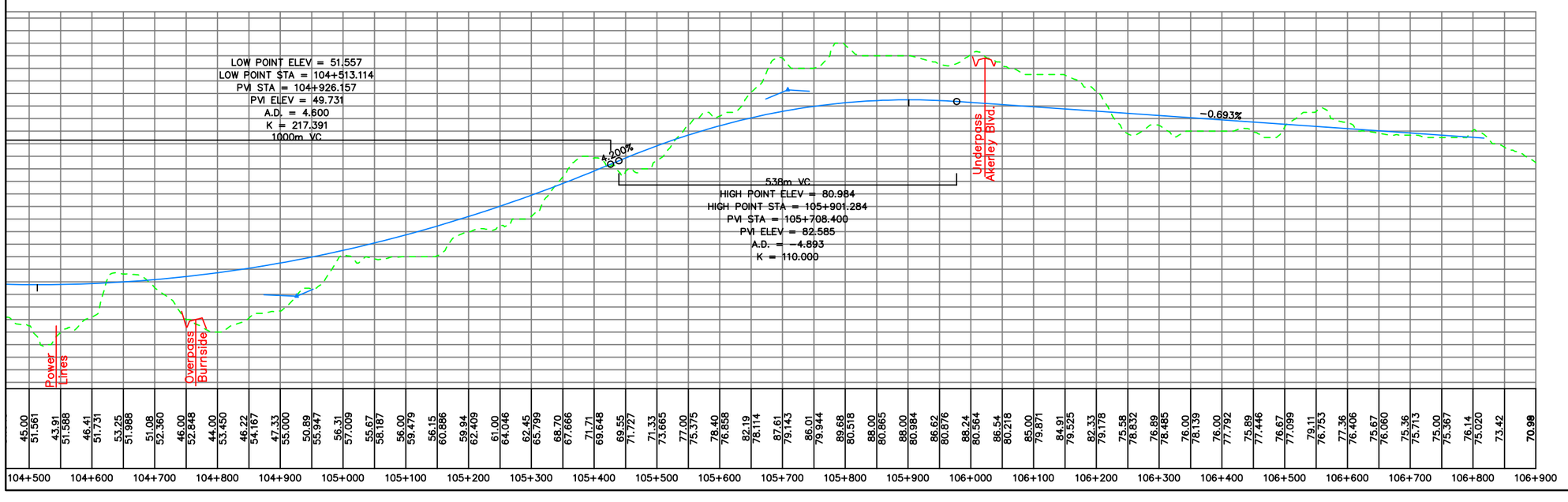

LEGEND:

- LAYOUT PLANS
- WATER COURSE / WATER BODY
- TRANSMISSION LINE
- CN RAIL
- SEWER LINE
- WATER LINE
- ROW
- STRUCTURES
- BARRIER WALL
- RAISED CURB
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- HRM PROPERTY
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- 3 - BRIDGE NUMBER

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- Bikeway Routing Received from HRM Active Transportation Plan;
- Land Use Information Derived from Aerial Photography Interpretation;

No.	Date	Revision Description	Appr'd

NOVA SCOTIA Transportation and Infrastructure Renewal

HALIFAX REGIONAL MUNICIPALITY

Stantec

Highway 107 Corridor

CONSTRAINTS PLAN PLAN 3

DWG No.	SK-0004
REVISION:	A
SCALE:	1:7500
DATE:	FEB. 6, 2009
PRODUCED BY:	JRC
APPROVED BY:	

Nov 06, 2009 9:54am jclark

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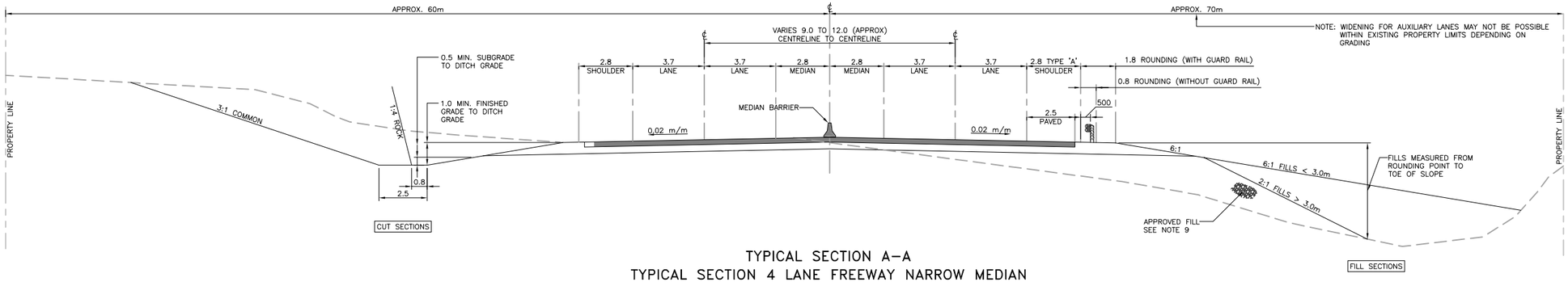


TYPICAL SECTION A–A
TYPICAL SECTION 4 LANE FREEWAY NARROW MEDIAN
HIGHWAY 107

SCALE: N.T.S.

