

9.0 Recommendations

One of the main objectives of this report was to provide the City with a Master Plan for the future development of the Gaetz Avenue corridor to the 115,000 population horizon. This document would outline the requirements for roadway and intersection capacity improvements, safety, business access, pedestrian and bicycle movements, transit and landscaping requirements. The report would identify land requirements and review the building setback criteria to accommodate the overall plan.

The following recommendations outline the means by which the City can implement the information presented in this report.

- To provide adequate levels of service and increase the overall safety and efficiency of the Gaetz Avenue corridor to the 115,000 population, the City should use the Redevelopment Plan and associated planning tool as a guideline for development of acceptable solutions as redevelopment occurs.
- To increase roadway capacity, long-term operational efficiency, and provide adequate spacing between signalized intersections, the signals at 78 Street should be removed and relocated to 78A Street. In order to accommodate existing businesses accessed at 78 Street a northbound and southbound protected left turn lane on Gaetz Avenue could be provided. Signals should also be installed at 80 Street.
- The City should consider maintaining the existing land use bylaw building set back criteria of 15 meter for C4 zoning and 9 meter for C2 zoning. Where future property lines are adjusted the current bylaw would apply. The building setback distance where service road bulbing is installed would be reduced to 6 meters from the property line.
- Prior to implementation of any recommended improvements that affect private property or access, further stakeholder consultation should be completed. This is of particular concern where elimination of service roads may require joint access agreements. In these situations the City should be an active participant and ensure the agreements are in place prior to implementing any changes.
- Landowners should be afforded the opportunity to purchase surplus land through removal of the service roads.
- The City should consider the relaxation of the frontage landscaping requirements for C2 and C4 zoning where businesses are highly impacted by service road bulbing.
- Where locations of existing businesses or properties do not allow the desired improvements to occur, the City should consider a staged approach to development. This report outlines the various methods of staging that could occur.

- The two most favorable options for the upgrade of the Gaetz Avenue and 32 Street intersection are Option 4, the one-way couplet, and Option 5, widening the existing intersection. Option 4 is superior in terms of overall roadway capacity, level of service and pedestrian safety. Option 5, widening of the existing intersection, is more favorable from the business owners' point of view for access and building frontage. Option 5 will meet the traffic capacity requirements, however there is some question as to the acceptable level of service at the 115,000 ultimate population for some of the turning movements. Due to the amount of public opposition to the most favorable option, City administration and council need to review this item further to determine the recommended solution
- A 1.5 meter wide walkway will be located where service roads remain in place and a 3.0 meter wide walkway will be located where service roads are removed. A bicycle route has been designated along the west side of Gaetz Avenue where it will utilize the 3.0 meter wide walkway, except for service road locations where the bicycle route will make use of the service road. The alignment of the walkways may be straight with a consistent offset from the road or slightly undulating to enhance the aesthetic appearance. Figures 8.1 to 8.8 show the landscape concept plan for the corridor. Figure 8.9 shows a rendering of the landscape cross section on a typical street in Red Deer. Finally the design cross section in Figure 8.10 shows the position of the plantings, street furniture, and other cross section elements.
- The City should adopt a common landscape theme along Gaetz Avenue as detailed in Section 8 of this report to identify the roadway as a City entrance corridor and enhance the overall aesthetics of the corridor without jeopardizing safety or visibility for business owners. Street furnishings along the corridor should be consistent and may include benches, trash receptacles, bus shelters, bollards, signage, and signal lights to complement the lights standards. Light standards would consist of 45' standard poles painted black with a flat glass fixture to minimize light pollution and will be located on both sides of the roadway. Where service roads are retained the dual headed fixture light standard will be used. Architectural metal banner plates would also be incorporated to identify Gaetz Avenue as a unique corridor.

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Stantec



June 25, 2004
File: 112870826 09

Attention: Gaetz Avenue Adjacent Stakeholder

Dear Sir or Madam:

Reference: Development Setback Study - Stakeholder Information Letter

Your organization has been identified as a potential stakeholder in the stakeholder consultation process for the Gaetz Avenue Development Setback Study. The City would like to inform you of a stakeholder consultation meeting being held to discuss issues in the area of Gaetz Avenue from Delburne Road to 37th Street and Gaetz Avenue from 68th Street to Highway 11A. We encourage your attendance and participation in the discussion and information exchange of the Gaetz Avenue Development Setback Study. If you are not able to attend please complete and return the attached comment form.

One of the City's primary transportation objectives has been to improve the functionality of the Gaetz Avenue corridor. Historically, Gaetz Avenue was designed and functioned as a major thoroughfare for motorists in Central Alberta. The evolution to city traffic patterns is no longer supported by the existing condition of Gaetz Avenue. A recent transportation study has demonstrated that a large proportion of the vehicles using Gaetz Avenue have destinations related to commerce and employment. Issues pertaining to access to businesses, overall safety, and efficiency of intersections have been identified.

The Setback Study will include a functional review of the right of way requirements to widen Gaetz Avenue to six lanes and improve operational efficiency at intersections. Establishing the setback will enable the City to facilitate the future widening of Gaetz Avenue which may involve relocation or closure of existing service roads, service road bulbing, changes to existing landscape, creation of common access to businesses, right in-right out accesses, mid-block bulbing, and median widening. We have attached several examples of previously constructed service road and access improvements associated with widening of Gaetz Avenue and improving intersection capacity for discussion purposes.

Stakeholder consultation meetings will be held on two dates both in the morning and the afternoon to address issues and to share ideas and information with regards to the impact upon

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June 25, 2004
Page 2 of 2

Reference: Development Setback Study - Stakeholder Information Letter

adjacent businesses, service roads and accesses due to widening of Gaetz Avenue. You are welcome to attend the meeting that impacts your area of concern.

Where

City Hall, 4914 – 48 Avenue, Second Floor-South Side,

When

July 7 9:00 am - 37th Street to 33rd Street, *Wapiti Room*
11:00 am – 32nd Street / Gaetz Avenue Intersection, *Crimson Star Room*
1:00 pm – 30th Street to Molly Bannister Drive, *Wapiti Room*
3:00 pm – Molly Bannister Drive to Bennett Street, *Crimson Star Room*
5:00 pm – Bennett Street to Delburne Road, *Wapiti Room*

July 8 9:00 am – 68th Street to 71st Street (Phelan), *Wapiti Room*
11:00 am – 71st Street to 74th Street, *Crimson Star Room*
1:00 pm – 74th Street to 77th Street, *Wapiti Room*
3:00 pm – 77th Street to Highway 11A, *Crimson Star Room*

The meetings will run for 90 minutes. Please note the times shown are valid for occupants on both sides of Gaetz Avenue.

A copy of this information letter and comment sheet is available for viewing on the City of Red Deer's website www.city.red-deer.ab.ca

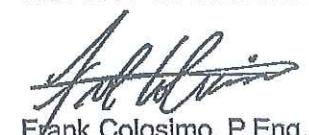
Information gathered at these meetings will be reviewed and incorporated into the draft recommendations that will be presented at a future open house. A media release will be issued and the final date for public consultation will be announced.

