# MUNICIPAL CLASS <br> ENVIRONMENTAL ASSESSMENT 

## WEST ROAD

## Town of South Bruce Peninsula \& Municipality of Northern Bruce Peninsula



BRUCE COUNTY HIGHWAYS DEPARTMENT PUBLIC INFORMATION SESSIONS

August 2017

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### 1.0 BACKGROUND REVIEW

- West Road is a 29 km road section between Oliphant (Bruce Road 13) and Ferndale Road (Bruce Road 9). West Road is composed of a number of individually named road sections: Bryant Street, Huron Road, Howdenvale Road, Daddy Weir Road and West Road
- Road Designation Study (2003/ 2004) resulted in the West Road being transferred to the County of Bruce road system.
- Ontario Municipal Board Decision (2012) and County Official Plan
- Municipal Class Environmental Assessment Study Area is the entirety of the West Road
- West Road is classified as a Class 3 and Class 4 Road based on the Minimum Maintenance Standards


## West Road



### 2.0 MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT PLANNING PROCESS

- Planning of municipal infrastructure projects or activities is subject to the Environment Assessment Act, R.S.O. 1990, and requires the proponent to complete an Environmental Assessment (EA)
- Municipal Class EA process was developed by the Municipal Engineers Association (MEA), in consultation with the Ministry of Environment and Climate Change (MOECC)
- Municipal Class EA solicits input and approval from regulatory agencies, municipalities and public at the local level. This process leads to an evaluation of the alternatives in view of the significance of environmental impacts and the choice of effective mitigation measures



## COUNTY OF BRUCE <br> MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT <br> WEST ROAD <br> TOWN OF SOUTH BRUCE PENINSULA \& MUNICIPALITY OF NORTHERN BRUCE PENINSULA

## NOTICE OF STUDY COMMENCEMENT \& PUBLIC INFORMATION SESSIONS

The County of Bruce is undertaking a Municipal Class Environmental Assessment (Class EA) Study to determine the future needs for road maintenance and capital improvements on the 29 km road section between Oliphant (Bruce Road 13) and the Ferndale Road (Bruce Road 9), known as the West Road.

The study is being conducted in accordance with the requirements of the Municipal Class Environmental Assessment (Class EA) which is an approved process under the Environmental Assessment Act. The specific approach of the study, whether a Master Plan project or Schedule C project, will be determined through the Class EA process.

The Class EA will involve a thorough examination of the problem/opportunity and constraints that will direct future decisions regarding maintenance and capital improvements.

## PUBLIC INFORMATION SESSIONS:

Public consultation is a key component of the EA process. The County of Bruce will be conducting discretionary public information sessions to present and receive comment on the problem/opportunity statement. The sessions have been scheduled as follows:

Date: Wednesday August 26, 2015
Time: $\quad 6: 30 \mathrm{pm}-8: 00 \mathrm{pm}$
Location: Lion's Head \& District Community Centre 4 Tackabury Street, Lion's Head

Date: Thursday August 27, 2015
Time: $\quad 6: 30 \mathrm{pm}-8: 00 \mathrm{pm}$
Location: Wiarton \& District Community Centre 526 Taylor Street, Wiarton

For further information on this study please contact: County of Bruce Highways Department Brian Knox, County Engineer 30 Park Street, P.O. Box 398, Walkerton, ON NOG 2V0 P:519-881-2400 F:519-507-3030

bknox@brucecounty.on.ca
This Notice Issued: August 11, 2015

### 3.0 PHASE 1 - DISCRETIONARY PUBLIC INFORMATION SESSIONS AUGUST 2015

- Over 200 people attended the August Public Information Sessions
- Summary of Questions/ Comments
o Opinions that the solution to the EA may improve the possibility of a wind power development
o Many comments supported a road surface improvement
o Great opposition to a right-of-way width of 30 m
o Concern over impact on the environment
o Expression of concern over road use safety


# 4.0 PHASE 1 - PROBLEM STATEMENT 

## Existing Road Observations:

### 4.1 Official Plan Designation

- The Bruce County Official Plan designates the West Road as either rural collector or urban collector.
- The Official Plan indicates the minimum right-of-way width for road sections shown as 'urban' shall be 20 meters.
- The Official Plan indicates that the minimum right-of-way width for County roads shown as 'rural' shall be 30 meters yet, does not apply to the West road.
- A special provision of the Official Plan states that for the West Road, any road widening shall be in accordance with the findings of this Municipal Class Environmental Assessment.


### 4.2 Current Posted Speed

- The posted speed on the West Road varies between $50 \mathrm{~km} / \mathrm{hr}$ and $80 \mathrm{~km} / \mathrm{hr}$.
- The posted speed is an important factor when reviewing geometric requirements.


## West Road <br> Posted Speed Limits



### 4.3 Traffic Counts

Traffic counts completed during the summer months are summarized in the table below and figure.

| Year | Bruce Road <br> 13 and Spry <br> Lake Road | Spry Lake <br> Road and <br> Red Bay Road | Red Bay Road <br> to Howdenvale <br> Road | Howdenvale <br> Road / Huron <br> Road to Daddy <br> Weir Road | Daddy Weir <br> Rowdenvale <br> Road to Little <br> Pike Bay Road | Little Pike <br> Bay Road to <br> Bruce Road 9 |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| 2006 | 1922 | 1177 | 614 | 217 | 308 | 603 |
| 2009 | 1233 | 849 | 501 | 213 | 270 | 499 |
| 2012 | 1960 | 1234 | 1071 | 179 | 318 | 444 |
| 2015 | 2299 | 1427 | 765 | 235 | 137 | 540 |
| 2016 | 1848 | 1278 | 750 | 167 | 162 | 436 |
| 2017 | 1734 | 1207 | 685 | 149 | 335 | 477 |

## West Road <br> Daily Traffic Volumes



### 4.4 Surface Condition

- Generally
o south portion of the road between Oliphant and Howdenvale is asphalt or surface treatment


## o center portion between Howdenvale and Little Pike Bay Road is gravel

o northerly portion between Little Pike Bay Road and Bruce Road 9 is asphalt pavement

- Existing portions with hard surfacing are aged and deteriorated.
- Gravel portion is difficult to maintain
- The enclosed photos depict the deteriorated condition of the surface. The photos are from Google maps 'street view' dated J une $2013 \& 2015$.

West Road Photos - Google Maps June 2013/2015







### 4.5 Geometric Design Elements

The Bruce County Highways Department assigns the following design elements to its road system:

- Past practice, based on implementing the recommendations of provincial and national standards, is for the County to assess a design speed of 10 km above the posted speed.
- Design parameters for vertical crest curves and sag curves provide for adequate visibility along the road for stopping site distance.
- Design parameters for the horizontal curvature of the road also provides for stopping site distance.
- Lane widths provide for opposing vehicle separation distances
- Shoulder widths provide a location for stranded vehicles, emergency forces, slowmoving vehicles and for snow storage.
- Shoulder widths also provide improved sight distances for vehicles entering/ leaving the road.


### 4.6 Encroachments onto Private Property

- Number of locations where the road is currently on private property or the road is not centered and that road features are on private property.
- Existing right of way property line is generally straight and in a number of locations the road has horizontal curves, where the road encroaches on private property.
- Sections where the road is not centered on the road allowance.


### 4.7 Drainage

- Current locations where the road lacks the drainage of the granular horizon. This is aggravated where there are wetlands and subsequent high groundwater table.
- Existing drainage consists of thirteen culverts in excess of 600 mm and a number of smaller centerline pipes
- Currently no issues with surface water crossing the road.
- Existing drainage features and patterns will be maintained.


### 4.8 Topography

The topography of the road varies from:

- Sand dunes
- Wetlands
- Sand with shallow bedrock
- Flat Agricultural poorly drained (Fernale Flats)


### 4.9 Geotechnical

- Department engaged geotechnical consultant to review the West Road in 2015. The north 8 km of the West Road were reviewed in 2010.
- The geotechnical assessment concluded that the distressed surface reflected poor drainage, increased traffic loading, inadequate base/ sub base and possibly poor past construction practices.

COUNTY OF BRUCE
MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
WEST ROAD
TOWN OF SOUTH BRUCE PENINSULA \& MUNICIPALITY OF NORTHERN BRUCE PENINSULA

## PROBLEM STATEMENT

The County issued a Municipal Class Environmental Assessment (EA) 'Notice of Commencement' for the West Road on August 11, 2015. Comments were received through attending Municipal Council meetings, hosting two discretionary public information sessions and correspondence from stakeholders. The comments received were considered in the preparation of this problem statement.

## Problem

The West Road (composed of road sections known as Bryant Street, Huron Road, Howdenvale Road, Daddy Weir Road and West Road that represents approximately 29 km ) has a number of deficiencies, that includes:

- road encroachments on private property,
- road geometry,
- inadequate road structure,
- poor road surface condition.


## Problem Statement

To assess existing conditions and develop a preferred solution for road improvements to address West Road deficiencies.

## Acknowledgment



The County acknowledged the following concerns raised at the Municipal Council meetings, discretionary public information sessions and through correspondence received.

- the EA for the West Road is not related to any wind power development;
- any widening of the existing road allowance will be applied locally and based on addressing the problem statement;
- the EA will include a review of existing environmental conditions, assessment of potential effects on the environment of alternative solutions and an identification of potential effects on the environment of the preferred solution;
- concern over road use safety will be evaluated; and
- the EA will include consultation with the Saugeen Ojibway Nations and Métis.


## Path Forward

The County will begin Phase 2 of the EA process which includes the following items:

- Identify alternative solutions to problem,
- Select EA schedule,
- Inventory natural, social, economic environment,
- Identify impact of alternative solutions on the environment and mitigating measures,
- Consult review agencies and public,
- Tentatively schedule Public Information Sessions for early summer 2016,
- Select preferred solution,
- Review and confirm choice of EA schedule.

Issued: January 21, 2016

> | BRUCE COUNTY HIGHWAYS DEPARTMENT |
| :---: |
| Attention: Brian Knox, P.Eng. County Engineer |
| P.O. Box 398, 30 Park Street, Walkerton ON NOG2V0 |
| Phone: 519-881-2400 |
| Fax: 519-507-3030 Email: bknox@brucecounty.on.ca |

### 5.0 PHASE 2 - ALTERNATIVE SOLUTIONS

- Identify alternative solutions to problem
- Select Schedule
- Inventory natural, social, economic environment
- Identify impact of alternative solutions on the environment and mitigating measures
- Evaluate alternative solutions: identify recommended solutions
- Consult review agencies and public
- Select preferred solution
- Review and confirm choice of schedule



### 5.1 Phase 2 - Identify Alternative Solutions to Problem

## Alternative 1 - Do Nothing

Meet Minimum Maintenance Standards

## Alternative 2- Spot Repair

Isolated areas with edge cracking, allegatoring and wheel tracking will be repaired and short sections resurfaced. This will not be a uniform application. Examples: crack sealing and spray patch operations.

## Alternative 3 - Rehabilitation

Pulverize, re-shape and ensure platform is adequate, add strength with addition of granular ' A ' and apply uniform lift of gravel or hot mix, resulting in a uniform grade raise of approximately 200 mm . Generally maintain vertical and horizontal alignment.

## Alternative 4 - Reconstruction

Establish new vertical grade and/ or horizontal alignment to suit design speed, ensure full granular horizon, leave in gravel or apply uniform lift of hot mix.

## Alternative 1 - Do Nothing

- Ontario Regulation 239/ 02 - Minimum Maintenance Standards
- West Road is a Class 3 \& Class 4 Road

Potholes
6. (1) If a pothole exceeds both the surface area and depth set out in Table 1,2 or 3 to this section, as the case may be, the minimum standard is to repair the pothole within the time set out in Table 1, 2 or 3 , as appropriate, after becoming aware of the fact. O. Reg 239/02, s. 6 (1)
(2) A pothole is deemed to be in a state of repair if its surface area or depth is less than or equal to that set out in Table 1,2 or 3 , as appropriate. O. Reg. 239/02, s. 6 (2); O. Reg. 47/13, s. 6.