Topographic Planning Map

Highway 107 Extension

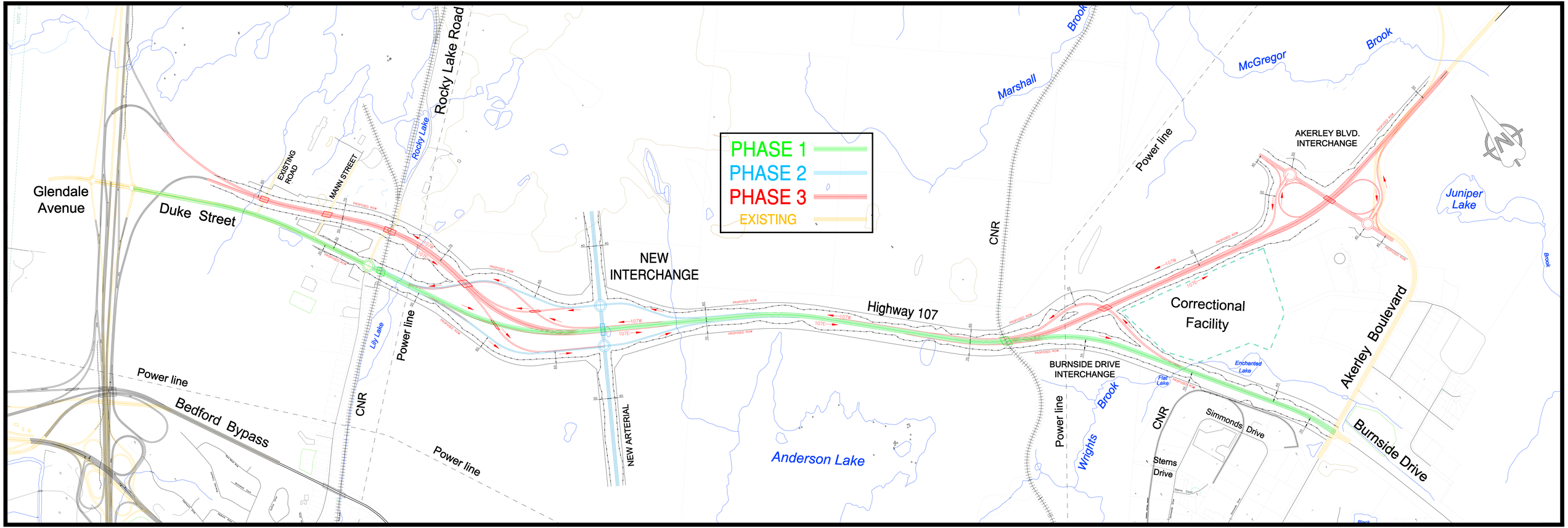
PRELIMINARY
(not for construction)

GREEN Phase 1(a): Duke St to Burnside Dr (no access along alignment)
BLUE Phase 1(b): Optional Land Access via Interchange
ORANGE Phase 2(a): Completion of Highway 107 (Hwy 102 end)
Phase 2 (b): Completion of Highway 107 (Burnside end)

Designed by: HP&D				NOVA SCOTIA Transportation and Infrastructure Renewal	Scale: 1:10 000
Surveyed by:			MK.	DATE	REVISION		Date: January, 2009
Drawn by: RBM							File No. :
Checked by:							Sheet No. : 1 of 2
Approved by:							

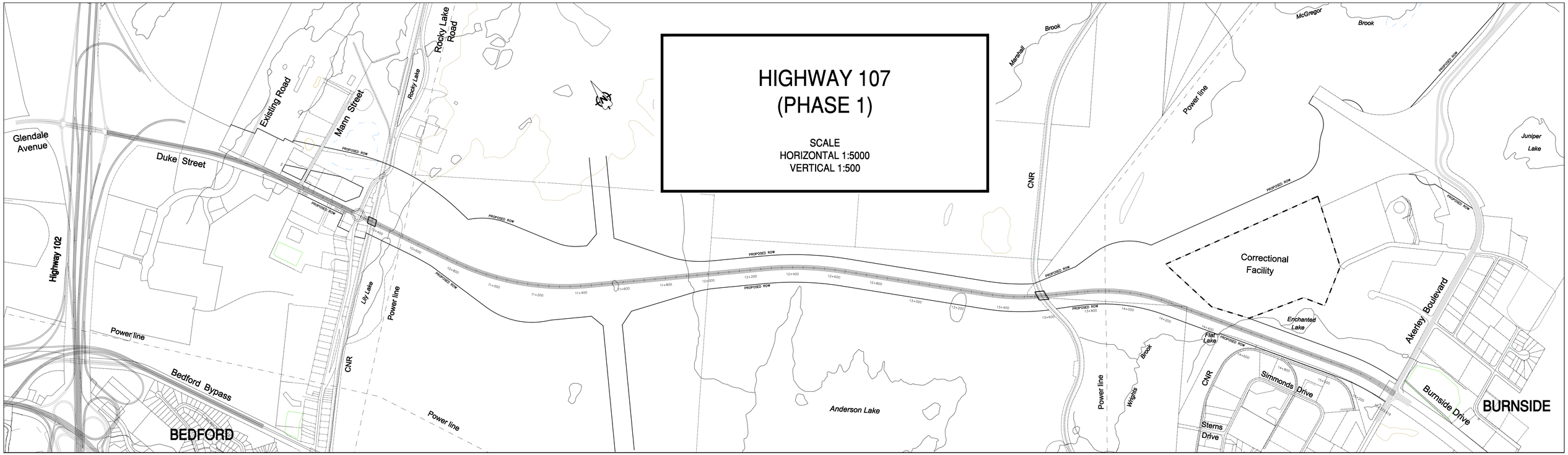
Highway 107 Extension
Option 1A
Hwy 107 Halifax Co.