For more information, please contact:

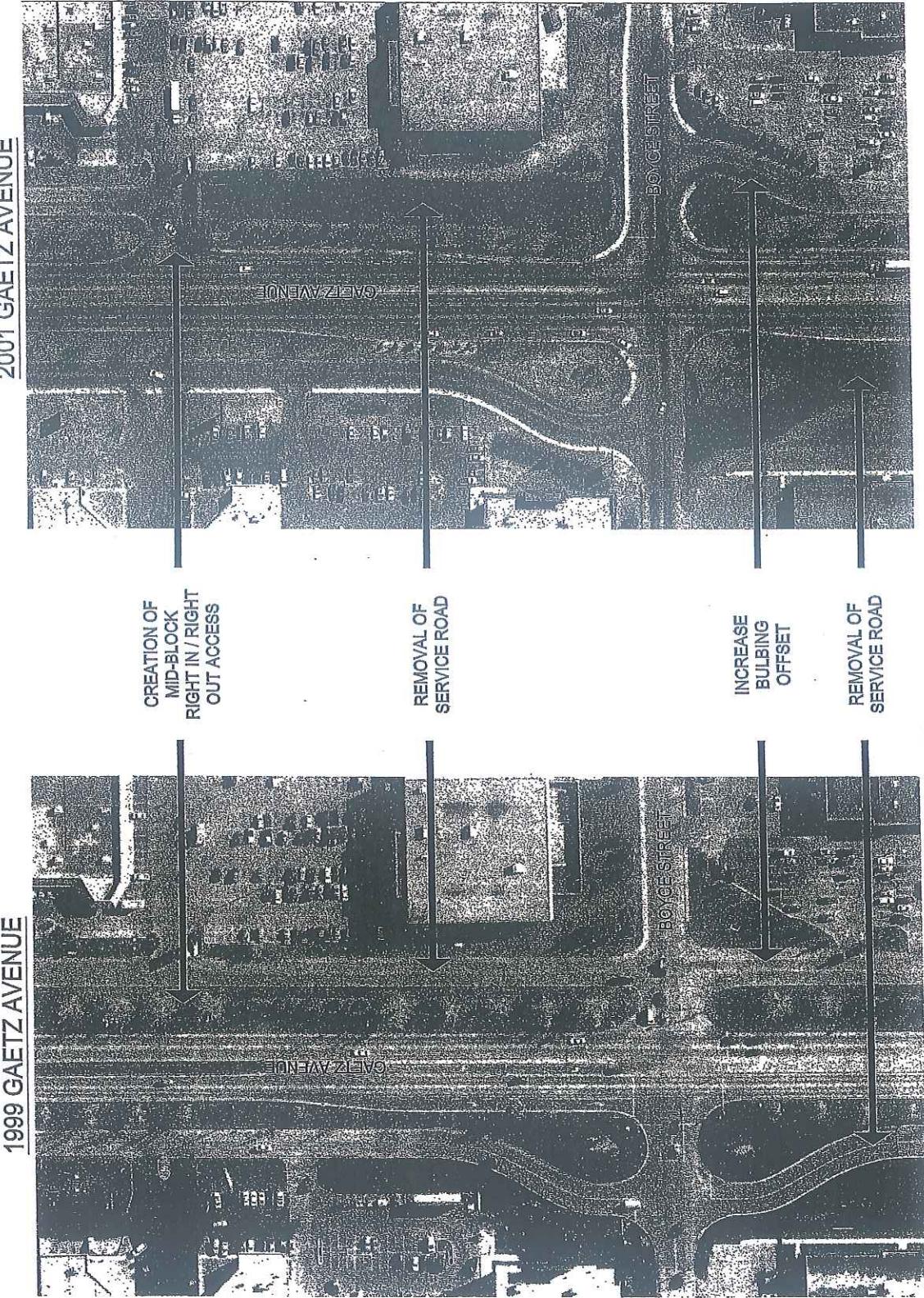
STANTEC CONSULTING LTD.


Russ Wlad, P.Eng.
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rwlad@stantec.com

THE CITY OF RED DEER


Frank Colosimo, P.Eng.
Streets Engineer
Tel: 403-342-8158
frank.colosimo@reddeer.ca

1999 GAETZ AVENUE



W:\Jdd\12870826-Gaetz Ave Setback Study\dwg\Report\70826-2001 vs 1999.dwg
2005-01-14 11:22:41 By: bmcutcheon

January, 2005

112870826

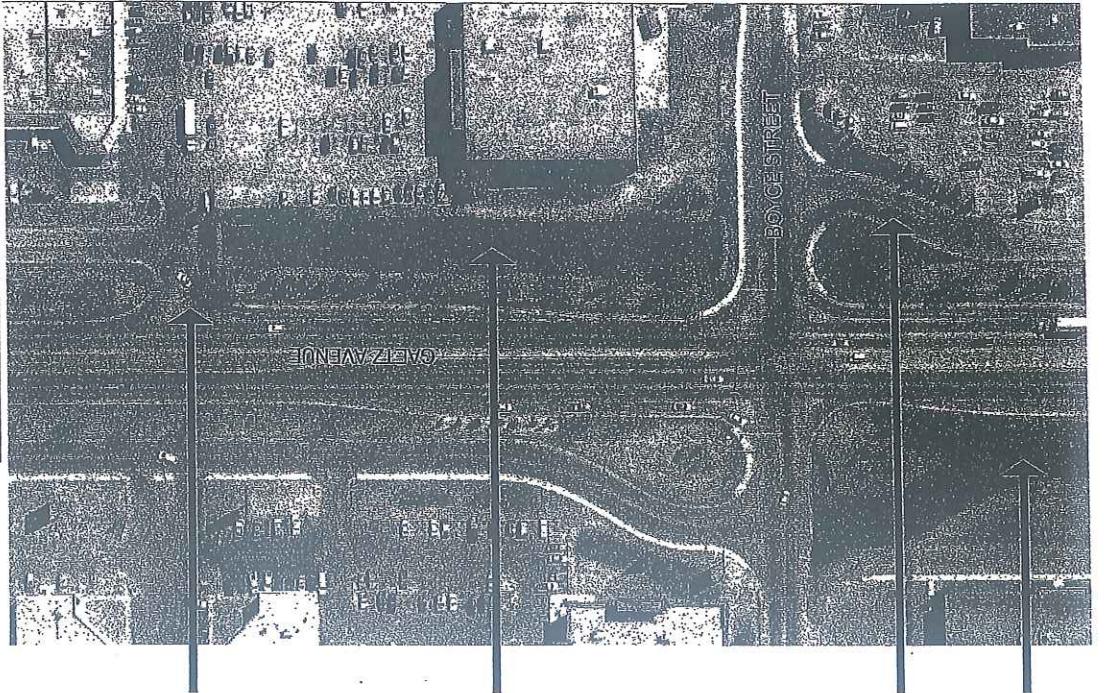
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2001 GAETZ AVENUE



January, 2005

112870826

CITY OF RED DEER
GAETZ AVENUE DEVELOPMENT
SETBACK STUDY

Figure No.

