

National Guide
to Sustainable
Municipal
Infrastructure



Guide national pour
des infrastructures
municipales
durables

WORKSHOP PRIMER

TRANSIT BEST PRACTICES

FOR

**THE NATIONAL GUIDE TO SUSTAINABLE MUNICIPAL
INFRASTRUCTURE**

PREPARED JOINTLY BY:
NATIONAL GUIDE TO SUSTAINABLE MUNICIPAL INFRASTRUCTURE
TRANSPORT CANADA
CANADIAN URBAN TRANSIT ASSOCIATION*

Workshop Primer Transit Best Practices

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*This primer was developed as a discussion document for the purposes of a transit priority setting workshop. It is not intended to represent the views of any of the parties involved in its preparation.

1. INTRODUCTION

This primer is for participants taking part in the Transit Best Practices Workshop on May 31, 2003. Its purpose is to provide information and a framework for discussions. It is not intended to be comprehensive; rather it is a starting point for deliberations.

The purpose of the workshop is to identify a number of “best practices” topic areas that the workshop participants feel would benefit from a comprehensive national consultation, research, writing and dissemination process. The topic areas will be prioritized at the workshop and following the workshop, a working group will be selected to begin working on the first priority topic.

As background for the workshop, the primer contains:

- Background on the National Guide to Sustainable Municipal Infrastructure and how the Transit Best practices project relates to it;
- A framework for considering/categorizing Transit Best Practices;
- Background from recent studies on urban transit and urban transportation generally; and,
- An introduction to Transport Canada’s Urban Transportation Showcase Program that is supporting the initial stages of the Transit Best Practices project and the development of one of the best practices that support its objectives.

Thank you for agreeing to commit your time and energy to the workshop and to the larger process. We believe that the time is right for such a project. Public transit and urban transportation issues are on the agenda at all levels of government and for citizens generally. Our hope is that the project will help municipalities and others apply efficient, effective, sustainable and innovative approaches to their unique urban transportation challenges.

2. THE NATIONAL GUIDE TO MUNICIPAL INFRASTRUCTURE

In 2001, the federal government, through its Infrastructure Canada Program and the National Research Council (NRC), joined forces with the Federation of Canadian Municipalities (FCM) to create the National Guide to Sustainable Municipal Infrastructure.

The Guide is both a national network of people and a growing collection of published reports that set out best practices in six key areas –1) roads 2) potable water 3) storm and wastewater 4) decision making and investment planning 5) environmental protocol – and now, 6) transit. Each report draws on the best Canadian experience and knowledge and summarizes it for decision-makers and technical personnel. To date, 16 best practices have been published. The best practices are available on-line and in hard copy.



2.1 WHAT ARE BEST PRACTICES?

Best Practices are the best proven methods and technologies for municipal infrastructure planning, design, construction, management, assessment, maintenance and rehabilitation taking into account economic, environmental and social factors.

By gathering and synthesizing the best Canadian experience and knowledge, the Guide helps municipalities get the maximum return on every dollar they spend on infrastructure. Its creation is made possible through \$12.5 million from Infrastructure Canada, in-kind contributions, technical resources, the collaborative effort of municipal practitioners, researchers and other experts, and a host of volunteers throughout the country.

2.2 HOW ARE BEST PRACTICES DEVELOPED?

Technical committees, in consultation with stakeholders, identify priorities for best practices in each of the other five areas. A technical committee selects the priority and appoints working groups to conduct the work. With the help of consultants, information is gathered through surveys of municipal practices and published literature. Best practices are extracted and documented and then tested through peer review and consultation using a large network of practitioners, elected officials, administrators, academics, industry representatives and others. Comments are incorporated to ensure a high level of objectivity and rationale in the published best practices.

In selecting priority topic areas, it is helpful to keep in mind the following criteria:

- *Relevance to users* –How many municipalities would benefit? How many citizens? How likely is the community to apply a best practice?
- *Environment* – Is it consistent with environmental protection? Could it reduce the use of resources, improve efficiency, and lower demand for municipal services?
- *Financial* – What is the impact on the bottom line? What are the long-term and life cycle implications?
- *Minimizing community risk* – What are the consequences of *not* creating a best practice – the consequences to health, safety and quality of life?
- *Public concern* – Where does it currently rank on the public agenda?
- *Continuity/Linkage*– Can it be linked to other best practices? Is it part of a continuum?
- *Integration* – Can it be integrated with other work?
- *Innovation* – Does it contribute to innovation and new technology use?
- *Avoids duplication* - Is there another best practice of the same nature?
- *Pay for Say* – Is there associated funding?