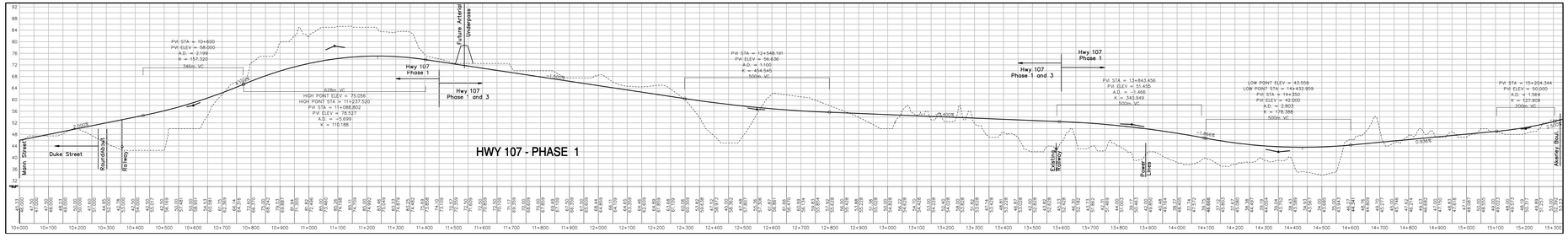
Topographic Planning Map



HIGHWAY 107 - PHASING

SCALE 1:4000


HIGHWAY 107
(PHASE 1)
SCALE
HORIZONTAL 1:5000
VERTICAL 1:500
Glendale Avenue
Duke Street
Highway 102
Existing Road
Mann Street
Rocky Lake Road
Rocky Lake
PROPOSED ROW
Lily Lake
Power line
CNR
Bedford Bypass
BEDFORD
Anderson Lake
Marshall Brook
McGregor Brook
Juniper Lake
Correctional Facility
Enchanted Lake
Flat Lake
Akerley Boulevard
Simmonds Drive
Burnside Drive
Sterns Drive
Wrights Brook
BURNSIDE


HWY 107 - PHASE 1
Duke Street
Roundabout
Railway
Future Arterial Underpass
Hwy 107 Phase 1
Hwy 107 Phase 1 and 3
Existing Bridge
Power Lines
Akerley Blvd

APPENDIX D
Costing

14.1 Phase 1 Highway 107 (Duke Street Extension)

Item No.	Item / Description	Side	STA	STA	Code	Work Planned	Approx Length m	Average Width m	Unit	Approximate Quantity	Approximate Unit Cost ($)	Approximate Total Cost	Sub-totals
						Description							
14.1.1	Duke St from 4C Ramp to Rocky Lake Road	Lt+Rt	9050	10300	1	Pavement Widening	1250	8	m2	10,000	$90	$900,000	
	- assume existing 3 lane section is widened to 5 lanes	Lt+Rt	9050	10300	5	curb and gutter	2500	N/A	m	2,500	$75	$187,500	
	- asume new urban section with storm sewer and sidewalks	Lt+Rt	9050	10300	6	1.8 m Concrete Sidewalk	2500	N/A	m	2,500	$150	$375,000	
		Lt+Rt	9050	10300	9	Storm Sewer with MH's, CB's - local dr	1250	N/A	m	1,250	$430	$537,500	
		Lt+Rt	9050	10300	4	Excavation - Unclassified - New Construction		N/A	m3	20,000	$14	$280,000	$2,280,000
14.1.2	Highway 107 from Rocky Lake Road to Burnside Drive	N/A	10300	15334	29	4-lane freeway with narrow median	5034	N/A	m	5,034	$2,800	$14,095,200	
	Highway 107 from Rocky Lake Road to Burnside Drive	N/A	10300	15334	4	Excavation - Unclassified - New Constructio	5034	N/A	m3	920,000	$14	$12,880,000	$26,975,200
14.1.2	Intersections												
	Roundabout at New Road and Rocky Lake Road	N/A	N/A	N/A	51	Roundabout	1	N/A	each	1	$100,000	$100,000	
	Changes to Akerley / Burnside Intersection and new signals	N/A	N/A	N/A	50	Intersection Signals	1	N/A	each	1	$150,000	$150,000	$250,000
14.1.3	Structures						Over	Under					
	CNR Crossing No. 1 - just east of Rocky Lake Road	N/A	N/A	N/A	40	Structure	30.4	40	m2	1,216	$3,500	$4,256,000	
	CNR Crossing No. 2 - station 13+600 (Trail or CN??)	N/A	N/A	N/A	40	Structure	37.9	50	m2	1,895	$3,500	$6,632,500	$10,888,500
14.1.4	Trail	N/A	10300	15334	15	3.0 m Wide Trail	5034	3	m2	15,102	$40	$604,080	$604,080
	Sub-Total											**$40,997,780**	**$40,997,780**
	Engineering Costs				70	Allowance for Engineering					0%		$0
	Miscellaneous				71	Miscellaneous Items (culverts, landscaping, paint, signage, etc.)					15%		$6,149,667
	Contingency				72	Design Contingency					0%		$0
	TOTAL												$47,147,447
	ROUNDED												**$47,000,000**

