

New Brunswick's Road Infrastructure Plan 2008-2011



December 2007

TABLE OF CONTENTS

1.0	Background	2
2.0	Asset Management	3
3.0	Current Condition of Highway Infrastructure	5
3.1	Highways	5
3.2	Bridges	6
4.0	Developing the Road Infrastructure Plan	7
5.0	The Strategy	8

1.0 BACKGROUND

New Brunswick must have a robust transportation system in order to connect communities and to get people, goods, and services to market. It is an essential part of the foundation for a strong and competitive provincial economy. The province has a responsibility to ensure the sustainability of the highway network. For this reason, as part of its Action Plan to be Self-Sufficient in New Brunswick, the government is committed to evaluate transportation infrastructure priorities and in particular, the need to improve highways that connect rural and urban areas and improve the flow of industrial goods.

Recognizing that the rural road infrastructure is an integral part of the province's transportation system, one of government's "Charter for Change" commitments is to put in place a three-year plan to ensure the sustainability of rural roads well into the future.

The provincial rural road system is defined as all unsurfaced roads, chipseal roads, and local asphalt roads. Approximately 73% of New Brunswick highways are rural in nature. The break down of the provincial highway system is as follows:

Surface Type	Total Highway Network (Including Rural Roads)	Rural Roads Only
Asphalt	6,000 km	1,000 km
Chipseal	9,300 km	9,300 km
Unsurfaced	3,300 km	3,300 km
TOTAL	18,600 km	13,600 km

When developing a strategy for improving the provincial highway system and specifically addressing the rural road infrastructure needs of New Brunswick, costs associated with rehabilitating rural roads must be understood:

Rehabilitation costs (depending upon the current level of deterioration of the road) range from:

- \$10,000 to \$20,000/km for unsurfaced roads;
- \$30,000 to \$60,000/km for chipseal roads; and
- \$80,000 to \$600,000/km for asphalt roads.

The above costs present a challenge when striving for long-term sustainability of 18,600 km of highway infrastructure; 13,600 km of which are rural roads. Another challenge includes the increased rehabilitation costs associated with upgrading surface types of roads. For example:

- Converting 50 km/yr of unsurfaced roads to chipseal would result in additional rehabilitation costs of approximately \$175,000/year (unsurfaced roads are less costly to rehabilitate than chipseal roads); and
- Converting 50 km/yr of chipseal to asphalt surface would result in additional rehabilitation costs of approximately \$850,000/year (chipseal roads are less costly to rehabilitate than asphalt roads).

Also, increased highway inventory as a result of building new alignments adds to the overall rehabilitation funding required to ensure sustainability of the system. It is clear that current funding levels are insufficient to sustain additional infrastructure.

2.0 ASSET MANAGEMENT

The basis for the development of a three-year plan to specifically address the road infrastructure needs of New Brunswick is an asset management business model that takes into consideration a number of factors such as the age and condition of the highway network, various options for rehabilitation, asset deterioration characteristics, and performance targets. An asset management system is used to analyze these factors and to select project priorities based on the best time to apply the most cost effective economical treatment to its assets. This is also known as a least life cycle cost approach.

***THE ASSET MANAGEMENT BUSINESS MODEL
PROVIDES THE INFORMATION AND TOOLS
TO SELECT:***

- ***THE RIGHT TREATMENT***
- ***AT THE RIGHT PLACE***
- ***AT THE RIGHT TIME***

Asset management identifies how assets deteriorate over time and when is the appropriate time to intervene (rehabilitate) in order to avoid costly reconstruction of the asset. If roads are treated at the appropriate time, a larger volume of roads can be done while at the same time achieving higher performance levels (i.e. good/fair/poor).



