

Transportation Demand Management for Interprovincial Travel in the National Capital Region

Study Report

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Acknowledgments

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EXECUTIVE SUMMARY

Introduction

In recent years, the demand for transportation in the National Capital Region has outpaced the ability of the various government transportation agencies to provide the needed transportation supply. This has been particularly true for interprovincial travel, where planning for a new bridge has met with opposition, for economic, environmental, and social reasons. In a climate of limited resources, agencies have begun to look for new, more cost-effective ways of dealing with user demand. This has led to the consideration of a number of possible measures that come under the broad classification of Transportation Demand Management (TDM).

The Phase II of the study on interprovincial bridges conducted by the Joint Administration Committee on Planning and Transportation (JACPAT) has addressed the need of using such measures in order to optimize the existing infrastructures, and to delay the construction of a new bridge.

Another joint study, regrouping several government agencies, on transportation planning in the central area of Ottawa, set a common vision for a central area transportation strategy. Some guiding principles related to TDM measures are also contained in that report, as the necessity to encourage the use of public transit.

With this in mind, the JACPAT directed the TRANS committee to examine the opportunities for the use of TDM in the National Capital Region (NCR). The purpose of this initiative was to analyze the potential for applying TDM to solve the problems of interprovincial travel in the NCR, and to develop an action plan for TDM by way of the following tasks:

- Determine the set of TDM measures most suitable for interprovincial travel, based on an understanding of TDM measures implemented in Canada and elsewhere;
- Obtain consensus among affected agencies on the proposed TDM measures;
- Identify concise responsibilities and tasks for implementation associated with each of the TDM measures;
- Establish the priority of selected TDM measures;
- Obtain public input on the proposed TDM strategies.

This study examines the possibilities for TDM implementation in the National Capital Region, and recommends an Action Plan for Transportation Demand Management for Interprovincial Travel in the National Capital Region.

Definition of Transportation Demand Management (TDM)

TDM is a strategy aimed at alleviating urban traffic congestion through the management of travel demand. TDM measures are primarily directed at commuter travel and are designed to reduce dependence on the single occupant vehicles (SOVs), to shift the timing of travel to less congested time periods, and to reduce the general demand for commuter travel. TDM attempts to change commuter behavior in three main ways: shifting the mode of transportation, eliminating trips, and lowering peak demand.

Study Process

This study consisted of the following tasks:

Literature Review

The first step in the study was the completion of a review of the literature concerning TDM, in order to identify the full range of possible TDM measures. The measures that were identified were classified into four different types:

Enhanced Options

- Promotion of Ridesharing
- Promotion of Transit
- Promotion of Non-Motorized Modes
- General Traffic Improvements
- Improved Information and Education

Incentives

- Parking Management
- Promotion of High Occupancy Vehicles
- Trip Reduction Programs (voluntary / mandatory)
- Road / Congestion Pricing
- Increase in Convenience for Non-SOV Commuters

Work Management

- Flextime
- Compressed Work Week
- Telecommuting

Land Use

- Changes in Land Use
- Encouragement of Neo-Traditional Neighbourhood Development (NTND)

At the same time a list was compiled of potential TDM evaluation criteria:

- Performance of Current TDM Activities
- Potential for Impact

- Marketing Potential
- Costs (capital /operating)
- Acceptability
- Feasibility / Implementability
- Benefits to Users
- Environmental Impacts
- Economic Impacts
- Time Frame
- Benefits to Transportation System

The literature review and the list of potential TDM evaluation criteria provided a master list of TDM measures and evaluation criteria that was used to select measures and criteria that fit the needs of the NCR.

Identification of TDM Strategies and Evaluation Criteria

Using the master lists that were developed during the literature review, TDM strategies for the NCR were developed. Since many TDM measures act in a complementary way, it is important to group together into TDM strategies those measures that can work together synergistically. Eleven TDM strategies were developed, each containing between three and seven individual measures:

- *Strategy 1:* Ridesharing
- *Strategy 2:* Bottleneck Bypasses for Ridesharers and Transit
- *Strategy 3:* Implementation of HOV Facilities and Network (lane conversion)
- *Strategy 4:* High Occupancy Vehicle Designated Bridge
- *Strategy 5:* Construction of HOV Facilities and Network (lane construction)
- *Strategy 6:* Work Management
- *Strategy 7:* Vehicle Trip-Reduction By-Laws
- *Strategy 8:* Transit, Bicycle, and Pedestrian Friendly Development, Land Uses, and Networks
- *Strategy 9:* Interprovincial Central Area Transit
- *Strategy 10:* Transit Improvements
- *Strategy 11:* Improved Information and Education

At the same time, the list of evaluation criteria was modified and expanded to take into account of the requirements of the NCR. The final list of evaluation criteria used in evaluating the eleven strategies is as follows:

- Person Throughput
- Technical Feasibility
- Technical Flexibility
- Operation
- Travel-Time Reduction
- Travel-Time Reliability
- Market Potential

- Public Support
- Capital Costs
- Operating Costs
- Economic (Benefit / Cost)
- Benefits to Environment
- Implementation Scheduling
- Competition with Existing Measures
- Conformity with Local Transportation and Development Plans
- Compatibility with NCR Image Plans
- Levels of Jurisdiction and Coordination Required

From this research, it was possible to continue to the next phase of the study, the evaluation of the TDM strategies.

TDM Evaluation

The evaluation of TDM was conducted in two stages:

Stage 1 involved the use of the Planning Balance Sheet analysis, where each of the strategies was given a score for each of the criteria. In addition to the raw score, each evaluation criteria was given a weighting factor to reflect the varying importance of the criteria. For each strategy, the weighted scores were then added up, to produce a relative ranking of all the strategies. Based on this analysis, five TDM strategies were retained for further study:

- Ridesharing Program
- Bottleneck Bypasses for Ridesharers and Transit
- Implementation of HOV Facilities and Network (lane conversion)
- HOV Designated Bridge
- Transit Improvements

In addition, the strategy *Improved Information and Education* was retained, since it scored quite well, and can act as a support measure for all the other strategies.

In order to implement these strategies, it is necessary to classify them into individual action programs. This allows the development of implementation priorities for the various TDM measures. The five strategies that were identified for further study corresponded to the following twelve TDM actions:

- Local ridesharing programs
- Preferential HOV parking at worksites
- Voluntary employer-based incentives
- Park and Ride facilities
- Parking management
- Bypasses to congestion at bridges
- Conversion of existing lanes to HOV-use on bridges and bridge approaches
- Financial incentives

- Congestion pricing
- Transit-fare subsidies
- Operational priority for transit
- Information and education programs

The twelve measures were then reevaluated in Phase II of the evaluation, using the same criteria as before. This evaluation was much more qualitative in nature, and took into account the particular requirements of the NCR. This evaluation process showed that all of the measures have the potential for positive impact, but that it was important to develop some sense of implementation priorities, to ensure that the implementation was done as effectively as possible.

Consultation Process

Two types of consultations were held: focus groups with randomly selected members of the public, and workshops that were conducted with representatives from community organizations and government agencies.

Focus Groups

Four focus groups were held, two in Ottawa and two in Hull. The participants were presented with six of the twelve measures that had been chosen, and asked for their opinions on them. The opinions expressed showed there is a high level of interest in transportation planning among NCR citizens. In addition to their qualitative comments, participants were asked to give numerical rankings to the measures, in a process known as a Pareto vote. Participants were asked to give their most preferred option a score of 3, their second most preferred option a score of 2, and their third most preferred option a score of 1. This gave an approximate ranking of the measures, showing the most popular with this sample of the public. The overall results of this voting process across all the focus groups are presented in Table 1:

Table 1: Synthesis of Pareto Vote Results

| Measures | Preferences | |
|--|-------------|----------------------------|
| | Individual | Related to the Common Good |
| Local Ridesharing Programs | 63 | 68 |
| Conversion of Existing Lanes to HOV Use on Bridges | 49 | 42 |
| Congestion Pricing | 8 | 5 |
| Parking Management | 6 | 9 |
| Congestion Bypasses Near Bridges | 43 | 39 |
| Transit Priority Light Cycles | 35 | 35 |

Workshops

The second part of the consultation process involved workshops with representatives from community organizations and government agencies. In addition to soliciting the opinions of these representatives, the workshops were intended to develop implementation priorities for the measures that had been chosen for further study. All twelve measures were presented to these representatives.

The first workshop was held with representatives from community organizations with a demonstrated interest in transportation issues. The representatives were presented with the selected TDM measures, and asked for their opinions. Opinions were recorded and are contained in the accompanying consultation report. During the course of these discussions, the representatives asked that three new measures be added to the list for implementation:

- Improved network and infrastructure for alternative modes.
- Land-use management.
- Resident-assisted transportation planning.

In addition, the measure called *Transit-pass subsidies* was changed to the more general, *Public transit improvements*, to reflect the need for better public transit in the NCR.

After this discussion, participants were asked to achieve a consensus on implementation priorities for the measures. The representatives classified the measures into three groups, according to the impact that they will have and the schedule on which they can be implemented. Placement in Group I indicated that the measure will have a large impact and can be implemented in the short-term, while placement in Group III indicated that the measure will have a low impact and/or will take a long time to implement. Through this process, the following priorities were developed:

Priorities - Community Organizations

(according to scheduling and impacts)

- | | |
|---------|---|
| Group I | <ul style="list-style-type: none">• Ridesharing programs• Preferential HOV parking at worksites• Park and Ride facilities• Congestion bypasses for HOVs at bridge approaches• Conversion of existing lanes to reserved HOV lanes• Operational priority for transit at traffic lights• Information and education program• Land-use management |
|---------|---|

Group II

- Resident-assisted transportation planning
- Voluntary employer-based incentives
- Parking management
- Congestion pricing on bridges
- Improvements to the public transit system
- Improved network and infrastructure for alternative modes

Group III

- Government supported incentives
-

The second workshop was held for representatives from government agencies. At this workshop, participants were presented with all fifteen measures, and asked to discuss them. Since most of them were already familiar with the measures, it was in fact only necessary to discuss the three measures that had been recently added at the other workshop.

Representatives were presented with the results of all the previous evaluations that had taken place, and the results of the focus groups and the previous workshop. They were asked to achieve a consensus on implementation priorities for the TDM measures. Based on this process, the following list of priorities was developed:

Priorities - Government Agencies

(according to scheduling and impacts)

Group I

- Ridesharing programs
- Preferential HOV parking at worksites
- Park and Ride facilities
- Congestion bypasses for HOVs at bridge approaches
- Conversion of existing lanes to reserved HOV lanes
- Operational priority for transit at traffic lights

Group II

- Voluntary employer-based incentives
- Parking management
- Government supported incentives
- Improvements to the public transit system
- Information and education program
- Improved network and infrastructure for alternative modes
- Land-use management
- Resident-assisted transportation planning

Group III

- Congestion pricing on bridges
-

TDM Action Plan

Based on workshops and focus groups, the Action Plan for Transportation Demand Management for Interprovincial Travel in the National Capital Region was developed. This action plan modifies the three groupings, giving those from Group I high priority status, and those from Group II and Group III low priority status. The actions in Group I have been given high priority status in respect with their feasibility, their schedule of implementation, their impact and their cost.

