

APPENDIX D

NEEDS ASSESSMENT

EXISTING NEED

- Every year, adverse weather conditions, or adverse road surface conditions contribute to many collisions on the provincial road network, and in urban areas in Manitoba.
- This problem is particularly serious for truck drivers, who have to travel on these roads throughout the year, under many different weather conditions.
- There is a need to use advanced technologies to monitor and forecast adverse weather or road surface conditions.
- The information obtained from monitoring and forecasting could be used to develop an intelligent road maintenance strategy.
- This approach should be applied to both rural and urban areas in the province.
- Accurate information is needed at a central location/source.

Need #1

Reduce collisions during adverse weather and/or road surface conditions

POTENTIAL STAKEHOLDERS

- Manitoba Transportation and Government Services
- City of Winnipeg Public Works—Transportation Division
- Manitoba and Winnipeg Emergency Response
- Environment Canada
- University of Manitoba
- Cities of Brandon and Portage la Prairie
- Bordering Provinces and States
- Agriculture (sensors/chemical)
- Manitoba Health
- Tourism
- MPI

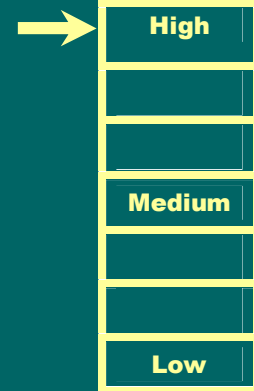
ASSOCIATED USER SERVICES:

- Environmental Conditions Management
- Operations and Maintenance
- Traveller Information
- Emergency Vehicle Management
- On-Board Safety Monitoring

FACTS

- There are 17,734 kilometers of provincial highways in Manitoba. 95% of this road network is comprised of undivided highways, and 5% of divided highways.
- In Winnipeg, the street system consists of 1,720 lane-kilometers of Regional streets, 5,030 lane-kilometers of Local and Collector streets, and 196 bridges and structures.
- Every year, there are approximately 5,500 reported traffic collisions on Manitoba’s provincial road network. In Winnipeg, there are about 14,000 reported traffic collisions per year. Nearly 40% of these collisions involve adverse road surface conditions.
- Many collisions are concentrated on specific road segments or at particular intersections in rural areas. In Winnipeg, two-thirds of all collisions take place at intersections.
- The City of Winnipeg currently has 2 Doppler radar sites that are used for snow removal operations (Bishop Grandin Boulevard and Disraeli Freeway).

PRIORITY OF NEED:



PRIORITY OF NEED

- Extreme weather conditions frequently occur in Manitoba and road safety is a high priority, which makes this a high priority need.
- This need is equally important to urban and rural areas.
- The system should be implemented for emergency conditions at least on selected highways such as the Perimeter highway around Winnipeg, or at key locations within the city.

EXISTING NEED

- Manitoba is largely rural in nature. Rural environments are often characterized by long travel distances, minimal traffic congestion, travel in unfamiliar territory, and rugged terrain in remote areas.
- Major urban road networks are arterial-based with no freeway operation. One of the limiting factors in these systems is the river crossing locations.
- There should be a central notification, coordination and decision-making protocol to respond to urban and rural incidents in the most effective and efficient manner. This system must be applicable province-wide, including urban areas such as Winnipeg and Brandon.
- It is important to have an efficient incident management response system for situations involving hazardous materials. This system must contain accurate information on cargo contents and location, and it must be accessible in a timely manner.
- There is a need for a system that advises drivers and service providers (e.g. emergency service personnel or towing companies) of incidents at bridge/river crossings or major thoroughfares. This will allow motorists the ability to make informed decisions regarding their travel route.

Need #2

Improve incident notification and response in Manitoba

POTENTIAL STAKEHOLDERS

- Manitoba Transportation and Government Services
- Manitoba Trucking Association /Trucking industry
- Manitoba and Winnipeg Emergency Response
- University of Manitoba
- Manitoba Public Insurance
- Municipalities

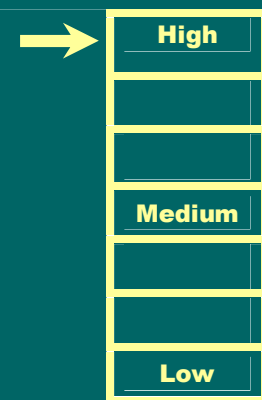
ASSOCIATED USER SERVICES:

- Traveller Information
- Traffic Control
- Incident Management
- Emergency Vehicle Management
- Hazardous Material Planning and Incident Response
- Emergency Notification and Personal Security

FACTS

- There are 17,734 kilometers of provincial highways in Manitoba. The province is largely rural in nature, with most of the truck movements taking place on selected corridors. Every year, there are approximately 5,500 reported traffic collisions on Manitoba’s provincial road network.
- In Winnipeg, the street system consists of 1,720 lane-kilometers of Regional streets including 9 river crossings
- Traffic in Winnipeg generates 5 billion vehicle kilometers of travel, and 40 million urban goods movement trips per year.
- Many collisions are concentrated on specific road segments or at particular intersections.
- Between 1996 and 2000, there were 1,092 heavy truck collisions on the provincial road network.
- 5% of these collisions have involved a hazardous cargo. Two of these collisions resulted in fatality and 17 resulted in injury.

PRIORITY OF NEED:



PRIORITY OF NEED

- This is a high priority need.
- Developing and implementing a province-wide incident management system may help enhance road safety by providing immediate emergency response when needed. This may reduce the severity of collisions particularly involving hazardous materials in rural areas.

EXISTING NEED

- There are approximately 580 traffic signals in Winnipeg, half of which are electromechanical-based.
- Currently, there are no system-wide communication capabilities regarding traffic control signals in Winnipeg.
- There is a need to create a system of traffic control signals that can communicate information to a central traffic management system and to other traffic signals as required.
- All users should be accommodated by this new system of traffic control signals.
- This system should efficiently move people and goods to and from downtown, as well as around Winnipeg.
- There is a need for pre-emption of traffic signals for emergency response

Need #3

Improve traffic control and monitoring in urban areas

POTENTIAL STAKEHOLDERS

- City of Winnipeg Public Works—Transportation Division
- Emergency Services

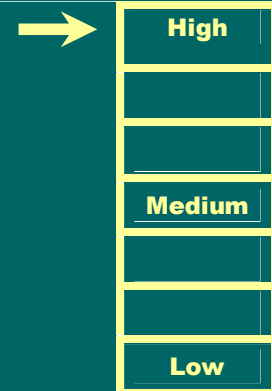
ASSOCIATED USER SERVICES:

- Traffic Control
- Traveller Information
- Emergency Vehicle Management

FACTS

- Traffic in Winnipeg generates 5 billion vehicle kilometers of travel, and 40 million urban goods movement trips per year.
- The street system consists of 1,720 lane-kilometers of Regional streets, 5,030 lane-kilometers of Local and Collector streets, and 196 bridges and structures.
- Traffic control signals in downtown Winnipeg generally operate on a fixed-time scheme. Signals in other areas of the city generally operate on a semi or fully actuated scheme.
- The City is currently conducting a pilot project on Bishop Grandin Boulevard to create communication between traffic control signals and a central traffic management system.
- The United States Department of Transportation reported that adaptive signal control has reduced traffic delay by 14 - 44% (ITS Benefits: 2001 Update)
- Fuel consumption may be reduced by 13% with improved traffic signal operations (reported by United States Department of Transportation - Delivery of Future Transportation)

PRIORITY OF NEED:



PRIORITY OF NEED

- The safe and efficient movement of people and goods is a high priority for the Transportation Division of the City of Winnipeg, making this need a high priority.
- There is current emphasis on improving the management of the available infrastructure, rather than building additional infrastructure.

EXISTING NEED

- The border crossing process for commercial vehicles involves a complex set of checks and inspections related to Customs, Immigration, safety, and other regulations.
- With increased emphasis on security issues, there are many systems currently in place to check the credentials of commercial vehicles crossing the border to and from the U.S. In some cases, using the wrong system can result in significant delays.
- There is a need to develop and implement a standard system or platform for the checking of credentials at all border crossings in Canada, not only in Manitoba. This system should be used by all agencies in charge of security issues and clearance, both in Canada and the U.S.
- The system should be flexible enough so that it gives consideration to motor carriers who do not have access to technology, or who prefer not to file documents electronically.
- The system should integrate Manitoba infrastructure with border infrastructure agencies and activities to expedite transportation.

