



APPENDIX I

REVIEW OF RURAL ROAD FUNCTIONAL CLASSIFICATION AND DESIGN STANDARDS



REVIEW OF RURAL ROAD FUNCTIONAL CLASSIFICATION AND DESIGN STANDARDS

1.0 PURPOSE OF THIS APPENDIX

Section 4.1 of the main report presented the definitions and general descriptions of the County’s existing road classification system and the associated design standards. An overview of selected key elements contained in the County’s classification system and design standards (traffic volume by classification, design speed, posted speed, road width, design life, surface type and right-of-way requirements) was summarized in Table 1 of the main report.

EBA was asked to review and evaluate the County’s functional road classification criteria and design standards, and make recommendations regarding any changes required. In particular, EBA was asked to propose suitable functional road classification system/criteria that could be applied by County staff to update functional classification designations of particular rural roads if and when warranted by future changes in factors such traffic volumes, road functions, etc.

This appendix presents the results of EBA’s review of Strathcona County’s rural road functional classification and design criteria. Conclusions are drawn from published guidelines (national and other), and from consultation with selected municipal and provincial jurisdictions.

2.0 OUTLINE OF RESEARCH TASKS UNDERTAKEN TO SUPPORT THIS SECTION

The following was undertaken to support the preparation of this section:

- Consultation with selected provincial and municipal jurisdictions to obtain documented policies and an understanding of practices.
- Review of national guidelines from Canada and the U.S. and of selected studies.

3.0 SUMMARY OF INPUT FROM SELECTED PROVINCIAL AND MUNICIPAL JURISDICTIONS

The following table outlines agencies that were contacted and the input received.

AGENCIES CONTACTED AND INPUT RECEIVED	
Agency	Available Reference and / or Input Received
Alberta Transportation	Highway Geometric Design Guide.
Saskatchewan Highways and Transportation	Relevant sections of the Design Manual were provided by Department staff.
British Columbia Ministry of Transportation	Did not receive input on classifications and design standards.
Red Deer County, Alberta	Did not receive input on classifications and design standards.



Wheatland County, Alberta	Road Design Guidelines were provided by County Staff.
Municipal District of Rocky View, Alberta	Design standards obtained from M.D. website.
Regional Municipality of Wood Buffalo, Alberta	Relevant sections of the Engineering Servicing Standards were obtained from documents in EBA's library.
Parkland County, Alberta	Did not receive input on classifications and design standards.
Mountain View County, Alberta	Did not receive a response.
Rural Municipality of Gray, Manitoba	Did not receive a response.
Rural Municipality of Prosser, Manitoba	Did not receive a response.
Ontario Good Roads Association	Did not receive a response.

Highlights of the information from the various jurisdictions is presented below:

Alberta Transportation Highway Geometric Design Guide⁽¹⁾

- Chapter H, Local Roads.
- Generally refers to gravel surface roads.
- Width is variable based on design speed, traffic volume traffic composition and function. In general:
 - 0 vpd to 200 vpd, 8 m road
 - 200 vpd to 1,500 vpd, 9 m road
 - 1,500 vpd to 2,500 vpd, 10 m road
 - 2,500 vpd to 9,000 vpd, 11.8 m road
- There are provisions for 6 m and 7 m roads in low traffic volume (less than 50 vpd) and low design speed (less than 60 km/h) environments.
- Right-of-way for 9 m and 10 m roads is 40 m basic.
- Generally two lane roadways with design speed of 90 km/h and posted speed of 80 km/h.
- One lane, two-way roadways are considered suitable in some cases where the Average Annual Daily Traffic (AADT) is less than 50 and the design speed is not more than 50 km/h.
- Alignment controls are specified by design speed.


Transportation Association of Canada Geometric Design Guide for Canadian Roads⁽²⁾

- Rural road classification as Local, Collector, Arterial and Freeway.
- Service function, land service, traffic volume, flow characteristics, design speed, average running speed, vehicle type and normal connections are provided for each classification.

- In terms of service function and land service, arterials, collectors and locals are most similar to the current classification of roadways in Strathcona County.
- In terms of traffic volume the TAC classification for local roads is for those less than 1,000 vpd, and for collectors is 1,000 vpd to 5,000 vpd.
- Road width is defined by travel lane; shoulder width is prescribed by design hourly volume for a specific design speed. For general information typical sections are provided by classification and show travel lane and shoulder by design speed.
- A rural local road (serves less than 1,000 vpd) would have a road width of 8 m for a design speed of 60 km/h to 80 km/h and a road width of 8.6 m for a design speed of 90 km/h to 100 km/h.
- A rural collector road (serves between 1,000 vpd and 5,000 vpd) would have a road width of 11 m for a design speed of 90 km/h and a design hourly volume of less than 450 vehicles.
- The TAC guide does not specifically reference right-of-way in the section on cross-section elements.