14.1	**Phase 1 Highway 107 (Duke Street Extension)**	**Summary**	6.3	km
1.0	Roadways - Gravels / Asphalt / etc.			$16,949,280
2.0	Mass Excavation			$13,160,000
3.0	Structures			$10,888,500
	Sub-Total			**$40,997,780**
	Provisional	15%		$6,149,667
				$47,147,447

14.2 Phase 2 New Interchange on Highway 107

Item No.	Item / Description	Side	STA	STA	Code	Work Planned	Approx Length m	Average Width m	Unit	Approximate Quantity	Approximate Unit Cost ($)	Approximate Total Cost	Sub-totals
						Description							
14.2.1	New Arterial (to daylighting triangles only)												
	New Arterial Raodway - 4 lane	Full	400	1200	28	4 Lane arterial roadway	800	N/A	m	800	$2,300	$1,840,000	
	Roundabout 1 at Ramp Terminals	N/A	N/A	N/A	51	Roundabout	1	N/A	each	1	$100,000	$100,000	
	Roundabout 2 at Ramp Terminals	N/A	N/A	N/A	51	Roundabout	1	N/A	each	1	$100,000	$100,000	
	New Arterial and Roundabouts	Full	400	1200	4	Excavation - Unclassified - New Constructio	800	N/A	m3	15000	$14	$210,000	$2,250,000
14.2.2	Structures						Over	Under					
	New Interchange Structure	N/A	N/A	N/A	40	Structure	24.8	51.8	m2	1284.64	$3,500	$4,496,240	$4,496,240
14.2.3.	Ramps												
	Ramp 1 - New Arterial to Duke Street	1 - lane	90000	90450	33	Roundabout to BN	450	N/A	m	450	$1,200	$540,000	
	Ramp 1 - New Arterial to Duke Street	2 - lane	90450	90900	34	BN to BN	450	N/A	m	450	$1,400	$630,000	
	Ramp 2 - Duke Street to New Arterial	1 - lane	70250	70900	33	BN to BN	650	N/A	m	650	$1,200	$780,000	
	Ramp 2 - Duke Street to New Arterial	2 - lane	70900	71286	34	BN to Roundabout	386	N/A	m	386	$1,400	$540,400	
	Ramp 3 - includes aux lanes	1 - lane	30000	30800	33	to Roundabout	800	N/A	m	800	$1,200	$960,000	
	Ramp 4 - includes aux lanes	1 - lane	10000	11000	33	to taper	1000	N/A	m	1000	$1,200	$1,200,000	
	Interchange Ramps - Mass Excavation (also includes ramps 5, 6 and 7 from phase 3)				4	Excavation - Unclassified - New Constructio	0	N/A	m3	907000	$14	$12,698,000	$17,348,400
	Sub-Total											**$24,094,640**	**$24,094,640**
	Engineering Costs				70	Allowance for Engineering					0%		$0
	Miscellaneous				71	Miscellaneous Items (culverts, landscaping, paint, signage, etc.)					15%		$3,614,196
	Contingency				72	Design Contingency					0%		$0
	TOTAL												$27,708,836
	ROUNDED												**$28,000,000**

14.2	**Phase 2 New Interchange on Highway 107**	**Summary**	4.5	Km
1.0	Roadways - Gravels / Asphalt			$6,690,400
2.0	Mass Excavation			$12,908,000
3.0	Structures			$4,496,240
	Sub-Total			**$24,094,640**
	Provisional	15%		$3,614,196
				$27,708,836