1.0

Client/Project

CITY OF RED DEER

GAETZ AVENUE DEVELOPMENT
SETBACK STUDY

Figure No.

1.0

Red Deer
THE CITY OF



1:2000

Stantec

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GAETZ AVENUE DEVELOPMENT SETBACK STUDY

Comment Form

Interested parties are invited to share their comments, concerns and/or ideas with the Project Consultants, Stantec Consulting Ltd. and the City of Red Deer. If you cannot attend the focus group meeting you may submit your comments to the City of Red Deer through their web site.

Please enter in the space provided, your mailing address, phone numbers and name in order for us to provide you with notice of project progress.

Mail or fax the form to:

Stantec Consulting Ltd.
600 – 4808 Ross Street
Red Deer, AB T4N 1X5
Fax: (403) 342-0969

Name(s): _____

Address: _____

Phone(s): _____

**Please place your comments on the next page.
(Be sure to send both sides if sending by fax)**

GAETZ AVENUE DEVELOPMENT SETBACK STUDY

Comment Form

Mail or fax to:

Stantec Consulting Ltd.
600 – 4804 Ross Street
Red Deer, AB T4N 1X5

Fax: (403) 342-0969



December 1, 2004
File: 112870826 09

Attention: Gaetz Avenue Adjacent Stakeholder

Dear Sir or Madam:

Reference: Gaetz Avenue Redevelopment Study - Open House Information

The City of Red Deer would like to invite you to the upcoming Open House to present the proposed future redevelopment of Gaetz Avenue, from Highway 11A to 67 Street and from 37 Street to Delburne Road. We encourage your attendance and participation, as your comments are an essential component in the development of the final recommendations. If you are not able to attend please complete and return the attached comment form.

The main objectives of the Gaetz Avenue Redevelopment Study are to determine the **long term** upgrading requirements for Gaetz Avenue and include the following components:

- Widening of Gaetz Avenue to six lanes and improvement of operational efficiency and safety at intersections through reconfiguring or closing existing service roads, service road bulbing and creation of new right in right out accesses.
- Access management to businesses.
- Right of Way requirements and associated building and signage setback requirements.
- Pedestrian and bicycle movements.
- Incorporation of a landscaping concept establishing Gaetz Avenue as an aesthetically pleasing corridor.

Direct stakeholder consultation and focus groups with affected businesses has guided the development of the attached conceptual block plan for your area. We look forward to your continued input at our next Open House.



Stantec

The Open Houses will be held at the following venues on the following dates and times:

South 37 Street to Delburne Road

December 14, 2004

- Capri Hotel, Palermo Room
Time: 5 p.m. to 7 p.m.
Presentation: 5:30 p.m.
Refreshments will be provided.

North Hwy 11A to 67 Street

December 16, 2004

- North Hill Inn, Glendale Room
Time: 5 p.m. to 7 p.m.
Presentation: 5:30 p.m.
Refreshments will be provided.

The Open House will provide opportunities to review the conceptual block-by-block plans, which will provide you with an opportunity to engage in direct discussion with the Project Team and The City, as well as a scheduled presentation at 5:30 p.m.

A copy of this information letter, comment sheet and attached plans is available for viewing on The City of Red Deer's Web site www.reddeer.ca, under 'Keeping You Informed', 'Projects and Initiatives'.

Information gathered at these meetings and through the comment forms will be reviewed and incorporated into the final recommendations of the Gaetz Avenue Redevelopment Study, which is expected to be presented to Council in early 2005.

Any inquiries should be forwarded to Tracey Steed, (tsteed@stantec.com) of Stantec Consulting at (403) 341-3320.

Sincerely,

Frank Colosimo, P.Eng.
The City of Red Deer
Streets Engineer
Tel: (403) 342-8158
Fax: (403) 8211
frank.colosimo@reddeer.ca

Russ Wlad, P.Eng.
Stantec Consulting Ltd.
Project Manager
Tel: 403-341-3320
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rwlad@stantec.com

December 8, 2004

Gaetz Avenue Redevelopment Study

1. Why Is The City looking to redevelop Gaetz Avenue?

Over the past few years the use of Gaetz Avenue has changed from a through-fare for motorists to a major inter-city commerce and employment route. As Red Deer continues to grow, The City is examining long-term development requirements that will enhance traffic flow, improve efficiency at intersections, allow proper access to businesses and increase safety on this route. The Gaetz Avenue Redevelopment Study takes into consideration recommendations from The City's 2003/2004 Transportation Plan which identifies this corridor as a key area for redevelopment.

2. What is being explored through this study?

The study examines long term needs for widening Gaetz Avenue in the south from Delburne Road to 37 Street, and in the north from 68 Street to Highway 11A. Specifically, this review looks at:

- Widening Gaetz Avenue to six lanes to increase capacity for current and future traffic;
- Improving operational efficiency and safety at intersections by:
 - reconfiguring or closing existing service roads to reduce traffic conflicts between crossroad intersections and main intersections;
 - creating new right in, right out accesses to adjacent businesses; and
 - developing service road bulbs to improve turning movements for larger vehicles.
- Providing well-defined pedestrian and cyclist paths and incorporating provisions for pedestrian and bicycle traffic into intersection improvements;
- Developing Right of Way requirements and associated building and signage setback requirements; and
- Incorporating landscaping standards to improve visual appeal.

3. Who is involved in the study?

The City of Red Deer is conducting this study with support from Stantec Consulting. Stakeholders and the public are also playing a key role in shaping the study and its recommendations. More than 70 business owners along Gaetz Avenue have already provided feedback on initial study results and conceptual designs. The City has conducted targeted focus groups with both business owners and roadway users and will gather further input from the public through open houses.

4. When would widening on Gaetz Avenue begin?

The study proposes the following timeline:

- Next year (2005): Widen Gaetz Avenue between 71 Street and 77 Street;
- Within the next five years: Improve intersections at 32 Street and Delburne Road;
- Within the next five to ten years: Widen Gaetz Avenue between 19 Street and 34 Street; and
- Beyond 10 years: Widen other sections of Gaetz Avenue. (Note: Timing would depend on the redevelopment of adjacent areas.)

5. Why is the study exploring the possibility of closing some service roads?

While service roads provide drivers with important access to adjacent businesses, crossroad intersections are too close to the main intersections on Gaetz Avenue. This close proximity means that drivers must monitor too many conflict points and have insufficient time to make safe driving decisions.

6. How will motorists access businesses without service roads?

Other means of access will be provided where service roads are eliminated. In some cases, direct access right in and right out from Gaetz Avenue will be provided. In other cases, joint access to a crossroad may be developed through adjoining properties.

7. Will land be available for purchase if a service road is removed?

Yes, in locations where service roads are closed there may be an opportunity for landowners to negotiate the purchase of surplus lands from The City.