The action plan consists of the following:

- Scope - description of the measure.
- Present Status - examples of the measure that currently exist.
- Action - the actions that must be taken for implementation.
- Agencies Involved - public and private agencies that must be involved.
- Cost (Low = < \$100,000; Medium = \$100,000 - \$500,000; High = > \$500,000).

High Priority TDM Actions

1. Aylmer Ridesharing Demonstration Project

- Action***
- Begin demonstration project for commuters travelling between Aylmer and Ottawa (2-year demonstration project).
- Scope***
- This measure involves setting up programs, supported by both private and public sectors, that will encourage single occupant vehicle (SOV) users to travel by carpool or vanpool for their daily commute.
- Agencies Involved***
- Public: RMOC, CUO, OC Transpo, STO, MTO, MTQ, municipalities
 - Private: Large and medium-sized employers, insurance companies, sponsors.
- Cost***
- Low.

2. Preferential HOV Parking at Government Worksites

- Action***
- Installation of preferential parking measures at parking lots controlled by government agencies (where applicable).
- Scope***
- This measures involves reserving preferential parking spaces, such as those near the entrance or in a covered area, for workers who travel by carpool or vanpool.
- Agencies Involved***
- Public: RMOC, CUO, municipalities, federal and provincial government agencies.
- Cost***
- Low.

3. Voluntary Employer-Based and Financial Incentives

- Action*
- Provide employers with material and expertise necessary to set up voluntary programs.
 - Promote the establishment of incentive programs among employers.
 - Establish programs for government employees, to provide an example to private companies.
 - Carefully analyze monetary incentives that can be implemented to manage transportation demand, and implement those that are most promising.
- Scope*
- This measure involves implementing policies, both by government agencies and private companies, that discourage people from commuting by SOV. Incentives include rewards for transit-users, elimination of free parking and changes in tax policy, information and contests.
- Agencies Involved*
- Public: Municipal, regional, provincial and federal government agencies, OC Transpo and STO.
 - Private: Large and medium-sized employers, sponsors.
- Cost*
- Low (mainly borne by employers).

4. Information and Education Program on TDM Measures

- Action*
- Identify a communication strategy ensuring information and education for communities on a permanent basis.
 - Identify sponsors who will help to fund education and information programs as a means of product placement and advertising.
 - For each TDM project, prepare a communication plan and matching promotion.
- Scope*
- Provide information to the public about the TDM measures that are being implemented. In addition, provide communities with information about transportation conditions and help them to make more informed travel decisions.
- Agencies Involved*
- Public: NCC, RMOC, CUO, OC Transpo, STO, MTO, MTQ.
 - Private: Employers, sponsors.
- Cost*
- Medium.

5. Conversion of Existing Lanes to HOV use on the Chaudière Bridge and Approaches

- Action*
- Undertake a detailed feasibility study on Chaudière bridge to determine the best scenario for lane conversion and proceed with implementation.
- Scope*
- This measure involves converting existing traffic lanes to HOV-only use on the bridge and approaches, aiming to increase person throughput on the existing infrastructure.
- Agencies Involved*
- Public: NCC, RMOC, OC Transpo, CUO, STO, MTO, MTQ, Public Works and Government Services Canada.
- Cost*
- Medium (\$500,000).

Low-Priority TDM Actions

6. Park and Ride Facilities

- Action*
- Identify and implement information and education programs to promote the use of park and ride lots.
 - Identify additional park and ride lots in Aylmer, Gatineau, Hull.
- Scope*
- Create parking lots at strategic locations along major transit routes, where commuters can transfer to public transit, thus reducing the number of SOVs crossing the Ottawa River.
- Agencies Involved*
- Public: RMOC, CUO, OC Transpo, STO, municipalities.
- Cost*
- Low (for promotion only) - high (for new lot construction program).

7. Parking Management

- Action*
- Reduce or eliminate the minimum parking space by-law requirements.
 - Develop a regional strategy to manage the parking supply using the tools listed above, and proceed with implementation of that strategy.
- Scope*
- Manage the supply of parking to reduce the number of cars that travel to and park in congested areas, using measures such as increased rates and taxes for parking spaces, reductions in employee parking subsidies, and reductions in the total parking supply.
- Agencies Involved*
- Public: RMOC, CUO, municipalities.
 - Private: Employers, parking lot operators.
- Cost*
- Low (mainly involves legislative efforts).

8. Public Transit Improvements

- Action*
- Increase number of buses and service frequencies on both sides of the river.
 - Improve connectivity and routing between the two separate public transit systems.
 - Extension of dedicated right-of-way, high quality service into Quebec.
 - Better access for people with large items, children, and bicycles.
- Scope*
- This measure aims to improve the existing public transit infrastructure make reference to existing studies and network, as well as build new ones. Possible actions include improve connectivity between the two systems and between transit and other modes, extension of the current reserved lane / transitway service, and the implementation of new services.
- Agencies Involved*
- Public: STO, OC Transpo.
- Cost*
- High.

9. Improved Network and Infrastructure for Alternative Modes

- Action*
- Construct new bicycle and pedestrian paths where needed and feasible.
 - Improve laws that protect the right-of-way of alternative modes.
 - Implement jitney or collective taxi service, possibly as a private venture.
 - Identify opportunities for use of other alternative modes for interprovincial travel (cross-river shuttle buses, watercraft).
- Scope*
- Improve the network and infrastructure for bicycles, pedestrians, paratransit (jitneys, collective taxis), cross-river shuttles, and other alternative modes.
 - Create incentives that will make these modes more popular and encourage commuters to use them, such as easier transfers between alternative modes and public transit.
- Agencies Involved*
- Public: NCC, RMOC, CUO, OC Transpo, STO.
 - Private: Private transportation companies.
- Cost*
- High.

10. Land Use Management

- Action*
- Sustainable planning must continue to be integrated into the regional planning master plan that is under revision, so that it can start to have an effect as quickly as possible.

Scope

- In the process of creating new long-range planning strategies, include measures to encourage an urban form that is more suitable for transit and other alternative modes.

Agencies Involved

- Public: NCC, RMOC, CUO, municipalities.
- Private: Citizens' groups.

Cost

- Low.

11. Resident-Assisted Transportation Planning

Action

- Create citizens' transportation advisory committees, to ensure that the public is included in the planning process from the very beginning and has the opportunity to provide a continual input into the process.

Scope

- Planning is assisted by the individual members of the community, who work with planners, engineers and architects. Uses an ecological approach to planning to achieve the goals of the community and the region.

Agencies Involved

- Public: All government transportation and planning agencies.
- Private: Private transportation companies.

Cost

- Low.

12. Congestion Pricing

Action

- A feasibility study of the measure should be undertaken, taking into account public opinion concerning the principle, as well as experience in other areas.
- New automatic toll collection schemes may have to be developed further to ensure successful operation.

Scope

- Designate one interprovincial bridge as an HOV-only facility at peak periods. Sell excess capacity to SOVs using Automatic Toll Collection devices. This measure aims at increasing person throughput on the bridge without restricting it to HOVs only.

Agencies Involved

- Public: STO, OC Transpo, municipalities, MTQ, MTO.

Cost

- Low (toll revenue should cover capital and operating costs).

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Appendix A - Identification of TDM Measures

Appendix B - Evaluation Criteria

Appendix C1 - Report on the Focus Groups

Appendix C2 - Report on the Workshops

Part 1

INTRODUCTION

1.1 *Background*

Recognizing the importance of integrated and sustainable transportation planning, the different levels of government in the National Capital Region (NCR) are exploring strategies and measures to inhibit traffic congestion and ensure an efficient and effective transportation system, while respecting the principle of sustainable planning and development.

As part of this effort, the Joint Administrative Committee on Planning and Transportation (JACPAT) has directed the TRANS Committee to examine the opportunities for the application of Transportation Demand Management (TDM) in the NCR. The TRANS Committee is made up of representatives from seven agencies: the National Capital Commission (NCC); the Regional Municipality of Ottawa-Carleton (RMOC); the Communauté urbaine de l'Outaouais (CUO); OC Transpo; the Société de transport de l'Outaouais (STO); the Ontario Ministry of Transportation (MTO), and the Ministère des Transports du Québec (MTQ). The purpose of this initiative is to analyze the potential application of TDM measures in the NCR, with particular attention paid to interprovincial travel. Based on this, an action plan is to be prepared, detailing implementation policies for the selected TDM measures.

1.2 *Definition of TDM*

Transportation Demand Management has become popular as a strategy aimed at alleviating urban traffic congestion through the management of travel demand. TDM measures are primarily directed at commuter travel and are designed to reduce dependence on the single occupant vehicle (SOV), to shift the timing of travel to less congested time periods, and to reduce the general demand for commuter travel. TDM attempts to change commuter behavior in three main ways:

- shifting the mode of transportation
- eliminating trips
- lowering peak demand

By doing this, TDM measures attempt to preserve the community and the environment, while at the same time ensuring mobility for travellers.

1.3 Study Objectives

As described in the Terms of Reference developed for this study by the TRANS Committee, the objectives of this study are the following:

- Determine the set of TDM measures most suitable for interprovincial travel, based upon an understanding of TDM measures implemented in Canada and elsewhere;
- Obtain a consensus among affected agencies on the proposed TDM measures;
- Identify concise responsibilities and tasks for implementation associated with each of the TDM measures;
- Establish the priority of selected TDM measures;
- Obtain public input on the proposed TDM strategies.

1.4 Study Design

Figure 1 shows the conceptual design of the study, with the five main tasks that were performed.