2.3 WHAT TOPICS HAVE ALREADY BEEN GIVEN PRIORITY?

The range is extensive. Thirty topics identified to date provide both decision-making and investment planning tools and advice on such specific problems as deteriorating water distribution systems, technologies for rehabilitating sewer systems and preventive maintenance for municipal roads to name a few.

You can find a complete list and the published reports online at www.infraguide.gc.ca or by contacting us toll-free at 1-866-330-3350.



2.4 EXPANDING THE SCOPE

As a second phase of work begins, the scope of the Guide is expanding to include municipal transit issues and demand-side management. There are also plans to aggressively communicate and market the Guide, to develop an education strategy, to adopt a suite of IT tools that support streamlined business practices, to assess and fine-tune its governance structure, to identify and establish a long term financial base, and to develop ways to continuously engage and grow the extensive network that has come together to create the Guide – a network that you are now part of.

3.0 TRANSIT BEST PRACTICE FRAMEWORK

The topics discussed below are provided as a starting point for workshop discussions. They have been grouped into categories that are borrowed from research commissioned by Transport Canada on public transit. (This research is described in more detail in section 4.) These categories will help define breakout groups at the workshop.

3.1 A CAPABLE SYSTEM

1. Market-Tailored Transit Services

Transit services need to be designed to meet the specific needs of localized travel markets within each city. Many Canadian transit systems have implemented innovative approaches to service delivery for various types of transit markets. Examples include:

- Bus Rapid Transit in Segregated Rights-of Way for High Speed Commuter Travel
 - Ottawa's Transitway
 - Planned initiatives in other cities
- On-Street Bus Rapid Transit for Travel Along Major Urban Arterial Streets
 - Quebec City's Metrobus
 - Vancouver's B-Line
- Limited Stop and Non-Stop Express Bus Services
 - Most medium and large-sized cities
- Demand Responsive Services for Low Density Markets
 - Hamilton's Transcab
 - Winnipeg's DART
 - Alberta (Red Deer, Sherwood Park, Lethbridge)
 - Ontario (Whitby, Ottawa)
 - Quebec (Quebec City, Rimouski, Montreal South Shore)

There are very likely others that the participants will identify. A compendium of the features, advantages, disadvantages, costs, and conditions for application for each of these types of services for reference by all cities is needed.



2. *Transit Accessibility*

Most municipalities offer specialized transit services for persons with disabilities. The challenge is to manage the costs of expanding access by achieving an optimal balance between specialized services and full access to conventional transit. This includes a transition from high floor to low floor vehicles and major retrofits to stations, stops, shelters, curbs and platforms, where applicable. Due to cost implications, an incremental approach is required. Many transit systems have developed accessibility plans, which are now a requirement for Ontario municipalities wishing to comply with the Ontarians with Disabilities Act.

3. *Improved Transit User Information*

Transit systems have traditionally relied on paper-based products to communicate information to the public on how to use their services. Such items as printed timetables, maps, and posted schedules at stops will always be important. More recently, however, many transit systems have taken a more comprehensive approach to include IVR (interactive voice response), internet web sites for comprehensive schedule information, web-based trip planners, on-board next stop enunciation and display, and next bus departures at major stops/stations and activity centres. The data and technological requirements to provide the necessary integration are complex and require coordination amongst all the functional areas of transit (planning, scheduling, marketing, operations, and IT). As an initial phase, many transit systems have successfully developed applications for scheduled information. As automatic vehicle location becomes more prevalent, the systems will be enhanced to provide real-time information.

4. *Improved Comfort, Convenience, and Safety of Transit Travel*

These attributes are important for all aspects of transit travel, including the walk to/from the service, waits at the stop/station, and the ride on the transit vehicle. While many transit systems have implemented new vehicle designs (low floor buses, double-deckers, articulated buses) with features to make the on-vehicle part of the trip better, several cities have undertaken comprehensive programs to upgrade waiting areas at major stops, to significantly expand the number of passenger shelters (especially through public-private partnerships), to improve snow clearing standards for walking paths leading to bus stops, and to implement polices (such as Request-Stop) that empower bus operators to better meet the needs of individual passengers.

