LOW-VOLUME ROADS: PROBLEMS, NEEDS, AND IMPACT STATUS IN CANADA

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BACKGROUND

The Canadian Road Network consists of over 800,000 kilometers of roads that serve a population of approximately 26 million. Approximately 610,000 kilometers, or 76 percent, of these roads can be classified as rural local roads that carry low traffic volumes. In addition, 490,000 kilometers of these rural local roads have either earth or gravel surfaces.

In the past, geometric design standards for these types of roads were not specifically addressed in Canada. Both road planners and designers were faced with either using national standards that were developed for a higher classification of roads, which resulted in roads being built at a great cost that was unrelated to their function, or reducing these higher classification standards to meet economic constraints, usually without a logical basis for doing so.

In many instances, the lack of national design standards for these roads and the pressure to reduce costs resulted in agencies developing their own design standards or, in certain instances, in constructing roads without regard for any design standards. This has resulted in the creation of standards that are not compatible with the road function, non-uniformity of standards between jurisdictions, arbitrary selection of standards, and in many cases, an unsafe road.

It was therefore evident that there was a need within the Canadian road system for a set of national geometric design standards that recognized the unique qualities of rural roads with local traffic volume.

In 1983, the Transportation Association of Canada (TAC), a non-profit, non-partisan association of corporate members including federal, provincial, territorial and municipal governments; a wide range of carriers and suppliers of transportation goods and services; and the academic community, approved the establishment of a project steering committee to research and develop a set of geometric design standards for low-volume, rural roads that would be the product of a consensus of the majority of users in Canada.

These standards were incorporated as a separate chapter in the 1986 TAC Manual of Geometric Design Standards for Canadian Roads. The objectives of the project were defined as follows:

- To establish uniform national standards for the classification of low-volume roads to meet the special services requirements of road agencies across Canada;
- To provide standards compatible with the present economic requirements without jeopardizing the safety or effectiveness of the road; and
- To provide standards for road agencies that relate to the type of road function and that will ensure standardization.

DEFINITION

Low-volume roads (LVR) in Canada include rural road systems, roads to or within isolated communities, recreational roads and resource development roads. The maximum ADT presently specified for low-volume roads in Canada is 200. Design speed ranges from 30 kilometers/hour to 100 kilometers/hour. Standards were developed for one lane/one way, one lane/two way, and two way roads. Based on the results of the questionnaire the LVR Subcommittee has recommended:

- Including the object height of 380 millimeters used for determining crest vertical curvature in Chapter H, in addition to the 150 millimeter object height. The lower object height would be used for roads with low maintenance, since low-volume roads are low cost roads. The higher object height, as used for roads with higher volumes, is appropriate for low-volume roads.
- Continuing monitoring research on roadway widths.
- Reviewing the definition of low-volume roads with the goal to increase the ADT to 300 or 400 as the next step.

PROBLEMS AND NEEDS

Because this was the first attempt at developing Canadian Standards for LVR, a LVR Subcommittee within the Geometric Design Technical Standing Committee (which reports to the Infrastructure Council) of the Transportation Association of Canada was formed to:

- Monitor and evaluate current research;
- Form liaisons with organizations/agencies involved in similar LVR activities including the Transportation Research Board, the various road agencies, universities;
- Review, evaluate and recommend changes to Chapter H Low-Volume Roads of the Manual of Geometric Design Standards for Canadian Roads;
- Recommend and undertake approved research projects; and
- Conduct workshops as required.

A large percentage of roads in Canada are low-volume (approximately 76%). A substantial effort went into developing national standards for LVR to minimize the non-uniform treatment of LVR between road jurisdictions. Since the standards were developed utilizing information available prior to 1986, the LVR Subcommittee has had a minimum amount of feedback which would support any observations on their application by road agencies in Canada. In 1991, a questionnaire was distributed to many government agencies, municipalities, consultants to determine the extent of their usage, and any shortfalls in the standards identified through the questionnaire would be addressed in the next Manual update.