Transportation Demand Management

for Interprovincial Travel in National Capital Region

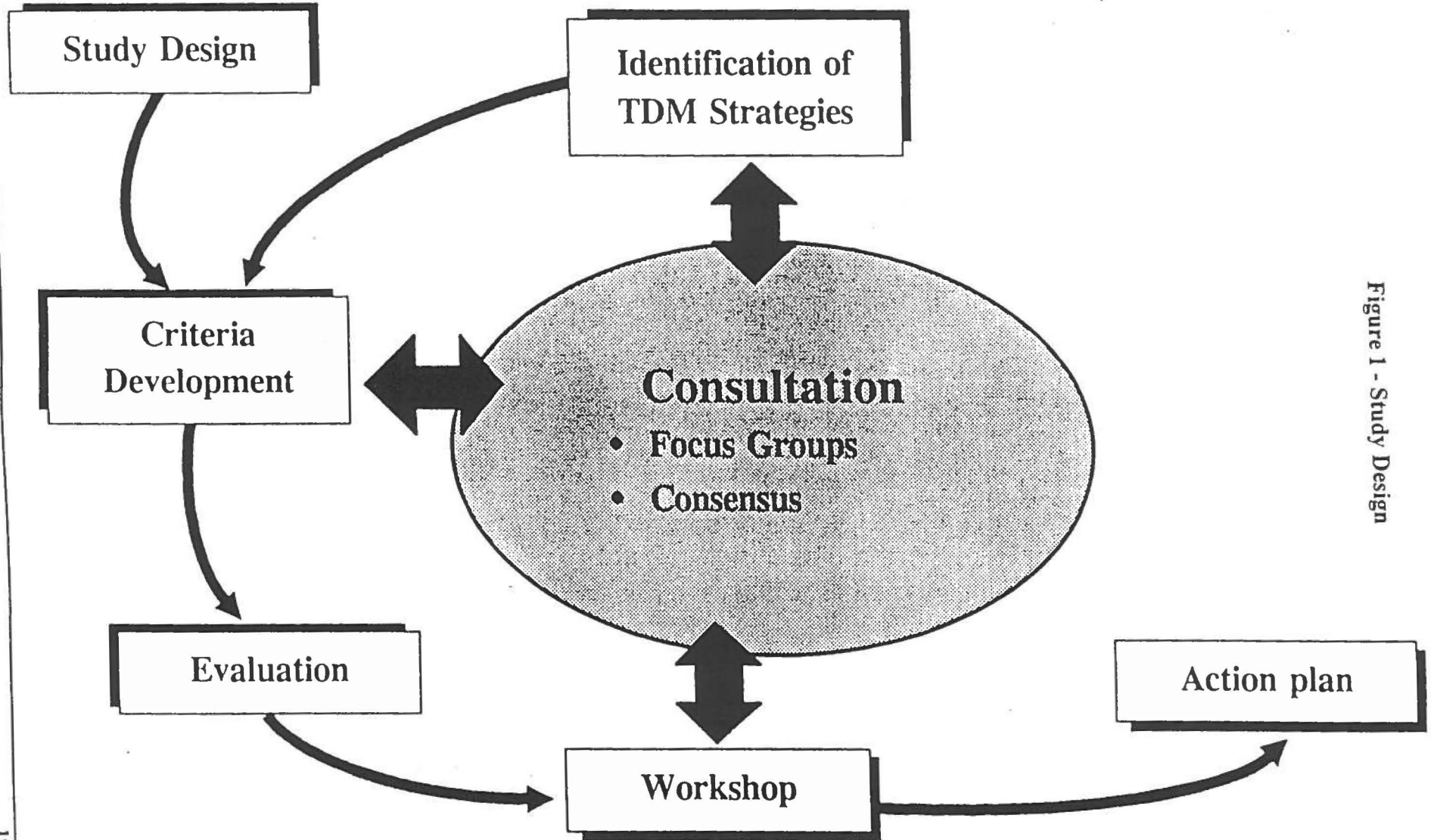


Figure 1 - Study Design

Part 2

LITERATURE REVIEW

The first stage of this study was the production of a bibliographical research document, containing information about previous TDM research documents. In addition, a number of previous TDM reports, evaluations, and action plans were obtained. Using this bibliographical research report along with these other documents, a literature review was conducted. This review identified TDM measures that should be evaluated for application in the National Capital Region. In addition, the literature also allowed for the identification of criteria that could be used to evaluate the applicability and utility of the TDM measures identified.

The literature review was conducted mainly using information about experience in North America. Although TDM has been applied in Europe and Japan, it was felt that previous experience in North America would be more relevant to the NCR, due to the similar economic and social conditions. Implementations of TDM in the Japan and Europe have consisted mainly of parking and congestion pricing. Although these measures do have some potential for success in the NCR, they are unlikely to have very much popular support in today's economic climate. In addition, these measures have also been studied and suggested in North America, so they will be considered in any case. Appendices A and B present a synthesis of the literature review process.

2.1 Findings of Literature Review

The literature review process was quite productive, in a number of ways. The most important sources of information were the report produced by Transport 2021 for the Greater Vancouver Regional District, the report produced by Apogee Research, Inc., for the National Association of Regional Councils, the research document produced by Macrae for the Canadian Energy Research Institute, and a number of articles in Volume 1280 of the Transportation Research Record. These documents provided a wealth of information about TDM experience in other cities, and what has and hasn't worked. In addition, they provided valuable insight into the steps that are necessary to evaluate TDM measures, and how these could be integrated into the chosen analysis techniques. The literature review also allowed some initial identification of those measures and evaluation criteria that can be used in the NCR. This literature provided information about previous research, previous experience, and previous evaluation concerning TDM. At this point, it is necessary to begin tailoring the research and analysis to conform to the particular needs of the NCR, in order to produce solutions that will work for the region.

Part 3

DEVELOPMENT OF TDM STRATEGIES

Once the literature review was complete, the next step was developing TDM strategies that could be studied for possible implementation. These strategies combine together measures that were developed previously, to create packages of complementary actions. These strategies can then be evaluated as units, to determine which ones should be implemented. What follows is a listing of the strategies that were developed for evaluation:

- **Strategy 1 - Ridesharing**
A program to encourage ridesharing in the NCR. This strategy includes:
 - ridesharing program
 - preferential HOV parking at worksites
 - voluntary employer-based incentives
 - construction of park and ride lots for rideshare staging
 - parking management

- **Strategy 2 - Bottleneck Bypasses for Ridesharers and Transit**
Miscellaneous preferential measures to allow ridesharers and transit vehicles to bypass congestion at the approaches to bridges and other problem areas. This strategy includes:
 - bypasses to congestion
 - ridesharing program
 - parking management

- **Strategy 3 - Implementation of HOV Facilities and Network (lane conversion)**
Implementation of a network of HOV lanes, by converting existing lanes to HOV- only usage. This strategy includes:
 - conversion of existing lanes for HOV use
 - ridesharing program
 - construction of park and ride facilities for HOV staging
 - parking management and preferential HOV parking at worksites
 - voluntary employer-based incentives
 - government supported incentives

- **Strategy 4 - High Occupancy Vehicle Designated Bridge**
Designation of an Ottawa River bridge as HOV only. This strategy includes:
 - designation of a bridge as HOV only
 - ridesharing program
 - construction of park and ride facilities for HOV staging
 - parking management and preferential HOV parking at worksites
 - congestion pricing for SOVs using the bridge

- **Strategy 5 - Construction of HOV Facilities and Network (lane construction)**
Construction of a network of HOV lanes, by building extra lanes for HOV only usage. This strategy includes:
 - construction of new lanes for HOV use
 - ridesharing program
 - construction of park and ride facilities for HOV staging
 - parking management and preferential HOV parking at worksites
 - voluntary employer-based incentives
 - government supported incentives

- **Strategy 6 - Work Management**
Strategy by employers, supported by government regulations, to reduce congestion by providing more flexible working arrangements for employees. This strategy includes:
 - staggered hours / flextime
 - telecommuting
 - variable tariff road-pricing
 - changes in land-use management

- **Strategy 7 - Vehicle Trip Reduction By-Laws**
Strategy to require, through the use of by-laws, that employers reduce the number of SOV trips that are being made by their employees. This strategy includes:
 - by-laws requiring increases in Average Vehicle Ridership (AVR) and decreases in trip distances
 - ridesharing program
 - employer incentives for ridesharers
 - parking management at worksites
 - telecommuting

- **Strategy 8 - Transit, Bicycle, and Pedestrian Friendly Development, Land Uses, and Networks**
Strategy to provide alternative modes of transportation that will reduce the dependence of commuters on private motor-vehicle usage, and to decrease emissions and encourage more efficient urban land-use patterns. This strategy includes:
 - promotion of Neo-Traditional Neighbourhood Development (NTND)
 - government incentives to developers for the redevelopment of urban areas
 - bicycle and pedestrian facilities at employment locations (bicycle storage, showers, lockers, etc.)

- **Strategy 9 - Interprovincial Central Area Transit**
Strategies to improve circulation across the Ottawa River. This strategy includes:
 - implementation of a cross-river circulator / "people mover" to improve transportation during working-hours
 - park and ride for users
 - parking management
 - voluntary employer-based incentives

- **Strategy 10 - Transit Improvements**

Strategies to improve usage of transit. This strategy includes:

- operational priority for transit vehicles
- providing express bus services
- employee fare subsidies
- construction of park and ride lots for transit users
- implementation of HOV lanes
- parking management
- changes in land-use management
- implementation of technologies to increase comfort, improve information systems, and reduce travel time

- **Strategy 11 - Improved Information and Education**

Strategies to provide improved information about commuting conditions, and educate commuters about TDM measures and how they can use them. This strategy can stand alone, or can be used as a support measure for other strategies that are implemented. This strategy includes:

- information about roadway and traffic conditions
- education about alternative (non-SOV) commute modes
- better promotion of alternative modes
- possible crossovers between Intelligent Transportation Systems (ITS), such as Automatic Vehicle Locator Systems (AVLS), and TDM measures

Part 4

EVALUATION OF TDM STRATEGIES

4.1 *Criteria for Evaluation*

Based on the results of the literature review, it was possible to develop criteria for use in the evaluation process. These criteria take into account the particular nature of the NCR, as well as the particular concerns that residents of the region are likely to have. What follows is a listing of the criteria developed:

- **Person Throughput**
The number of people per hour (rather than vehicles per hour), that can be carried on a given link. Strategies that cause an increase in this area are considered good.
- **Technical Feasibility**
The degree of difficulty that is involved in physically implementing the measures in a strategy. More easily implemented strategies are considered good.
- **Technical Flexibility**
The amount of flexibility, over the long-term, that is present in the technology of implementing the measures in a strategy. This includes the ability to modify, expand, or possibly abandon the strategy. More flexible strategies are considered good.
- **Operation**
The ease of operation of implementing the measures in a strategy, over the short-term. This includes the ability to modify the operation, as well as the general difficulties that are involved in operating it. More easily operated and enforced strategies are considered good.
- **Travel-Time Reduction**
The reduction in travel time for riders that would be possible for commuters who are affected by implementing the measures in a strategy. Reductions in travel time are considered good.
- **Travel-Time Reliability**
The increases in travel time reliability that are possible from the implementation of the measures in a strategy. Increases in reliability are considered good.
- **Market Potential**
The attraction that implementing the measures in a strategy will have to users, and the degree to which they will use those measures. Strategies with greater market potential are considered good.

- **Public Support**
The amount of support for implementing the measures in a strategy, among both users and non-users. Strategies with greater public support are considered good.
- **Capital Costs**
The capital costs involved in initially implementing the measures in a strategy. Lower capital costs are considered good.
- **Operating Costs**
The operating costs that are associated with the day-to-day operation and maintenance of the measures in a strategy. Lower operating costs are considered good.
- **Economic (Benefit/Cost)**
The economic benefit/cost ratio for the measures that are included in a strategy. Higher benefit/cost ratios are considered good.
- **Benefits to Environment**
The collective benefits to the environment produced by implementing the measures in a strategy. These include reductions in emissions, reduced land-use by transportation infrastructures, and decreases in visual and noise pollution. More environmentally beneficial strategies are considered good.
- **Implementation Scheduling**
The schedule within which the measures in a strategy can be implemented. Strategies that can be implemented on a short time-scale are considered good.
- **Competition with Existing Measures**
The degree to which the measures in a strategy will compete with or steal from infrastructures and measures (particularly transit) that have already been successful at reducing travel demand. Strategies that will improve overall effectiveness of existing measures are considered good.
- **Conformity with Local Transportation and Development Plans**
The degree to which implementing the measures in a strategy conforms to the transportation or development plans that have been developed by agencies within the NCR. Strategies with a greater degree of conformity are considered good.
- **Compatibility with NCR Image Plans**
The degree to which the proposed measures in a strategy will impact the image that the National Capital Region wishes to project. Strategies that do not negatively impact this image are considered good.
- **Levels of Jurisdiction and Coordination Required**
The amount of coordination that must be achieved between different agencies, and the amount of government intervention that will be required, to implement a strategy.

Strategies that require less government action and inter-agency coordination are considered good.