5. *Innovative Fare Initiatives*

During the past decade, several transit systems have added new fare options to provide more choice and more economy for passengers. Examples include deep discount strategies, weekly passes, day passes, post-secondary passes, time-slice transfers, employer-paid transit pass programs, discounts for social assistance recipients, and coupon programs for pass purchasers. The objective has been to attract additional ridership while maintaining or increasing revenues. These approaches can be used with existing fare collection methods or in conjunction with the implementation of new electronic fare collection technologies.

3.2 A COMPATIBLE SYSTEM

1. *Transportation Management Associations (TMA)*

TMA's are an innovative marketing solution to promote modal shift from single occupant vehicles to public transit and other modes like walking and cycling. It allows transit systems to stay close to the needs of the business community and build strong partnerships. Transportation Management Associations can implement commuter trip reduction projects in partnership with local employers and real estate developers to promote improved employee awareness and the use



of alternate modes of transport. Examples from large metropolitan areas like Toronto and Montreal, to smaller communities such as Kelowna and Brandon, show that transportation demand management has great promise. By integrating car-pooling with the help of a trip matching software and a communication campaign, customizing public transit routes and schedules, TMAs can help to move Canada's municipalities towards more sustainable transportation.

2. *Intermodal Terminals*

Integration of modes allows a municipality's transportation system to offer the most flexible and efficient service to the population. Intermodal terminals, which can include bus, rail, ferry and automobile components, are the key to a successful regional transport integration strategy.

Examples include the Seabus Terminal in downtown Vancouver (ferry, commuter rail, SkyTrain, bus), Union Station in Toronto (commuter rail, intercity rail, light rail, bus and subway), Hamilton GO Station (commuter rail, local bus, intercity bus and auto) and the Gare Centrale in Montreal (intercity rail, commuter rail, regional bus and subway). There is a potential for many more applications of the intermodal concept that can act as a catalyst for economic development and seamless travel.

3. *Improved Integration of Transit with Land Use Planning*

Supportive land use conditions must be provided in our cities if transit is to play a larger role in our urban transportation systems. Some cities have made some initial steps in the transit-oriented design of new communities. These are especially important for cities experiencing rapid growth. Some cities have concentrated on "retrofitting" the existing built environment to be more transit-friendly. Examples include transit-oriented streetscapes (Vancouver, Calgary, Winnipeg, Toronto, Montreal, Quebec City) and the strategic infill redevelopment of lands adjacent to existing high quality transit services. The CITE is researching current best practices and processes for reviewing site plans in the development approval process in the context of alternative transportation modes.

4. *Improved Integration of Transit with Other Modes*

Many cities have made good progress in integrating the automobile (park and ride, kiss and ride) and the bicycle (bike racks on buses, bike storage lockers, expansion of cycling and pedestrian paths in conjunction with rapid transit and transit priority initiatives) with transit service. While these physical facilities are important, the marketing approaches used to make citizens aware of these new multi-modal opportunities for travel are necessary components of mode integration strategies.

3.3 A CONSERVING AND CLEAN SYSTEM

1. *Alternative Propulsion Technologies for Transit*

Many Canadian cities have introduced alternative fuel vehicles into service or conducted trials for a limited time. Example technologies include ethanol-blends, methanol, CNG, LNG, LPG and hydrogen fuel cells. These approaches are important to ensure that transit fleets meet emission reduction targets as part of broader programs to implement the Kyoto Protocol.

2. *Energy Efficiency and Conservation Programs*

Most transit systems have implemented programs to reduce energy use in many aspects of their operations (in-service fleet, auxiliary fleet, buildings, maintenance practices, recycling, etc.). Not only do transit systems provide a leadership role for other large municipal services, it is important



to build public support through such programs to position transit as a key part of the solution to environmental issues.

3. *Public Outreach Programs for Commuting Options*

Some transit systems have delivered extensive public education programs regarding the environmental and economic implications of mode choices people make for their trips. Proactive programs such as these are necessary to make the public aware of the transportation options they have and to reduce their dependence on automobiles.