8. Will the purchase of this land alter the building setback?

Yes, the building setback will depend on the final location of the property line. Where service road property is purchased, both the property line and the associated setback line will move forward.

9. Why are service road bulbs needed?

Road bulbs increase the curb radius as well as the separation between Gaetz Avenue and service roads at crossroad intersections. The bulbs improve turning movements for larger vehicles. Increased separation between Gaetz Avenue and service roads also provides more time for driver decisions.

10. How will landscaping be integrated into the proposed improvements?

The City has incorporated a strategy for landscaping that will beautify Gaetz Avenue while allowing motorists a clear view of businesses along this route.

11. What provisions will be made for pedestrians and cyclists?

Pedestrian and cyclist routes will be provided on designated pathways along boulevards and next to service roads. Provisions for pedestrian and bicycle traffic will also be incorporated into intersection improvements.

12. How will the proposed improvements increase safety?

Widening Gaetz Avenue to six lanes will provide more capacity for a growing number of vehicles, reducing congestion and traffic challenges stemming from congestion. Amendments to adjacent service road intersections are also expected to significantly reduce vehicle collisions. In addition, well-defined routes for pedestrians and cyclists will mean increased safety for those who are travelling by foot or bicycle.

13. When will the study be complete?

The City is nearing the final stages for this study anticipates that it will be complete in early 2005. Once finalized, The City will then present the study to Council for review and consideration.

14. Where can I find more information?

Plans can be viewed on The City's Web site at www.reddeer.ca in "Keeping You Informed" under the heading "Projects and Initiatives."

**Stantec**

To: Frank Colosimo, P.Eng
City of Red Deer
File: 112870830-01a

From: Neal Cormack, P.Eng
Stantec Consulting Ltd.
Date: March 29, 2005

Reference: Gaetz Avenue North Widening Signalization Options for Northlands Industrial Park

PUBLIC CONSULTATION

Following the open house meetings in December, and additional open house related issues, Stantec met with the Industrial business owners during an open house in early March 2005, and the following verbal comments were noted:

- Some people wanted to relocate the access to Kingstone Drive to 79 Street instead of at 80 Street. However, this would require a joint access agreement for the commercial development to the north, and therefore as the internal road network system was already established on the east side of Gaetz and 79 Street, it did not make any sense to disrupt the existing businesses any further.
- Similarly, some people wanted direct access to the east side of Northlands Industrial Park off 77 Street. However, this would still require a joint access agreement for the commercial development to the north.
- There was concern with turning movements of WB-20 and WB-35 (Super B's) vehicles entering the service roads off Gaetz.
- Signals at 78 or 79 Street viewed as direct access to ring road.
- A small group of business owners wanted signalization to remain at 78 Street.
- In the long term it was felt that if lights at 78 Street had to be removed the preferred option would be to install lights at 79 Street and not at 78A Street, to ensure direct access to the North Industrial ring road.
- Felt by many people that 80 Street signalization will have minimal impact on traffic and had no relevance. Stakeholders felt it did not address their needs for access to and from Gaetz Avenue.

Reference: Gaetz Avenue North Widening Left Turn Storage Bay Lengths

- Some people expressed issues with existing parking and road widths including additional turning movements which would be required if 78A Street was signalized.
- Some felt, whatever signalization is done, that two sets of lights should be placed this year (2005) to help relieve traffic congestion on 78 Street.
- Removal of lights at 78 Street was a significant change to businesses immediately adjacent 78 street including traffic exiting off Gaetz southbound onto 78 Street.

OPTION OUTLINE

Referring to the comments receive above, two (2) options were considered for the signalization for the Northlands Industrial Park along Gaetz Avenue as outlined below:

Option 1

Install new lights at 80 Street and 78A Street and remove signal at 78 Street.

Option 2

Install new lights at 80 Street and 79 Street and remove signal at 78 Street.

OPTION PRO'S AND CONS

Option 1

Pros
<ul style="list-style-type: none">• Improved equal intersection spacing and improved signalization sequence and progression of traffic along Gaetz Avenue.• Roadway widths on 80 Street and 78A Street are 14m FOC to FOC, which exceeds current day City of Red Deer Industrial Collector Roadway Standards.• 80 Street intersection aligns with future Kingsway residential and commercial developments.• 78A Street provides better mid-block service road access to businesses on the west side of Gaetz Avenue.

Reference: Gaetz Avenue North Widening Left Turn Storage Bay Lengths

Con's

- Provides no direct access to ring road from 78A Street and requires additional turning movements.
- 80 Street and 78A Street parking would need to be restricted at the corners of the intersection. 49 Avenue parking would be restricted between 80 Street and 79 Street and between 79 Street and 78 Street.
- Reconfiguration of 49 Avenue and 79 Street intersection would be recommended to redirect the existing flow of traffic and allow 49 Avenue to become the direct link to the ring road and therefore improve traffic flow from 80 Street.
- Less perceived direct route to ring road to businesses.

Option 2

Pro's

- Direct connection to Industrial ring road from 79 Street with improved truck access with fewer turning movements required.
- Minimizes areas where parking would be restricted i.e. 49 Avenue between 79 Street and 78 Street would no longer be required.
- Reconfiguration of 49 Avenue and 79 Street intersection would no longer be required.

Con's

- Uneven spacing of intersections along Gaetz between 80 Street and 78 Street causing difficulties in signalization sequencing.
- Roadway widths on 79 Street and 78 Street are 11.5 FOC to FOC, which presently does not comply with either City of Red Deer Industrial Local or Industrial Collector current day Roadway Standards.
- Bulbing on the west side of Gaetz and 79 Street would not be as centrally located for service road access as compared to 78A Street. Further distance of travel for business owners along the west side of Gaetz near Totem as a result of service road redevelopment at the intersection of 79 Street and not at 78A Street.

Reference: Gaetz Avenue North Widening Left Turn Storage Bay Lengths

- The northbound left turn lane at 80 Street will require 105 m of storage for the 115,000 population horizon and will require 218 m back to back for turning lanes in both directions at the intersection, which will not fit in it's current configuration. Therefore, double north bound left turn storage lanes at 80 Street will be required for the 115,000 population horizon to enable sufficient room to be provided between turning lanes in both directions should signalization be installed at 79 Street. This will require additional widening on the west side of Gaetz to accommodate this requirement. However, should 50 m minimum Red Deer Design Standard storage lanes be provided for the 85,000 population horizon, 163 m will be required back to back for turning lanes in both directions, which will fit in it's current configuration.
- Potential that 79 Street could exceed 5,000 traffic volume, requiring the design of 45 m bulbs, which would further impact business owners.
- Vehicle's making a left turn off Gaetz at Totem may have difficulty in finding sufficient gaps in southbound traffic in order to safely make the left turn movement.

RECOMMENDATIONS

Stantec recommends that Option 1 provides the best long term solution, and that no changes are made to the current Redevelopment Plan at this time.