14.3 Phase 3A - Highway 107 from Exit 4C to New Interchange - Westerly Connections

Item No.	Item / Description	Side	STA	STA	Code	Work Planned	Approx Length m	Average Width m	Unit	Approximate Quantity	Approximate Unit Cost ($)	Approximate Total Cost	Sub-totals
		Side	**STA**	**STA**		**Description**							
14.3.1	Highway 107 from 4C to New Interchange	N/A	100200	101100	29	4-lane freeway with narrow median	900	N/A	m	900	$2,800	$2,520,000	
	Highway 107 from 4C to New Interchange	N/A	101100	101500	29.6	6-lane freeway with narrow median	400	N/A	m	400	$3,300	$1,320,000	
	Highway 107 from 4C to New Interchange	N/A	101500	102000	29	4-lane freeway with narrow median	500	N/A	m	500	$2,800	$1,400,000	
	Highway 107 from 4C to New Interchange	N/A	100200	102000	4	Excavation - Unclassified - New Constructio	1800	N/A	m3	250000	$14	$3,500,000	$8,740,000
14.3.2	Structures						Over	Under					
	Highway 107 over Existing Roadway	N/A	N/A	N/A	40	Structure	26.8	19	m2	509.2	$3,500	$1,782,200	
	Highway 107 over Mann Street	N/A	N/A	N/A	40	Structure	26.8	19	m2	509.2	$3,500	$1,782,200	
	Highway 107 over Rocky Lake Rd and CNR	N/A	N/A	N/A	40	Structure	26.8	60	m2	1608	$3,500	$5,628,000	
	Highway 107 over Ramp 1	N/A	N/A	N/A	40	Structure	34.2	17.5	m2	598.5	$3,500	$2,094,750	
	Ramp 5 over Ramp 6	N/A	N/A	N/A	40	Structure	15	15	m2	225	$3,500	$787,500	
	Ramp 7 over Phase 1 road	N/A	N/A	N/A	40	Structure	15	30.4	m2	456	$3,500	$1,596,000	$13,670,650
14.3.3	Ramps												
	Ramp 5 - New Arterial to 107W	1 - lane	50200	50650	33		450	N/A	m	450	$1,200	$540,000	
	Ramp 6 - 107W to Duke Street	1 - lane	40400	40850	33		450	N/A	m	450	$1,200	$540,000	
	Ramp 7 - Duke Street to New Arterial	1 - lane	60400	60800	33		400	N/A	m	400	$1,200	$480,000	$1,560,000
	Excavation - included in phase 2 ramps or the mianline construction (item 14.3.1)												
	Sub-Total											**$23,970,650**	**$23,970,650**
	Engineering Costs				70	Allowance for Engineering					0%		$0
	Miscellaneous				71	Miscellaneous Items (culverts, landscaping, paint, signage, etc.)					15%		$3,595,598
	Contingency				72	Design Contingency					0%		$0
	TOTAL												$27,566,248
	ROUNDED												**$28,000,000**

14.3	**Phase 3A - Highway 107 from Exit 4C to New Interchange - Weste**	**Summary**	3.1	Km
1.0	Roadways - Gravels / Asphalt			$6,800,000
2.0	Mass Excavation			$3,500,000
3.0	Structures			$13,670,650
	Sub-Total			**$23,970,650**
	Provisional	15%		$3,595,598
				$27,566,248

14.4 Phase 3B - Highway 107 from B Drive Int to Exis Hwy 107

Item No.	Item / Description	Side	STA	STA	Code	Work Planned	Approx Length m	Average Width m	Unit	Approximate Quantity	Approximate Unit Cost ($)	Approximate Total Cost	Sub-totals
		Side	**STA**	**STA**		**Description**							
14.4.1	Highway 107 from CNR Crossing No 2 to Existing 107	N/A	104200	105200	29	4-lane freeway with narrow median	1000	N/A	m	1000	$2,800	$2,800,000	
	Highway 107 from CNR Crossing No 2 to Existing 107	N/A	105200	105850	29.3	5-lane freeway with narrow median	650	N/A	m	650	$3,000	$1,950,000	
	Highway 107 from CNR Crossing No 2 to Existing 107	N/A	105850	106600	29.6	6-lane freeway with narrow median	750	N/A	m	750	$3,300	$2,475,000	
	Highway 107 from CNR Crossing No 2 to Existing 107	N/A	104200	106600	4	Excavation - Unclassified - New Constructio	2400	N/A	m3	450000	$14	$6,300,000	$13,525,000
14.4.2	Structures						Over	Under					
	Highway 107 over Burnside Drive Interchange Ramp	N/A	N/A	N/A	40	Structure	26.8	17.5	m2	469	$3,500	$1,641,500	$1,641,500
14.4.3	Ramps												
	Ramp 8 - Burnside Drive to 107W	2 - lane	20800	21900	34		1100	N/A	m	1100	$1,400	$1,540,000	
	Ramp 8 - Burnside Drive to 107W - Excavation is allowance only				4	Excavation - Unclassified - New Construction			m3	90000	$14	$1,260,000	$2,800,000
	Sub-Total											**$17,966,500**	**$17,966,500**
	Engineering Costs				70	Allowance for Engineering					0%		$0
	Miscellaneous				71	Miscellaneous Items (culverts, landscaping, paint, signage, etc.)					15%		$2,694,975
	Contingency				72	Design Contingency					0%		$0
	TOTAL												$20,661,475
	ROUNDED												**$21,000,000**