TABLE 1
POTHOLES ON PAVED SURFACE OF ROADWAY

| Class of Highway | Surface Area | Depth | Time |
| :--- | :--- | :--- | :--- |
| 1 | $600 \mathrm{~cm}^{2}$ | 8 cm | 4 days |
| 2 | $800 \mathrm{~cm}^{2}$ | 8 cm | 4 davs |
| 3 | $1000 \mathrm{~cm}^{2}$ | 8 cm | 7 days |
| 4 | $1000 \mathrm{~cm}^{2}$ | 8 cm | 14 days |
| 5 | $1000 \mathrm{~cm}^{2}$ | 8 cm | 30 days |

O. Reg. 239/02, s. 6, Table 1.

TABLE 2
POTHOLES ON NON-PAVED SURFACE OF ROADWAY

| Class of Highway | Surface Area | Depth | Time |
| :--- | :--- | :--- | :--- |
| 3 | $1500 \mathrm{~cm}^{2}$ | 8 cm | 7 days |
| 4 | $1500 \mathrm{~cm}^{2}$ | 10 cm | 14 days |
| 5 | $1500 \mathrm{~cm}^{2}$ | 12 cm | 30 days |

TABLE 3
POTHOLES ON PAVED OR NON-PAVED SURFACE OF SHOULDER

| Class of Highway | Surface Area | Depth | Time |
| :--- | :--- | :--- | :--- |
| 1 | $1500 \mathrm{~cm}^{2}$ | 8 cm | 7 days |
|  | $1500 \mathrm{~m}^{2}$ |  | 7 day |
| 3 | $1500 \mathrm{~cm}^{2}$ | 8 cm | 14 days |
| 4 | $1500 \mathrm{~cm}^{2}$ | 10 cm | 30 days |
|  | $1500 \mathrm{~cm}^{2}$ | 12 cm | 60 days |

O. Reg. 239/02, s. 6, Table 3.

## Shoulder drop-offs

7. (1) If a shoulder drop-off is deeper, for a continuous distance of 20 metres or more, than the depth set out in the Table to this section, the minimum standard is to repair the shoulder drop-off within the time set out in the Table after becoming aware of the fact. O. Reg. 239/02, s. 7 (1).
(2) A shoulder drop-off is deemed to be in a state of repair if its depth is less than or equal to that set out in the Table. O. Reg. 239/02, s. 7 (2); O. Reg. $47 / 13$, s. 7.
(3) In this section,
"shoulder drop-off" means the vertical differential, where the paved surface of the roadway is higher than the surface of the shoulder, between the paved surface of the roadway and the paved or non-paved surface of the shoulder. O. Reg. 239/02, s. 7 (3).

TABLE
SHOULDER DROP-OFFS

| Class of Highway | Depth | Time |
| :--- | :--- | :--- |
| 1 | 8 cm | 4 days |
| 2 | $-{ }^{\prime}$ |  |
| 3 | 8 cm | 7 days |
| 4 | 8 cm | 14 days |
| 5 | 8 cm | 30 days |

O. Reg. 239/02, s. 7, Table.

## Cracks

8. (1) If a crack on the paved surface of a roadway is greater, for a continuous distance of three metres or more, than both the width and depth set out in the Table to this section, the minimum standard is to repair the crack within the time set out in the Table after becoming aware of the fact. O. Reg. 239/02, s. 8 (1).
(2) A crack is deemed to be in a state of repair if its width or depth is less than or equal to that set out in the Table. O. Reg. 239/02, s. 8 (2); O. Reg. 47/13, s. 8.

TABLE
CRACKS

| Class of Highway | Width | Depth | Time |
| :--- | :--- | :--- | :--- |
| 1 | 5 cm | 5 cm | 30 days |
| 2 | 5 cm | 5 cm | 30 davs |
| 3 | 5 cm | 5 cm | 60 days |
| 4 | 5 cm | 5 cm | 180 days |
| 5 | 5 cm | 5 cm | 180 days |

## Alternative 2 - Spot Repair





|  | NORTH <br> - $\qquad$ | NOTES: |  |  |  | pracer | $\underset{\substack{\text { WEST ROAD } \\ \text { PRELMINARY DESIGN }}}{\text { cen }}$ |  |  | $\frac{d x}{25}$ |
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### 5.2 Phase 2 - Select Schedule

West Road Environmental Assessment will be conducted in accordance with the requirements of a Schedule ' C '.

## Schedule C

- Potential for significant environmental effects
- Must proceed under the full planning and documentation procedure of the Municipal Class EA document
- Requires an Environmental Study Report (ESR) be prepared and filed on the public record for review by the public and regulatory agencies.
- Proponents to complete Phase 1 through 5 of the Municipal Class EA process.



# 5.3 Phase 2 - Inventory Natural, Social, Economic Environment 

Studies complete to date:

- Preliminary Natural Heritage Background Review - 2015
- Geotechnical Road Assessment - 2010 \& 2015
- OLS Survey - 2015
- Preliminary Road Assessment Inventory - 2015
- Natural Heritage Study - 2017
- Stage 1 Archaeological Assessment - 2017


### 5.4 Phase 2 - Identify Impact of Alternative Solutions on the Environment \& Mitigating Measures

### 5.4.1 Alternative Solutions

- Alternative 1 - Do Nothing
- Alternative 2 - Spot Repair
- Alternative 3 - Rehabilitation
- Alternative 4 - Reconstruction


### 5.4.2 Road Sections

Distinguished sections similar in nature based on existing road conditions.

- Official Plan Designation
- Posted Speed
- Traffic Count
- Geometric Design Elements
- Surface Conditions
- Drainage
- Topography
- Geotechnical Review


## Road Sections

| 1A | Bryant Street | Oliphant Way (Bruce Road 13) to <br> Spry Lake |
| :--- | :--- | :--- |
| 1B | Bryant Street | Spry Lake to Hemlock Rd |
| 2A | Bryant Street | Hemlock Rd to Amabel/ Albemarle <br> Rd |
| 2B | Huron Road | Amabel/ Albemarle Rd to Kowal <br> Lane |
| 3 | Huron Road | Kowal Lane to Howdenvale Rd |
| 4A | Howdenvale <br> Road | Huron Rd to 620 Howdenvale Rd |
| 4B | Howdenvale <br> Road | 620 Howdenvale Rd to 536 <br> Howdenvale Rd |
| 4C1 | Howdenvale <br> Road | 536 Howdenvale Rd to LOT 10, CON <br> 3 WBR |
| 4C2 | Howdenvale <br> Road | LOT 10, CON 3 WBR toLOT 4/ 5, <br> CON 3 WBR |
| 4D | Daddy Weir <br> Road | LOT 4/ 5, CON 3 WBR to Shanty <br> Lane |
| 4E | West Road | Shanty Lane to Pike Bay Rd |
| 4F | West Road | Pike Bay Rd to Little Pike Bay Rd |
| 5A | West Road | Little Pike Bay Rd to Spry Rd |
| 5B | West Road | Spry Rd to Ferndale Rd <br> (Bruce Road 9) |

## West Road

Physical Characteristics


### 5.4.3 Environments

>Transportation

- Vertical Alignment
- Horizontal Alignment
- Surface Deficiencies
- Road Width
- Safety
$>$ Natural
- Natural Heritage Features
- Terrestrial Environment
- Aquatic Environment
$>$ Cultural
- Impacts to Archaeological Resources
- Built Heritage Features
> Social
- Property Impacts/ Land Acquisition
- Construction Disruption
- Economic Development
- Cycling
$>$ Economic
- Construction Costs
- Maintenance Costs


### 5.4.3.1 TRANSPORTATION

Vertical alignment

- Vertical alignment refers to the 'grade of the road' and the parameters required for drivers to have sufficient sight distances so that drivers can control the speed of their vehicles to avoid striking an unexpected obstacle.
- An appropriate vertical alignment is based on the posted speed.
- An example are MTO roads where design speed is set 20 or $30 \mathrm{~km} / \mathrm{h}$ above the posted speed. This reflects a higher margin of safety.
- Municipal roads generally have the design speed equal the posted speed.
- The County standard is to have the design speed 10 kph above the posted speed.
- An example of this application are reflected in the attached pictures of Bruce Road 9 south of Barrow Bay where the design speed is 80 kph and the posted speed is 70 kph .
- Attached is the plan and profile of the first section of road north of Oliphant. The profile illustrates the vertical geometry.


Bruce Road 9 - south of Barrow Bay (North)

$\square$


## Horizontal alignment

- In a similar sense to the above, horizontal alignment refers to the sight distance horizontally along the road.
- An appropriate horizontal alignment is based on the posted speed.
- The application on MTO, Municipal and County roads are similar to vertical alignment
- Bruce Road 9, Barrow Bay example
- An important element in horizontal site distance is the proximity of bush/ vegetation.
- Attached is the plan and profile of a section of the road, Red Bay. The plan illustrates the horizontal geometry.


Bruce Road 9 - south of Barrow Bay (north)


## Surface Deficiencies

- Surface deficiencies include wheel tracking, surface alligatoring, edge cracking, transverse and longitudinal cracking, loss of course aggregate, bleeding of the surface to create an extremely smooth surface.
- Traditionally, the useful life of surface treatment is approximately 8 to 10 years and for hot mix is between 15 and 20 years.


## Road Width (cross-section)

- The road width or cross-section is the sum of the lane width, shoulder width, and boulevard.
- Lane width generally varies between 3.3 m and 3.6 m and we have selected a lane width of 3.35 m for the West Road.
- The appropriate shoulder width allows for the control of vegetation, the clearing of snow and a location for disabled vehicles. The width of shoulders varies between 1.5 m and 2.4 m and we have selected a shoulder width of 1.5 m for the West Road.
- The boulevard is between the edge of the shoulder and the tree/ bush line and is termed the 'clear zone' to manage vegetation and snow accumulation in order to provide horizontal sight distances and to assist vehicles entering and leaving the road. In order to be considered a component of 'clear zone' the boulevard must be a maximum of a one in three slope. To obtain a 'clear zone' we require tree trimming to 8 metres from proposed centerline.
- Hydro One maintains one boulevard.
- Utilities
- Proposed typical cross-section attached




## Safety

- safety is a combination of the above
- safety is a reflection of managing liability


### 5.4.3.2 Natural Environment

## Natural Heritage Features

- Areas of Natural and Scientific Interest Howdenvale, Sucker Creek, Sauble Falls ANSI proximity
- Significant Wetlands -throughout study area
- Significant Woodlands - Not present within study area
- Significant Valleylands - Not present within study area
- Karst
- Threatened or Endangered Species Habitat


## Impacts to Terrestrial Habitat

- Species at Risk, significant or sensitive species and their habitat
- Regionally Rare Flora
- Tree removal


## Impacts to the Aquatic Habitat

- Fisheries habitat

Best Management Practices, Mitigation Measures and Regulatory Permits will be required based on the alternative solutions.

## West Road

Areas of Natural and Scientific Interest


## West Road

Wetland



## West Road Area Observations



### 5.4.3.3 Cultural Environment

The cultural environment includes the interests of archaeological potential and built heritage.

- Stage 1 Archaeological Assessment completed and outlined areas that retain archaeological potential and areas that do not retain archaeological potential.
- Stage 2 Archaeological Assessment is recommended for portions of the Study Area retaining archaeological potential.
- Maps identify areas of archaeological potential.



## Legend

$\square$ Study Area
(2) Photo Location and Direction
$\square$ Retains Archaeological Potential
$\square$ Retains no Archaeological Potential

- West Road and Shoulder of Road,

Retains no Archaeological Potential


## Legend

$\square$ Study Area
(2) Photo Location and Direction
$\square$ Retains Archaeological Potential
$\square$ Retains no Archaeological Potential

- West Road and Shoulder of Road, Retains no Archaeological Potential



## Legend

$\square$ Study Area
(2) Photo Location and Direction

Retains Archaeological Potential
$\square$ Retains no Archaeological Potential

- West Road and Shoulder of Road, Retains no Archaeological Potential
$\xrightarrow{\longrightarrow}$


### 5.4.3.4 Social Environment

- Property Impacts / Land Acquisition
- Construction Disturbance
- Economic Development
- Cycling


## Land Acquisition - 7 cases

Case 1
Existing Road is not Centered in the ROW, and distance from Centreline of Road to Property Line is less than 10.058 m ( 33 ft )

The existing road is not centered in the ROW and the typical minimum municipal ROW half-width distance of 33 feet $(10.058 \mathrm{~m})$ from the centreline of the road to the property line is not achieved.

Reconstruction of the road to locate it back to the centre of the ROW would be expensive and have a significant environmental impact. In these cases, it may be more appropriate to purchase widening from adjacent landowners to achieve the typical minimum municipal ROW half-width distance of 33 feet $(10.058 \mathrm{~m})$ from the centreline of the road to the property line.

No realignment but widening is required.

## Case 1



Drawing 6

## Case 2

Centreline of the road is less than 10.058m (33feet) from the Street Line and Acquiring Additional Widening is Not Feasible.

When the existing road encroaches onto private property and acquiring widening to achieve the 33 foot ROW half distance would be an undue hardship to the landowner, it is more appropriate to reconstruct (realign) the road to achieve the minimum 33 feet distance from road center to street line.

Realignment required, widening not required.


Drawing 12

## Case 3

Existing Right of Way width is less than 66 feet and the existing road platform is extremely narrow

## (Howdenvale Road)

From the intersection of Huron Road and Howdenvale Road to 2.0 km easterly, the ROW total width varies from 16.1 m ( 53 feet) to 20.12 ( 66 feet). In addition, the platform width is very narrow $(6.0 \mathrm{~m})$. Because of the number of houses on the north side and the existing hydro on the north side, the most practical solution is to shift the alignment about 2.5 m south and acquire the majority of widening on the south side.

## Realignment required, and widening required.



## Case 4

Minor Realignment Through Horizontal Curves to Increase Safety Through Improved Visibility
as Well as Achieving a Minimum Design Speed
Very sharp horizontal curves, combined with trees encroaching to the edge of existing edge of roadway, results in very poor visibility.

Realignment required, and widening required.


Drawing 19

Case 5
Road Deviation Outside of the Original Right of Way due to Proximity to Wetland (Con 3, Lots 10 \& 11)

The existing road deviates outside of the original ROW due to proximity of Wetland and is entirely on private property.