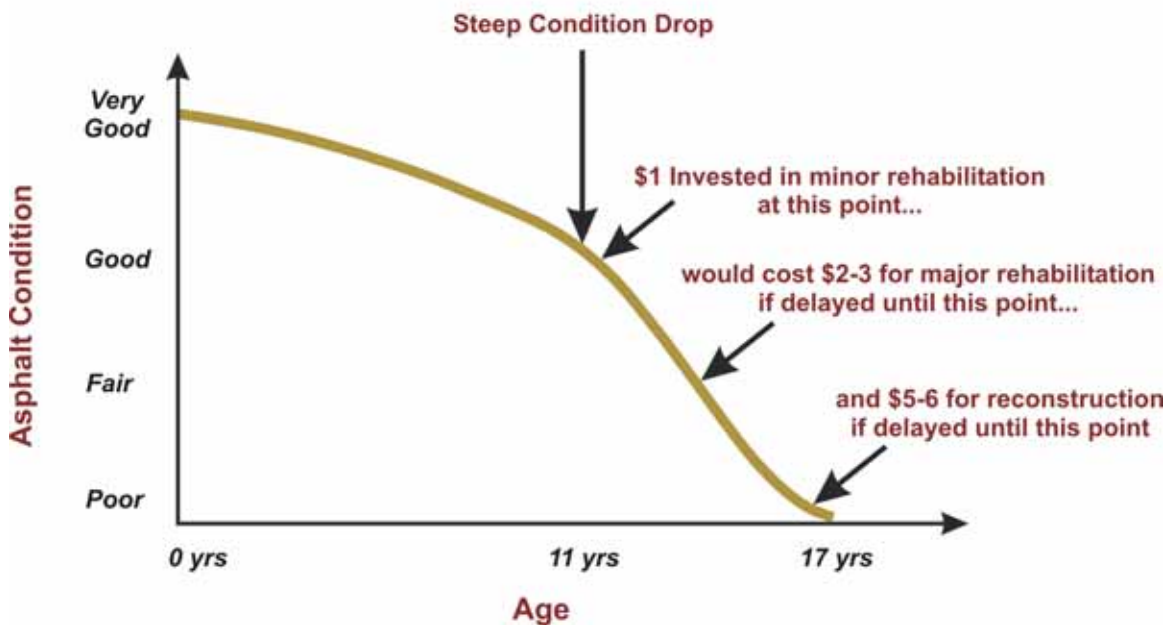
Good

Fair

Poor

The following graph illustrates that the asset management system recommends that rehabilitation be carried out on assets before they experience a steep condition drop resulting in treatment activities such as reconstruction that are five to six times the cost.

Premise Behind Asset Management



By balancing complex and often conflicting needs, asset management provides a way to manage the province's highway network at an overall least cost while at the same time, enhancing performance and safety for everyone using it.

3.0 CURRENT CONDITION OF HIGHWAY INFRASTRUCTURE

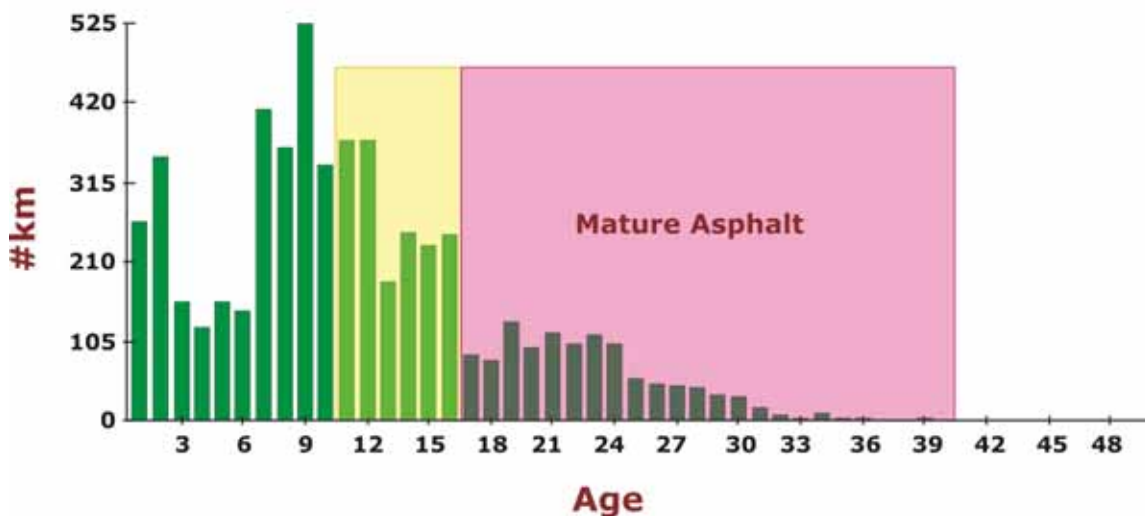
Information collected as part of the asset management process provides the necessary details for decision making on the current state of all transportation assets. This information provides insight on the magnitude of the challenge of maintaining the integrity of the highway system within the limits of fiscal reality.

3.1 Highways

When looking, for example, at the current age of all asphalt highways, it can be seen that there is a significant number that are greater than 17 years old and are therefore considered “mature asphalt” (see pink area in graph). These highways may already require more costly major rehabilitation or reconstruction work.

Also important to note are the number of highways that are between 11 and 17 years. If rehabilitation activities are not carried out on these assets before they become mature, there will be a significant additional financial burden for maintaining their integrity. Performance will also be significantly compromised as these also become part of the mature asphalt inventory.