4.2 Evaluation Process

Following the identification of TDM strategies and criteria for evaluating them, these strategies were subjected to a two part evaluation. The first step involved using the Planning Balance Sheet analysis, where the strategies were evaluated qualitatively using the criteria developed above. This provided an initial evaluation of the strategies, and allowed a number of strategies to be eliminated from consideration. The second step in the evaluation involved taking the strategies that were selected for further consideration, and breaking them up into their component measures. These measures were then evaluated in an in-depth qualitative fashion, again using the criteria developed above.

4.3 Planning Balance Sheet Evaluation

As laid out in the original study design, the methodology for doing the first step in the evaluation process was the Planning Balance Sheet. With the Planning Balance Sheet, the different strategies are listed on one axis of a table, and the various evaluation criteria are put on the other axis. In this case, this results in a table that is seventeen by eleven, since there are seventeen evaluation parameters and eleven strategies. For each strategy and each criterion, a score is given, indicating how that strategy measures up to that criterion. In addition, each criterion has a weighting factor, so that certain criteria can be given more importance than others. When all the weighting factors and evaluation scores are filled in, a score is calculated for each strategy, simply by adding up the evaluation scores multiplied by their weighting factors. In this way, each strategy is given a numerical score, to determine the most promising strategies.

As with any evaluation of this type, there is a certain amount of subjectivity, even if the final results are numerical. However, in the case of this evaluation, a number of different individuals, including the members of the Steering Committee, gave input into the scores and weighting factors for the evaluation. In this way, it was possible to get a fairly accurate and objective result, since the subjectivities will most likely balance themselves out over group.

In this manner, the Planning Balance Sheet was filled out. The results of this process are shown in Table 1.

Table 1 PLANNING BALANCE SHEET

Transport Demand Management Strategies

| Evaluation criteria | Weighting scale | Ridesharing program | Bottleneck bypasses for ridesharers and transit | Implementation of HOV facilities and network (lane conversion) | HOV designated bridge | Construction of HOV facilities and network (lane construction) | Work management | Vehicle trip reduction by-laws | Transit, bicycle & pedestrian friendly development, land use and networks | Interprovincial central area transit | Transit improvements | Improved information and education |
|---|-----------------|---------------------|---|--|-----------------------|--|-----------------|--------------------------------|---|--------------------------------------|----------------------|------------------------------------|
| Person throughput | 3 | 1 | 2 | 3 | 3 | 1 | 3 | 1 | 2 | 2 | 3 | 1 |
| Technical feasibility | 2 | 3 | 3 | 2 | 2 | 2 | 0 | 1 | 2 | 2 | 1 | 2 |
| Technical flexibility | 2 | 2 | 2 | 2 | 1 | 2 | 0 | 2 | 0 | 2 | 1 | 3 |
| Operation | 1 | 1 | 2 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 2 | 2 |
| Travel-time reduction | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 0 | 0 | 1 | 1 | 1 |
| Travel-time reliability | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 0 | 1 | 2 | 2 | 1 |
| Market potential | 2 | 1 | 3 | 3 | 2 | 1 | 3 | 1 | 2 | 2 | 2 | 2 |
| Public support | 3 | 3 | 1 | 1 | 1 | 3 | 1 | 2 | 3 | 2 | 3 | 3 |
| Capital costs | 2 | 3 | 2 | 1 | 1 | 2 | 0 | 2 | 2 | 1 | 2 | 2 |
| Operating costs | 1 | 2 | 3 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 2 |
| Economic (benefit/cost) | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 2 | 3 | 1 | 2 | 2 |
| Benefits to environment | 3 | 2 | 2 | 3 | 3 | 2 | 0 | 3 | 3 | 1 | 3 | 2 |
| Implementation Scheduling | 2 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 3 |
| Competition with existing measures (transit) | 2 | 1 | 3 | 2 | 3 | 1 | 1 | 2 | 2 | 3 | 3 | 3 |
| Conformity with local & regional transp. & dev. plans | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 3 |
| Compatibility with NCR image plans | 1 | 2 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 3 |
| Levels of jurisdiction and coordination required | 2 | 1 | 2 | 2 | 3 | 0 | 1 | 0 | 0 | 1 | 2 | 2 |
| Total | | 72 | 80 | 79 | 75 | 58 | 41 | 57 | 68 | 64 | 77 | 77 |

Weighting scale: 1 = moderately important; 2 = important 3 = important
 Evaluation scale: 0 = neutral or negative; 1 = average; 2 = good 3 = excellent

4.3.1 Identification of Strategies for Further Study

Based on the Planning Balance Sheet Analysis and input from the Steering Committee, following five strategies were selected for further study:

- **Ridesharing Program**
- **Bottleneck Bypasses for Ridesharers and Transit**
- **Implementation of HOV Facilities and Network (lane conversion)**
- **HOV Designated Bridge**
- **Transit Improvements**

In addition, the strategy *Improved Information and Education* was retained, since it scored quite well, and can act as a support measure for all the other strategies.

4.3.2 Selection of TDM Measures for Further Study

When looking at the actual implementation of TDM, it is necessary to break the strategies down into their component measures. Each strategy is made up of measures that will be implemented separately, so these measures must be looked at individually in order to produce an action plan.

In order to do this, the six selected strategies were broken down into their component measures. In this way, the following list of TDM measures were identified as those that needed to be studied and evaluated further, and discussed in the public consultation process.

- **Local ridesharing programs**
- **Preferential HOV parking at worksites**
- **Voluntary employer-based incentives**
- **Park and Ride facilities**
- **Parking management**
- **Bypasses to congestion at bridges**
- **Conversion of existing lanes to HOV-use on bridges and bridge approaches**
- **Financial incentives**
- **Congestion pricing**

- **Transit-fare subsidies**
- **Operational priority for transit**
- **Information and education programs**

4.4 Evaluation of TDM Measures

One step in the evaluation process consisted of a more in-depth qualitative analysis of the TDM measures that had passed through the first evaluation step. While the Planning Balance Sheet analysis provided an evaluation that was global in nature, this second evaluation is intended to be a more local evaluation, taking into account the particular needs and requirements of the NCR. This analysis will provide a framework within which to prioritize the measures for implementation. The Phase II evaluation uses the same evaluation criteria as Phase I, and the results are shown on the following pages.

4.4.1 Measure 1: Local Ridesharing Programs

This measure appears to have a good potential for success. It has a good potential to increase vehicle occupancy across bridges in the National Capital Region. It has a number of advantages, including the fact that a program currently exists, and it requires very little in the way of fixed infrastructure. In addition, it offers a fairly simple way to increase person throughput, and other jurisdictions have had success with this type of program. The main disadvantage is the high degree of involvement that this requires on the part of the organizing agency. Initial matching can be difficult, and once the match has been made, it is important to follow up to ensure that pools are doing well. In addition, there are many people who do not want to carpool due to the necessary social interaction.

| | |
|--|---|
| <i>Person Throughput</i> | Although vehicle occupancy in the NCR is high, there is still a potential for further increase. |
| <i>Technical Feasibility</i> | Reliable rideshare matching software is available. |
| <i>Technical Flexibility</i> | Programs can be expanded, reduced, revised, or shut-down, depending on how successful they are. |
| <i>Operation</i> | Ridesharing programs require follow-up to ensure proper functioning. |
| <i>Travel-Time Reduction</i> | No reduction. Likely increase possible. |
| <i>Travel-Time Reliability</i> | Increase due to possible reduction in traffic |
| <i>Market Potential</i> | Fairly good, due to well-defined origins and destinations. |
| <i>Public Support</i> | Good. |
| <i>Capital Costs</i> | Low. |
| <i>Operating Costs</i> | Low infra costs. |
| <i>Economic (benefit/cost)</i> | Very good. \$ saved for facilities. |
| <i>Benefits to Environment</i> | Excellent. |
| <i>Implementation Scheduling</i> | Short-term. |
| <i>Competition with Existing Measures (transit)</i> | In this location, measure direct competition with existing transit not applicable. |
| <i>Conformity with Local & Regional Transp. & Dev. Plans</i> | Yes. |
| <i>Compatibility with NCR Image</i> | Yes. |
| <i>Levels of Jurisdiction & Coordination Required</i> | Involvement of both private and public sectors during planning, implementation, and follow-up. |

4.4.2 Measure 2: Preferential HOV Parking at Worksites

This measure does not have the potential to have a very great impact, at least not in the short-term. However, it is not very costly, and is similar to a measure already in place that provides preferential parking for the handicapped. In many cases, the investment will be made by the companies that own the parking lots, and can be done as part of routine maintenance. The other important impact of this measure is that it provides a psychological reinforcement of the importance of ridesharing. By giving ridesharers preferential treatment, it demonstrates that ridesharing is important and worthy of special treatment.

| | |
|--|---|
| <i>Person Throughput</i> | By itself, this measure does not provide any significant increase in person throughput. |
| <i>Technical Feasibility</i> | Preferential parking can be implemented at private worksites without government financial assistance. |
| <i>Technical Flexibility</i> | Can be modified according to needs. |
| <i>Operation</i> | Easy to implement, maintain and upgrade. |
| <i>Travel-Time Reduction</i> | Reduction in walking time from car to destination. |
| <i>Travel-Time Reliability</i> | No significant impact. |
| <i>Market Potential</i> | At most, 10% of parking spaces could be affected. Selection of vehicle occupancy (2+ vs. 3+) would vary according to local characteristics of worksite. |
| <i>Public Support</i> | Good. |
| <i>Capital Costs</i> | About \$100 per parking space. |
| <i>Operating Costs</i> | Not significant. |
| <i>Economic (benefit/cost)</i> | Not significant. |
| <i>Benefits to Environment</i> | Not significant. |
| <i>Implementation Scheduling</i> | Short-term. |
| <i>Competition with Existing Measures (transit)</i> | Not significant. |
| <i>Conformity with Local & Regional Transp. & Dev. Plans</i> | Yes. |
| <i>Compatibility with NCR Image</i> | Yes. |
| <i>Levels of Jurisdiction & Coordination Required</i> | Involvement of municipalities and employers. |

4.4.3 Measure 3: Voluntary Employer-Based Incentives

This measure also has a fairly low potential impact, but at the same time, the cost is very low, particularly since it can be absorbed by businesses in most cases. The main problem is that because all incentives are voluntary, there is no real pressure for anyone to take advantage of them. For this reason, it is important that government agencies do their utmost to promote the voluntary incentives, both to employees and employers, to ensure that they have as high an impact as possible.