Need #4

Improve security and expedite border crossing inspection and clearance for commercial vehicles

POTENTIAL STAKEHOLDERS

- Manitoba Trucking Association
- Trucking Industry
- Canada Customs and Revenue Agency
- U.S. Customs
- Province of Manitoba, North Dakota and Minnesota
- Customs Brokers
- Manufacturers, Importers/Exporters
- Shippers/Receivers

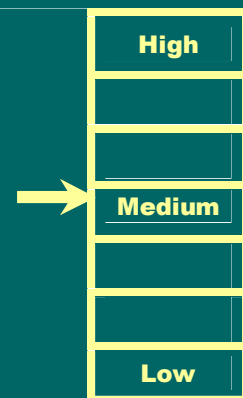
ASSOCIATED USER SERVICES:

- Commercial Vehicle Electronic Clearance
- Commercial Vehicle Administrative Processes
- Automated Roadside Safety Inspections

FACTS

- Trucking accounts for nearly 90 percent of value-related land trade to and from Manitoba across the Manitoba-U.S. border. Land trade is mainly with the northern and mid-western U.S. states.
- The Emerson-Pembina crossing is one of the three major border crossings on the western Canada-U.S. border. Truck traffic at this crossing is growing at a rate of about 7 % per year. The Emerson-Pembina crossing is the only international border crossing where long combination vehicles (Rocky Mountain doubles, turnpike doubles, and triples) can legally operate under special permit.
- Customs and Immigration clearance has significantly improved at the Emerson crossing over the years. The old system included paper documents being presented and checked in the border office. Approximately 90% of commercial vehicle drivers had to go in the office. This has been reduced through the use of electronic clearance where only approximately 25% of commercial vehicles are required to visit the office with paper work. FAST and NEXUS programs are being expanded to include Emerson-Pembina.
- There is no vehicle inspection facilities, or inspectors at the border (for mechanical fitness). On the Canadian side, the closest weigh station is located just north of the border, and on the US side, the scale is located at Joliette, ND.

PRIORITY OF NEED:



PRIORITY OF NEED

- This is a medium priority need. Canada Customs and Revenue Agency officials are working on systems to improve security. Much improvement has taken place over the last few years; however, more should be done regarding credential checking for crossing vehicles.

EXISTING NEED

- Seasonal weight limits (winter weight premiums and spring weight restrictions) are an important and complex aspect of truck transportation regulation in Manitoba and the rest of the Prairie region.
- Premium weight allowances in winter provide opportunities to increase truck productivity and lower shipping costs for dense commodities. Spring weight restrictions help reduce inordinate deterioration and pavement damage often associated with weak pavement and/or subgrade conditions.
- Manitoba uses a fixed-time system for permitting increased winter weight limits. This means that winter weight premiums are in effect from December 1 to the last day of February of the following year.
- Spring weight restrictions may be in effect from March 18 to May 31 of each year. The start date is based on the Thaw index which is used to predict the condition of the base course over a five day period. This Thaw Index, developed in Minnesota, relates air temperature to pavement temperature taking into consideration weather forecasts and environmental conditions such as solar radiation. The five day forecast is fundamental to predicting when implementation of restrictions is warranted and to provide stakeholders with 48 hours notice when the start date is delayed.
- There is a need to improve the predictability of the Thaw Index model by developing Regional Solar Radiation factors. A condition-based system whereby the physical condition of the road is measured (e.g., frost depths and thaw depths) would augment the current process and allow the department to more accurately predict the start date.
- Strength recovery equipment would be required to test pavement strength recovery to determine spring weight restrictions end dates.
- This technology may also benefit winter weight premiums. However, increased weights is dependent on the condition and loading capacity of other infrastructure such as bridges and structures.
- This system would involve real-time monitoring and forecasting of pavement and subgrade conditions, and it should apply region-wide.

Need #5

Provide an improved system for the application of seasonal weight limits

POTENTIAL STAKEHOLDERS

- Manitoba Trucking Association
- Trucking industry
- Manitoba Transportation and Government Services
- University of Manitoba
- Industry
- Rural communities
- Municipalities
- Shippers/Receivers

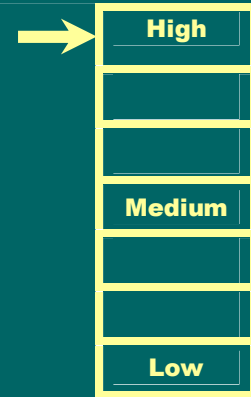
ASSOCIATED USER SERVICES:

- Environmental Conditions Management
- Weather and Environmental Data Management