14.4	**Phase 3B - Highway 107 from B Drive Int to Exis Hwy 107**	3.5	km	
1.0	Roadways - Gravels / Asphalt			$8,765,000
2.0	Mass Excavation			$7,560,000
3.0	Structures			$1,641,500
	Sub-Total			**$17,966,500**
	Provisional	15%		$2,694,975
				$20,661,475

14.5 Phase 3C - Akerley Interchange

Item No.	Item / Description	Side	STA	STA	Code	Work Planned	Approx Length m	Average Width m	Unit	Approximate Quantity	Approximate Unit Cost ($)	Approximate Total Cost	Sub-totals
		Side	**STA**	**STA**		**Description**							
14.5.1	New Arterial												
	New Arterial Roadway - 4 lane	Full	2000	2800	28	4 Lane arterial roadway	800	N/A	m	800	$2,300	$1,840,000	
	Roundabout 1 at Ramp Terminals	N/A	N/A	N/A	51	Roundabout	1	N/A	each	1	$100,000	$100,000	
	Roundabout 2 at Ramp Terminals	N/A	N/A	N/A	51	Roundabout	1	N/A	each	1	$100,000	$100,000	
	New Arterial Roadway - 4 lane	N/A	2000	2800	4	Excavation - Unclassified - New Constructic	800	N/A	m3	100000	$14	$1,400,000	$3,440,000
14.5.2	Structures						Over	Under					
	Akerley over Highway 107	N/A	N/A	N/A	40	Structure	24.8	51.8	m2	1284.64	$3,500	$4,496,240	$4,496,240
14.5.3	Ramps												
	Ramp 1	1 - lane	0	300	33		400	N/A	m	400	$1,200	$480,000	
	Ramp 2	1 - lane	0	300	33		400	N/A	m	400	$1,200	$480,000	
	Ramp 3	1 - lane	0	300	33		400	N/A	m	400	$1,200	$480,000	
	Ramp 4	1 - lane	0	300	33		400	N/A	m	400	$1,200	$480,000	
	Interchange Ramps - Mass Excavation - Allowance assumed some grading already done for this interchange				4	Excavation - Unclassified - New Construction			m3	35000	$14	$490,000	$2,410,000
	Sub-Total											**$10,346,240**	**$10,346,240**
	Engineering Costs				70	Allowance for Engineering					0%		$0
	Miscellaneous				71	Miscellaneous Items (culverts, landscaping, paint, signage, etc.)					15%		$1,551,936
	Contingency				72	Design Contingency					0%		$0
	TOTAL												$11,898,176
	ROUNDED												**$12,000,000**

	Phase 3C - Akerley Interchange		2.4	km	
1.0	Roadways - Gravels / Asphalt				$3,960,000
2.0	Mass Excavation				$1,890,000
3.0	Structures				$4,496,240
	Sub-Total				**$10,346,240**
	Provisional	15%			$1,551,936
					$11,898,176

	HIGHWAY 107 - SUMMARY No 1 - Cost per phase (excluding provisional costs)			Rounded
14.1	Phase 1 Highway 107 (Duke Street Extension)		$40,997,780	$41,000,000
14.2	Phase 2 New Interchange on Highway 107		$0	$0
14.3	Phase 3A - Highway 107 from Exit 4C to New Interchange - Westerly Connections		$23,970,650	$24,000,000
14.4	Phase 3B - Highway 107 from B Drive Int to Exis Hwy 107		$17,966,500	$18,000,000
14.5	Phase 3C - Akerley Interchange		$10,346,240	$10,000,000
12.3	Interchange: Highway 107 at Exit 4C (Option 1 Costing)		$12,020,000	$12,000,000
	Sub-Total		**$105,301,170**	$105,000,000
	Engineering Costs, Misc and Contingency	15%	$15,795,176	$16,000,000
			$121,096,346	$121,000,000

** Full build-out to phase 3, but excluding phase 2 (the interchange)

	HIGHWAY 107 - SUMMARY No 2 - Cost per phase with provisional costs in each phase	
14.1	Phase 1 Highway 107 (Duke Street Extension)	$47,000,000
14.2	Phase 2 New Interchange on Highway 107	$0
14.3	Phase 3A - Highway 107 from Exit 4C to New Interchange - Westerly Connections	$28,000,000
14.4	Phase 3B - Highway 107 from B Drive Int to Exis Hwy 107	$21,000,000
14.5	Phase 3C - Akerley Interchange	$12,000,000
12.3	Interchange: Highway 107 at Exit 4C (Option 1 Costing)	$14,000,000
	Sub-Total	**$122,000,000**