The following staged improvements are recommended:

Stage 1

- Installation of traffic signalization at 80 Street (2005).
- Restricted parking at the corners of the 80 Street intersection and restricted parking on 49 Avenue between 80 Street and 79 Street.
- Reconfiguration of 49 Avenue and 79 Street intersection would be recommended to redirect the existing flow of traffic and allow 49 Avenue to become the direct link to the ring road and therefore improve traffic flow from 80 Street.
- Monitor traffic flow at 78 Street after installation of traffic signalization at 80 Street. This analysis would monitor traffic flow and volume changes at the 78 Street intersection. The signal could remain at 78 Street if significant redistribution of traffic to 80 Street occurs.

Stantec

April 1, 2005
Frank Colosimo, P.Eng
Page 5 of 5

Reference: Gaetz Avenue North Widening Left Turn Storage Bay Lengths

- Monitor traffic flow at 78 Street after installation of traffic signalization at 80 Street. This analysis would monitor traffic flow and volume changes at the 78 Street intersection. The signal could remain at 78 Street if significant redistribution of traffic to 80 Street occurs.

Stage 2

- Installation of traffic signalization at 78A Street (Future).
- Restricted parking at the corners of the 78A Street intersection and restricted parking on 49 Avenue between 79 Street and 78 Street (Future).
- Coordination of signals at 78A Street with all other signals to ensure proper traffic flow is achieved along Gaetz corridor. If redistribution of traffic from 78 Street to 78A Street occurs then the signalization at 78 Street could remain.

Stage 3

- Due to the close proximity of the intersection of 78 Street to 77 Street, the storage capacity is limited on Gaetz Avenue. Eventually the traffic volume on Gaetz Avenue will increase to a point where the signalization at 78 Street will need to be removed.

These staged improvements will allow Gaetz to function and assist the business community and their customers in adapting to future redevelopment of this portion of Gaetz Avenue and the Northlands Industrial Park.

Should you have any further questions regarding the above please do not hesitate to contact us.

Sincerely,

STANTEC CONSULTING LTD.

Neal Cormack, P.Eng
Associate
ncormack@stantec.com

Attachment: Figure 8.1 Gaetz Avenue Setback Concept 77 Street to 80 Street

c: Russ Wlad – Stantec Consulting Ltd.



September 10, 2004

John Umlah, P.Eng.
Project Engineer
Stantec Consulting
600-4808 Ross Street
Red Deer AB T4N 1X5

Dear Mr. Umlah:

RE: Preliminary Safety Review of the Gaetz Avenue Development Setback Study

We are pleased to submit our safety review of the Gaetz Avenue Development Setback Study. The report is the same as the report that was e-mailed to you on September 10.

We thank you for the opportunity to undertake this safety review. Please do not hesitate to contact Gerry Smith or myself if you have any questions.

Respectfully submitted

A handwritten signature in black ink that reads "John Morrall".

John Morrall, P.Eng.
President

**GAETZ AVENUE DEVELOPMENT
SETBACK STUDY**

PRELIMINARY SAFETY REVIEW

THE CITY OF RED DEER

September 2004

Gaetz Avenue Development Setback Study

Preliminary Safety Review

1.0 Introduction

The City of Red Deer has retained Stantec Consulting to conduct the Gaetz Avenue Development Setback Study from 19th Street to 37th Street and 67th Street to Highway 11A, including the development of a functional plan for the widening of Gaetz Avenue. The Stantec Design Team has retained Canadian Highways Institute Ltd. & GCS Technology to undertake a preliminary safety review of the existing Gaetz Avenue between 19th Street and 37th Street and the resulting functional plans, to identify potential safety issues.

A preliminary safety review is similar but not as rigorous as a road safety audit. It involves a field review of the facility and a review of collision data by experienced road safety engineers to identify existing safety related deficiencies that can be addressed in the development of the functional plan. It also involves a review of the functional plans as they are developed to identify the potential for the geometry and operational features in the plans to contribute to collisions. The safety review is not a standards conformance check and it does not consider design issues other than road safety.

The preliminary safety review focused exclusively on safety issues related to the existing conditions on Gaetz Avenue, the parallel service roads and all intersections between 19th Street and 37th Street and the modifications to Gaetz Avenue, the service roads and the intersections between 19th Street and 37th Street and between 67th Street and Highway 11A inclusive. It is recognized that the Project Team has other issues to consider when developing a project and the issue of a road safety must be carefully weighed against the other issues that impact a project.

2.0 Background

Gaetz Avenue is the main north-south major arterial in the City of Red Deer providing access to a wide range of land uses as well as accommodating through and local trips. It provides two lanes in each direction with parallel service roads on both sides that provide direct access to commercial, industrial and residential land-use.

Signalized intersections provide separate left-turn lanes with protected/permissive (PR/PE) signal phasing. The posted speed is 60 km/h.

Separate right-turn lanes are provided at some intersections and there are right-turn cut-offs in all 4 quadrants at the Gaetz Avenue/19th Street/Delburne Road intersection and the Gaetz Avenue/67th Street intersection and on the west side of Gaetz Avenue at 22nd Street, 77th Street and at Highway 11A.

The north-south service roads have STOP-controlled intersections with the east-west streets.

The existing service roads are located immediately adjacent to Gaetz Avenue and their intersection with the cross streets are within the area of influence of the existing Gaetz Avenue/cross street signalized intersection. Although at some cross-streets the service roads are "bulbed out" slightly, they are still within the area of influence of the Gaetz Avenue intersection. The location of the intersection relative to Gaetz Avenue and the short distance between Gaetz Avenue and the service roads creates a number of safety related problems at the service road intersections with the cross streets that can lead to collisions, particularly when cross street volumes are high.

3.0 Basis of the Preliminary Safety Review

The safety review was carried out by:

Dr. John Morrall, Ph.D., P. Eng., Canadian Highways Institute Ltd.
Mr. Gerald Smith, MSc., P. Eng., GCS Technology

The following documents were provided by the Project Team:

- Functional plans of Gaetz Avenue widening between 19th Street and 37th Street and 67th Street and Highway 11A, identified as fig. 1.0 – 8.0
- Large scale functional plans of Options 1 and 4 for the treatment of the Gaetz Avenue/32nd Street intersection.
- A large scale functional plan of an optional treatment of the 19th Street/Delburne Street intersection, identified as Option 1..
- Collision diagrams for the intersection and mid block collisions between 19th Street and 37th Street and balanced traffic movements.
- Existing and proposed Gaetz Avenue cross sections.

John Morrall visited the site on August 25, 2004 to conduct the daytime and nighttime field review. At the same time meetings were held with John Umlah and Dave Brown, Stantec Consulting and Frank Colosimo, Streets Engineer, The City of Red Deer.