FACTS

- There is a myriad of complex regulations pertaining to spring weight restrictions and winter weight premiums in the Prairie region.
- In the Prairie region, seasonal weight limits are in effect at one place or another for a 7-month period. Therefore, winter premiums or spring restrictions play a part in managing the balance between protecting the region’s highways and influencing commercial vehicle characteristics and operations.
- In the Prairie region and neighbouring U.S. jurisdictions, only Alberta uses a condition-based approach where advanced technologies are used to introduce and terminate spring weight restrictions and/or winter weight premiums.
- Manitoba’s approach to spring weight restrictions is based on the Minnesota developed after two years of extensive research. This model includes a specified period of time for restrictions to be in place to allow for pavement strength recovery. Manitoba extended this time frame by two weeks to take into account greater frost depths.
- Saskatchewan has a fixed-time system for winter and a fixed duration (45 days) but variable start dates by region for spring. Alberta has a totally variable system, based on weather and frost depth.
- Some communities in Manitoba have only one access road, which may be weight restricted. To address these situations an extensive list of commodities that are allowed to travel at higher weights has been developed to prevent undue hardship. Other commodities are considered under permit.

PRIORITY OF NEED:



PRIORITY OF NEED

- This is a high priority need. Seasonal weight limit policies can have significant pavement cost implications. They can also significantly affect trucking costs due to increased travel distances associated with spring weight restrictions.

EXISTING NEED

- There are many situations in which roads are closed due to bad weather conditions. This is particularly the case with the Trans-Canada highway during winter. There are also many situations where roadway construction causes delays.
- Vehicular traffic traveling on these roads has no way of knowing when this will occur, and is faced with long delays. This is particularly problematic for the trucking industry due to the nature of their operations.
- There is a need for the implementation of an information system that can advise travelers and the truck operators of road closures and other incidents well in advance of the location. Real-time information that could be beneficial to travelers includes detours, weather and road conditions, and road closures.

Need #6

Improve traveler information in rural areas

POTENTIAL STAKEHOLDERS

- Manitoba Transportation and Government Services
- Trucking industry
- Tourism
- Environment

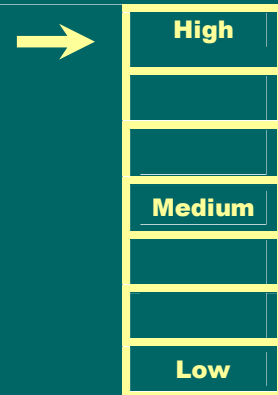
ASSOCIATED USER SERVICES:

- Traveller Information
- Weather and Environmental Data Management

FACTS

- There are 17,734 kilometers of provincial highways in Manitoba. 95% of this road network is comprised of undivided highways, and 5% of divided highways.
- Existing road closure, construction area, and highway condition information may be hours outdated.
- Transport Canada reported Manitoba’s 1996 AADT on the National Highway System averages 4,800 vehicles per day and carries 28% of total traffic. Manitoba’s sections of the National Highway System consist of PTH 1, PTH 16, PTH 75 and south perimeter highway of Winnipeg.
- Travel time may be reduced by 13% with up-to-date roadway conditions (reported by United States Department of Transportation - Delivering the Future of Transportation).

PRIORITY OF NEED:



PRIORITY OF NEED

- This is considered a high priority need. Providing timely information to motor carriers may result in considerable time saving to the industry, as well as reduced fuel emissions.

EXISTING NEED

- Winnipeg Transit riders have a desire to have better real-time information on the arrival times of busses. Weather conditions in Winnipeg have a major constraint on attracting riders to the transit system. Decreasing the waiting time at transit stops would improve the ridership levels.
- There is a need to have a system in place where bus drivers involved in situations affecting their schedule can immediately communicate with personnel updating the route time/location information.
- A good monitoring system will be needed to provide data and create accurate schedules.
- Increasing the use of transit priority including diamond lanes and signal priority would also help increase ridership.
- Additional payment options such as Smart Cards or proximity cards, would improve the efficiency and convenience of the system

Need #7

Provide more convenient transit service

POTENTIAL STAKEHOLDERS

- Winnipeg Transit
- City of Winnipeg Public Works

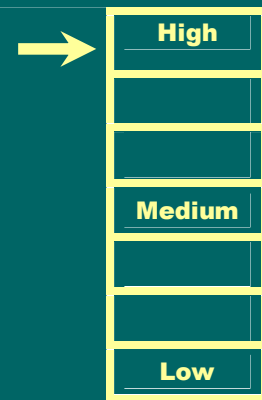
ASSOCIATED USER SERVICES:

- Public Transport Management
- En-Route Transit Information
- Demand Responsive Transit
- Electronic Payment

FACTS

- Approximately one-third of Winnipeg’s residents make regular use of the transit system. About 4 in 10 residents make at least one trip on transit each week.
- The current information system does not provide real time information to the ridership. Riders do not know if the busses are running on schedule or not and therefore cannot adjust their schedule accordingly.
- Better communication between operators and riders would increase ridership.
- **Improving user information** is a recommendation of the The Guide for Better Transit for Winnipeg, January 2000.
- Transit travel time may be reduced by 8-10% with signal priority (reported by United States Department of Transportation - Delivering the Future of Transportation).