## Widening required.



Drawing 31

Case 6

# Vertical Geometry required to Achieve proposed design speed results in toe of fill slope enbankments to extend beyond 10.058m (33 feet) 

Design speed is largely based on stopping sight distances. In undulating topography, to achieve the required sight distances, lowering road crests and raising road sags is often required. Where existing centreline of road elevation is required to be raised (fill), if the elevation difference between the centreline of the road and the existing grade at the property line is greater than 1.83 m ( 6 feet) then the toe of the fill slope will extend beyond 10.058 m based on 3 horizontal: 1 vertical slope.

Realignment not required, widening is required.

## Case 7

## Drainage Consideration (West Road)

A section of the West Road from Little Pike Bay Rd to Ferndale Road, has deep drainage ditches of up 2.0 m depth below road centreline and 1.0 m below the adjacent field. If we assume 3:1 fore slope and 2:1 back slope, the top of bank of the ditch will extend beyond 10.058 m ( 33 feet) from centerline. Generally, the County should own the roadside ditch.

Realignment not required, widening is required.


## Construction Disturbance

- Disturbances that are generally associated with construction works include:
- Noise
- Road closures
- Traffic delays
- Aesthetics
- Bush line growth


## Economic Development

- Commercial access
- Tourism
- Community impacts

Cycling

- Paved Shoulders
- Great Lakes Waterfront Trail



## West Road <br> Proposed Paved Shoulder



### 5.3.4.5 Economic Environment

## Construction Costs

- Considers the capital construction cost of the alternative solution
o Rehabilitation costs range from \$100,000$\$ 150,000$ per kilometre for hotmix and $\$ 50,000$ $\$ 100,000$ per kilometre for gravel surface.
o Reconstruction costs range from $\$ 200,000$ $\$ 400,000$ per kilometre for hotmix and $\$ 150,000$ to $\$ 300,000$ for gravel surface.


## Maintenance Costs

- Considers the cost associated with ongoing maintenance
o Spray patching
o Crack sealing
o Pot hole patching
o Edge patching
o Placing gravel, grading, applying dust control


### 5.5 EVALUATE ALTERNATIVE SOLUTIONS: IDENTIFY RECOMMENDED SOLUTIONS

## West Road - Section 1 A

Physical Characteristics by Section - 1A



| WEST ROAD - EVALUATION OF TRANSPORTATION CRITERIA |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SECT SURFACE: ASPHALT STATION RANGE |  |  |  |  |  |  |
| 1A | 0+000 |  | 2+250 |  |  |  |
| FROM OLIPHANT WAY | TO |  | SPRY LAKE |  |  |  |
| COUNTY OP DESIGNATION | COLLECTOR RURAL |  |  |  |  |  |
| CONSTRUCTION HISTORY | 1975 |  | Approx. |  |  |  |
| JUNE 2017 DAILY TRAFFIC VOLUME | 1734 |  | WRA |  | NC - No Change |  |
| GEOMETRIC DESIGN ELEMENTS | EXISTING CONDITION |  | ALTERNATIVE 1 \& 2 |  | ALTERNATIVE 3 \& 4 |  |
| POSTED SPEED (km/h) | 60 |  | 60 |  | 60 |  |
| DESIGN SPEED (km/h) | 70 |  | 70 |  | 70 |  |
|  | STANDARD | COMMENT | STANDARD | IMPACT | STANDARD | IMPACT |
| ALIGNMENT |  |  |  |  |  |  |
| VERTICAL CURVES |  |  |  |  |  |  |
| CREST (K) | 25 | FLAT | 25 | NC | 25 | NC |
| SAG (K) | 25 | FLAT | 25 | NC | 25 | NC |
| HORIZONTAL CURVE RADII (m) | 190 | STRAIGHT | 190 | NC | 190 | NC |
| LOCATION ON ROW | CENTRED | CENTRED | CENTRED | NC | CENTRED | NC |
| PLATFORM |  |  |  |  |  |  |
| LANE WIDTH (m) | 3.35 | 3.66 | 3.35 | NC | 3.35 | NARROWER |
| SHOULDER WIDTH (m) | 1.5 | 1.04 | 1.5 | NC | 1.5 | WIDER |
| TOTAL PLATFORM WIDTH | 9.7 | 9.4 | 9.7 | NC | 9.7 | WIDER |
| RIGHT OF WAY (m) | 20.117 | 20.117 | 20.117 | 20.117 | 20.117 | 20.117 |

## West Road - Section 1 B

Physical Characteristics by Section - 1B



| WEST ROAD - EVALUATION OF TRANSPORTATION CRITERIA |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SECT SURFACE: ASPHALT | STATION RANGE |  |  |  |  |  |
| 1B | $2+250$ |  | 3+120 |  |  |  |
| FROM | SPRY LAKE TO |  | HEMLOCK RD |  |  |  |
| COUNTY OP DESIGNATION | COLLECTOR RURAL |  |  |  |  |  |
| CONSTRUCTION HISTORY | 1991 |  | Approx. |  |  |  |
| JUNE 2017 DAILY TRAFFIC VOLUME | 1207 |  | WRB |  | NC - No Change |  |
| GEOMETRIC DESIGN ELEMENTS | EXISTING CONDITION |  | ALTERNATIVE 1 \& 2 |  | ALTERNATIVE 3 \& 4 |  |
| POSTED SPEED (km/h) | 50 |  | 50 |  | 60 |  |
| DESIGN SPEED (km/h) | 60 |  | 60 |  | 70 |  |
|  | STANDARD | COMMENT | STANDARD | IMPACT | STANDARD | IMPACT |
| ALIGNMENT |  |  |  |  |  |  |
| VERTICAL CURVES |  |  |  |  |  |  |
| CREST (K) | 15 | FLAT | 15 | NC | 25 | NC |
| SAG (K) | 18 | FLAT | 18 | NC | 25 | NC |
| HORIZONTAL CURVE RADII (m) | 130 | STRAIGHT | 130 | NC | 190 | NC |
| LOCATION ON ROW | CENTRED | O/S 2.0m RT OF CL | CENTRED | NC | CENTRED | NC |
| PLATFORM |  |  |  |  |  |  |
| LANE WIDTH (m) | 3.35 | 3.4 | 3.35 | NC | 3.35 | NARROWER |
| SHOULDER WIDTH (m) | 1.5 | 1.95 | 1.5 | NC | 1.5 | NARROWER |
| TOTAL PLATFORM WIDTH | 9.7 | 10.7 | 9.7 | NC | 9.7 | NC |
| RIGHT OF WAY (m) | 20.117 | 30.48 | 20.117 | NC | 20.117 | NC |

## PRELIMINARY EVALUATION OF ALTERNATIVE SOLUTIONS

| Road Section 1A\& 1B : Bryant Street - Oliphant Way (Bruce Road 13) to Hemlock Road |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Alternative 1 Do Nothing | Alternative 2 Spot Repair | Alternative 3 <br> Rehabilitation | Alternative 4 Reconstruction |
| Problem Statement |  | Does Not Address Problem Statement | Does Not Address Problem Statement | Addresses Problem Statement | Addresses Problem Statement |
| Factor | Criteria |  |  |  |  |
| Transportation | Vertical Alignment | Does not improve surface deficiencies | Short term solution to overcome surface deficiencies | Meets Standards | Meets Standards |
|  | Horizontal Alignment |  |  |  |  |
|  | Surface Deficiencies |  |  |  |  |
|  | Road Width |  |  |  |  |
|  | Safety |  |  |  |  |
| Natural Environment | Natural Heritage Features | No impact | Minimal impact | Best Management Practices; Mitigation | Best Management Practices, Mitigation, Permits |
|  | Terrestrial Environments |  |  |  |  |
|  | Aquatic Environments |  |  |  |  |
| Cultural Environment | Impacts to archaeological resources \& Built heritage features | No impact | No impact | Archaeological Potential | Archaeological Potential |
| Social Environment | Property impacts / land acquisition (Case 1-7)* | No impact | No impact | No impact | No impact |
|  | Construction Disruption | No impact | Minimal impact | Short term impacts | Short terms impacts |
|  | Economic Development | No change | No change | No change | No change |
|  | Cycling | No improvement | Minimal Improvement | Improvement | Improvement |
| Economic Environment | Construction costs | No Impact | No Impact | $\begin{aligned} & \text { Est. \$100,000- } \\ & \$ 150,000 \text { per km } \end{aligned}$ | $\begin{aligned} & \text { Est. } \$ 200,000- \\ & \$ 400,000 \text { per km } \end{aligned}$ |
|  | Maintenance costs | On going | On Going | Reduced | Reduced |
| PROPOSED PRELIMINARY PREFERRED ALTERNATIVE |  |  |  | Hot Mix |  |



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 1 A - DRAWING 1




PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 1 A - DRAWING 2




PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 1 A \& B-DRAWING 3




PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 1 B - DRAWING 4


|  | NORTH | NOTES: | - |  |  |  | ${ }_{\text {Proicer }}$ | $\underset{\text { WEST ROAD }}{\substack{\text { WRELIMINARY DESIGN }}}$ |  |  | $\frac{12}{2}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
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|  |  |  |  |  |  |  |  | $\underset{\text { STA. } 2+340 \text { TO }}{\text { P/ }}$ |  |  | county |
|  |  |  | $\bigcirc$ |  | Mc |  |  | STA. $2+340$ TO |  |  |  |



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 1 B - DRAWING 5


## NORTH

## NOTES:

|  |  |  |  | macer | WEST ROAD PRELIMINARY DESIGN |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| - |  |  |  |  |  |  |  |
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## West Road - Section 2 A

Physical Characteristics by Section - 2A


| WEST ROAD PRELIMINARY ASSESSMENT |  |  |
| :---: | :---: | :---: |
| SECT SURFACE: ASPHALT | STATION RANGE |  |
| 2A | 3+120 | 4+360 |
| FROM HEMLOCK RD | TO | AMABEL/ALBERMARLE |
| COUNTY OP DESIGNATION | LLECTOR RUR |  |
| CONSTRUCTION HISTORY | 1992 | Approx. |
| JUNE 2017 DAILY TRAFFIC VOLUME | 1207 | WRB |
| GEOMETRIC DESIGN ELEMENTS | STANDARD | EXISTING CONDITION |
| CURRENT POSTED SPEED (km/h) | 80 | 80 |
| CURRENT DESIGN SPEED (km/h) | 90 | 90 |
| ALIGNMENT |  |  |
| VERTICAL CURVES <br> CREST (K) | 50 | FLAT |
| SAG (K) | 40 | FLAT |
| HORIZONTAL CURVE RADII (m) | 340 | STRAIGHT |
| LOCATION ON ROW | CENTRED | CENTRED |
| PLATFORM |  |  |
| LANE WIDTH (m) | 3.35 | 3.4 |
| SHOULDER WIDTH (m) | 1.5 | 1.5 |
| TOTAL PLATFORM WIDTH | 9.7 | 9.8 |
| RIGHT OF WAY (m) | 20.117 | 30.48 |
| DRAINAGE |  |  |
| Wetland |  |  |
| High groundwater table |  |  |
| TOPOGRAPHY |  |  |
| - Wetland |  |  |
| VEGETATION |  |  |
| Mixed Deciduous/Coniferous |  |  |
| Geotechnical |  |  |
| - BH 17-22 |  |  |
| Utilities |  |  |
| Hydro/Telephone/CATV |  |  |
| Comments |  |  |


| WEST ROAD - EVALUATION OF TRANSPORTATION CRITERIA |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SECT SURFACE: ASPHALT | STATION RANGE |  |  |  |  |  |
| 2A | 3+120 |  | 4+360 |  |  |  |
| FROM | HEMLOCK RD TO |  | AMABEL/ALBERMARLE BNDY |  |  |  |
| COUNTY OP DESIGNATION | COLLECTOR RURAL |  |  |  |  |  |
| CONSTRUCTION HISTORY | 1992 |  | Approx. |  |  |  |
| JUNE 2017 DAILY TRAFFIC VOLUME | 1207 |  | WRB |  | NC - No Change |  |
| GEOMETRIC DESIGN ELEMENTS | EXISTING CONDITION |  | ALTERNATIVE 1 \& 2 |  | ALTERNATIVE 3 \& 4 |  |
| POSTED SPEED (km/h) | 80 |  | 80 |  | 80 |  |
| DESIGN SPEED (km/h) | 90 |  | 90 |  | 90 |  |
|  | STANDARD | COMMENT | STANDARD | IMPACT | STANDARD | IMPACT |
| ALIGNMENT |  |  |  |  |  |  |
| VERTICAL CURVES |  |  |  |  |  |  |
| CREST (K) | 50 | FLAT | 50 | NC | 50 | NC |
| SAG (K) | 40 | FLAT | 40 | NC | 40 | NC |
| HORIZONTAL CURVE RADII (m) | 340 | STRAIGHT | 340 | NC | 340 | NC |
| LOCATION ON ROW | CENTRED | CENTRED | CENTRED | NC | CENTRED | NC |
| PLATFORM |  |  |  |  |  |  |
| LANE WIDTH (m) | 3.35 | 3.4 | 3.35 | NC | 3.35 | NC |
| SHOULDER WIDTH (m) | 1.5 | 1.5 | 1.5 | NC | 1.5 | NC |
| TOTAL PLATFORM WIDTH | 9.7 | 9.8 | 9.7 | NC | 9.7 | NC |
| RIGHT OF WAY (m) | 20.117 | 30.48 | 20.117 | NC | 20.117 | NC |