Saskatchewan Highways and Transportation⁽³⁾

- Classifications are based on service requirements such as links between communities or other destinations of a certain population. Classifications are summarized as follows:
 - Class 1** Roads that serve major inter-provincial and international travel as well as regional service centres with 3,000 or greater population. Includes a link between regional and base hospitals.
 - Class 2** Roads which serve communities or Indian Reserves of greater than 1,000 population, flagship parks and link hospitals to regional hospitals or base hospitals.
 - Class 3** Roads which serve communities or Indian Reserves of greater than 500 population and larger provincial or regional parks or historic sites. These roads link special care homes or health centres to hospitals.
 - Class 4** Roads that serve communities of greater than 100 population, large industrial sites and parks with greater than 25,000 yearly visitations. These roads generally have a network spacing of 20 kilometres, carry 40,000 tonnes annually with 100 vehicles per day and serve as an inter-municipal link.
 - Class 5** Roads that serve communities of less than 100 population, medium industrial sites and parks with greater than 10,000 yearly visitations. These roads generally have a network spacing of 10 kilometres, carry 10,000 tonnes annually with 50 vehicles per day.
 - Class 6** Roads that provide access to individual residences and small industrial sites as well as school bus routes.
 - Class 7** Roads that provide land access.
- Functional standards are provided for rural highways and define road width and surface type to serve a specified traffic volume and design speed. For example, road width for 150 vpd to 500 vpd and design speed of 110 km/h is 8.6 m and the surface type is either pavement or a thin membrane structure.



Wheatland County⁽⁴⁾


- Road design guidelines are presented in Guidelines and Procedures for Outside Parties, Section 9.4.1. These guidelines are currently under review and are about to be presented to County Council for approval.⁽⁵⁾
- Classification is presented with respect to type of development serviced (i.e. hamlet or country residential roads, low volume roads and industrial/commercial service access roads). The road widths range from 8.6 m to 10 m depending on use, and surface types include gravel, double seal coat and asphalt concrete pavement. The Wheatland County guidelines also refer to the TAC Geometric Design Guide for Canadian Roads.

MD of Rocky View⁽⁶⁾

- Classification by service function.
- “Local” refers to less than 200 vpd with design speed of 60 km/h to 70 km/h and width of 7 m.
- “Collector” includes moderate volume subclass (200 vpd to 500 vpd) with design speed of 90 km/h and width of 8 m and high traffic volume subclass (501 vpd to 2,500 vpd) with design speed of 90 km/h and width of 9 m.
- “Arterial” is greater than 2,500 vpd with design speed of 100 km/h and width of 10 m.
- Right-of-way varies with maximum of 30 m.
- Local roads have gravel surface; other roads are shown in the table as paved.

4.0 CONCLUSIONS WITH RESPECT TO CLASSIFICATION AND DESIGN STANDARDS

- In comparison to the road classification systems and associated design standards presented in national guidelines and in use in other jurisdictions, Strathcona County could benefit from clearer and greater definition for their current classification system.
- The design standards for the existing classifications are comparable to other jurisdictions (TAC, however, may define wider road widths).
- Both classifications and design standards may not adequately address the segments of rural roadway that connect into the urban fringe area around Sherwood Park, where traffic volumes are much higher than 1,000 vpd. It is not likely necessary to create a new classification, but instead refer to the TAC guidelines and the use of engineering judgement in these unique higher traffic volume areas.
- The roads within and adjacent to the Alberta Industrial Heartland could be given special area consideration. An overall classification could be defined for these roads based primarily on proportion of truck traffic and adjacent land use. Traffic movement and access is likely of equal importance, and traffic volumes are likely to vary. It may be difficult to develop specific design standards to cover the variety of situations that may arise as development in the industrial heartland proceeds. In this case, the existing



design standards (Dwg. B-5 Rural and Dwg. B-6 Rural) could be maintained, and supplemented with reference to the TAC guidelines and the use of engineering judgement in these unique situations where traffic flow, access, peak hourly volumes and vehicle type will need to be considered.

- Other special areas to be considered include the Country Residential Policy Area, the Rural/Urban Transition Policy Area, and even areas around specific development such as the Northern Bear Golf Course. These areas and the associated road network may require engineering judgement and the application of design standards outside of those associated with the County's classifications to meet the unique uses of the area. In these special cases, the TAC guidelines could be referred to. In the Country Residential Policy Area and the Rural/Urban Transition Policy Area, although some of the rural grid roads may have traffic volumes that are currently less than 250 vpd, by nature of the current and future development in the area, the primary function of the rural grid roads is traffic movement over local access. In this case it may be beneficial to classify all rural grid roads in these areas as a minimum of Class II.
- The areas north and northeast of Sherwood Park referred to as Urban Reserve and Transition Urban Reserve Policy Area may require special consideration in the future depending on the rate at which transition to an urban type of development plan for the area occurs. It is anticipated that development of these areas to an urban character is in the long term. For purpose of the current SSRMP update, it is likely sufficient to have roads in these areas maintain consideration as rural roads.