4.0 Preliminary Safety Review Comments

4.1 Assessment of Collisions

Collisions on Gaetz Avenue at the various cross street intersections are primarily rear end collisions. The high number of rear end collisions could relate to a number of factors including:

- Congestion on Gaetz Avenue - poor level of service - creating backups at the intersection. Drivers running into the back of the queue.
- Aggressive drivers anxious to get to their destination.
- Lack of attention to the conditions on the road.
- Driver distractions from within the vehicle, on the roadway or from the roadside.

Collisions at the service road/cross street intersections are primarily right angle collisions with some left turn across path. The high number of right angle collisions would appear to be a result of the operating conditions at these intersections and the high driver workload. Drivers on the north-south service roads headed to Gaetz Avenue or the

east-west cross-roads, must first stop, look for gaps left and right as well as through, then turn left or right and stop almost immediately. This high work load would explain some of the collisions. The through movements on the service road are also made difficult in terms of limited sight distance to vehicles turning left from Gaetz Avenue as these vehicles are not only turning quickly, but from a blind spot.

Vehicles exiting from Hwy 2 to Gaetz do so at high speed. The section from the ramp terminal to 19 Street is tangent and provides a high speed environment. These conditions contribute to the 22 NB collisions (2000-2002) most of which are rear-end collisions at Gaetz and 19 Street. There were also 13 rear end collisions and one left turn across path with an unknown direction of travel in the 2000 – 2002 period.

4.2 Existing Conditions - 19th Street to 37th Street

- The very short intersection spacing between Gaetz Avenue and the service roads at each of the intersections provides a storage length for a maximum of two vehicles, depending on vehicle size and the amount of the "bulb out". The lack of storage can result in a blocked intersection that limits sight distance. The high volume of turning traffic to and from the service roads to the east-west streets results in traffic conflicts, which are evident in the collision diagrams. Clearly, the short intersection space between the service roads and Gaetz Avenue at the cross street intersections is the most problematic safety issue in the Gaetz Avenue corridor.
- Vehicles on the service roads have difficulty entering the cross streets during periods of higher volumes and drivers can become frustrated and make unsafe maneuvers.
- Vehicles on the cross streets stopped for a signal at Gaetz Avenue, can back up into or across the service road intersections – two stopped vehicles create a back up into the intersection. Vehicles on the service road are forced to wait for the traffic to clear before proceeding or take a chance and work around or through the stopped vehicles – when working around or through the stopped vehicles drivers cannot always see vehicles turning from Gaetz Avenue. The presence of semi-trailer trucks exacerbates the situation.
- Vehicles on the service road stopped at the cross street intersection have difficulty seeing left turning traffic coming from Gaetz Avenue, as the vehicles are essentially coming from behind, and may proceed when unsafe to do so.
- Vehicles on the service road stopped at the cross street intersection may not recognize that there is right turning traffic on Gaetz Avenue entering the cross street and may proceed when unsafe to do so.
- Vehicles on the cross streets approaching Gaetz Avenue are focusing on the signal ahead, setting up for their lane, identifying conditions in the intersection or speeding up to make the signal – and are not paying attention to vehicles entering from the service road.
- Drivers of vehicles turning off Gaetz Avenue at a mid block access point, ie to Bower Place, are typically concentrating on where they are going to park and may forget about vehicles on the service road. Similarly, drivers of vehicles on the service road may not see or recognize drivers turning off Gaetz Avenue.

- The access point on SB Gaetz Avenue, just north of McDonalds, is such that higher exit speeds from Gaetz Avenue are possible further contributing to the potential for collisions at the service road intersection.
- There appears to be the potential for collisions on Gaetz Avenue on the NB approach to the 19th Street/Delburne intersection as vehicles are leaving the freeway environment (Highway 2) at high speeds and encountering their first signalized intersection in a reasonably short distance. The drivers of NB vehicles, particularly unfamiliar drivers, would also be intent on determining whether they want or need to turn left, turn right or proceed through the intersection, resulting in a high driver workload situation. Although there is limited distance between the last ramp entrance to the roadway and the 19th Street/Delburne Road intersection, consideration should be given to implementing measures to slow traffic.
- The existing cross-section on Gaetz Avenue has rolled curb on the median and on the outer separations: Typically, arterial roadways have a barrier curb on the median and outer lane – although a barrier curb is not effective as a barrier it does deter slower moving traffic from leaving the travelled lanes and it also serves to delineate the edge of pavement, particularly in times of inclement weather.

4.3 Proposed Functional Plan

The upgrade to the corridor involves widening Gaetz Avenue to 6 lanes and addressing the service road concerns by eliminating the service road connection and using direct access to development. Alternatively intersections with the cross streets are relocated further away from the Gaetz Avenue intersection by “bulbing out” the service road at the cross street intersection.

The auditors note that the overall concept of the functional plan to remove service roads where possible will eliminate some conflicts and hence reduce collisions, especially the right angle collisions at the intersection of the service roads and cross streets.

Bulbing will increase the storage length and improve intersection sight distance and thus should reduce conflicts and collisions.

Increasing the spacing of the service road intersection relative to Gaetz Avenue should:

- Allow more than one vehicle to stack on the cross street at the Gaetz intersection reducing the effect of vehicles blocking or interfering with the service road intersection.
- Allow a semi-trailer truck to stack at the Gaetz intersection reducing the effect of blocking the intersection.
- Allow vehicles stopped on the service road to better see and recognize vehicles turning left and right from Gaetz into the cross street.

However, the service road intersections will still be within the influence of the Gaetz Avenue intersection and:

- Vehicles stopped at the service road intersection with the cross street will still have to contend with traffic on the cross street approaching the Gaetz intersection and

search for a gap to enter or cross the cross street, depending on the volumes on the cross street.

- Depending on the volumes on the cross street, the service road intersection could still be blocked with backup from the Gaetz intersection, forcing vehicles on the service road to work around or through the stopped vehicles.
- Vehicles on the cross street approaching Gaetz Avenue could still be in the position of focusing on the Gaetz intersection and not noticing vehicles entering from the service road.

Other Issues

- Proposed access point off 19th Street to future development in SW quadrant of the intersection is located close to the proposed new intersection off 19th Street to the future development and is off the added eastbound lane on 19th Street – there is a potential conflict between traffic exiting from the new intersection and traffic entering at the access point.
- Proposed access point off Gaetz Avenue to future development in the SW quadrant of the intersection is located in the SB acceleration lane from 19th Street to Gaetz Avenue – there is a potential conflict with traffic accelerating to Gaetz Avenue and traffic entering the acceleration lane and decelerating to the proposed access point.
- NB right turn to Delburne Road – the presence of the acceleration lane on Delburne Road suggests it is a high speed roadway. Also, the right lane drops at 49th Avenue creating a merge situation with a lane drop – vehicles accelerating onto Delburne Road while other vehicles on Delburne Road, destined for 49th Avenue, are decelerating will create conflicts.
- Mid Block access – as the prime focus on Gaetz Avenue is to accommodate through traffic the presence of mid block right in/right out access points has the potential to cause problems between higher speed through traffic and slower moving traffic entering or exiting the access points from the through lanes. Consideration should be given to providing a right turn storage lane at the various right in/right out access points throughout the corridor to minimize the potential for conflicts between through and turning traffic. Where there are several access points within a block, consideration should be given to implementing an auxiliary lane in the block. An auxiliary lane has the added benefit of accommodating transit stops off the through lanes.