## PRELIMINARY EVALUATION OF ALTERNATIVE SOLUTIONS

| Road Section 2A: Bryant Street - Hemlock Road to Amabel/Albemarle Road |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Alternative 1 Do Nothing | Alternative 2 Spot Repair | Alternative 3 Rehabilitation | Alternative 4 Reconstruction |
| Problem Statement |  | Does Not Address Problem Statement | Does Not Address Problem Statement | Addresses Problem Statement | Addresses Problem Statement |
| Factor | Criteria |  |  |  |  |
| Transportation | Vertical Alignment | Does not improve surface deficiencies | Short term solution to overcome surface deficiencies | Meets Standards | Meets Standards |
|  | Horizontal Alignment |  |  |  |  |
|  | Surface Deficiencies |  |  |  |  |
|  | Road Width |  |  |  |  |
|  | Safety |  |  |  |  |
| Natural Environment | Natural Heritage Features | No impact | Minimal impact | Best Management Practices, Mitigation, Permits | Best Management Practices, Mitigation, Permits |
|  | Terrestrial Environments |  |  |  |  |
|  | Aquatic Environments |  |  |  |  |
| Cultural Environment | Impacts to archaeological resources \& Built heritage features | No impact | No impact | No impact | No impact |
| Social Environment | Property impacts / land acquisition (Case 1-7)* | No impact | No impact | No impact | No impact |
|  | Construction Disruption | No impact | Minimal impact | Short term impacts | Short terms impacts |
|  | Economic Development | No change | No change | No change | No change |
|  | Cycling | No improvement | Minimal Improvement | Improvement | Improvement |
| Economic Environment | Construction costs | No Impact | No Impact | $\begin{aligned} & \text { Est. \$100,000- } \\ & \$ 150,000 \text { per km } \end{aligned}$ | $\begin{aligned} & \text { Est. \$200,000- } \\ & \$ 400,000 \text { per km } \end{aligned}$ |
|  | Maintenance costs | On going | On Going | Reduced | Reduced |
| PROPOSED PRELIMINARY PREFERRED ALTERNATIVE |  |  |  | Hot Mix |  |



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 2 A - DRAWING 5




PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 2 A - DRAWING 6


## West Road - Section 2 B

Physical Characteristics by Section - 2B




## PRELIMINARY EVALUATION OF ALTERNATIVE SOLUTIONS

| Road Section 2B: Huron Road - Amabel/Albemarle Road to Kowal Lane |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Alternative 1 Do Nothing | Alternative 2 Spot Repair | Alternative 3 Rehabilitation | Alternative 4 Reconstruction |
| Problem Statement |  | Does Not Address Problem Statement | Does Not Address Problem Statement | Addresses Problem Statement | Addresses Problem Statement |
| Factor | Criteria |  |  |  |  |
| Transportation | Vertical Alignment | Does not improve surface deficiencies | Short term solution to overcome surface deficiencies | Meets Standards | Meets Standards |
|  | Horizontal Alignment |  |  |  |  |
|  | Surface Deficiencies |  |  |  |  |
|  | Road Width |  |  |  |  |
|  | Safety |  |  |  |  |
| Natural Environment | Natural Heritage Features | No impact | Minimal impact | Best Management Practices, Mitigation, Permits | Best Management Practices, Mitigation, Permits |
|  | Terrestrial Environments |  |  |  |  |
|  | Aquatic Environments |  |  |  |  |
| Cultural Environment | Impacts to archaeological resources \& Built heritage features | No impact | No impact | No impact | No impact |
| Social Environment | Property impacts / land acquisition (Case 1-7)* | No impact | No impact | Land Acquisition-1 | Land Acquisition-1 |
|  | Construction Disruption | No impact | Minimal impact | Short term impacts | Short terms impacts |
|  | Economic Development | No change | No change | No change | No change |
|  | Cycling | No improvement | Minimal Improvement | Improvement | Improvement |
| Economic Environment | Construction costs | No Impact | No Impact | $\begin{aligned} & \text { Est. \$100,000- } \\ & \$ 150,000 \text { per km } \end{aligned}$ | $\begin{aligned} & \text { Est. \$200,000- } \\ & \$ 400,000 \text { per km } \end{aligned}$ |
|  | Maintenance costs | On going | On Going | Reduced | Reduced |
| PROPOSED PRELIMINARY PREFERRED ALTERNATIVE |  |  |  | Hot Mix |  |



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 2 B - DRAWING 6


## NORTH

NOTES:


|  |  |  |  | Prover | WEST ROAD PRELIMINARY DESIGN |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
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| , |  | or | wie | Scale ${ }^{\text {y }}$ :17000 | dream er: mo | 0 | $\underset{\substack{\text { penem } \\ 6}}{ }$ |




PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 2 B - DRAWING 7


|  | NORTH | NOTES: | - |  |  |  | рrosec: | WEST ROAD PRELIMINARY DESIGN |  |  | $\frac{12}{2}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
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|  |  |  | - | Esastsumssow | co | Jweli | mue | PLAN AND STA. $4+680$ To |  |  | BRUCE county |
|  |  |  | - |  |  | are |  | oramere: mc |  |  |  |



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 2 B - DRAWING 8


## NORTH

## NOTES:




PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 2 B - DRAWING 9


|  | NORTH | NOTES: | - |  |  |  | pronecr |  |  |  | $\frac{1}{2}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | - |  |  |  | $\pi \mathrm{me}$ | PLAN AND PROFILE STA. $6+240$ TO STA. $7+020$ |  |  | BRUCE highways highways |
|  |  |  | - |  |  |  |  |  |  |  |  |
|  |  |  | $\stackrel{\square}{\square}$ | Frist sumsmon | wc | $\xrightarrow{\text { Juelt }}$ |  |  |  |  |  |
|  |  |  |  |  |  |  |  | oramer er mc | 0 |  |  |

## West Road - Section 3

Physical Characteristics by Section - 3


| WEST ROAD PRELIMINARY ASSESSMENT |  |  |
| :---: | :---: | :---: |
| SECT SURFACE: ASPHALT | STATION RANGE |  |
| 3 | 7+230 | 11+350 |
| FROM KOWEL LANE | TO | OWDENVALE ROAD |
| COUNTY OP DESIGNATION | LECTOR URB |  |
| CONSTRUCTION HISTORY | Approx. |  |
| JUNE 2017 DAILY TRAFFIC VOLUME | 685 | WRB1 |
| GEOMETRIC DESIGN ELEMENTS <br> CURRENT POSTED SPEED (km/h) <br> CURRENT DESIGN SPEED (km/h) <br> ALIGNMENT <br> VERTICAL CURVES <br> CREST (K) SAG (K) <br> HORIZONTAL CURVE RADII (m) LOCATION ON ROW 10m Encroachments | STANDARD $\begin{gathered} 50 \\ 60 \\ \\ \\ 15 \\ 18 \\ 130 \\ \text { CENTRED } \end{gathered}$ | EXISTING CONDITION <br> 50 <br> 60 <br> 1 deficient <br> 4 deficient <br> Acceptable (min 190m) <br> MEANDERS <br> $8+225$ to $8+275$ LT <br> $8+310$ TO 8+450 RT <br> 8+490 TO 8+530 LT <br> 8+930 to 9+090 LT <br> 9+700 to 9+810 LT <br> 10+615 TO 10+800 RT <br> 11+160 TO 11+250 LT |
| PLATFORM <br> LANE WIDTH (m) SHOULDER WIDTH (m) TOTAL PLATFORM WIDTH (AVG) | $\begin{gathered} 3.35 \\ 1.5 \\ 9.7 \end{gathered}$ | $\begin{gathered} 3.2 \\ 1.05 \\ 8.5 \end{gathered}$ |
| RIGHT OF WAY (m) | 20.117 | 26.5 (varies) |
| DRAINAGE Good to Poor |  |  |
| TOPOGRAPHY <br> - Dunes |  |  |
| VEGETATION <br> - Mixed Deciduous/Coniferous |  |  |
| Geotechnical- BH 38-57 |  |  |
| Utilities <br> Hydro/Telephone/CATV |  |  |
| Comments |  |  |



| Road Section 3: Huron Road - Kowal Lane to Howdenvale Road |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Alternative 1 Do Nothing | Alternative 2 <br> Spot Repair | Alternative 3 Rehabilitation | Alternative 4 Reconstruction |
| Problem Statement |  | Does Not Address Problem Statement | Does Not Address Problem Statement | Addresses Problem Statement | Addresses Problem Statement |
| Factor | Criteria |  |  |  |  |
| Transportation | Vertical Alignment | Does not improve surface deficiencies or encroachments | Short term solution to overcome surface deficiencies; does address encroachments | Meets Standards | Meets Standards |
|  | Horizontal Alignment |  |  |  |  |
|  | Surface Deficiencies |  |  |  |  |
|  | Road Width |  |  |  |  |
|  | Safety |  |  |  |  |
| Natural Environment | Natural Heritage Features | No impact | Minimal impact | Best Management Practices, Mitigation, Permits | Best Management Practices, Mitigation, Permits |
|  | Terrestrial Environments |  |  |  |  |
|  | Aquatic Environments |  |  |  |  |
| Cultural Environment | Impacts to archaeological resources \& Built heritage features | No impact | No impact | Archaeological Potential | Archaeological Potential |
| Social Environment | Property impacts / land acquisition (Case 1-7)* | No impact | No impact | Land Acquisition 1 \& 2 | Land Acquisition 1 \& 2 |
|  | Construction Disruption | No impact | Minimal impact | Short term impacts | Short terms impacts |
|  | Economic Development | No change | No change | No change | No change |
|  | Cycling | No improvement | Minimal Improvement | Improvement | Improvement |
| Economic Environment | Construction costs | No Impact | No Impact | $\begin{aligned} & \text { Est. } \$ 100,000- \\ & \$ 150,000 \text { per km } \end{aligned}$ | $\begin{aligned} & \text { Est. } \$ 200,000- \\ & \$ 400,000 \text { per km } \end{aligned}$ |
|  | Maintenance costs | On going | On Going | Reduced | Reduced |
| PROPOSED PRELIMINARY PREFERRED ALTERNATIVE |  |  |  | Hot Mix |  |



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 3 - DRAWING 10




PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 3 - DRAWING 11




PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 3 - DRAWING 12




PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 3 - DRAWING 13


|  | NORTH | NOTES: | - | - |  |  |  |  |  |  | $\frac{d x}{2}$ |
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|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | WEST ROAD PRELIMINARY DESIGN |  |  |  |
|  |  |  | - | fres sumsson | wc | wnekit | nne | $\begin{aligned} & \text { PLAN AND PROFILE } \\ & \text { STA. } 9+360 \text { TO STA. } 10+140 \end{aligned}$ |  |  |  |
|  |  |  | 0 | neseer |  | one |  | Dratwer er me |  |  |  |



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 3 - DRAWING 14




## West Road

Physical Characteristics by Section - 4A


| WEST ROAD PRELIMINARY ASSESSMENT |  |  |
| :---: | :---: | :---: |
| SECT SURFACE: GRAVEL | STATION RANGE |  |
| 4A | 11+350 | 12+840 |
| FROM HURON ROAD | TO | 2 HOWDENVALE ROAD |
| COUNTY OP DESIGNATION | LLECTOR RUR |  |
| CONSTRUCTION HISTORY | 149 Approx. |  |
| JUNE 2017 DAILY TRAFFIC VOLUME | 149 | WRC |
| GEOMETRIC DESIGN ELEMENTS <br> CURRENT POSTED SPEED (km/h) <br> CURRENT DESIGN SPEED (km/h) <br> ALIGNMENT <br> VERTICAL CURVES <br> CREST (K) SAG (K) <br> HORIZONTAL CURVE RADII (m) LOCATION ON ROW <br> 10m Encroachments | $\begin{gathered} \hline \text { STANDARD } \\ 60 \\ 70 \\ \\ \\ 25 \\ 25 \\ 190 \\ \text { CENTRED } \end{gathered}$ | EXISTING CONDITION <br> 60 <br> 70 <br> 3 deficient <br> 1 deficient <br> STRAIGHT <br> MEANDERS <br> 11+270 to 11+430 LT <br> $11+370$ to $12+840$ RT |
| PLATFORM <br> LANE WIDTH (m) SHOULDER WIDTH (m) TOTAL PLATFORM WIDTH (AVG) | $\begin{gathered} 3.35 \\ 1.5 \\ 9.7 \end{gathered}$ | $\begin{aligned} & 3 \\ & 0 \\ & 6 \end{aligned}$ |
| RIGHT OF WAY (m) | 20.117 | 12.2 TO 20.1 (varies) |
| DRAINAGEPOOR |  |  |
| TOPOGRAPHY <br> WETLAND |  |  |
| VEGETATION |  |  |
| Geotechnical |  |  |
| Utilities <br> - Hydro/Telephone/CATV |  |  |
| Comments |  |  |