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| <i>Person Throughput</i> | Potential for person throughput increase will be realized with the implementation of other measures. |
| <i>Technical Feasibility</i> | Implementation is dependent on employers, so they must be given an incentive to become involved. |
| <i>Technical Flexibility</i> | Programs can be easily adapted and upgraded to meet new needs. |
| <i>Operation</i> | Involves follow-up, but no full time staff. |
| <i>Travel-Time Reduction</i> | None, unless other measures are implemented. |
| <i>Travel-Time Reliability</i> | None, unless other measures are implemented. |
| <i>Market Potential</i> | High, if incentives are attractive. |
| <i>Public Support</i> | Very good. |
| <i>Capital Costs</i> | Not significant. |
| <i>Operating Costs</i> | Incentives such as transit-pass subsidies can be costly, but taxation policies can ease the burden. |
| <i>Economic (benefit/cost)</i> | Good. |
| <i>Benefits to Environment</i> | Good. |
| <i>Implementation Scheduling</i> | Short-term to mid-term. |
| <i>Competition with Existing Measures (transit)</i> | No. |
| <i>Conformity with Local & Regional Transp. & Dev. Plans</i> | Yes. |
| <i>Compatibility with NCR Image</i> | Yes. |
| <i>Levels of Jurisdiction & Coordination Required</i> | Public agencies and private companies will need to work together to implement incentives. |

4.4.4 Measure 4: Park and Ride Facilities

This measure has a good potential for reducing interprovincial vehicle travel. However, other measures must also be put in place to ensure that once users transfer to transit, their commute is at least as convenient as it was before. Since park and ride users have already made the decision to own and operate a car, they need a powerful incentive to get out of it and use transit. It is also important to note that park and ride lots currently exist in the NCR and are well used. In addition, commuters parking at unofficial lots (shopping centers, churches) show that there is an unsatisfied demand for park and ride facilities.

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| <i>Person Throughput</i> | This measure has the potential to eliminate a large number of cars from traffic, depending on total lot capacity and usage. |
| <i>Technical Feasibility</i> | Measure must be integrated into overall transportation plan (infrastructures + transit + development). |
| <i>Technical Flexibility</i> | If not properly located, park and ride facilities may have to be abandoned because of low usage. |
| <i>Operation</i> | Maintenance and security are the main concerns. |
| <i>Travel-Time Reduction</i> | No reduction by itself, but potentially important if other measures, such as HOV lanes, are implemented. |
| <i>Travel-Time Reliability</i> | Same as above. |
| <i>Market Potential</i> | Very good, if preferential measures are implemented. |
| <i>Public Support</i> | Very good. |
| <i>Capital Costs</i> | Cost of a parking space is between \$3,000 and \$5,000, depending on land value and accessibility. |
| <i>Operating Costs</i> | Relatively low, although some maintenance and surveillance is needed. More buses may have to be purchased to serve transit demand at lots. |
| <i>Economic (benefit/cost)</i> | Excellent. |
| <i>Benefits to Environment</i> | Excellent. |
| <i>Implementation Scheduling</i> | Short- to mid-term, depending on land availability. |
| <i>Competition with Existing Measures (transit)</i> | None. |
| <i>Conformity with Local & Regional Transp. & Dev. Plans</i> | Yes. |
| <i>Compatibility with NCR Image</i> | Yes |
| <i>Levels of Jurisdiction & Coordination Required</i> | Transit agencies, regional governments, and municipalities must cooperate for implementation. |

4.4.5 Measure 5: Parking Management

Parking management appears to one of the most successful means of reducing commuter travel. In the Los Angeles area, studies have shown it to be one of the few effective ways of increasing Average Vehicle Ridership (AVR) at worksites. The costs are very low, since the measure mainly involves changes in legislation, but the political capital needed may be fairly high. In addition, parking management appears to have a significant impact at locations where parking is currently free (mainly in the suburbs), but is difficult to implement in more urban locations where increasing parking costs may simply drive businesses out of the area.

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| <i>Person Throughput</i> | No direct increase from measure itself, but potential is good with complementary measures. |
| <i>Technical Feasibility</i> | Requires tough by-laws and policies. |
| <i>Technical Flexibility</i> | Once implemented, this measure requires legislative action for modification. |
| <i>Operation</i> | N/A. |
| <i>Travel-Time Reduction</i> | None by itself, but resulting reduction in SOV travel will result in time savings for all. The excess capacity that is generated must be allocated to HOV modes, otherwise new SOV travellers will negate gains. |
| <i>Travel-Time Reliability</i> | Same as above. |
| <i>Market Potential</i> | Good. |
| <i>Public Support</i> | Poor. |
| <i>Capital Costs</i> | N/A. |
| <i>Operating Costs</i> | N/A. |
| <i>Economic (benefit/cost)</i> | Excellent. |
| <i>Benefits to Environment</i> | Excellent. |
| <i>Implementation Scheduling</i> | Mid- to long-term. |
| <i>Competition with Existing Measures (transit)</i> | No. |
| <i>Conformity with Local & Regional Transp. & Dev. Plans</i> | Yes. |
| <i>Compatibility with NCR Image</i> | Yes. |
| <i>Levels of Jurisdiction & Coordination Required</i> | Private companies and public agencies must coordinate efforts. |

4.4.6 Measure 6: Bypasses to Congestion at Bridges

Congestion bypasses have a high potential for success, particularly because of the image that they give to collective modes; that they can avoid congestion much more easily. In addition, a real travel time reduction is possible, and users will feel that they are truly gaining an advantage over SOVs. Measures can be implemented either individually, or as part of a larger plan that connects together HOV facilities. However, it can be difficult to ensure compliance with these measures, and non-HOVs may use the facilities on a regular basis. An effective enforcement program should pay for itself through ticket revenues at first, but long-term enforcement may remain a problem.

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|--|--|
| <i>Person Throughput</i> | Model shift that is created has a high potential to increase person throughput. |
| <i>Technical Feasibility</i> | Experience shows this measure is easily implemented. |
| <i>Technical Flexibility</i> | Flexibility depends on type of implementation: signaling and detection can be modified more easily than geometric modifications. |
| <i>Operation</i> | Monitoring and surveillance may be required to optimize performance. |
| <i>Travel-Time Reduction</i> | High |
| <i>Travel-Time Reliability</i> | Excellent. |
| <i>Market Potential</i> | High. |
| <i>Public Support</i> | High. |
| <i>Capital Costs</i> | Option 1: Signaling and detection devices only (\$100,000 per bridge approach). Option 2: Modification of geometrics (\$250,000 per bridge approach). |
| <i>Operating Costs</i> | Not significant. |
| <i>Economic (benefit/cost)</i> | Good. |
| <i>Benefits to Environment</i> | Excellent. |
| <i>Implementation Scheduling</i> | Between one and three years. |
| <i>Competition with Existing Measures (transit)</i> | No |
| <i>Conformity with Local & Regional Transp. & Dev. Plans</i> | Yes. |
| <i>Compatibility with NCR Image</i> | Yes. |
| <i>Levels of Jurisdiction & Coordination Required</i> | Federal, provincial, regional and municipal levels. |

4.4.7 Measure 7: Conversion of Existing Lanes to HOV Use on Bridges and Bridge Approaches

HOV lane conversion represents a very effective way of giving priority to HOVs. Not only does it provide an exclusive HOV right-of-way, but in many cases, it removes capacity that was formerly in general use. SOV commuters waiting in traffic who see buses and carpools passing them in their own lane will be very tempted to change modes. At the same time, it is important to be aware of public response to this type of measure, since many citizens may not be very happy about losing this capacity to HOVs. Costs are initially high for the conversion itself, but can be quite low once the lane is in place.

| | |
|--|---|
| <i>Person Throughput</i> | Person throughput could double or triple along certain corridors. |
| <i>Technical Feasibility</i> | Certain bridge corridors are easily converted, while others will require creative solutions. |
| <i>Technical Flexibility</i> | Lane geometry and usage can be modified as necessary. |
| <i>Operation</i> | Some monitoring and surveillance are required. |
| <i>Travel-Time Reduction</i> | Very good: time saving between 10% and 30% during peak hours. |
| <i>Travel-Time Reliability</i> | Very good. |
| <i>Market Potential</i> | High. |
| <i>Public Support</i> | High. |
| <i>Capital Costs</i> | Average is about \$600,000 per bridge (but Portage Bridge conversion is estimated at \$300,000). |
| <i>Operating Costs</i> | Low, except for reverse-flow designs. |
| <i>Economic (benefit/cost)</i> | Very good. |
| <i>Benefits to Environment</i> | Excellent. |
| <i>Implementation Scheduling</i> | One to three years. |
| <i>Competition with Existing Measures (transit)</i> | No. |
| <i>Conformity with Local & Regional Transp. & Dev. Plans</i> | Yes. |
| <i>Compatibility with NCR Image</i> | Yes. |
| <i>Levels of Jurisdiction & Coordination Required</i> | Coordination between federal, provincial, regional, and municipal governments, along with transit agencies. |

4.4.8 Measure 8: Financial Incentives

Incentives of this type have a good potential to affect commuter behavior, because they provide some monetary incentive to stop commuting in an SOV. In addition, they often level the playing field between commuters who drive and those who use transit, since the level of employee benefit provided is evened out. However, these incentives can be costly, either to the government or employers, depending on who is paying. If employers are forced to pay, then they may move to a jurisdiction without such incentive programs, while government entities are generally no longer in a position to spend large amounts of money speculatively. However, if these types of incentives are implemented properly, with proper levels of support, they can work successfully.

| | |
|--|---|
| <i>Person Throughput</i> | Good potential for increase, as long as other measures are implemented. |
| <i>Technical Feasibility</i> | This measure may require tough by-laws and policies. |
| <i>Technical Flexibility</i> | Can be adapted to changing needs. |
| <i>Operation</i> | Involvement of public agencies is crucial. |
| <i>Travel-Time Reduction</i> | Good potential, depending on complementary measures. |
| <i>Travel-Time Reliability</i> | Same as above. |
| <i>Market Potential</i> | Good. |
| <i>Public Support</i> | Good. |
| <i>Capital Costs</i> | Resources are required at the planning stage. |
| <i>Operating Costs</i> | Close follow-up needed. |
| <i>Economic (benefit/cost)</i> | Good. |
| <i>Benefits to Environment</i> | Excellent. |
| <i>Implementation Scheduling</i> | Short- to mid-term. |
| <i>Competition with Existing Measures (transit)</i> | No |
| <i>Conformity with Local & Regional Transp. & Dev. Plans</i> | Yes. |
| <i>Compatibility with NCR Image</i> | Yes. |
| <i>Levels of Jurisdiction & Coordination Required</i> | Government planners have to be involved. |

4.4.9 Measure 9: Congestion Pricing

Congestion pricing represents very powerful approach to the promotion of non-SOV travel. The pricing policy forces users to pay the full cost that they are incurring, both to the facility and to society. At the same time, since users are being asked to pay for their use, capital and operating costs should be easily recovered within a relatively short time. Particularly with the advent of new Automated Toll Collection technologies, congestion pricing can be implemented without significant delay or inconvenience to users. However, it is very important to be aware of public opinion during the implementation of this measure, since there is a high potential for backlash. Significant attempts should be made to gather public support for the measure before implementation. In addition, educational programs will be required to ensure that users understand how the technology works.

| | |
|--|---|
| <i>Person Throughput</i> | Good potential in certain bridge corridors. |
| <i>Technical Feasibility</i> | Technology is available and right-of-way and approach configurations are compatible with design requirements. |
| <i>Technical Flexibility</i> | Very flexible, since toll structure is variable. |
| <i>Operation</i> | Toll collection is automated, but monitoring is needed. |
| <i>Travel-Time Reduction</i> | Very good, assuming that HOV lanes are provided along the approaches to bridges. |
| <i>Travel-Time Reliability</i> | Very good. |
| <i>Market Potential</i> | A feasibility study is needed to analyze this. |
| <i>Public Support</i> | Poor. |
| <i>Capital Costs</i> | \$500,000 to \$1,000,000 (but toll revenues can amortize this). |
| <i>Operating Costs</i> | Costs will be paid by toll revenues. |
| <i>Economic (benefit/cost)</i> | Very good. |
| <i>Benefits to Environment</i> | Excellent. |
| <i>Implementation Scheduling</i> | Two to four years. |
| <i>Competition with Existing Measures (transit)</i> | No. |
| <i>Conformity with Local & Regional Transp. & Dev. Plans</i> | Yes. |
| <i>Compatibility with NCR Image</i> | Yes. |
| <i>Levels of Jurisdiction & Coordination Required</i> | To be determined during feasibility study. |