5.0 REVIEW OF THE FUNCTIONAL ROAD CLASSIFICATION SYSTEM / CRITERIA

The County's current system for functional road classification was described in Section 4.1 of the main report. EBA's recommendations regarding future functional classification of the County's rural roads are summarized below:

1. Adopt the proposed functional road classification system criteria presented in Table 13. The County's current system for functional road classification, discussed in Section 4.1, relies almost exclusively on traffic volumes as the classification criterion. EBA proposes that additional factors (in addition to traffic volume) should be utilized to determine the functional classification of County's rural roads in future. Below is the list of suggested classification factors:
 - a. Traffic volume and type
 - b. Function of the road
 - c. Connection to the Provincial Highway Network
 - d. Spatial hierarchical system
 - e. Continuity




Table 13 of the main report elaborates on the above system of factors/criteria for a proposed revised functional classification system for Strathcona County rural roads, and applies the proposed criteria/factors with respect to the various rural road classifications. Further definition is provided in table for each proposed class of road in terms of traffic volume and type, function, connection to the provincial highway network, spatial hierarchical characteristics and continuity.

It is recommended that the County adopt the proposed system/criteria for future reviews of the functional classification of the County's rural roads.

At the present time, EBA does not propose reclassification of any specific roads.

In the future, as and when substantial changes in one or more of the five classification factors a to e in the above list indicate that the functional classification of specific rural roads needs reviewing, the County can apply the proposed classification system/criteria to determine whether functional classification of the affected roads warrants a change. For example, the traffic volume on a road may increase because of industrial, residential or other developments. Another example is a "subdivision application" that may trigger a quick functional classification check for the affected road(s). It is recommended that traffic volumes on the affected roads be double checked by special counts to ensure accuracy and to avoid misclassification. It is understood that any future functional classification revisions will be brought before Council for review and approval.

2. Keep the current six classifications (Class I, II, III, and IV roads; CRS roads; and Hamlet roads).
3. Create a new Industrial Roads classification to deal with special heavy industrial (truck) traffic in the Heartland area, and elsewhere as applicable. Table 13 (of the main report) suggests classification criteria for Industrial Roads.
4. Consider reversing Class III and Class IV names to de-confuse the current situation in which the inferior surface standard of "gravel" is numbered Class III and the superior surface standard of "dust-suppressed" is numbered Class IV.
5. For classification of roads in Special Areas, apply the suggested requirements in the proposed classification criteria.

EBA believes that the proposed classification system provides greater depth of definition in the criteria (beyond traffic volume) to better represent the system needs. In addition, it specifically defines "Industrial Roads" as a separate functional classification. Also, it proposes to removing the confusion of the current Class III versus Class IV definition (in which Class IV - Dust-Suppressed is superior to Class III - Gravel) by referring to Class III as dust-suppressed and Class IV as gravel.



6.0 REVIEW OF THE RURAL ROAD DESIGN STANDARDS

The County's current design standards for rural roads were described in Section 4.1, and summarized in Table 1 of the main report. The main recommendations for revisions to the rural road design standards are summarized below.

1. EBA's evaluation shows that, for all functional road classifications except the ones listed in point 2 below, the County's geometric and surfacing design standards (road-top width and other geometric and structural features) are expected to well serve the County's needs for the foreseeable future, and therefore EBA recommends that no changes are required.
2. For industrial roads and very high traffic volume Class I roads, it is recommended that the County should conduct individual engineering analyses to determine appropriate geometric and structural dimensions in accordance with the Transportation Association of Canada guidelines.

REFERENCES

- (1) Alberta Transportation, "Highway Geometric Design Guide", Government of Alberta, 1995 (updated 1999).
- (2) Transportation Association of Canada, "Geometric Design Guide for Canadian Roads", Transportation Association of Canada, 1999.
- (3) Saskatchewan Highways and Infrastructure, "Design Manual", Government of Saskatchewan, 1992.
- (4) Wheatland County, "Road Design Guidelines, Section 9.4.1 - Guidelines and Procedures for Outside Parties", Wheatland County, 2009.
- (5) Churchill, David, Strathcona County, June 22 and 23, 2009. Personal communication via telephone.
- (6) M.D. of Rocky View No. 44, "Road Classification and Pavement Structure Guidelines", M.D. of Rocky View No. 44, May 4, 2004.