PRIORITY OF NEED:



PRIORITY OF NEED

- This is a high priority need.

EXISTING NEED

- Manitoba Transportation regulates the weights and dimensions of motor vehicles on provincial highways. Vehicles which exceed these regulations are required to obtain permits from the Department to travel on these highways.
- The permitting process is labour intensive, relying on specialized knowledge of experienced staff using dated technology. It involves a complex and varying set of rules and regulations covering multiple types of permits, restrictions and exemptions which are described in manuals provided to staff responsible for issuing permits. Consultation with other jurisdictions and agencies such as Manitoba Hydro and Manitoba Telephone System are often required to ensure the specifications on the permits comply with their conditions.
- There is a need to improve the efficiency of the permitting process while providing safety to the carrier as well as the motoring public.
- It would be desirable to have consistent permit policies between the province and cities.

Need #8

Improve efficiency of the permitting process

POTENTIAL STAKEHOLDERS

- Manitoba Transportation and Government Services
- Trucking Industry
- City of Winnipeg
- City of Brandon

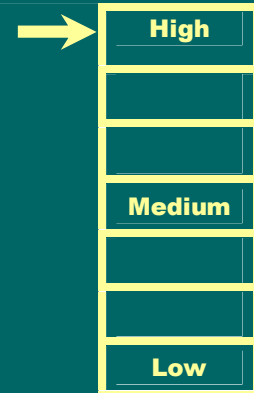
ASSOCIATED USER SERVICES:

- Commercial Vehicle Administrative Processes
- Automated Roadside Safety Inspection
- Commercial Vehicle Electronic Clearance

FACTS

- The manual nature of the permitting system causes costly delays for carriers and is an administrative burden.
- Multiple jurisdictions issuing permits to travel within Manitoba is a duplication of services and required information.
- With the current system industry may have to wait for up to 58 hours to obtain required approval from different agencies.
- If a carrier enters either the City of Brandon and/or Winnipeg, up to three agencies must be contacted to obtain three different permits.
- Financial administration of this program is complicated and involves a number of staff.
- Permits are issued at several locations throughout the province including the Department's regional offices, the Head Office in Winnipeg, and several weigh stations. Each office has various operating hours and provides some but not necessarily all permitting services. Due to these inconsistent and unpredictable operating procedures, carriers are not always able to acquire the necessary permits. Therefore, compliance officers cannot legitimately impose fines for operating without a permit. This is believed to result in significant lost revenue to the province.

PRIORITY OF NEED:



PRIORITY OF NEED

- This is a high priority need due to the significant costs associated with having a manual permitting system.
- Streamlining the current system would be very beneficial to both industry and government. Motor carriers would benefit from a more efficient and effective system, therefore saving in operating costs. Enforcement officers would be able to electronically check for validity of permits presented by motor carriers in the field during inspections.
- The automation of the permitting system could be the first step towards the implementation of a one-stop shop for electronic purchase of credentials, and automated mileage and fuel reporting.

EXISTING NEED

- Wildlife-vehicle collisions cause many mortalities for wildlife in Manitoba, especially deer.
- Collisions involving wildlife have increased for three consecutive years in Manitoba.
- There is a need to reduce wildlife-vehicle collisions in Manitoba. Implementing a wildlife warning system will increase highway safety for drivers and wildlife and will reduce the staggering costs of wildlife-vehicle collisions.