4.4.10 Measure 10: Transit-Fare Subsidies

Transit fare subsidies are a good way of encouraging commuters to at least try public transit for their commute. In many cases, commuters do not realize that there is a convenient way for them to get to work using public transit, and this may give them an incentive to try. In addition, subsidies like this have the effect of levelling the playing field for commuters. Whereas workers who drive often receive free parking, transit users often receive nothing, even though they don't waste space in a parking lot. In these cases, transit fare subsidies equalize the benefits, and make transit use more attractive. The only problem with transit fare subsidies is determining who pays for them, and how they are administered. Particularly with the two transit agencies in the NCR, implementation may be difficult.

| | |
|--|--|
| <i>Person Throughput</i> | Good potential, with implementation of complementary measures. |
| <i>Technical Feasibility</i> | Source for subsidy budget must be determined. |
| <i>Technical Flexibility</i> | Adjustments to subsidy level are possible. |
| <i>Operation</i> | Follow-up needed to ensure proper functioning. |
| <i>Travel-Time Reduction</i> | N/A. |
| <i>Travel-Time Reliability</i> | N/A. |
| <i>Market Potential</i> | Good. |
| <i>Public Support</i> | Very good. |
| <i>Capital Costs</i> | Planning and coordination require resources from governments. |
| <i>Operating Costs</i> | Employers and/or public agencies must provide budget. |
| <i>Economic (benefit/cost)</i> | Good. |
| <i>Benefits to Environment</i> | Excellent. |
| <i>Implementation Scheduling</i> | Mid-term. |
| <i>Competition with Existing Measures (transit)</i> | No. |
| <i>Conformity with Local & Regional Transp. & Dev. Plans</i> | Yes. |
| <i>Compatibility with NCR Image</i> | Yes. |
| <i>Levels of Jurisdiction & Coordination Required</i> | Private companies and public agencies must work together. |

4.4.11 Measure 11: Operational Priority for Transit

This measure provides a less expensive way to provide some priority for transit, as compared to the congestion bypasses of measure 6. While they are not as effective, they do provide many of the same benefits, and can be implemented in a much wider area along interprovincial routes, not just at bridge approaches. A priority light can also function as a first step towards the installation of a full congestion bypass, depending on budget and acceptability. Priority measures also provide the same sort of visual advantage to transit, which can make commuters consider changing modes. It is difficult to say whether enforcement is a problem, but if the lights are properly designed, people should obey their own lights, not those for transit vehicles. If a region-wide system is developed, with consistent design throughout, then drivers should become used to their presence and obey them. Some education may be needed, to ensure that drivers understand the system's functioning.

| | |
|--|---|
| <i>Person Throughput</i> | Good potential for increase. |
| <i>Technical Feasibility</i> | Required new technology is available. |
| <i>Technical Flexibility</i> | Plans can be adjusted to changing needs. |
| <i>Operation</i> | Some monitoring and enforcement needed. |
| <i>Travel-Time Reduction</i> | Good. |
| <i>Travel-Time Reliability</i> | Good. |
| <i>Market Potential</i> | Very good. |
| <i>Public Support</i> | High. |
| <i>Capital Costs</i> | Between \$2,000 and \$5,000 per intersection. |
| <i>Operating Costs</i> | Very low. |
| <i>Economic (benefit/cost)</i> | Very good. |
| <i>Benefits to Environment</i> | Excellent. |
| <i>Implementation Scheduling</i> | One to three years. |
| <i>Competition with Existing Measures (transit)</i> | No. |
| <i>Conformity with Local & Regional Transp. & Dev. Plans</i> | Yes. |
| <i>Compatibility with NCR Image</i> | Yes. |
| <i>Levels of Jurisdiction & Coordination Required</i> | Municipalities and transit authorities. |

4.4.12 Measure 12: Information and Education Programs

Information and education programs form an important and integral part of any TDM measure. Many of the measures that are being proposed are new to the NCR, and it is important that they be properly promoted and explained to the public before and during implementation. In addition, some of these measures may be unacceptable to the public, so it is important that they be properly promoted to gain acceptance. Information and education can also function as a stand alone measure, since people may be induced to change their behavior if they are presented with all their commuting options. Costs for this type of program can be high, but they can also be included in existing promotion campaigns at a somewhat lower cost. Other elements of this measure are difficult to analyze, since the measure is very different from the others.

| | |
|--|---|
| <i>Person Throughput</i> | N/A. |
| <i>Technical Feasibility</i> | Other information and education programs are well established; these measures could be implemented using this existing expertise. |
| <i>Technical Flexibility</i> | Programs can be defined separately for each TDM measure and each market. |
| <i>Operation</i> | Follow-up is crucial to success. |
| <i>Travel-Time Reduction</i> | N/A. |
| <i>Travel-Time Reliability</i> | N/A. |
| <i>Market Potential</i> | Good. |
| <i>Public Support</i> | Very good. |
| <i>Capital Costs</i> | High. |
| <i>Operating Costs</i> | Medium to high. |
| <i>Economic (benefit/cost)</i> | Difficult to analyze. |
| <i>Benefits to Environment</i> | Good. |
| <i>Implementation Scheduling</i> | Long-term. |
| <i>Competition with Existing Measures (transit)</i> | No. |
| <i>Conformity with Local & Regional Transp. & Dev. Plans</i> | Yes. |
| <i>Compatibility with NCR Image</i> | Yes. |
| <i>Levels of Jurisdiction & Coordination Required</i> | Government agencies at all levels must be involved in these programs. |

4.5 Evaluation Findings

This second part of the evaluation process looked at the selected measures in terms of the requirements of the NCR, as well as their overall effectiveness. The results indicate that all of the selected measures have the potential to be effective if implemented. This confirms the results of the Planning Balance Sheet analysis that was conducted in the first round evaluation. Each of the measures has a number of advantages and disadvantages, but in all cases, the positive aspects outweigh the negative ones.

Some, such as the voluntary employer-based incentives, and the preferential parking for HOVs, are not very expensive, but are not like to have a large impact. Others, such as the HOV lane conversions and congestion bypasses, are a good deal more expensive, but have the potential to have a very significant impact on mode split and travel behavior in the NCR. Measures such as parking management and congestion pricing also have the potential to be quite effective, and would be innovative actions in the region. However, those measures require a good deal of political will and public support to be implemented, since they may have the effect of raising commuting costs quite substantially. Other measures fall somewhere in between, with a medium cost and a medium impact.

What is clear from this evaluation, however, is that there is no magic solution, that costs nothing and solves all the problems. Each of the solutions that can have a large impact requires either money, political will, or both, to implement. The less expensive solutions do not have as great an impact, and will require some effort to have any impact at all. This means that the region as a whole must be committed to the objectives of TDM for this project to be successful.

This evaluation did not result in the elimination of any measures from consideration, and it was not intended to. These evaluation tables provide the information needed to make decisions about how to implement these measures. Since it is not possible for all of the measures to be implemented simultaneously, it is necessary to develop some sort of priority listing of the measures, to guide the action plan.

This action plan could contain a certain number of demonstration projects for testing measures in different areas where the results expected are difficult to assess. One of them could consist in conducting a ridesharing demonstration project in Aylmer. Some projects, however, appear already to have a strong potential of success. Among them, we can mention the opportunity to implement HOV reserved lanes on National Capital Region's bridges, as Chaudière bridge for instance.

The method chosen to develop these implementation priorities is a series of consultations and workshops, to determine the opinions of the public, as well as community organizations and government agencies. Since these are the people who will have to install, use, and maintain the TDM measures that are implemented, it was felt that they should be the ones who decided how to perform this implementation. The process and results of this consultation process are described in the next section.

Part 5

PUBLIC CONSULTATIONS

Once the specific TDM measures had been identified, consultations were held to gather the input of the public. This involved two distinct stages: focus groups with members of the general public, and workshops with organizations that have a demonstrated interest in transportation issues. The public focus groups were held to determine the public acceptability of some potentially controversial measures, while the goal of the workshops was to develop a consensus as to the implementation priorities for the TDM measures. A technical report was written detailing the focus group and workshop process, and this is included in the technical report that accompanies this final report.

5.1 *Focus Groups*

Four focus groups were held, two in English and two in French. An outside consultant with experience facilitating public focus groups was brought in to conduct the focus groups, although the main consultant was available for technical assistance. Annex 1 presents the report of the outside consultant detailing the results of the discussions that were held during the focus group.

Care was taken to ensure the participation of a representative sample of the population, in order to obtain valid results. The focus groups included commuters using a wide variety of modes: public transit, private car, carpooling, bicycle, and walking. In total, 35 citizens participated in the focus groups; 18 English-speaking, and 17 French-speaking.

The focus group participants were presented with six of the twelve TDM measures. It was felt that presenting all twelve of the measures would have made the focus groups too complicated. If the participants were asked to comment on such a large number of measures, they would very likely get confused, and provide commentaries that were not very useful. In addition, presenting all twelve measures would have made the focus groups very long, and would have resulted in lower quality results. These six measures were chosen based on the results of the evaluation done in the previous section. The six measures are listed below, along with the reason why each was chosen in parentheses after the measure.

- **Local ridesharing programs** (This measure requires a good deal of voluntary participation, so it is important to get a feel for whether people will participate.)
- **Conversion of existing bridge lanes to HOV lanes** (Lane conversion can be very controversial, so it is important to gather public opinion at this stage. In addition, this can be a complicated, expensive process, so it should be supported by the public.)

- **Congestion pricing on bridges** (Congestion pricing has never been implemented in North America, and has many opponents due to the rise in commuting costs, so public perception is very important.)
- **Parking management** (Parking management can increase commuting costs considerably, so it is important to know what people think about it.)
- **Congestion bypasses at bridge approaches** (Congestion bypasses have a potential for abuse, and may involve new construction, so public support is crucial to successful implementation.)
- **Transit priority at traffic lights** (Transit priority lights must be respected by the public, so the public should be consulted on their use.)

The commentaries that were made over the course of these focus groups were recorded by the facilitator as they were made. Participants were asked for the perceived advantages and disadvantages of each measure, and were also encouraged to make suggestions for improvement. The results of these focus groups were quite interesting and helpful, and provided good insight into the public acceptance of the proposed measures. The responses indicate that there is a high level of interest in transportation planning on the part of the public, and that citizens wish to have an impact on the process.

In order to obtain a qualitative analysis of participants' opinions of the various measures, a Pareto vote was taken for each group. Under this system, participants are asked to vote for their three favorite TDM measures, giving their first choice a score of 3, their second choice a score of 2, and their third choice a score of 1. The scores are then added up for each measure, to provide a ranking of all of the measures. Participants were asked to score the measures both for their individual preference and for their perceived contribution to the common good. The synthesis of the Pareto vote results for the four focus groups is shown in Table 2.