|  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{array}{lll} & \\ \text { SEST ROAD - EVALUATION OF TRANSPORTATION CRITERIA }\end{array}$ |  |  |  |  |  |  |  |  |
| 4A 11+350 |  |  | 12+840 |  |  |  |  |  |
| FROM | HURON ROAD TO |  | 620 HOWDENVALE ROAD |  |  |  |  |  |
| COUNTY OP DESIGNATION COLLECTOR RURAL | COLLECTOR RURAL |  |  |  |  |  |  |  |
| CONSTRUCTION HISTORY | Approx. |  |  |  |  |  |  |  |
| JUNE 2017 DAILY TRAFFIC VOLUME 149 | 149 |  | WRC |  |  |  | NC - No Change |  |
| GEOMETRIC DESIGN ELEMENTS | EXIS | NG CONDITION | ALTERNA | VE 1 \& 2 | ALTERN | TIVE 3 | ALTERN | TIVE 4 |
| POSTED SPEED (km/h) |  | 60 |  |  |  |  |  |  |
| DESIGN SPEED (km/h) |  | 70 |  |  |  |  | 7 |  |
|  | STANDARD | COMMENT | STANDARD | IMPACT | STANDARD | IMPACT | STANDARD | IMPACT |
| ALIGNMENT |  |  |  |  |  |  |  |  |
| VERTICAL CURVES |  |  |  |  |  |  |  |  |
| CREST (K) | 25 | 3 DEFICIENT | 25 | NC | 25 | NC | 25 | MEETS STD |
| SAG (K) | 25 | 1 DEFICIENT | 25 | NC | 25 | NC | 25 | MEETS STD |
| HORIZONTAL CURVE RADII (m) | 190 | STRAIGHT | 190 | NC | 190 | NC | 190 | NC |
| LOCATION ON ROW | CENTRED | MEANDERS | CENTRED | NC | CENTRED | CENTRED | CENTRED | CENTRED |
| 10m Encroachments |  | $11+270$ to $11+430$ LT |  | NC | ACQUIRE LAND | CASE 3 | ACQUIRE LAND | CASE 3 |
|  |  | $11+370$ to $12+840$ RT |  | NC | ACQUIRE LAND | CASE 3 | ACQUIRE LAND | CASE 3 |
| PLATFORM |  |  |  |  |  |  |  |  |
| LANE WIDTH (m) | 3.35 | 3 | 3.35 | NC | 3.35 | WIDER | 3.35 | WIDER |
| SHOULDER WIDTH (m) | 1.5 | 0 | 1.5 | NC | 1.5 | WIDER | 1.5 | WIDER |
| TOTAL PLATFORM WIDTH (AVG) | 9.7 | 6 | 9.7 | NC | 9.7 | WIDER | 9.7 | WIDER |
| RIGHT OF WAY (m) | 20.117 | 12.2 TO 20.1 (Varies) | 20.117 | NC | 20.117 | NC | 20.117 | NC |

## PRELIMINARY EVALUATION OF ALTERNATIVE SOLUTIONS

| Road Section 4A: Howdenvale Road - Huron Road to 620 Howdenvale Road |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Alternative 1 Do Nothing | Alternative 2 Spot Repair | Alternative 3 Rehabilitation | Alternative 4 Reconstruction |
| Problem Statement |  | Does Not Address Problem Statement | Does Not Address Problem Statement | Does Not Address Problem Statement | Addresses Problem Statement |
| Factor | Criteria |  |  |  |  |
| Transportation | Vertical Alignment | Does not address deficiencies | Does not address deficiencies | Addresses width, surface deficiencies \& encroachments; not vertical alignment | Meets Standards |
|  | Horizontal Alignment |  |  |  |  |
|  | Surface Deficiencies |  |  |  |  |
|  | Road Width |  |  |  |  |
|  | Safety |  |  |  |  |
| Natural Environment | Natural Heritage Features | No impact | Minimal impact | Best Management Practices, Mitigation, Permits | Best Management Practices, Mitigation, Permits |
|  | Terrestrial Environments |  |  |  |  |
|  | Aquatic Environments |  |  |  |  |
| Cultural Environment | Impacts to archaeological resources \& Built heritage features | No impact | No impact | Archaeological Potential | Archaeological Potential |
| Social Environment | Property impacts / land acquisition (Case 1-7)* | No impact | No impact | Land Acquisition 3 | Land Acquisition 3 |
|  | Construction Disruption | No impact | Minimal impact | Short term impacts | Short terms impacts |
|  | Economic Development | No change | No change | No change | No change |
|  | Cycling | No improvement | No improvement | No improvement | Minimal improvement |
| Economic Environment | Construction costs | No Impact | No Impact | $\begin{aligned} & \text { Est. \$100,000- } \\ & \$ 150,000 \text { per km } \end{aligned}$ | $\begin{aligned} & \text { Est. \$200,000- } \\ & \$ 400,000 \text { per km } \end{aligned}$ |
|  | Maintenance costs | On going | On Going | Reduced | Reduced |
| PROPOSED PRELIMINARY PREFERRED ALTERNATIVE |  |  |  |  | Hot Mix |




PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 4 A - DRAWING 16




PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 4 A - DRAWING 17



## West Road

Physical Characteristics by Section - 4B


| WEST ROAD PRELIMINARY ASSESSMENT |  |  |
| :---: | :---: | :---: |
| SECT SURFACE: GRAVEL | STATION RANGE |  |
| 4B | 12+840 | 13+980 |
| FROM 620 HOWDENVALE ROAD | TO | 6 HOWDENVALE ROAD |
| COUNTY OP DESIGNATION | LLECTOR RUR |  |
| CONSTRUCTION HISTORY | 149 Approx. |  |
| JUNE 2017 DAILY TRAFFIC VOLUME | 149 | WRC |
| GEOMETRIC DESIGN ELEMENTS <br> CURRENT POSTED SPEED (km/h) <br> CURRENT DESIGN SPEED (km/h) <br> ALIGNMENT <br> VERTICAL CURVES <br> CREST (K) SAG (K) <br> HORIZONTAL CURVE RADII (m) LOCATION ON ROW <br> 10m Encroachments | $\begin{gathered} \hline \text { STANDARD } \\ 60 \\ 70 \\ \\ \\ 25 \\ 25 \\ 190 \\ \text { CENTRED } \end{gathered}$ | EXISTING CONDITION <br> 60 <br> 70 <br> 4 deficient <br> 3 deficient <br> ACCEPTABLE <br> MEANDERS $\begin{aligned} & 12+840 \text { TO } 13+280 \text { RT } \\ & 13+440 \text { TO } 13+550 \text { LT } \end{aligned}$ |
| PLATFORM <br> LANE WIDTH (m) SHOULDER WIDTH (m) TOTAL PLATFORM WIDTH (AVG) | $\begin{gathered} 3.35 \\ 1.5 \\ 9.7 \end{gathered}$ | $\begin{aligned} & 3 \\ & 0 \\ & 6 \end{aligned}$ |
| RIGHT OF WAY (m) | 20.117 | 20.1 (Varies) |
| DRAINAGEFAIR |  |  |
| TOPOGRAPHY DUNES |  |  |
| VEGETATION <br> Mixed Deciduous/Coniferous |  |  |
| Geotechnical <br> - BH 66-71 |  |  |
| Utilities <br> Hydro/Telephone/CATV |  |  |
| Comments |  |  |



## PRELIMINARY EVALUATION OF ALTERNATIVE SOLUTIONS

| Road Section 4B: Howdenvale Raod - 620 Howdenvale Road to 536 Howdenvale Road |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Alternative 1 Do Nothing | Alternative 2 Spot Repair | Alternative 3 Rehabilitation | Alternative 4 Reconstruction |
| Problem Statement |  | Does Not Address Problem Statement | Does Not Address Problem Statement | Does Not Address Problem Statement | Addresses Problem Statement |
| Factor | Criteria |  |  |  |  |
| Transportation | Vertical Alignment | Does not address deficiencies | Does not address deficiencies | Addresses width, surface deficiencies and encroachments and horizontal alignments; not vertical | Meets Standards |
|  | Horizontal Alignment |  |  |  |  |
|  | Surface Deficiencies |  |  |  |  |
|  | Road Width |  |  |  |  |
|  | Safety |  |  |  |  |
| Natural Environment | Natural Heritage Features | No impact | Minimal impact | Best Management Practices, Mitigation, Permits | Best Management Practices, Mitigation, Permits |
|  | Terrestrial Environments |  |  |  |  |
|  | Aquatic Environments |  |  |  |  |
| Cultural Environment | Impacts to archaeological resources \& Built heritage features | No impact | No impact | Archaeological Potential | Archaeological Potential |
| Social Environment | Property impacts / land acquisition (Case 1-7)* | No impact | No impact | Land Acquisition 1 \&3 | Land Acquisition 1 \& 3 |
|  | Construction Disruption | No impact | Minimal impact | Short term impacts | Short terms impacts |
|  | Economic Development | No change | No change | No change | No change |
|  | Cycling | No improvement | No improvement | No improvement | Minimal improvement |
| Economic Environment | Construction costs | No Impact | No Impact | Est. \$50,000-\$100,000 per km | $\begin{gathered} \text { Est. \$150,000- } \\ \$ 350,000 \text { per km } \end{gathered}$ |
|  | Maintenance costs | On going | On Going | Reduced | Reduced |
| PROPOSED PRELIMINARY PREFERRED ALTERNATIVE |  |  |  |  | Hot Mix |



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 4B - DRAWING 17


## NORTH

## NOTES:




PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 4B - DRAWING 18



## West Road

Physical Characteristics by Section - 4C1


| WEST ROAD PRELIMINARY ASSESSMENT |  |  |
| :---: | :---: | :---: |
| SECT SURFACE: GRAVEL | STATION RANGE |  |
| 4C1 | 13+980 | 15+460 |
| FROM 536 HOWDENVALE ROAD | TO | T 10 CON 3 WBR |
| COUNTY OP DESIGNATION | LLECTOR RUR |  |
| CONSTRUCTION HISTORY | Approx. |  |
| JUNE 2017 DAILY TRAFFIC VOLUME | 149 | WRC |
| GEOMETRIC DESIGN ELEMENTS <br> CURRENT POSTED SPEED (km/h) <br> CURRENT DESIGN SPEED (km/h) <br> ALIGNMENT <br> VERTICAL CURVES <br> CREST (K) SAG (K) <br> HORIZONTAL CURVE RADII (m) LOCATION ON ROW 10m Encroachments | $\begin{gathered} \hline \text { STANDARD } \\ 60 \\ 70 \\ \\ \\ 25 \\ 25 \\ 190 \\ \text { CENTRED } \end{gathered}$ | EXISTING CONDITION <br> 60 <br> 70 <br> 7 deficient <br> 7 deficient <br> 3 deficient <br> MEANDERS <br> 14+310 TO 14+400 LT <br> 14+460 TO 14+550 LT <br> 14+880 TO 14+955 LT <br> 15+370 TO 15+460 RT |
| PLATFORM <br> LANE WIDTH (m) SHOULDER WIDTH (m) TOTAL PLATFORM WIDTH (AVG) | $\begin{gathered} 3.35 \\ 1.5 \\ 9.7 \end{gathered}$ | $\begin{aligned} & 3 \\ & 0 \\ & 6 \end{aligned}$ |
| RIGHT OF WAY (m) | 20.117 | 20.100 |
| DRAINAGE <br> - FAIR |  |  |
| TOPOGRAPHY <br> - SAND/SHALLOW BEDROCK |  |  |
| VEGETATION <br> Mixed Deciduous/Coniferous |  |  |
| Geotechnical <br> - BH 72-90 |  |  |
| Utilities |  |  |
| Comments |  |  |


| WEST ROAD - EVALUATION OF TRANSPORTATION CRITERIA |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SECT SURFACE: GRAVEL STATION RANGE |  |  |  |  |  |  |  |  |
| 4C1 13+980 |  |  | 15+460 |  |  |  |  |  |
| FROM | 536 HOWDENVALE ROAD TO |  | LOT 10 CON 3 WBR |  |  |  |  |  |
| COUNTY OP DESIGNATION COLLECTOR RURAL | COLLECTOR RURAL |  |  |  |  |  |  |  |
| CONSTRUCTION HISTORY |  |  | Approx. |  |  |  |  |  |
| JUNE 2017 DAILY TRAFFIC VOLUME | 149 |  | WRC |  | NC - No Change |  |  |  |
| GEOMETRIC DESIGN ELEMENTS <br> POSTED SPEED (km/h) <br> DESIGN SPEED (km/h) | EXISTING CONDITION |  | ALTERNATIVE 1 \& 2 |  | ALTERNATIVE 3 |  | ALTERNATIVE 4 |  |
|  |  | 60 |  | 0 |  |  |  |  |
|  |  | 70 |  |  |  |  |  |  |
|  | STANDARD | COMMENT | STANDARD | IMPACT | STANDARD | IMPACT | STANDARD | IMPACT |
| ALIGNMENT |  |  |  |  |  |  |  |  |
| VERTICAL CURVES |  |  |  |  |  |  |  |  |
| CREST (K) | 25 | 7 DEFICIENT | 15 | 5 DEFICIENT | 15 | 5 DEFICIENT | 15 | 3 DEFICIENT |
| SAG (K) | 25 | 7 DEFICIENT | 18 | 4 DEFICIENT | 18 | 4 DEFICIENT | 18 | 2 DEFICIENT |
| HORIZONTAL CURVE RADII (m) | 190 | 3 DEFICIENT | 130 | 3 DEFICIENT | 130 | 3 DEFICIENT | 130 | 1 DEFICIENT |
| LOCATION ON ROW | CENTRED | MEANDERS | CENTRED | NC | CENTRED | CENTRED | CENTRED | CENTRED |
| 10m Encroachments |  | 14+310 TO 14+400 LT |  | NC | ACQUIRE LAND | CASE 4 | ACQUIRE LAND | CASE 4 |
|  |  | 14+460 TO 14+550 LT |  | NC | ACQUIRE LAND | CASE 4 | ACQUIRE LAND | CASE 4 |
|  |  | 14+880 TO 14+955 LT |  | NC | ACQUIRE LAND | CASE 4 | ACQUIRE LAND | CASE 4 |
|  |  | 15+370 TO 15+460 RT |  | NC | ACQUIRE LAND | CASE 4 | ACQUIRE LAND | CASE 4 |
| PLATFORM |  |  |  |  |  |  |  |  |
| LANE WIDTH (m) | 3.35 | 3 | 3.35 | NC | 3.35 | WIDER | 3.35 | WIDER |
| SHOULDER WIDTH (m) | 1.5 | 0 | 1.5 | NC | 1.5 | WIDER | 1.5 | WIDER |
| TOTAL PLATFORM WIDTH (AVG) | 9.7 | 6 | 9.7 | NC | 9.7 | WIDER | 9.7 | WIDER |
| RIGHT OF WAY (m) | 20.117 | 20.1 | 20.117 | NC | 20.117 | NC | 20.117 | NC |