Consideration should also be given to providing a right turn storage lane at the various intersections along the corridor, particularly the intersections that now have a right turn storage lane ie. 71st Street NB, 78th Street SB, 78A Street NB, 79th Street NB, 80th Street NB and SB.

- Proposed “Joint Access Roadway on Private Property” – there is the potential for conflicts between the increased level of traffic on the joint access roadway and vehicles moving in and out of parking spaces unless the roadway is well defined and separated from parking.

- There is concern for the movement of traffic in the areas identified as "joint access agreement" in terms of whether vehicles will use the area to move between businesses, and, if so, how will the area be defined and how will traffic be controlled?
- There is concern for vehicles entering the "joint access" area related to the lack of sufficient "throat" distance on the private property, which could cause vehicles to back up onto the adjacent through lane. In addition, the "joint access" area identified between 34th Street and 36th Street is quite narrow and almost replicates the service road with the same kind of problems at the access point if the "joint access" area is to function as a distribution roadway.
- Access off the bulb out on the service road at Southside Dodge Chrysler Jeep (fig. 3.0) – There is a potential conflict with vehicles entering the service road from Gaetz Avenue destined for the access point not recognizing vehicles proceeding south on the service road. A similar situation exists at the access point off the bulb out at MGM Ford Lincoln.
- The service road connection to Nash St. (68th Street) on the west side of Gaetz Avenue appears to remains as is, ie. in close proximity to Gaetz Avenue, with the same issues identified previously. The situation is exacerbated with the service road connection on the south side of 68th Street offset such that through traffic on the service road must find its way through the traffic on 68th Street.
- Maintaining access from 77th Street to the cul-de-sac on the east service road creates a potential safety problem as vehicles on the service road intent on turning around the cul-de-sac may not see vehicles entering from 77th Street, while vehicles on 77th Street approaching Gaetz Avenue may not recognize vehicles slowing to use the access to the cul-de-sac. There is also the potential for vehicles on the service road to use the access point to enter 77th Street.
- The configuration of the SB acceleration lane from Highway 11A to Gaetz Avenue encourages a high speed entrance which gives the impression that Gaetz Avenue is a high speed roadway. Also, the acceleration lane ends within the area of influence of the 80th Street intersection and vehicles accelerating and concentrating on the merge may not recognize vehicles stopped for the signal.
- Right turn cut-off from NB Gaetz Avenue to Northland Drive – two vehicles, one through from Highway 11A accelerating away from the intersection and one on the cut-off accelerating to merge – both potentially approaching the 90 degree turn at high speed.
- There is no left turn shown on NB Gaetz Avenue at 34 Street.
- The proposed cross-section on Gaetz Avenue retains the rolled curb on the median and on the outer separations. Typically, arterial roadways have a barrier curb on the median and outer lane – although a barrier curb is not effective as a barrier, it does deter slower moving traffic from leaving the traveled lanes and it also serves to delineate the edge of pavement, particularly in times of inclement weather.

4.4 Vulnerable Road User Safety Issues

Vulnerable road users (VRUs) includes pedestrians and bicyclists of all ages and physical abilities and VRUs on "wheels" such as wheel chairs, in-line skaters, scooters, and skateboards.

Pedestrians

- Curb Cuts and Ramps - ramps located in the centre of a corner radius should be avoided. Such locations force the visually impaired and wheelchair user into the intersection where they must turn to reach and use the crosswalk. Each corner radius should have two curb cuts. At a minimum, curb cuts or depressions should be 1000 mm with flared sides that do not exceed a 10% slope and should have a tactile warning texture extending the full width and depth of the ramp. Slopes with graduations not exceeding 8% contribute to the usefulness of the sidewalks. The lower portion of ramps and curb cuts must be flared into the street or sidewalk at the lower end of a ramp or curb cut.
- Crosswalks at bulbing – there are a number of crosswalks at bulbs including Compu Soft, Boyce, Phelan Street, 68 Street, Speedy Glass, Nolan (74 Street), 78 Street, and 80 Street at UHaul Royal Service. It is understood that these crosswalks will not be marked. The auditors believe that it is imperative that these cross walks are marked as they will form part of the new continuous 1.5 m walkway and/or new 3.0 m bike path/walkway system. Drivers are habituated to the existing service roads which do not incorporate cross walks. The introduction of the new bike path/walkway system will violate driver expectation at cross walk locations. Hence, the need to mark the crosswalks to increase driver awareness.
- Crosswalks at new access points – crosswalks for the new bike path/walkway are proposed in addition to crosswalks at existing streets such as 35 Street. Similar to the crosswalks at bulbs, these crosswalks are new and thus may violate driver expectations as drivers are habituated to turning from Gaetz to the cross streets without expecting pedestrians and cyclists. Crosswalks must be marked similar to the bulb locations, as these are unexpected crossing locations for motorists.
- Missing crosswalks – Crosswalks are not shown at the Burger King and Ford access points (Fig. No. 6.0) and 79 Street. Crosswalks should be shown at these locations.
- Curb parking restrictions – currently parking is allowed on the service roads. Parking restrictions will be required to improve sight distance at crosswalks. For parallel parking, a parking restriction 6 m back from the crosswalks to provide for adequate pedestrian sight distance would enhance safety.

Bicyclists

- The aforementioned safety issues for pedestrians at crosswalks also applies to cyclists.
- The bike path is located on the west side of Gaetz Avenue and utilizes the service roads and joint access roadways. The change from bike path to service road should not pose a safety issue for experienced adult cyclists as vehicle volumes and speeds are lower on the service roads. However, for the inexperienced cyclist or child cyclist

going from an exclusive path to a service road shared with moving and parked vehicles raises a safety issue.

- Traffic control devices for the new bike path should include regulatory signs such as stop and dismount at crosswalks and yield to pedestrians on shared walkways. The shared pathway sign (RB-93) would indicate cyclists as well as pedestrians are permitted to use the paths.

4.5 32nd Street/Gaetz Avenue Intersection Options

Option 1

- Pedestrians crossing Gaetz Avenue must cross 9 lanes (approximately 50 m) of pavement. The medians on Gaetz shown in Option 1 should be made adequate to accommodate a pedestrian refuge island. Refuge islands are commonly found along wide, multi-lane streets where adequate pedestrian crossing time could not be provided without adversely affecting the traffic flow. Pedestrian refuge islands provide a resting area for pedestrians, particularly those who are wheelchair bound, elderly or otherwise unable to completely cross an intersection within the provided signal time.
- The exit from SB Gaetz Avenue to 51st Avenue gives the impression of a high speed exit – that, coupled with the access to the Capri Hotel which follows immediately, may create problems, particularly with unfamiliar drivers.
- The exit from NB Gaetz Avenue to 49th Avenue also gives the appearance of high speed exit, again with local access points following.
- The connections from Gaetz Avenue to 49th and 51st Avenues could become defacto ramp type connections – given that the connections are local streets, the high speed configuration should be discouraged.