Table 2: Synthesis of Pareto Vote Results

| Measures | Preferences | |
|--|-------------|----------------------------|
| | Individual | Related to the Common Good |
| Local Ridesharing Programs | 63 | 68 |
| Conversion of Existing Bridge Lanes to HOV Lanes | 49 | 42 |
| Congestion Pricing on Bridges | 8 | 5 |
| Parking Management | 6 | 9 |
| Congestion Bypasses at Bridges Approaches | 43 | 39 |
| Transit Priority at Traffic Lights | 35 | 35 |

5.2 Workshops

While the focus groups provided insight into the thoughts of the general public on the proposed TDM measures, the workshop sessions were intended to gather more informed opinions to determine which measures would be the most acceptable to the community at large. With this in mind, two workshop sessions were organized, the first for representatives of community organizations, the second for representatives from government agencies.

5.2.1 Workshop I - Community Organizations

More than thirty English and French organizations were invited to send representatives to the first workshop. Of these, approximately fifteen indicated that they intended to send someone, and in the end, eight participants attended, representing seven organizations:

- Association des citoyens pour le transport et l'environnement (ACTE)
- Association des résidents des Hautes Plaines
- Auto-Free Ottawa
- Citizens for Safe Cycling
- City of Ottawa Environmental Advisory Committee
- Federation of Ottawa-Carleton Citizens' Associations
- Greater Ottawa Ecology

Following introduction and preliminary activities, the various TDM measures were presented. Each of the measures generated debate, both about the merits of the specific measure, and also about the TDM concept itself and the nature of this particular study. These discussions were quite constructive, and the input provided was very helpful in prioritizing the measures, and making changes and additions where necessary. In the process of these discussions, the representatives felt that there were a number of ideas that still needed to be incorporated into the study process. As a result of this, three new TDM measures were added to the existing list of twelve.

- **Improved network and infrastructure for alternative modes (bicycle, pedestrian, etc.)**
- **Land-use management**
- **Resident-directed transportation planning**

In addition, the representatives recommended that the measure called *Transit-pass subsidies* be changed to the more general *Public transit improvements*, to reflect the need for better public transit in the NCR.

Following this, the participants were presented with the Pareto scores from the focus groups that had been held previously, in order to assist them in prioritizing the measures.

Once all the data had been presented, the workshop participants were asked, as a group, to assign each measure to one of four groups, according to the ease of implementation and the scheduling. Placement in Group I indicated that the measure could be implemented quickly and would have

a large impact, while placement in Group III indicated that it would be difficult to implement and/or would have a low impact. Based on this process, the following priorities were developed:

Priorities - Community Organizations

(according to scheduling and impacts)

- | | |
|-----------|--|
| Group I | <ul style="list-style-type: none">• Ridesharing programs• Preferential HOV parking at worksites• Park & Ride facilities• Congestion bypasses for HOVs at bridge approaches• Conversion of existing lanes to reserved HOV lanes• Operational priority for transit at traffic lights• Information and Education Programs• Land-use management• Resident-assisted transportation planning |
| Group II | <ul style="list-style-type: none">• Voluntary employer-based incentives• Parking management• Congestion pricing on bridges• Improvements to the public transit system• Improve network and infrastructure for alternative modes |
| Group III | <ul style="list-style-type: none">• Government supported incentives |
-

These priorities were developed on a consensus basis, meaning it was necessary that each participant in the workshop agrees to the ranking that each measure was given. These rankings were meant to take into account both the opinions of the individuals present, the collective opinions of the groups they represented, and the opinions of the general public as represented by the results of the focus groups.

5.2.2 Workshop II - Government Agencies

A second workshop was held the morning following the first workshop. Participants included representatives from various municipal agencies in the NCR, as well as members of the Steering Committee. The purpose of this workshop was to take the results of all the previous TDM research and consultations, and develop a consensus as to the priority that should be given to each of the measures.

The first part of the workshop consisted mainly of a discussion of the previous consultation results, including the Pareto scores from the focus groups and the comments from the workshop

the night before. In addition, the three newly added measures were presented to the participants, so that they could include them in their evaluation process.

The second part of the workshop consisted of a presentation of the priorities that were developed during the first workshop, and discussion of them. Based on this discussion, the results of the previous TDM research and consultations, and the experience and knowledge of those present at this workshop, a new list of TDM priorities was developed. These priorities were grouped in a similar fashion as the previous list:

Priorities - Government Agencies

(according to scheduling and impacts)

Group I

- Ridesharing programs
- Preferential HOV parking at worksites
- Park & Ride facilities
- Congestion bypasses for HOVs at bridge approaches
- Conversion of existing lanes to reserved HOV lanes
- Operational priority for transit at traffic lights

Group II

- Voluntary employer-based incentives
- Parking management
- Government supported incentives
- Improvements to the public transit system
- Information and Education Programs
- Improve network and infrastructure for alternative modes
- Land-use management
- Resident-assisted transportation planning

Group III

- Congestion pricing on bridges
-

Part 6

TRANSPORTATION DEMAND MANAGEMENT ACTION PLAN

6.1 *Development of Action Plan*

One of the main goals of this TDM initiative is the development of an action plan to recommend and prioritize the implementation of TDM measures in the National Capital Region. This section presents the Action Plan for Transportation Demand Management for Interprovincial Travel in the National Capital Region.

The action plan prioritizes the TDM measures that have been chosen for implementation in the NCR, taking into account all stages of the study, including the literature review, the two stages of evaluation, the public consultation process, and input from the Steering Committee. These priorities are based on the results of the final workshop, made by the representatives from government agencies in conjunction with the consultant team. By taking into account the results of the evaluation and consultation that had taken place previously, the representatives from government agencies, along with the consultant team, were able to develop a final prioritization of TDM measures for implementation. In addition to the results of the previous evaluation, this prioritization took into account the potential impact of the measures and the schedule on which they could be implemented. Measures were judged to be superior if they had a greater impact and could be implemented more quickly. For some priorities, actions proposed in the plan could take the form of a demonstration project. The priorities represent the final conclusions of the workshops, and the order is the same as that which is listed at the end of the previous section.

The plan provides the information and direction needed to move quickly to the implementation of TDM in the National Capital Region. However, this report represents the final conclusions of this study, the consultant, and the Steering Committee. As such, the priorities represent those of that group of people. It is possible, and probably likely, that the priorities that will actually be followed the implementation will be different. With that in mind, this report attempts to present all the facts and analysis as clearly as possible, so that the most intelligent and worthwhile implementation policy can be developed.

6.2 *Elements of Action Plan*

In the following sections, the prioritized TDM measures are detailed. The following information is provided about each measure:

- **Scope** - Describes what the measure actually consists of, along with information about how this could be implemented in the NCR.

- **Present Status** - Any examples of this measure that are currently in place in the NCR. For measure for which there is no experience in the NCR, an example from another area is listed.
- **Action** - The actions that must be taken in order to implement or begin to implement the measure.
- **Agencies Involved** - The public and private sector agencies and companies that must be involved in order for the measure to be successful.
- **Cost** - The estimated implementation cost, according to the following scale :
Low < \$100,000
Medium = \$100,000 - \$500,000
High > \$500,000

6.3 Measures for Immediate action

This section covers the measures that will have a significant impact, that can be implemented quickly, and at relatively low cost (pages 35-39):

- Local ridesharing programs (Aylmer demonstration project)
- Preferential HOV parking at government worksites
- Voluntary employer-based and financial incentives
- Information and education programs
- Conversion of existing lanes to HOV use on the Chaudière bridge and approaches

6.3.1 Local ridesharing programs (Aylmer demonstration project)

The principal action proposed in the plan for this measure is to conduct a demonstration project in Aylmer. This demonstration project will help to determine the impact and the chance of success of this measure in the National Capital Region.

6.3.2 Preferential HOV parking at government worksites

Considering the vocation of the Region, this measure represents a good potential of increasing ridesharing in the National Capital Region.

6.3.3 Voluntary employer-based and financial incentives

When used in parallel with the previous measures, voluntary employer-based and financial incentives constitute a good complementary measure. Bringing parity between parking cost in government worksites and the market value parking is a good way to encourage transit and to promote ridesharing.

6.3.4 Information and education programs of TDM measures

Any TDM action plan must contain a program component about information and education. Each of the measures contained in the action plan needs to be promoted and publicized to be successful. Many of these measures are actually new to the public. Education of the public is then necessary to ensure that both users and non-users fully understand the function of the measures.

6.3.5 Conversion of existing lanes to HOV use on the Chaudière bridge and approaches

The possibility of implementing a reserved lane on the Chaudière bridge has been already looked at. The concept could consist in a reversible lane on the bridge used in one direction in the morning peak period and in the opposite direction in the evening peak period. Preferential treatment will be provided at the approaches.

Preliminary geometrical analyses show that this project is feasible. The width of the pavement on the bridge allows the implementation of a reversible lane. The pavement width on the bridge corridor varies from approximately 12,1m to 12,8m. The north section offers a pavement width of approximately 15,8m at the approach of Laurier intersection. A traffic island separates northbound from southbound traffic, north of the river.

Presently, the bridge provides one lane for traffic flow in each direction. Taking into consideration existing widths and traffic volumes, it becomes possible to create an extra, central lane which would be reversible and made operational only for HOV vehicles according to the time of day.

The concept should take into account the design at the entrance and at the exit of the reserved lane to ensure an easy access to the reserved lane for HOVs as well as to facilitate for them the insertion in the regular traffic at the end of the reserved lane. The preliminary cost evaluation of this project is about \$500,000.

Even though this extra reserved lane does not constitute a prime TDM measure, this action's primary impact being to increase capacity, it could act as a strong incentive in the promotion of public transit use and ridesharing. A feasibility study is necessary to determine with precision geometrical and traffic control elements.

6.4 Measures for long-term

Other measures for long-term consideration have been identified (pages 40-46):

- Park and ride facilities
- Parking management
- Public transit improvements
- Improved network and infrastructure for alternative modes
- Land use management
- Resident-assisted transportation planning
- Congestion pricing

1. Local Ridesharing Programs
(Aylmer Demonstration Project)

Scope

This measure involves setting up programs that will encourage single occupant vehicle (SOV) users to travel by carpool or vanpool for their daily commute. To be most effective, the programs should be local in nature, and supported by both private and public sectors, because of the necessity of matching users both at the origin and at the destination.

Present Status

The Ontario government currently operates the 1-800-56-SHARE automated matching system for public employees.

Action

- Begin immediately a two-year demonstration project for commuters travelling between Aylmer and Ottawa.
- Set up partnerships between public agencies (OC Transpo, STO) and private companies to promote ridesharing among employees.
- Create NCR Carpooling Association to provide local control and input in all aspects of ridesharing (matching, promotion, administration).
- Obtain sponsorship from corporations that want to project a positive public image.
- Resolve any legal, insurance, and jurisdictional issues that surround ridesharing.
- Designate a transportation coordinator to promote ridesharing at each worksite.

Agencies Involved

Public Agencies:

RMOC, CUO, OC Transpo, STO, MTO, MTQ, municipalities.

Private Sector:

Large and medium-sized employers, insurance companies, sponsors.

Cost - Low.