## PRELIMINARY EVALUATION OF ALTERNATIVE SOLUTIONS

| Road Section 4C1 : Howdenvale Road from 536 Howdenvale Road to LOT 10, CON 3 WBR |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Alternative 1 Do Nothing | Alternative 2 Spot Repair | Alternative 3 <br> Rehabilitation | Alternative 4 Reconstruction |
| Problem Statement |  | Does Not Address Problem Statement | Does Not Address Problem Statement | Does Not Address Problem Statement | Addresses Problem Statement |
| Factor | Criteria |  |  |  |  |
| Transportation | Vertical Alignment | Does not address deficiencies | Does not address deficiencies | Addresses width, surface deficiencies \& encroachments; not vertical, horizontal alignments | Addresses width, surface deficiencies \& encroachments; partially addresses vertical and horizontal alignment |
|  | Horizontal Alignment |  |  |  |  |
|  | Surface Deficiencies |  |  |  |  |
|  | Road Width |  |  |  |  |
|  | Safety |  |  |  |  |
| Natural Environment | Natural Heritage Features | No impact | Minimal impact | Best Management Practices, Mitigation, Permits | Best Management Practices, Mitigation, Permits |
|  | Terrestrial Environments |  |  |  |  |
|  | Aquatic Environments |  |  |  |  |
| Cultural Environment | Impacts to archaeological resources \& Built heritage features | No impact | No impact | Archaeological Potential | Archaeological Potential |
| Social Environment | Property impacts / land acquisition (Case 1-7)* | No impact | No impact | Land Acquisition 4 | Land Acquisition 4 |
|  | Construction Disruption | No impact | Minimal impact | Short term impacts | Short terms impacts |
|  | Economic Development | No change | No change | No change | No change |
|  | Cycling | No improvement | No improvement | No improvement | No improvement |
| Economic Environment | Construction costs | No Impact | No Impact | Est. \$50,000-\$100,000 per km | $\begin{aligned} & \text { Est. \$150,000- } \\ & \$ 350,000 \text { per km } \end{aligned}$ |
|  | Maintenance costs | On going | On Going | Reduced | Reduced |
| PROPOSED PRELIMINARY PREFERRED ALTERNATIVE |  |  |  |  | Gravel surface |



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 4C1 - DRAWING 18




## PROPOSED PRELIMINARY

PREFERRED ALTERNATIVE -

## SECTION 4C1 - DRAWING 20



## West Road

Physical Characteristics by Section - 4C2


| WEST ROAD PRELIMINARY ASSESSMENT |  |  |
| :---: | :---: | :---: |
| SECT SURFACE: GRAVEL | STATION RANGE |  |
| 4C2 | 15+460 | 17+940 |
| FROM LOT 10 CON 3 WBR | TO | T 4/5 CON 3 WBR |
| COUNTY OP DESIGNATION | LLECTOR RURAL |  |
| CONSTRUCTION HISTORY | Approx. |  |
| JUNE 2017 DAILY TRAFFIC VOLUME | 149 | WRC |
| GEOMETRIC DESIGN ELEMENTS <br> CURRENT POSTED SPEED (km/h) <br> CURRENT DESIGN SPEED (km/h) <br> ALIGNMENT <br> VERTICAL CURVES <br> CREST (K) SAG (K) <br> HORIZONTAL CURVE RADII (m) LOCATION ON ROW <br> 10m Encroachments | $\begin{gathered} \hline \text { STANDARD } \\ 60 \\ 70 \\ \\ \\ 25 \\ 25 \\ 190 \\ \text { CENTRED } \end{gathered}$ | EXISTING CONDITION <br> 60 <br> 70 <br> 12 deficient <br> 8 deficient <br> STRAIGHT <br> MEANDERS |
| PLATFORM <br> LANE WIDTH (m) SHOULDER WIDTH (m) TOTAL PLATFORM WIDTH (AVG) | $\begin{gathered} 3.35 \\ 1.5 \\ 9.7 \end{gathered}$ | $\begin{aligned} & 3 \\ & 0 \\ & 6 \end{aligned}$ |
| RIGHT OF WAY (m) | 20.117 | 20.100 |
| DRAINAGEFAIR |  |  |
| TOPOGRAPHY <br> - SAND/SHALLOW BEDROCK |  |  |
| VEGETATION <br> Mixed Deciduous/Coniferous |  |  |
| Geotechnical <br> - BH 72-90 |  |  |
| Utilities <br> CLEAR |  |  |
| Comments |  |  |



## PRELIMINARY EVALUATION OF ALTERNATIVE SOLUTIONS

| Road Section 4C2 : Howdenvale Road - LOT 10, CON 3 WBR to LOT 4/5, CON 3 WBR |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Alternative 1 Do Nothing | Alternative 2 Spot Repair | Alternative 3 Rehabilitation | Alternative 4 Reconstruction |
| Problem Statement |  | Does Not Address Problem Statement | Does Not Address Problem Statement | Does Not Address Problem Statement | Addresses Problem Statement |
| Factor | Criteria |  |  |  |  |
| Transportation | Vertical Alignment | Does not address deficiencies | Does not address deficiencies | Addresses width, surface deficiencies \& encroachments; not vertical, horizontal alignments | Meet standards |
|  | Horizontal Alignment |  |  |  |  |
|  | Surface Deficiencies |  |  |  |  |
|  | Road Width |  |  |  |  |
|  | Safety |  |  |  |  |
| Natural Environment | Natural Heritage Features | No impact | Minimal impact | Best Management Practices, Mitigation, Potential Permits | Best Management Practices, Mitigation, Permits |
|  | Terrestrial Environments |  |  |  |  |
|  | Aquatic Environments |  |  |  |  |
| Cultural Environment | Impacts to archaeological resources \& Built heritage features | No impact | No impact | Archaeological Potential | Archaeological Potential |
| Social Environment | Property impacts / land acquisition (Case 1-7)* | No impact | No impact | No impact | No impact |
|  | Construction Disruption | No impact | Minimal impact | Short term impacts | Short terms impacts |
|  | Economic Development | No change | No change | No change | No change |
|  | Cycling | No improvement | No improvement | No improvement | No improvement |
| Economic Environment | Construction costs | No Impact | No Impact | Est. \$50,000-\$100,000 per km | $\begin{aligned} & \text { Est. \$150,000- } \\ & \$ 350,000 \text { per km } \end{aligned}$ |
|  | Maintenance costs | On going | On Going | Reduced | Reduced |
| PROPOSED PRELIMINARY PREFERRED ALTERNATIVE |  |  |  |  | Gravel surface |



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 4C2 - DRAWING 21


NORTH
NOTES:



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 4C2 - DRAWING 22




PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 4C2 - DRAWING 23


|  | NORTH | NOTES: |  |  |  |  | proucer | WEST ROADPRELIMINARY DESIGN |  |  | $\frac{12}{2}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  | BRUCE |
|  |  |  |  |  |  |  |  |  |  |  | county |
|  |  |  | $\stackrel{\circ}{\square}$ | come | wc |  |  | STA. $17+160$ TO $_{\text {dramm }}^{\text {der }}$ |  |  |  |

## West Road

Physical Characteristics by Section - 4D


| WEST ROAD PRELIMINARY ASSESSMENT |  |  |
| :---: | :---: | :---: |
| SECT SURFACE: GRAVEL | STATION RANGE |  |
| 4D | 17+940 | 19+530 |
| FROM LOT 4/5 CON 3 WBR | TO | ANTY LANE |
| COUNTY OP DESIGNATION | LLECTOR RUR |  |
| CONSTRUCTION HISTORY | Approx. |  |
| JUNE 2017 DAILY TRAFFIC VOLUME | 149 | WRC |
| GEOMETRIC DESIGN ELEMENTS <br> CURRENT POSTED SPEED (km/h) <br> CURRENT DESIGN SPEED (km/h) <br> ALIGNMENT <br> VERTICAL CURVES <br> CREST (K) SAG (K) <br> HORIZONTAL CURVE RADII (m) LOCATION ON ROW <br> 10m Encroachments | $\begin{gathered} \hline \text { STANDARD } \\ 60 \\ 70 \\ \\ \\ 25 \\ 25 \\ 190 \\ \text { CENTRED } \end{gathered}$ | EXISTING CONDITION <br> 60 <br> 70 <br> 3 DEFFICIENT <br> 1 DEFFICIENT STRAIGHT MEANDERS |
| PLATFORM <br> LANE WIDTH (m) SHOULDER WIDTH (m) TOTAL PLATFORM WIDTH (AVG) | $\begin{gathered} 3.35 \\ 1.5 \\ 9.7 \end{gathered}$ | $\begin{aligned} & 3 \\ & 0 \\ & 6 \end{aligned}$ |
| RIGHT OF WAY (m) | 20.117 | 20.100 |
| DRAINAGE |  |  |
| TOPOGRAPHY |  |  |
| VEGETATION <br> Mixed Deciduous/Coniferous |  |  |
| Geotechnical- BH 72-100 |  |  |
| $\begin{array}{\|ll} \hline \text { Utilities } & \\ \bullet & \text { CLEAR } \end{array}$ |  |  |
| Comments |  |  |


|  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SECT   <br> WEST ROAD - EVALUATION OF TRANSPORTATION CRITERIA   <br> SURFACE: GRAVEL STATION RANGE |  |  |  |  |  |  |  |  |
| 4D 17+940 |  |  | 19+530 |  |  |  |  |  |
| FROM LOT 4 | LOT 4/5 CON 3 WBR TO |  | SHANTY LANE |  |  |  |  |  |
| COUNTY OP DESIGNATION COLLECTOR RURAL |  |  |  |  |  |  |  |  |
| CONSTRUCTION HISTORY |  |  | Approx. |  |  |  |  |  |
| JUNE 2017 DAILY TRAFFIC VOLUME | 149 |  | WRC |  |  |  | NC - No Change |  |
| GEOMETRIC DESIGN ELEMENTS | EXISTING CONDITION |  | ALTERNATIVE 1 \& 2 |  | ALTERNATIVE 3 |  | ALTERNATIVE 4 |  |
| POSTED SPEED (km/h) | 60 |  | 60 |  | 60 |  | 60 |  |
| DESIGN SPEED (km/h) | 70 |  | 70 |  | 70 |  | 70 |  |
|  | STANDARD | COMMENT | STANDARD | IMPACT | STANDARD | IMPACT | STANDARD | IMPACT |
| ALIGNMENT |  |  |  |  |  |  |  |  |
| VERTICAL CURVES |  |  |  |  |  |  |  |  |
| CREST (K) | 25 | 3 DEFICIENT | 25 | NC | 25 | NC | 25 | MEET STD |
| SAG (K) | 25 | 1 DEFICIENT | 25 | NC | 25 | NC | 25 | MEET STD |
| HORIZONTAL CURVE RADII (m) | 190 | STRAIGHT | 190 | NC | 190 | NC | 190 | NC |
| LOCATION ON ROW | CENTRED | MEANDERS | CENTRED | NC | CENTRED | CENTRED | CENTRED | CENTRED |
| PLATFORM |  |  |  |  |  |  |  |  |
| LANE WIDTH (m) | 3.35 | 3 | 3.35 | NC | 3.35 | WIDER | 3.35 | WIDER |
| SHOULDER WIDTH (m) | 1.5 | 0 | 1.5 | NC | 1.5 | WIDER | 1.5 | WIDER |
| TOTAL PLATFORM WIDTH (AVG) | 9.7 | 6 | 9.7 | NC | 9.7 | WIDER | 9.7 | WIDER |
| RIGHT OF WAY (m) | 20.117 | 20.117 | 20.117 | NC | 20.117 | NC | 20.117 | NC |