Need #9

Reduce wildlife-vehicle collisions

POTENTIAL STAKEHOLDERS

- MPI
- Manitoba Conservation
- Manitoba Transportation and Government Services
- City of Winnipeg

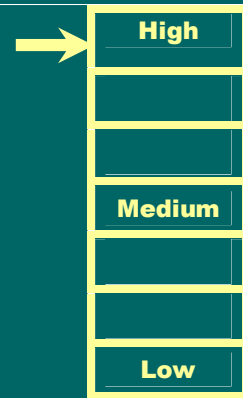
ASSOCIATED USER SERVICES:

- Automated Dynamic Warning and Enforcement

FACTS

- MPI reported for Year 2001:
 - \$18 million was paid out in wildlife claims. Claims have increased for three consecutive years.
 - 8,400 wildlife collisions in Manitoba.
 - 200 people were injured through wildlife collisions.
 - 2000 wildlife claims in the Brandon/Westman Region.
 - 2000 wildlife claims in the Winnipeg area.
- Deer population estimates are between 150,000 and 160,000.
- There are 60-70 deer-vehicle collisions reported each year in Winnipeg.
- Deer collision hot spots in Winnipeg:
 - Wilkes Avenue between Elmhurst Road and Kenaston Boulevard.
 - Sturgeon Road between Four Mile Road and Saskatchewan Avenue.
 - Kenaston Boulevard between Wilkes Avenue and Lawson Crescent.
 - Grant Avenue between Chalfont Road and Shaftsbury Boulevard
 - Roblin Boulevard between Chalfont Road and Shaftsbury Boulevard
 - Bishop Grandin Boulevard to Kenaston Boulevard.
- Deer collision hot spots in Manitoba:
 - PTH 59 and PR 206.
 - PTH 10 south of Brandon.

PRIORITY OF NEED:



PRIORITY OF NEED

- This is a high priority need.

EXISTING NEED

- Under the current enforcement system, all trucks are required to attend the inspection stations regardless if they are loaded/unloaded or previously inspected.
- In addition, there is an existing need to provide enforcement vehicles with systems to verify drivers' licenses and vehicle registrations, which will improve the efficiency of roadside safety checks.
- For both roadside and inspection station inspection activities, there is a need to streamline the processes to allow faster processing.

Need #10

Improve efficiency of truck inspection stations and roadside checks

POTENTIAL STAKEHOLDERS

- Manitoba Transportation and Government Services (Transport Compliance Officers)
- Manitoba Trucking Association
- Trucking Industry
- Winnipeg Police Service
- Royal Canadian Mounted Police (RCMP)

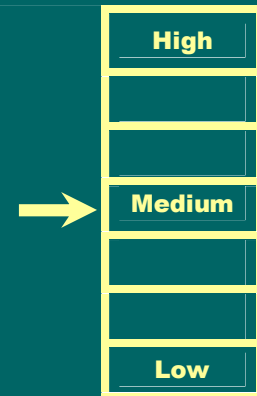
ASSOCIATED USER SERVICES:

- Automated Roadside Safety Inspections
- Commercial Vehicle Electronic Clearance

FACTS

- Detailed safety inspections take approximately one hour to complete.
- The current roadside system is initially reported by hand and then entered into computer system at the weigh station.
- In the current system, inspectors that are patrolling do not have computers in the vehicles, may inspect a vehicle in a remote area, and have to call into the office to check license and vehicle registration. Inspections at the weigh stations use the computer system.

PRIORITY OF NEED:



PRIORITY OF NEED

- Given the level of truck traffic in the Province of Manitoba, small efficiency improvements in inspection activities could have large overall gains in the industry. This is a medium priority need, given the recent advances in inspection efficiencies.

EXISTING NEED

- The Province of Manitoba collects road condition, traffic volumes (including trucks), and environmental data on a regular basis.
- A number of the data collection efforts are supported by data management and dissemination systems; however, there is a need to create a central data archive.
- The development of the archive would assist in providing common data protocols, efficient data capture techniques and easy access to historical data.

Need #11

More Efficient Data Capture for the Roadway System Management

POTENTIAL STAKEHOLDERS

- Manitoba Transportation and Government Services
- City of Winnipeg
- University of Manitoba

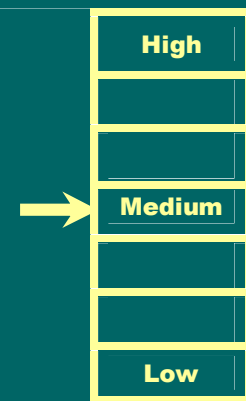
ASSOCIATED USER SERVICES:

- Traveller Information
- Traffic Control
- Travel Demand Management
- Operations and Maintenance
- Weather and Environmental Data Management

FACTS

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- Traffic in Winnipeg generates 5 billion vehicle kilometers of travel, and 40 million urban goods movement trips per year.

PRIORITY OF NEED:



PRIORITY OF NEED

- This is a medium priority need.