4. *Environmental Management Systems*

Many communities have incorporated environmental management systems in transit operations. Resulting improvements include efforts to reuse material, increased controls on discharges, pollution prevention programs, etc.

3.4 A COST-EFFICIENT SYSTEM

1. *Scheduling and Operations Strategies for Cost-Effective Service Delivery*

Many systems use such techniques as interlining, zonal express services, peak direction services, short-turning and a variety of transit priority measures (transit malls, reserved lanes, transit signal priority, queue bypass lanes, exclusive transit centres, etc.) to design efficient on-street transit service.

2. *ITS Tools to Improve the Monitoring and Management of Transit Service*

In the past few years, the costs of key building block technologies required for service planning, operations management, and passenger information have become more affordable. In addition, technological advances in global positioning have made it more feasible to implement these systems. Automatic passenger counting (APC) systems have been implemented in several cities. These systems gather abundant information on passenger loads, bus running times, dwell times, and delays that can be used to plan more effective routes and make schedule improvements. Automatic vehicle location (AVL) systems are being implemented to permit more effective management of on-street service, and, as importantly, to integrate bus location data into real-time passenger information systems delivered via IVR, the Internet, and wireless methods to homes, businesses, stops/stations, activity centres, and on-board passengers. The integration of AVL technology with the traffic signal system also permits the implementation of real-time transit signal priority. Many projects are underway in APC and AVL technologies in Calgary, Saskatoon, Winnipeg, Toronto, Ottawa, Gatineau, Montreal, Montreal South Shore, Laval, Quebec City, and St. John's.

3. *Collaborative Vehicle Procurement*

Joint vehicle procurement can provide significant savings for municipal infrastructure acquisition. Examples from Quebec, New Brunswick and British Columbia show that capital cost savings through common specifications and shared fleets can result in substantial benefits. In some cases, this approach has facilitated accelerated implementation of full accessibility by allowing for the deployment of low floor buses in municipalities of greatest need.

4. *Public-Private Partnerships*

In an era of serious funding constraints, public-private partnerships (P3) represent a promising source of creative and innovative alternatives to traditional investment measures. If carefully structured, P3s can leverage new sources of capital for major construction. Current examples include the Vancouver-Richmond-Airport Rapid Transit Plan and the York Rapid Transit Plan.



4.0 URBAN TRANSIT IN CANADA NOW

Transport Canada commissioned three transit studies as part of the Government of Canada's commitment to work with partners to help improve public transit infrastructure, as highlighted in the 2000 Speech From the Throne. The studies developed a national perspective on the needs and priorities of the transit industry and provided a better understanding of urban transit issues from an environmental and sustainable development viewpoint. They are:

1. *National Vision for Transit in Canada to 2020*, by IBI Group, which analyses long-term trends, international case studies and existing municipal vision statements, and proposes targets for urban transit ridership.
2. *Urban Transit in Canada — Taking Stock*, by McCormick Rankin Corp., both describes the current state of the Canadian transit industry and historic trends in provincial and municipal funding of urban transit, and assesses the industry's future needs.
3. *Economic Study to Establish a Cost-Benefit Framework for the Evaluation of Various Types of Transit Investments*, by HLB Decision Economics Inc., which provides an analytical framework to assess transit investments.

These studies can be found at:

<http://www.tc.gc.ca/programs/environment/UrbanTransportation/transitstudies>

We have taken the relevant portions of these studies and presented them in the following sections to provide a framework for consideration of best practices in urban transit.

4.1 NATIONAL VISION FOR TRANSIT IN CANADA TO 2020

The Vision study suggests that there is a growing consensus in Canadian urban areas that:

- The likelihood of meeting future urban transportation needs through road expansion alone appears to be increasingly impracticable from the standpoint of sustainable development, system capability, environmental impacts, liveable communities, and the accessibility to be provided to all groups of society (including the disabled and seniors, shippers, and those for whom travel by automobile is essential).
- Improving urban transit services in ways that increase the competitiveness of transit relative to the private automobile and which reduce the ever-increasing growth in car dependence are desirable from economic, social and environmental standpoints.
- Improvements in transit that attract individuals from the private automobile, as well as land use and transportation planning that leads to shorter trips, fewer motorized trips and increased use of cycling and walking are also seen as essential elements of meeting Canada's commitments to reductions in greenhouse gas emissions, improvements in air quality, and related health impacts, while also helping to conserve energy and reduce dependence on fossil fuels.
- Reduction in levels of road congestion are necessary to maintain and improve the competitiveness of urban economies, and thus of the national economy.