## PRELIMINARY EVALUATION OF ALTERNATIVE SOLUTIONS

| Road Section 4D: Daddy Weir Road from LOT 4/5, CON 3 WBR to Shanty Lane |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Alternative 1 Do Nothing | Alternative 2 Spot Repair | Alternative 3 Rehabilitation | Alternative 4 Reconstruction |
| Problem Statement |  | Does Not Address Problem Statement | Does Not Address Problem Statement | Does Not Address Problem Statement | Addresses Problem Statement |
| Factor | Criteria |  |  |  |  |
| Transportation | Vertical Alignment | Does not address deficiencies | Does not address deficiencies | Addresses width \& surface deficiencies; not vertical, horizontal alignments | Meets Standards |
|  | Horizontal Alignment |  |  |  |  |
|  | Surface Deficiencies |  |  |  |  |
|  | Road Width |  |  |  |  |
|  | Safety |  |  |  |  |
| Natural Environment | Natural Heritage Features | No impact | Minimal impact | Best Management Practices, Mitigation | Best Management Practices, Mitigation, Permits |
|  | Terrestrial Environments |  |  |  |  |
|  | Aquatic Environments |  |  |  |  |
| Cultural Environment | Impacts to archaeological resources \& Built heritage features | No impact | No impact | No impact | No impact |
| Social Environment | Property impacts / land acquisition (Case 1-7)* | No impact | No impact | No impact | No impact |
|  | Construction Disruption | No impact | Minimal impact | Short term impacts | Short terms impacts |
|  | Economic Development | No change | No change | No change | No change |
|  | Cycling | No improvement | No improvement | No improvement | No improvement |
| Economic Environment | Construction costs | No Impact | No Impact | Est. \$50,000-\$100,000 per km | $\begin{aligned} & \text { Est. \$150,000- } \\ & \$ 350,000 \text { per km } \end{aligned}$ |
|  | Maintenance costs | On going | On Going | Reduced | Reduced |
| PROPOSED PRELIMINARY PREFERRED ALTERNATIVE |  |  |  |  | Gravel surface |



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 4D - DRAWING 24


## NORTH

NOTES:



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 4D - DRAWING 25


## NORTH

NOTES:

|  | NORTH |  | NOTES: |  |  | meocer $\quad \begin{gathered}\text { WeST ROA } \\ \text { PRELIMNARY }\end{gathered}$ |  |  |  | $\frac{1 k}{25}$ |
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|  |  |  | - |  | $\square$ |  |  |  |  |  |
|  |  |  | - |  |  |  |  |  |  | BRUCE |
|  |  |  | - | Fers semsow | we. meser |  |  |  |  | $\underset{\substack{\text { county } \\ \text { highwas }}}{\text { BREE }}$ |
|  |  |  |  | mea | $\ldots$ |  | oeamer ex ne | 0 |  |  |

## West Road

Physical Characteristics by Section - 4E




| Road Section 4E: West Road from Shanty Lane to Pike Bay Road |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Alternative 1 Do Nothing | Alternative 2 Spot Repair | Alternative 3 <br> Rehabilitation | Alternative 4 Reconstruction |
| Problem Statement |  | Does Not Address Problem Statement | Does Not Address Problem Statement | Does Not Address Problem Statement | Addresses Problem Statement |
| Factor | Criteria |  |  |  |  |
| Transportation | Vertical Alignment | Does not address deficiencies | Does not address deficiencies | Addresses width \& surface deficiencies; not vertical, horizontal alignments | Meets Standards |
|  | Horizontal Alignment |  |  |  |  |
|  | Surface Deficiencies |  |  |  |  |
|  | Road Width |  |  |  |  |
|  | Safety |  |  |  |  |
| Natural Environment | Natural Heritage Features | No impact | Minimal impact | Best Management Practices, Mitigation, Permits | Best Management Practices, Mitigation, Permits |
|  | Terrestrial Environments |  |  |  |  |
|  | Aquatic Environments |  |  |  |  |
| Cultural Environment | Impacts to archaeological resources \& Built heritage features | No impact | No impact | Archaeological Potential | Archaeological Potential |
| Social Environment | Property impacts / land acquisition (Case 1-7)* | No impact | No impact | No impact | No impact |
|  | Construction Disruption | No impact | Minimal impact | Short term impacts | Short terms impacts |
|  | Economic Development | No change | No change | No change | No change |
|  | Cycling | No improvement | No improvement | No improvement | improvement |
| Economic Environment | Construction costs | No Impact | No Impact | $\begin{aligned} & \text { Est. \$100,000- } \\ & \$ 150,000 \text { per km } \end{aligned}$ | $\begin{aligned} & \text { Est. } \$ 200,000- \\ & \$ 400,000 \text { per km } \end{aligned}$ |
|  | Maintenance costs | On going | On Going | Reduced | Reduced |
| PROPOSED PRELIMINARY PREFERRED ALTERNATIVE |  |  |  |  | Hot Mix |



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 4E - DRAWING 26


|  | NORTH | NOTES: | - |  |  |  | proucer | $\xrightarrow[\text { WEST ROAD }]{\text { PRELIMINARY DESIGN }}$ |  |  | $\frac{12}{4}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | TnLe $\quad \begin{gathered}\text { PLAN AND } \\ \text { STA. } 19+500 \\ \text { T }\end{gathered}$ |  |  |  | BRUCE <br> county highways <br> 30 PARK STREET, WALKERTON ON NOG |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 5 |  | $\cdots$ |  | wc |  | Scale reflitioo | STA. $19+500$ TO |  |  |  |



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 4E - DRAWING 27




PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 4E - DRAWING 28



## West Road

Physical Characteristics by Section - 4F



| WEST ROAD - EVALUATION OF TRANSPORTATION CRITERIA |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SECT SURFACE: GRAVEL STATION RANGE |  |  |  |  |  |  |  |  |
| 4F 21+585 |  |  | 25+550 |  |  |  |  |  |
| FROM | PIKE BAY ROAD TO |  | LITTLE PIKE BAY ROAD |  |  |  |  |  |
| COUNTY OP DESIGNATION COLLECTOR RURAL | COLLECTOR RURAL |  |  |  |  |  |  |  |
| CONSTRUCTION HISTORY |  |  | Approx. |  |  |  |  |  |
| JUNE 2017 DAILY TRAFFIC VOLUME 335 | 335 |  | WRC |  |  |  | NC - No Change |  |
| GEOMETRIC DESIGN ELEMENTS POSTED SPEED (km/h) DESIGN SPEED (km/h) | EXISTING CONDITION |  | ALTERNATIVE 1 \&2 |  | ALTERNATIVE 3 |  | ALTERNATIVE 4 |  |
|  | 60 |  | 60 |  | 60 |  | 70 |  |
|  |  | 70 | 70 |  | 70 |  | 80 |  |
|  | STANDARD | COMMENT | STANDARD | IMPACT | STANDARD | IMPACT | STANDARD | IMPACT |
| ALIGNMENT VERTICAL CURVES |  |  |  |  |  |  |  |  |
| CREST (K) | 25 | 14 DEFICIENT | 25 | NC | 25 | NC | 35 | MEET STD |
| SAG (K) | 25 | 14 DEFICIENT | 25 | NC | 25 | NC | 30 | MEET STD |
| HORIZONTAL CURVE RADII (m) | 190 | STRAIGHT | 190 | NC | 190 | NC | 250 | NC |
| Location on row | CENTRED | MEANDERS | CENTRED | NC | CENTRED | NC | CENTRED | CENTRED |
| DEVIATION ROAD SECTION |  | $23+100$ to $24+000$ |  | NC |  | NC | ACQUIRE LAND | CASE 5 |
| PLATFORM |  |  |  |  |  |  |  |  |
| LANE WIDTH (m) | 3.35 | 3.5 | 3.35 | NC | 3.35 | WIDER | 3.35 | WIDER |
| SHOULDER WIDTH (m) | 1.5 | 0 | 1.5 | NC | 1.5 | WIDER | 1.5 | WIDER |
| TOTAL PLATFORM WIDTH (AVG) | 9.7 | 7 | 9.7 | NC | 9.7 | WIDER | 9.7 | WIDER |
| RIGHT OF WAY (m) | 20.117 | 20.117 | 20.117 | NC | 20.117 | NC | 20.117 | NC |

## PRELIMINARY EVALUATION OF ALTERNATIVE SOLUTIONS

| Road Section 4F: West Road from Pike Bay Road to Little Pike Bay Road |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Alternative 1 Do Nothing | Alternative 2 Spot Repair | Alternative 3 Rehabilitation | Alternative 4 Reconstruction |
| Problem Statement |  | Does Not Address Problem Statement | Does Not Address Problem Statement | Does Not Addresses Problem Statement | Addresses Problem Statement |
| Factor | Criteria |  |  |  |  |
| Transportation | Vertical Alignment | Does not address deficiencies | Does not address deficiencies | Addresses surface deficiencies only | Meets Standards |
|  | Horizontal Alignment |  |  |  |  |
|  | Surface Deficiencies |  |  |  |  |
|  | Road Width |  |  |  |  |
|  | Safety |  |  |  |  |
| Natural Environment | Natural Heritage Features | No impact | Minimal impact | Best Management Practices, Mitigation, Permit | Best Management Practices, Mitigation, Permit |
|  | Terrestrial Environments |  |  |  |  |
|  | Aquatic Environments |  |  |  |  |
| Cultural Environment | Impacts to archaeological resources \& Built heritage features | No impact | No impact | Archaeological Potential | Archaeological Potential |
| Social Environment | Property impacts / land acquisition (Case 1-7)* | No impact | No impact | No impact | Land Acquisition - 5 |
|  | Construction Disruption | No impact | Minimal impact | Short term impacts | Short terms impacts |
|  | Economic Development | No change | No change | No change | No change |
|  | Cycling | No improvement | No improvement | Improvement | Improvement |
| Economic Environment | Construction costs | No Impact | No Impact | $\begin{aligned} & \text { Est. \$100,000- } \\ & \$ 150,000 \text { per km } \end{aligned}$ | $\begin{aligned} & \text { Est. \$200,000- } \\ & \$ 400,000 \text { per km } \end{aligned}$ |
|  | Maintenance costs | On going | On Going | Reduced | Reduced |
| PROPOSED PRELIMINARY PREFERRED ALTERNATIVE |  |  |  |  | Hot Mix |



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 4F - DRAWING 29



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 4F - DRAWING 30

|  | NORTH | NOTES: | - |  |  |  | proucer | $\xrightarrow[\text { WEST ROAD }]{\text { PRELIMINARY DESIGN }}$ |  |  | $\frac{1}{4}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  | BRUCE <br> county highways |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | - |  | mc | Avont |  |  |  |  |  |  |  |  |
|  |  |  | - | neseom |  | ame |  | opame 日: mc | ${ }^{\text {nessem }}$ |  |  |



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 4F - DRAWING 31




PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 4F - DRAWING 32

|  | NORTH | NOTES: | - |  |  |  | proner | $\xrightarrow[\text { WEST ROAD }]{\text { PRELIMINARY DESIGN }}$ |  |  | $\frac{12}{2}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | nne: | ${ }_{\text {STA }}^{\text {PLAN AND }}$ |  |  | BRUCE |
|  | ${ }^{-10}$ |  | $\cdots$ | Pvalce weormarovessoun | +c\| |  | Schle | STA. $23+680$ TO |  |  | highways |