** Full build-out to phase 3, but excluding phase 2 (the interchange)

	HIGHWAY 107 - SUMMARY No 3 - Major Items **		Rounded
1.0	Roadways - Gravels / Asphalt	$41,950,580	$42,000,000
2.0	Mass Excavation	$27,147,500	$27,000,000
3.0	Structures	$36,203,090	$36,000,000
4.0	Miscellaneous Items (culverts, landscaping, paint, signage, etc.)	$15,795,176	$16,000,000
	Sub-Total	**$121,096,346**	$121,000,000

** Full build-out to phase 3, but excluding phase 2 (the interchange)

MASTER LIST USED IN COST TABLES

Code	Item	Cost	Unit
	WIDENING / EXCAVATION / ASSOCIATED ROADWAY WORK		
1	Pavement Widening	$90.00	m2
2	Highway Shoulder Construction - Wide shoulder with guard r	$500.00	m
3	Excavation -Unclassified - for re-construction	$25.00	m3
4	Excavation -Unclassified - for new construction	$14.00	m3
5	Curb and Gutter	$75.00	m
6	1.8 m Concrete Sidewalk	$150.00	m
7	Storm Leads and CB's	$60.00	m
8	Raised narrow median	$200.00	m
9	Storm Sewer with MH's, CB's - local drainage	$430.00	m
10	Crown Shift and New Jersey Barrier	$500.00	m
11	Retaining Wall - 1-3 m in height	$1,500.00	m
12	Retaining Wall - 3-7 m in height	$5,000.00	m
15	Trail with 300mm gravel and 50mm asphalt	$40.00	m2
	NEW ROADWAYS (including excavation for roadbase)		
19	local road - 9 m width	$2,300.00	m
20	4 Lane arterial roadway	$2,600.00	m
21	5 lane arterial roadway	$2,900.00	m
22	6 lane arterial roadway	$3,300.00	m
23	4-lane freeway with narrow median	$3,100.00	m
24	5-lane freeway with narrow median	$3,500.00	m
25	6-lane freeway with narrow median	$3,800.00	m
26	7-lane freeway with narrow median	$4,100.00	m
27	8-lane freeway with narrow median	$4,500.00	m
	NEW ROADWAYS (excluding excavation for roadbase)		
28	4 Lane arterial roadway	$2,300.00	m
29	4-lane freeway with narrow median	$2,800.00	m
29.3	5-lane freeway with narrow median	$3,000.00	m
29.6	6-lane freeway with narrow median	$3,300.00	m
	NEW RAMPS (including excavation for roadbase)		
30	Single Lane Ramp	$1,300.00	m
31	Two lane Ramp	$1,500.00	m
32	Three Lane Ramp	$1,800.00	m
	NEW RAMPS (excluding excavation for roadbase)		
33	Single Lane Ramp	$1,200.00	m
34	Two lane Ramp	$1,400.00	m
35	Three Lane Ramp	$1,600.00	m
	STRUCTURES		
40	New Bridge Structure	$3,500.00	m2
41	Expand Existing Bridge Structure	$5,000.00	m2
	INTERSECTIONS		
50	Intersection Signals	$150,000.00	each
51	Roundabout	$100,000.00	each
	DEMOLITION		
61	Bridge Demolition	$1,000.00	m2
62	Ramp / Road decommissioning	$200.00	m
	PROVISIONAL AMOUNTS		
70	Allowance for Engineering	0%	
71	Miscellaneous Items (Landscaping, paint, signage, etc.)	15%	
72	Design Contingency	0%	

Typical Road Construction Costs including excavation

Pavement Widening **Square Meter Cost including Common Excavation**

Description	Unit Price	Unit	Assumed Depth mm	Conversion Factor tonne/cu.m.	Cost per sq m	Say
Asphalt - surface course - Type C	$120.00	tonne	50	2.55	$15.30	$16.00
Asphalt - base course - Type B (two lifts)	$110.00	tonne	100	2.45	$26.95	$27.00
Gravels - Type 1	$25.00	tonne	150	2.2	$8.25	$9.00
Gravels - Type 2	$25.00	tonne	400	2	$20.00	$20.00
Common Excavation	$25.00	cu m	700	1	$17.50	$18.00
Total			700		$88.00	**$90.00**

Gravel Shoulder Structure - Square Meter Cost including Common Excavation (unpaved)

Description	Unit Price	Unit	Assumed Depth mm	Conversion Factor tonne/cu.m.	Cost per sq m	Say
Gravels - Type 1S	$30.00	tonne	150	2.2	$9.90	$10.00
Gravels - Type 1	$25.00	tonne	150	2.2	$8.25	$9.00
Gravels - Type 2	$25.00	tonne	400	2	$20.00	$20.00
Common Excavation	$16.00	cu m	700	1	$11.20	$12.00
Total			700		$49.35	**$51.00**