4.1.1 PROPOSED STRUCTURE FOR THE VISION

To assist in developing and structuring policy goals, first principles regarding the meaning of a sustainable transportation system were re-examined. As a result, a conclusion was reached in the study that any sustainable transportation system should be:

- **capable** of providing the necessary speed, capacity, frequency, coverage and connectivity to provide access to all activities in the urban areas with service that is safe, comfortable and convenient;
- **compatible** with liveable communities that support a vibrant economy, walkable streets, people-friendly places, and a high quality-of-life;
- **conserving** of energy and other natural resources and clean in terms of waste products; and
- **cost-efficient** in terms of efficient service delivery, appropriate and affordable transportation pricing, and adequate, predictable funding arrangements.

4.1.2 URBAN TRANSIT VISION STATEMENT

The Vision study proposed the following vision statement:

By 2020, Canada's urban transit/transportation policies and initiatives need to achieve: a reduced level of motorized travel per person; less dependence on the private automobile; improved transit accessibility for those who by reason of age, income, or physical disability are unable to drive; more competitive transit service delivered in an effective and cost-efficient manner that attracts users from their cars for a wider variety of trip purposes; and, resulting from the above, more capable, compatible, clean, conserving and cost-effective urban transit and transportation systems.

4.1.3 URBAN TRANSIT POLICY GOALS

The urban transit vision is described below more fully in terms of fifteen policy goals. The policy goals have been grouped by first-principle to highlight the linkage to the urban transit vision.

A Capable System:

1. Door-to-door, "seamless" travel by public transit and related modes within the entire urban area, unimpeded by jurisdictional boundaries or intermodal barriers, through integration of transit services, pricing, and passenger information systems, as well as intermodal coordination and parking policies.
2. Increased transit speed, capacity, frequency, coverage and connectivity to compete more effectively with the automobile and reduce automobile dependency in serving a wider variety of trip purposes, through general improvements in the network of transit services and increased integration of public and private transportation activities.
3. Improved accessibility to transit service for the disabled and seniors through modifications to new vehicle and infrastructure designs, retrofitting of existing infrastructure, and special services for these individuals in communities with modest or no conventional transit services.
4. Increased comfort, convenience and safety for transit users in both vehicles and waiting areas, through general improvements in the amenities of transit vehicles and waiting areas.
5. Improved transit service in currently transit-deprived areas, including use of appropriate service structures and technologies to provide transit services in an efficient and cost-effective manner.



A Compatible System:

6. Fewer and shorter motorized trips per person and more trips by transit, walking and cycling, largely through management of urban development, regardless of city size, in ways that lead to compact urban form and greater mixed land use plus more pedestrian-, transit- and cycling-friendly streetscapes.
7. More transit-friendly and walkable/cyclable streets and streetscapes through integrated planning, design and delivery of those services and facilities.
8. Greater opportunities for accommodating bicycles in connection with transit services through special features of transit stations and vehicles.

A Conserving and Clean System:

9. Reduced transit/transportation energy consumption and resource depletion through an increase in the proportion of vehicle-km involving more energy-efficient vehicles and the use of alternative propulsion systems.
10. Reduced emissions of greenhouse gases and other pollutants from transit/transportation through use of alternative fuels and propulsion systems plus greater reliance on transit, walking and cycling.

A Cost-Efficient System:

11. More efficient operation of transit vehicles and higher vehicle productivity, through road design and traffic engineering policies, urban development patterns that are more favourable to transit and consideration of alternative service delivery approaches.
12. Transit priority policies that improve average transit travel speed and net revenue per vehicle, thus increasing vehicle and driver productivity, as well as the attractiveness of transit relative to the private automobile leading to increased transit ridership and revenues and reduced net costs per rider.
13. Cost-effective planning and delivery of new and/or expanded levels of transit service as well as maintenance and rehabilitation of existing services and facilities based on appropriate governance which enables an integrated approach to urban development and provision of transit/transportation.
14. A level playing field from the standpoint of transit versus auto travel decisions based on consideration of real costs and affordability, including under-priced parking and rationalization of income tax regulations affecting allowable deductions and taxable benefits.
15. Generation of reliable, performance-based revenue streams to fund urban transit thereby making possible more cost-efficient capital investment programs, through public funding policies and drawing on road pricing and/or other user pricing mechanisms that account for the external costs imposed on society by road users and the co-benefits to society of achieving improved and more widely used transit.