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 4F - DRAWING 33




PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 4F - DRAWING 34


## West Road

Physical Characteristics by Section - 5


| WEST ROAD PRELIMINARY ASSESSMENT |  |  |
| :---: | :---: | :---: |
| SECT SURFACE: ASPHALT | STATION RANGE |  |
| 5A | 25+550 | 27+580 |
| FROM LITTLE PIKE BAY ROAD | TO | RYY ROAD |
| COUNTY OP DESIGNATION | LLECTOR RURAL |  |
| CONSTRUCTION HISTORY | Approx. |  |
| JUNE 2017 DAILY TRAFFIC VOLUME | 477 | WRC |
| GEOMETRIC DESIGN ELEMENTS <br> CURRENT POSTED SPEED (km/h) <br> CURRENT DESIGN SPEED (km/h) <br> ALIGNMENT <br> VERTICAL CURVES <br> CREST (K) SAG (K) <br> HORIZONTAL CURVE RADII (m) LOCATION ON ROW <br> 10m Encroachments | $\begin{gathered} \hline \text { STANDARD } \\ 80 \\ 90 \\ \\ \\ 50 \\ 40 \\ 340 \\ \text { CENTRED } \end{gathered}$ | EXISTING CONDITION <br> 80 <br> 90 <br> 1 DEFFICIENT <br> ACCEPTABLE <br> STRAIGHT <br> CENTRED <br> 25+500 to 27+500 LT/RT |
| PLATFORM <br> LANE WIDTH (m) SHOULDER WIDTH (m) TOTAL PLATFORM WIDTH (AVG) | $\begin{gathered} 3.35 \\ 1.5 \\ 9.7 \end{gathered}$ | $\begin{aligned} & 3.45 \\ & 1.65 \\ & 10.2 \end{aligned}$ |
| RIGHT OF WAY (m) | 20.117 | 20.117 |
| DRAINAGE <br> FAIR <br> Existing longitudinal drainage - locati | property |  |
| TOPOGRAPHY |  |  |
| VEGETATION |  |  |
| Geotechnical$\text { - } \quad \text { BH 23-41 }$ |  |  |
| Utilities |  |  |
| Comments |  |  |



| Road Section 5A: West Road from Little Pike Bay Road to Spry Road |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Alternative 1 Do Nothing | Alternative 2 Spot Repair | Alternative 3 Rehabilitation | Alternative 4 Reconstruction |
| Problem Statement |  | Does Not Address Problem Statement | Does Not Address Problem Statement | Does Not Addresses Problem Statement | Addresses Problem Statement |
| Factor | Criteria |  |  |  |  |
| Transportation | Vertical Alignment | Does not address deficiencies | Does not address deficiencies | Addresses alignment and road width, but does not provide adequate road structure, therefore short term solution to surface deficiencies | Meets Standards |
|  | Horizontal Alignment |  |  |  |  |
|  | Surface Deficiencies |  |  |  |  |
|  | Road Width |  |  |  |  |
|  | Safety |  |  |  |  |
| Natural Environment | Natural Heritage Features | No impact | Minimal impact | Best Management Practices, Mitigation | Best Management Practices, Mitigation |
|  | Terrestrial Environments |  |  |  |  |
|  | Aquatic Environments |  |  |  |  |
| Cultural Environment | Impacts to archaeological resources \& Built heritage features | No impact | No impact | Archaeological Potential | Archaeological Potential |
| Social Environment | Property impacts / land acquisition (Case 1-7)* | No impact | No impact | No Impact | Land Acquisition-7 |
|  | Construction Disruption | No impact | Minimal impact | Short term impacts | Short terms impacts |
|  | Economic Development | No change | No change | No change | No change |
|  | Cycling | No improvement | Minimal improvement | Minimal Improvement | Minimal Improvement |
| Economic Environment | Construction costs | No Impact | No Impact | $\begin{aligned} & \text { Est. \$100,000- } \\ & \$ 150,000 \text { per km } \end{aligned}$ | $\begin{gathered} \text { Est. \$200,000- } \\ \$ 400,000 \text { per km } \end{gathered}$ |
|  | Maintenance costs | On going | On Going | Reduced | Reduced |
| PROPOSED PRELIMINARY PREFERRED ALTERNATIVE |  |  |  |  | Hot Mix |




PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 5A - DRAWING 34

|  | NORTH | NOTES: |  | - |  |  | praecer | WEST ROAD ${ }_{\text {L }}^{\text {PRELIMINARY DESIGN }}$ |  |  | $\frac{12}{2}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | T |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | mre | PLAN AND PROFILE <br> STA. $25+200$ TO STA. $25+960$ |  |  |  |
|  |  |  | $\bigcirc$ | Putic wromumonsesowr | м | ${ }^{\text {Avont }}$ |  |  |  |  |  |
|  |  |  |  | nesem |  | ant | Sanker yilitioo | ofammer: mc | 0 |  |  |



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 5A - DRAWING 35

|  | NORTH | NOTES: | - |  |  |  | proser | $\xrightarrow[\text { WEST ROAD }]{\substack{\text { PreLIMINARY DESIGN }}}$ |  |  | $\frac{12}{5}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | $\square$ | - |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | PLAN AND PROFILE STA. $25+960$ TO STA. $26+720$ |  |  | BRUCE <br> county <br> highways <br> 30 PARK STREET, WALKERTON ON NOG 2 VO TEL: (519) 881-2400 FAX: (519) $507-3030$ |
|  |  |  | $\bigcirc$ | putuc wemamow sessovz | wc | N0615 |  |  |  |  |  |
|  |  |  | - | enesu |  | wis |  | orammer me | ${ }^{\text {ansen }}$ |  |  |



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 5A - DRAWING 36

|  | NORTH | NOTES: | [ |  |  |  | pracer | $\xrightarrow[\text { WEST ROAD }]{\text { PRELIMINARY DESIGN }}$ |  |  | $\frac{1}{2}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  | BRUCE county |
|  |  |  | $\bigcirc$ | Puutic nromumovesssave2 | wc | Avent | nne | $\begin{gathered} \text { PLAN AND PROFILE } \\ \text { STA. } 26+720 \text { TO STA. } 27+480 \end{gathered}$ |  |  |  |
|  |  |  |  | ceson |  | ${ }_{\text {ouf }}$ | Scale rinlinioc | סramer br mc | 0 |  |  |



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 5A - DRAWING 37




## PRELIMINARY EVALUATION OF ALTERNATIVE SOLUTIONS

| Road Section 5B: West Road from Spry Road to Ferndale Road |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Alternative 1 Do Nothing | Alternative 2 Spot Repair | Alternative 3 <br> Rehabilitation | Alternative 4 Reconstruction |
| Problem Statement |  | Does Not Address Problem Statement | Does Not Address Problem Statement | Addresses Problem Statement | Addresses Problem Statement |
| Factor | Criteria |  |  |  |  |
| Transportation | Vertical Alignment | Does not address deficiencies | Does not address deficiencies | Meets Standards | Meets Standards |
|  | Horizontal Alignment |  |  |  |  |
|  | Surface Deficiencies |  |  |  |  |
|  | Road Width |  |  |  |  |
|  | Safety |  |  |  |  |
| Natural Environment | Natural Heritage Features | No impact | Minimal impact | Best Management Practices, Mitigation | Best Management Practices, Mitigation |
|  | Terrestrial Environments |  |  |  |  |
|  | Aquatic Environments |  |  |  |  |
| Cultural Environment | Impacts to archaeological resources \& Built heritage features | No impact | No impact | Archaeological Potential | Archaeological Potential |
| Social Environment | Property impacts / land acquisition (Case 1-7)* | No impact | No impact | Land Acquisition- 7 | Land Acquisition- 7 |
|  | Construction Disruption | No impact | Minimal impact | Short term impacts | Short terms impacts |
|  | Economic Development | No change | No change | No change | No change |
|  | Cycling | No improvement | Minimal Improvement | Improvement | Improvement |
| Economic Environment | Construction costs | No Impact | No Impact | $\begin{aligned} & \text { Est. \$100,000- } \\ & \$ 150,000 \text { per km } \end{aligned}$ | $\begin{aligned} & \text { Est. \$200,000- } \\ & \$ 400,000 \text { per km } \end{aligned}$ |
|  | Maintenance costs | On going | On Going | Reduced | Reduced |
| PROPOSED PRELIMINARY PREFERRED ALTERNATIVE |  |  |  | Hot Mix |  |



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 5B - DRAWING 37

|  | NORTH | NOTES: | - |  |  |  |  |  |  | $\frac{d x}{2}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  | prosere: |  |  |  |  |
|  |  |  |  |  |  |  |  |  | WEST ROADPRELIMINARY DESIGN |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  | BRUCE |
|  |  |  |  |  |  |  |  | Tre | PLAN AND STA. $27+480$ TO |  |  |  |
|  |  |  |  |  |  |  |  | scale | drame ey mc |  |  |  |



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 5B - DRAWING 38



PROPOSED PRELIMINARY PREFERRED ALTERNATIVE - SECTION 5B - DRAWING 39


## West Road

Preliminary Proposed Speed Limits - August 23, 2017


## IDENTIFY RECOMMENDED SOLUTIONS

PROPOSED PRELIMINARY PREFERRED ALTERNATIVE

|  | Alternative 1 <br> Do Nothing | Alternative 2 <br> Spot Repair | Alternative 3 <br> Rehabilitation | Alternative 4 <br> Reconstruction |
| :--- | :--- | :--- | :---: | :---: |
| Section <br> 1A\&1B |  |  | HOTMIX |  |
| Section 2A |  |  | HOTMIX |  |
| Section 2B |  |  | HOTMIX |  |
| Section 3 |  |  |  | HOTMIX |
| Section 4A |  |  |  | HOTMIX |
| Section 4B |  |  |  | GRAVEL |
| Section 4C1 |  |  |  | GRAVEL |
| Section 4C2 |  |  |  | HOTMIX |
| Section 4D |  |  |  | HOTMIX |
| Section 4E |  |  |  |  |
| Section 4F |  |  |  |  |
| Section 5A |  |  |  |  |
| Section 5B |  |  |  |  |

## West Road

Preliminary Proposed Preferred Alternative


## TOWN OF SOUTH BRUCE PENINSULA \& MUNICIPALITY OF NORTHERN BRUCE PENINSULA

## PROBLEM STATEMENT

The County issued a Municipal Class Environmental Assessment (EA) 'Notice of Commencement' for the West Road on August 11, 2015. Comments were received through attending Municipal Council meetings, hosting two discretionary public information sessions and correspondence from stakeholders. The comments received were considered in the preparation of this problem statement.

## Problem

The West Road (composed of road sections known as Bryant Street, Huron Road, Howdenvale Road, Daddy Weir Road and West Road that represents approximately 29 km ) has a number of deficiencies, that includes:

- road encroachments on private property,
- road geometry,
- inadequate road structure,
- poor road surface condition.


## Problem Statement

To assess existing conditions and develop a preferred solution for road improvements to address West Road deficiencies.

## Acknowledgment



The County acknowledged the following concerns raised at the Municipal Council meetings, discretionary public information sessions and through correspondence received.

- the EA for the West Road is not related to any wind power development;
- any widening of the existing road allowance will be applied locally and based on addressing the problem statement;
- the EA will include a review of existing environmental conditions, assessment of potential effects on the environment of alternative solutions and an identification of potential effects on the environment of the preferred solution;
- concern over road use safety will be evaluated; and
- the EA will include consultation with the Saugeen Ojibway Nations and Métis.


## Path Forward

The County will begin Phase 2 of the EA process which includes the following items:

- Identify alternative solutions to problem,
- Select EA schedule,
- Inventory natural, social, economic environment,
- Identify impact of alternative solutions on the environment and mitigating measures,
- Consult review agencies and public,
- Tentatively schedule Public Information Sessions for early summer 2016,
- Select preferred solution,
- Review and confirm choice of EA schedule.

Issued: January 21, 2016

> | BRUCE COUNTY HIGHWAYS DEPARTMENT |
| :---: |
| Attention: Brian Knox, P.Eng. County Engineer |
| P.O. Box 398, 30 Park Street, Walkerton ON NOG2V0 |
| Phone: 519-881-2400 |
| Fax: 519-507-3030 Email: bknox@brucecounty.on.ca |

### 5.6 CONSULT REVIEW AGENCIES, PUBLIC, ABORIGINAL COMMUNITIES

Highways Committee - West Road EA Presentation
Notice of Public Information Session - mailed/ circulated
Municipality of Northern Bruce Peninsula Delegation
Notice of Public Information Session Published
Meeting with Agencies/ SON
Public Information Session - Lion's Head
Public Information Session - Wiarton
Town of South Bruce Peninsula Delegation
End of comment period from Public \& Landowners
Consultation with Agencies and Aboriginal Communities
Highways Committee - West Road EA Update

August 10, 2017
August 11, 2017
August 14, 2017
August 15, 2017
August 24, 2017
August 29, 2017
August 30, 2017
September 5, 2017
September 21, 2017
Ongoing
October 19, 2017

## COUNTY OF BRUCE MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT WEST ROAD <br> TOWN OF SOUTH BRUCE PENINSULA \& MUNICIPALITY OF NORTHERN BRUCE PENINSULA

## PHASE 2 - NOTICE OF PUBLIC INFORMATION SESSIONS

The County of Bruce is undertaking a Municipal Class Environmental Assessment (Class EA) Study to determine the future needs for road maintenance and capital improvements on the 29 km road section between Oliphant (Bruce Road 13) and the Ferndale Road (Bruce Road 9), known as the West Road. The study is being conducted in accordance with the requirements of a Schedule ' C ' Municipal Class Environmental Assessment (Class EA) which is an approved process under the Environmental Assessment Act.

The Schedule ' $C$ ' EA involves a thorough examination of the problem statement, a review of existing environmental conditions, and an assessment of potential effects on the environment that will direct future decisions regarding maintenance and capital improvements. A problem statement was released in January 2016 which stated the purpose of the Class EA is to "assess existing conditions and develop a preferred solution for road improvements to address West Road deficiencies".

## PUBLIC INFORMATION SESSIONS:

Public consultation is a key component of the EA process. The County of Bruce will be conducting public information sessions to present, evaluate and receive comments on recommended solutions to the problem statement.

The sessions have been scheduled as follows:


For further information on this study please contact:
County of Bruce Highways Department
Brian Knox, County Engineer
30 Park Street, P.O. Box 398, Walkerton, ON NOG 2V0
P: 519-881-2400 ext. 263 F: 519-507-3030
bknox@brucecounty.on.ca

This Notice Issued: August 15, 2017

## EXHIBIT A. 2 <br> MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

NOTE: This flow chart is to be read in conjunction with Part A of the Municipal Class EA