Current Age of Asphalt Highways

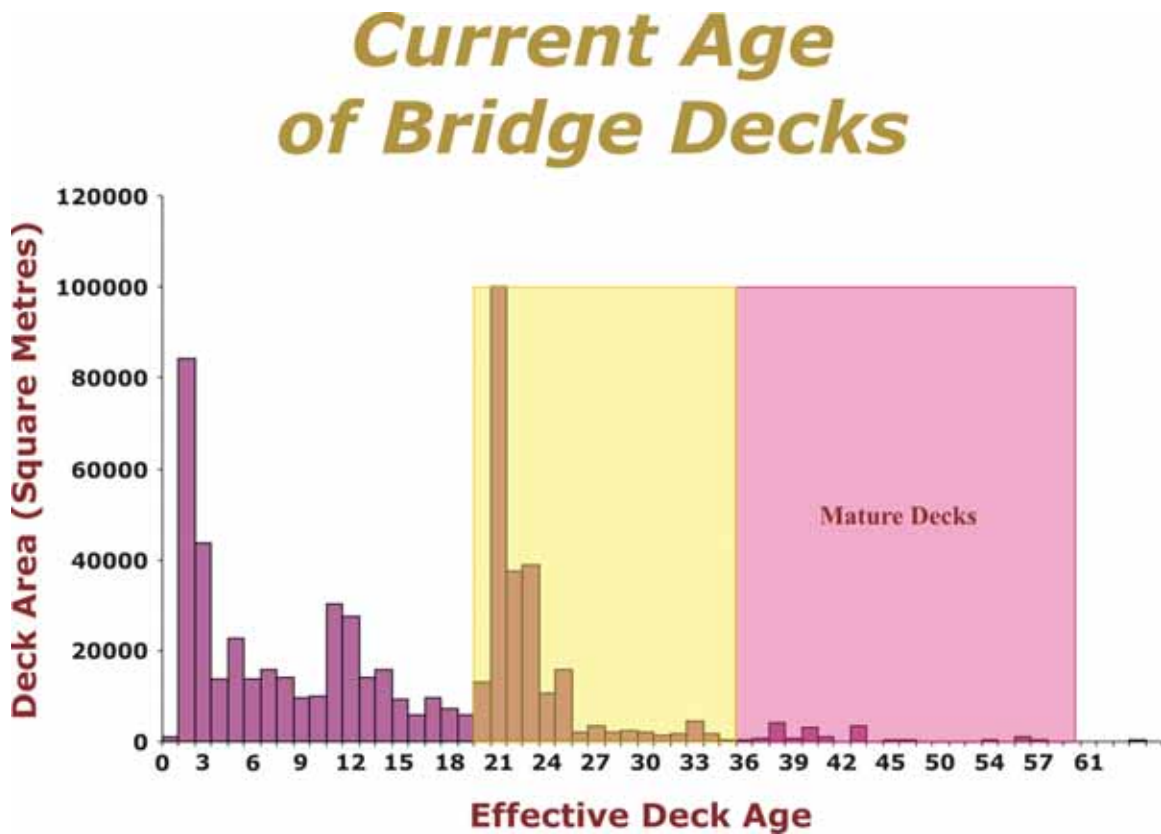


3.2 Bridges

There are 2,840 bridges on the provincial highway system. Included within this inventory are 740 bridge sized culverts and 212 bridges with weight restrictions. There are a large number of these bridges with similar age and condition challenges as the highways.

The normal bridge design life is 75 years, but at current funding levels, the replacement cycle is 250 years. In addition to the mature bridges there are numerous structures that have been built over the past 20 years that require timely deck rehabilitation so that the underlying structure is preserved. It is evident that it is necessary to address the needs of the bridges at the appropriate time before they deteriorate to the point where costly reconstruction is required.

The following graph illustrates the current state of all bridge decks in the province. Rehabilitation activities are required on the decks in the yellow area of the graph before the decks mature to a point where the underlying substructure will be adversely affected.



4.0 DEVELOPING THE ROAD INFRASTRUCTURE PLAN

A three-year plan for the rural road infrastructure that will meet the objectives of the “Charter for Change” and the “Road to Self-Sufficiency Report” was formulated using the asset management business model. This plan will put the province on the right path to attaining a sustainable rural road system well into the future.

When developing this plan, rural roads were evaluated as part of the entire highway network; meaning that the rural roads were modeled together with the entire highway system to ensure improvements to one component of the system is not at the expense of another component.

To summarize, the plan has been based on the following asset management principles:

- Rehabilitation work is carried out on an asset before more costly reconstruction is required;
- Least life cycle cost approach is used when selecting treatments for assets;
- The conversion of unsurfaced roads to chipseal surface and chipseal roads to asphalt surface increases the amount of funds required for rehabilitation.

The asset management system was able to determine what funding level is required to obtain the least life cycle cost of the highway network while not allowing a decline in overall highway condition. It was determined that a funding level of \$140 million/year for the next 3 years for the rehabilitation of the entire highway network did achieve this objective; \$40 million/year of this funding would need to be dedicated to the rehabilitation of the rural road system for the next 3 years. This was compared to the same funding level but not using a least life cycle cost approach. In this case, by rehabilitating highways at a later stage of deterioration, a significant decrease in condition of roads was projected.

The asset management system also determined funding levels required for the rehabilitation of bridges. Based on the information outlined in Section 3.2, it was determined that \$40 million/year for the next 3 years is required for sustainability of the provincial bridge inventory into the future.

5.0 THE STRATEGY

The following strategies will be adopted to address the province's road infrastructure needs:

- Move to a Least Life Cycle Cost approach for program development based on the principles of asset management.
- Invest \$180 million/year in the rehabilitation of the province's highways and bridges for the next three years.
- Dedicate \$40 million/year of this rehabilitation investment in the province's Rural Road Infrastructure for the next three years.
- Dedicate \$40 million/year of this rehabilitation investment in the province's bridge infrastructure for the next three years.

These strategies will address the needs in such a way as to ensure the highway network is well managed by maximizing performance and safety in the most economical way.