Option 4

- The alignment promotes higher speeds on Gaetz Avenue.
- There is the potential for wrong way movements at the 32nd Street/49th Avenue and 32nd Street/51st Avenue intersections and at the connection of 49th Avenue to SB Gaetz Avenue.
- The location of the 30th Street intersection at the end of the SB high speed curve on Gaetz Avenue creates the potential for collisions with vehicles on Gaetz Avenue not recognizing the end of the queue at 30th Street.
- The location of the access point at the end of the NB curve on Gaetz Avenue creates a potential problem as higher speed through traffic on Gaetz Avenue will be concentrating on maneuvering the curve and preparing for the intersection at 34th Street and may not notice vehicles either entering or exiting the access point.
- The left turn connections between NB and SB Gaetz Avenue present a potential conflict point as slower moving left turn traffic try to enter the higher speed traffic on Gaetz Avenue.

- There is a potential issue with vulnerable road users in the NW quadrant – related to the Capri Hotel and pedestrian access to the parking lot across SB Gaetz Avenue.
- There is also a potential safety issue with vulnerable road users in the SW quadrant related to access to the Chevrolet Oldsmobile Pike Wheaton dealership building from the parking lot.
- Access to business establishments, particularly in the NE quadrant, are not shown in Option 4. Access to commercial establishments in all quadrants pose a number of safety issues.

4.6 Non-Enforcement Techniques to Slow NB Traffic Approaching 19 Street

The auditors were asked to comment on non-enforcement techniques to slow NB traffic approaching 19 Street. Stantec Consulting is considering a gateway approach along this section of Gaetz Avenue.

Road safety issues arise along the section of Gaetz Avenue approaching the 19th Street/Delburne Road intersection and the intersection itself for several reasons. The off-ramp from Highway 2 is tangent to the main line and goes directly into Gaetz Avenue. In addition this section of Gaetz Avenue has all the appearance of a high speed environment. NB travellers who go into Gasoline Alley must weave across Gaetz Avenue in order to turn left at 19 Street in order to return to Highway 2 NB. Unfamiliar drivers sometimes exit inadvertently which can result in erratic last minute manuevers as they try to get to the left lane to return to Highway 2 to continue there journey NB.

Gateway Treatments

Gateways or entry treatments are used at the entrance to towns and cities to announce the start of the built-up environment and a change in the road environment. They typically use one or (more commonly) a combination of devices such as signing, marking, traffic control devices (such as AWF), pinch points, changes in surface texture and /or colour, road humps, landscaping features such as planting or street furniture, and rumble strips.

The following are some of the non-enforcement techniques to slow traffic exiting from Highway 2 and entering a gateway treatment on Gaetz Avenue:

- Pavement markings – transverse pavement markings with decreased spacing create the visual illusion that one is speeding up even when speed remains constant. A variation of this technique is the use of edge reflective raised pavement markers spaced at decreasing intervals. "Dragon Teeth" pavement markings (triangular markings on the edge of driving lanes, with the apex pointing toward the lane) are another means of slowing traffic.

A pavement marking scheme related to speed reduction countermeasures that came out of research in Australia, was shown to reduce the speed of speed adapted drivers by 9km/h in a simulator study. The scheme involved 3 consecutive, full width, transverse lines 0.6m in width, separated by 4.5m, followed by about 400m of peripheral transverse lines, with a transverse direction length of 0.6m, a width of 0.6m, and a separation of 4.5m. The lines are placed to the right and left of the

the tendency of drivers to move away from lane edge. The scheme has been applied successfully on Highway 407 at the termination of eastern end of the toll road and in Manitoba at a signalized intersection on the Trans-Canada Highway.

- Rumble strips – milled-in transverse rumble strips applied at intersection approaches have been found effective in reducing collisions at intersections by about 50%. Milled-in rumble strips at rural intersections are used throughout Alberta where there are safety issues. A TAC study is under way investigating warrants for installation of transverse rumble strips at intersections.
- Advance warning flash (AWF) – the AWF is particularly useful in warning motorists when the 19th Street signal is about to change. As the intersection approach speeds NB on Gaetz Avenue at 19th Street are high the AWF signal should be maintained.
- Planting of trees and shrubs is being considered as part of the gateway treatment. It is noted that trees are potential obstructions by virtue of their size and location in relation to vehicular traffic. Generally, a tree with an expected mature size greater than 100 mm (4" in diameter) is considered a fixed object.
- Welcome to Red Deer sign – is presently located south of Boyce. This sign should be relocated to approximately 18th Street as part of announcement of the start of the built-up environment of the City of Red Deer.

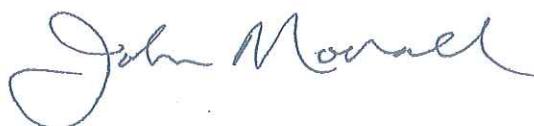
5.0 Concluding Remarks

A preliminary road safety review has been undertaken for the Gaetz Avenue Development Setback Study.

- The closure of some service roads, creation of cul-de-sacs and bulbing will reduce conflicts and hence collisions. However, the introduction of private approaches may result in an increase in collisions unless right turn storage or auxiliary lanes are provided.
- Provision has been made for vulnerable road users (VRUs) through the proposal for a new 1.5m and 3.0m bike path/walkway. The main safety issue for VRUs centres on the crosswalks at service roads and access points. Crosswalks should be marked as drivers are habituated to the existing situations, which do not include a bike path/walkway network. Traffic control devices are required for cyclists to stop and dismount before crossing a service road or access point and to share the path and yield to pedestrians.
- Option 1, Gaetz Avenue and 32 Avenue has fewer safety issues than Option 4. However, Option 1 does have safety issues, such as VRUs having to cross 9 lanes (approximately 50m of pavement) of traffic without a pedestrian refuge.
- A gateway treatment for Gaetz Avenue from the Highway 2 ramp terminal to 19 Street is strongly endorsed. A gateway treatment that incorporates a combination of non-enforcement techniques to slow traffic is required to reduce the number and severity of collisions, particularly rear end collisions at Gaetz Avenue and 19 Street.

This review and commentary was prepared by Canadian Highways Institute Limited/GCS Technology for Stantec Consulting and the City of Red Deer. The material in it reflects Canadian Highways Institute Limited/GCS Technology's best judgment in light of the information available to us at the time of the review. Any use which Stantec Consulting and the City of Red Deer or any third party makes of this review, or any reliance on it or any decisions made based on it, are the responsibility of Stantec Consulting and the City of Red Deer or any third party. Canadian Highway Institute Limited and GCS Technology accepts no responsibility for damages, if any, suffered by Stantec Consulting, the City of Red Deer or any third party as a result of decisions made or actions taken based on this review.

Respectfully submitted



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