It should be stressed that not all elements of this vision statement are applicable in every situation or even within different communities of the same jurisdiction. Transit priority in large urban areas that operate high frequency services in mixed traffic, for example, is not a policy that is likely to be relevant in small municipalities or even in low density communities of a large metropolitan region where existing or potential transit ridership would not justify such measures.



Similarly, alternative services that may be appropriate in these latter situations (e.g. smaller, more demand responsive vehicles) are not likely to be relevant for high-density transit corridors.

4.2 URBAN TRANSIT IN CANADA – TAKING STOCK

The purpose of this study was to describe and assess the current state of the Canadian transit industry, compare it with other places internationally, project the current industry into the future based on targets outlined in the National Vision study and identify the pressure points and resource gaps related to achieving this future vision.

The information and analysis presented in this study illustrates a number of challenges that would be faced in achieving the National Vision for transit in Canada including broader implementation of transportation demand management and fleet availability.

4.2.1 DEMAND MANAGEMENT

- The National Vision calls for a 50% increase in transit over the next 20 years, with demand for transit growing faster than the Canadian population (forecast to increase by 16% over this period). To support this ambitious goal, a systematic assessment of the factors that influence transit demand would be required and a concerted effort to improve and adjust practices and policies related to these factors. For example: Policies that recognize and support transit's integral role in creating a sustainable transportation system would be needed at all levels of government;
- Transit priority measures (tools to improve the mobility and “on-time” performance of transit vehicles through congested urban streets) would need to be the standard rather than the exception;
- Policies that allow flexibility of zoning requirements with respect to parking and development intensity adjacent to transit facilities would need to be established by urban municipalities;
- Policies that facilitate increased urban density would need to be researched, developed and implemented;
- Policies to integrate transit efficiency and service considerations into land use decisions would be needed at the municipal level;
- Improvements would be needed to transit service availability and reliability to a level as yet not obtained in Canada;
- Rapid Transit infrastructure development would be needed to ensure that transit could be competitive, particularly in a congested traffic environment;
- Policies that provide for increased charges for car use such as road tolls, complementary congestion charges, license surcharges and parking surcharges would be needed.

4.2.2 FLEET AVAILABILITY AND DURABILITY

When considering fleet expansion to support the substantial increase in transit demand envisioned, it is important to consider the capacity of the transit manufacturing industry. The three Canadian transit bus manufacturers have all experienced significant change over the past several years and have products that can generally meet the requirements of the transit systems. However, they are structured to serve the current Canadian market as well as compete in the U.S. market and they would face a challenge to quickly increase their manufacturing capacity to meet



an ongoing expanded market. To address this, they would have to invest and grow based on the future vision, and/or other manufacturers from the U.S. or elsewhere would have to become active in the Canadian market.

The U.S. transit bus market is much larger than Canada. Because the Canadian bus manufacturers compete in both markets, they naturally design their products to meet the needs of the largest market. Since U.S. transit systems typically replace their bus fleet after twelve years of life, the vehicles accommodate this and do not always meet the needs of Canadian agencies that traditionally keep their buses longer. Ensuring that buses purchased in Canada can meet the unique requirements of the Canadian environment for the desired time frame is a key issue.

5. URBAN TRANSPORTATION SHOWCASE PROGRAM

Transport Canada's Urban Transportation Showcase Program (UTSP) is involved in the Transit Best Practices Project because it contributes to the program's objectives for the development of best practices in the area of integrated approaches to sustainable urban transportation and because it contributes to the development of a national network of sustainable urban transportation practitioners.

The UTSP is a key component of the Government of Canada's *Action Plan 2000 on Climate Change*. The \$40 million program calls for the creation of municipality-based showcase programs to demonstrate and evaluate ways of reducing greenhouse gas emissions from transportation and to address other urban challenges, such as air quality, congestion, safety and rising operating costs.