Highway Shoulder Construction - Wide shoulder with guard rail

Description	Unit Price	Quantity per m	unit	per		Cost per m of Road	
Paved Part of Shoulder	$90.00	2.50	sq m	m of road		$225.00	
Unpaved Part of Shoulder	$51.00	3.90	sq m	m of road		$198.90	
Guard Rail	$80.00			m of road		$80.00	
Misc Items Landscaping / Painting / Trees / Signs	- not included here, added to final estimate						
(no sanitary or water services)							say
						$503.90	**$500.00**

Ramp Shoulder Construction - Narrow shoulder, no guard rail

Description	Unit Price	Quantity per m	unit	per		Cost per m of Road	
Paved Part of Shoulder	$90.00	0.50	sq m	m of road		$45.00	
Unpaved Part of Shoulder	$51.00	3.35	sq m	m of road		$170.85	
Guard Rail	$50.00			m of road		$50.00	
Misc Items Landscaping / Painting / Trees / Signs	- not included here, added to final estimate						
(no sanitary or water services)							say
						$265.85	**$300.00**

4 lane Urban Arterial with bike lanes, raised median, Pavement Width = 16 m

Description	Unit Price	Quantity per m	unit	per		Cost per m of Road	
Pavement Structure	$90.00	16.00	sq m	m of road		$1,440.00	
Curb and gutter	$75.00	4.00	m	m of road		$300.00	
Concrete Sidewalk - both sides + median	$90.00	4.50	sq m	m of road		$405.00	
Storm Sewer - Local Drainage (see calc. below)	$430.00	1.00	m	m of road		$430.00	
Misc Items Landscaping / Painting / Trees / Signs	- not included here, added to final estimate						
(no sanitary or water services)							say
						$2,575.00	**$2,600.00**
			5 lane Urban Arterial add		$315.00	$2,890.00	**$2,900.00**
			6 lane Urban Arterial add		$630.00	$3,205.00	**$3,300.00**

2 lane urban local, 9m width, no median , Pavement Width = 9 m

Description	Unit Price	Quantity per m	unit	per		Cost per m of Road	
Pavement Structure	$90.00	9.00	sq m	m of road		$810.00	
Curb and gutter	$75.00	2.00	m	m of road		$150.00	
1.8 Concrete Sidewalk - both sides	$90.00	3.60	sq m	m of road		$324.00	
Storm Sewer - Local Drainage (see calc. below)	$430.00	1.00	m	m of road		$430.00	
Sanitary + Water Service	$500.00	1.00	m	m of road		$500.00	
Misc Items Landscaping / Painting / Trees / Signs	- not included here, added to final estimate						
							say
						$2,214.00	**$2,300.00**

4 lane rural section Highway with 5.6m Narrow Median with Jersey Barrier, Pavement Width = 20.4 m

Description	Unit Price	Quantity per m	unit	per		Cost per m of Road	
Pavement Structure	$90.00	20.40	sq m	m of road		$1,836.00	
Wide Shoulder with guard rail	$500.00	2.00	m	m of road		$1,000.00	
Storm Sewer **	$60.00	1.00	m	m of road		$60.00	
Jersey Barrier	$200.00	1.00	m	m of road		$200.00	
Misc Items Landscaping / Painting / Trees / Signs	- not included here, added to final estimate						
(no sanitary or water services)							say
**CB's and leads would be required for superelevated sections						$3,096.00	**$3,100.00**
				5 lane Highway add	$333.00	$3,429.00	**$3,500.00**
				6 lane Highway add	$666.00	$3,762.00	**$3,800.00**
				7 lane Highway add	$999.00	$4,095.00	**$4,100.00**
				8 lane Highway add	$1,332.00	$4,428.00	**$4,500.00**

Single Lane Ramp - Rural Section, Pavement Width = 5 m

6 lane rural section Highway with narrow median, jersey barrier	Unit Price	Quantity per m	unit	per		Cost per m of Road	
pavement structure	$90.00	5.00	sq m	m of road		$450.00	
Wide Shoulder (right) with guard rail	$500.00	1.00	m	m of road		$500.00	
Narrow Shoulder (left), no guard rail	$300.00	1.00	m	m of road		$300.00	
Misc Items Landscaping / Painting / Trees / Signs	- not included here, added to final estimate						
(no storm, sanitary or water services)							say
						$1,250.00	**$1,300.00**
				2 lane Ramp add	$216.00	$1,466.00	**$1,500.00**
				3 lane Ramp add	$549.00	$1,799.00	**$1,800.00**

Storm Sewer Typical Cost

	Unit Price	Quantity per m	unit	per		Cost per m of Road	
Storm Sewer - Local Drainage	$300.00	1.00	m	m of road		$300.00	
MH's	$3,000.00	1.00	each	100	m of road	$30.00	
CB's	$2,500.00	2.00	each	50	m of road	$100.00	
						$430.00	
Storm Sewer - New CB's and Leads Only for widening	$3,000.00	1.00	each	50	m of road	**$60.00**	