2. Preferential HOV Parking at Government Worksites

Scope

- This measure involves reserving preferential parking spaces, such as those near the entrance or in a covered area, for workers who travel by carpool or vanpool.
- Mainly for use at parking lots that do not charge for parking, since paying lots already create a carpooling incentive by spreading the parking cost over all the carpoolers.
- This measure needs to be implemented as a by-law or regulation similar to that which requires preferential parking for the handicapped.

Present Status

- No current experience in NCR.
- In the US, preferential parking is often found at government agency parking lots. In addition, some jurisdictions have passed laws requiring that preferential parking be provided for workers at private worksites.

Action

- Installation of preferential parking measures at parking lots controlled by government agencies (where applicable).

Agencies Involved

Public Agencies:

RMOC, CUO, municipalities, federal and provincial government agencies.

Private Sector:

Employers, parking lot operators.

Cost - Low.

3. Voluntary Employer-Based and Financial Incentives

Scope

- This measure involves implementing policies, both by government agencies and private companies, that discourage people from commuting by SOV. These policies take the form of incentives that are provided to employees to travel by alternative mode.
- These incentives are usually paid for by employers.
- Incentives include rewards for transit-users/carpooling, elimination of free parking and changes in taxation policies.

Present Status

- No present experience in the NCR.
- Ontario government is promoting ridesharing for its employees.
- Government in the US have implemented programs to provide financial incentives for users who do not drive alone, with varying degrees of success.
- In the US, some employers (Microsoft, Caltrans) provide incentives for employees not to drive alone, to help the companies reduce parking demand or comply with government regulations.

Action

- Provide employers with material and expertise necessary to set up voluntary programs.
- Identify potential sponsors who will help to promote these incentives to workers.
- Promote the establishment of incentive programs among employers.
- Establish programs for government employees, to provide an example to private companies.
- Parking management measures should only affect long-term parking, not short-term.
- Reduce or eliminate the minimum parking space by-law requirements.
- Reach a consensus on the goals of the region with regard to downtown parking policy.
- Develop a regional strategy to manage the parking supply using the tools listed above, and proceed with implementation of that strategy.

Agencies Involved

Public Agencies:

Municipal, regional, provincial and federal government agencies.

Private Sector:

Large and medium-sized employers, sponsors.

Cost - Low (mainly borne by employers).

4. Information and Education Programs on TDM Measures

Scope

- Provide information to the public about TDM. Each of these measures will need to be promoted and publicized to be successful. In addition, a number of these measures will be new to the public, and it may be necessary to provide some education to ensure that both users and non-users fully understand how a measure functions.
- Implement measures that provide communities with information about transportation conditions and help them to make more informed travel decisions. Also, measures that increase communities' education and awareness about their transportation options. (These include information about transit and ridesharing alternatives, and possible crossovers between emerging Intelligent Transportation Systems (ITS) and TDM).

Present Status

- OC Transpo and STO currently have communications departments, which handle promotion and education for the transit agencies.

Action

- Identify a communication strategy ensuring information and education for communities on a permanent basis.
- Identify sponsors who will help to fund education and information programs as a means of product placement and advertising.
- For each TDM project, prepare a communication plan and matching promotion.
- Promote programs done jointly between all agencies that are involved in implementing TDM measures.

Agencies Involved

Public Agencies:

NCC, RMOC, CUO, OC Transpo, STO, MTO, MTQ.

Private Sector:

Employers, sponsors.

Cost - Medium.

5. Conversion of Existing Lanes to HOV use on the Chaudière Bridge and Approaches

Scope

- This measure involves converting existing traffic lanes to HOV-only use on the bridge and approaches.
- This measure can only be done if there is space to leave a general traffic lane, since the intention is not to create an HOV-only bridge.
- In many cases, this can be done while keeping all of the current lanes, by redesigning lane widths, median barriers, and sidewalks.
- This measure aims to increase person throughput on the existing infrastructure, without new construction or any increase in vehicle throughput.

Present Status

- STO has prepared a plan for lane conversion on the Portage Bridge. A study done for the STO identified two bridges that have lane conversion potential. Funding negotiations with the MTQ and other agencies are in progress.
- OC Transpo operates a transitway and reserved bus lane network in Ottawa-Carleton
- The RMOC Transportation Master Plan will consider HOV lanes in Ottawa-Carleton.

Action

- Undertake a detailed feasibility study on the Chaudière bridge to determine the best scenario for lane conversion.
- Based on this feasibility study, implement lane conversion at the most promising locations.

Agencies Involved

Public Agencies:

NCC, RMOC, OC Transpo, CUO, STO, MTO, MTQ, support of Public Works and Government Services Canada.

Cost - Medium (\$500,000).

6. Park and Ride Facilities

Scope

- Create parking lots at strategic locations where commuters can transfer to public transit, thus reducing the number of SOVs crossing the Ottawa River.
- Parking lots must be located along major transit routes, to give users the ability to reach their destination quickly. Commuters will only use these if it makes their trip more convenient, since they are using a car in any case.
- These sites can also be used as locations where carpool and vanpool users meet or for Kiss and Ride, where commuters are dropped off by a family member.

Present Status

- STO has an action plan involving the construction of 144 parking spaces in Gatineau (74 are built with potential for 70 more spaces), an potential of 400 spaces in Aylmer (120 in the first phase) and a total of 160 spaces planned in Hull.
- There are currently three lots operated by OC Transpo, with 260 spaces at Baseline, 515 at Orleans, and 300 at Greenborough. In addition, a fourth is opening at Kanata in October 1995, with 400 spaces. Transit parking is also available at Gloucester Center mall, and numerous other locations turn a blind eye to unofficial commuter parking.

Action

- Identify and implement information and education programs to promote the use of park and ride lots.
- Identify additional park and ride lots in Aylmer, Gatineau and Hull.

Agencies Involved

Public Agencies:

RMOC, CUO, OC Transpo, STO, municipalities.

Cost -low (for promotion only).
high (for new lot construction program).

7. Parking Management

Scope

- Manage the supply of parking in congested areas to reduce the number of cars that travel to and park in those areas. Parking management makes long-term parking more difficult, while not affecting short-term parking. In this way, commuters are discouraged from driving to work every day, but shoppers and other short-term users are still encouraged to travel downtown.
- Includes increased rates and taxes for parking spaces, reductions in employee parking subsidies, reductions in the total parking supply, and revisions to by-laws that proscribe a minimum number of parking spaces at developments.

Present Status

- Off-street parking (both public and private) in Ottawa is controlled by the city.
- On-street parking in Ottawa is controlled by the regional government.
- By-laws currently proscribe the minimum number of parking spaces at a development.
- A study to document the demand for and supply of parking in downtown Ottawa is in progress.
- Central Area Transportation Strategy recommends a parking management strategy that includes actions to limit long-term parking and encourage short-term parking.

Action

Agencies Involved

Public Agencies:
RMOC, CUO, municipalities.

Private Sector:
Employers, parking lot operators.

Cost - Low (mainly involves legislative efforts).

8. Public Transit Improvements

Scope

- This measure aims to improve the existing public transit infrastructure and network, as well as build new ones. A wide range of actions are possible, since there are many different areas in which public transit in the NCR can be improved and expanded.
- Possible actions include improve connectivity between the two systems and between transit and other modes, extension of the current reserved lane / transitway service, and implementation of new services.

Present Status

- Public transit providers in area provide a fairly good level of service, but there are some holes in the structure, travel times are sometimes overly long, and service frequencies can be low in the off-peak.
- OC Transpo Transitway provides high quality, reserved lane service.
- Interprovincial Rapid Transit Appraisal Study is currently in progress.

Action

- Increase number of buses and service frequencies on both sides of the river.
- Improve connectivity and routing between the two separate public transit systems.
- Extension of dedicated right-of-way, high quality service into Quebec.
- Better access for people with large items, children, and bicycles.

Agencies Involved

Public Agencies:

STO, OC Transpo, funding agencies.

Cost - High.

9. Improved Network and Infrastructure for Alternative Modes

Scope

- Improve the network and infrastructure for bicycles, pedestrians, paratransit (jitneys, collective taxis), cross-river shuttles, and other alternative modes.
- Create incentives that will make these modes more popular and encourage commuters to use them, such as easier transfers between alternative modes and public transit.
- This will reduce commuters dependence on SOVs and cause a modal shift towards these alternative modes, which will be good for the transportation network and the environment.
- This measure requires a region-wide approach in order to be successful.

Present Status

- Bicycle and pedestrian paths currently exist in the NCR.
- RMOC Cycling Transportation Network Study and NCC Recreational Pathways Study have identified new areas where bicycle paths can be created.
- Some other alternative modes are promoted to a small extent.

Action

- Construct new bicycle and pedestrian paths where needed and feasible.
- Improve laws that protect the right-of-way of alternative modes.
- Implement jitney or collective taxi service, possibly as a private venture.
- Identify opportunities for use of other alternative modes for interprovincial travel (cross-river shuttle buses, watercraft).

Agencies Involved

Public Agencies:

NCC, RMOC, CUO, OC Transpo, STO.

Private Sector:

Private transportation companies.

Cost - High.

10. Land Use Management

Scope

- In the process of creating new long-range planning strategies, include measures to encourage an urban form that is more suitable for transit and other alternative modes.
- Encourage development near transit hubs and mobility centers, and discourage spread-out urban sprawl developments.
- Although it is possible to affect transportation demand through simpler measures, the root cause of the current transportation problems is the quickly spreading out urban form. By putting controls on land use, it is possible to solve the problem at the source.

Present Status

- Some efforts to ensure development in a sustainable manner have been successful.
- Sustainable development is now one of the guiding principles in new regional planning initiatives.
- RMOC Official Plan Review land use scenario is currently being developed.
- The NCR does a good job of land use management, particularly in comparison with other regions.

Action

- Sustainable planning must continue to be integrated into the regional planning master plan that is under revision, so that it can start to have an effect as quickly as possible.
- The NCR is already a leader in this area, but more needs to be done to ensure success.

Agencies Involved

Public Agencies:

NCC, RMOC, CUO, municipalities.

Private Sector:

Citizens' groups.

Cost - Low.

11. Resident-Assisted Transportation Planning

Scope

- Planning is assisted by the individual members of the community, who work with planners, engineers and architects. Use an ecological approach to planning to achieve the goals of the community and the region. This measure can be implemented on a regional or a local community and neighbourhood level.
- By including community members from the beginning, it is possible to achieve some sort of consensus on the direction of transportation planning. Doing this will help to ensure that citizens are satisfied with the results, and also spreads out the responsibility for planning strategies.

Present Status

- Currently being implemented by citizen's groups in association with the Ottawa-Carleton Regional Plan Review.
- RAP-ROC - Residents' Associated Process - Region of Ottawa-Carleton.
- Greenprint Process.

Action

- Must be initiated by residents in association with government transportation agencies.
- Create citizens' transportation advisory committees, to ensure that the public is included in the planning process from the very beginning and has the opportunity to provide a continual input into the process.
- Work in concert with existing resident-assisted planning groups to broaden the scope of the process.

Agencies Involved

Public Agencies:

All government transportation and planning agencies.

Private Sector:

Private transportation companies.

Cost - Low.

12. Congestion Pricing

Scope

- Designate one interprovincial bridge as an HOV-only facility at peak periods. Sell excess capacity to SOVs using Automatic Toll Collection devices. This measure aims at increasing person throughput on the bridge without restricting it to HOVs only. The measure can be implemented without an overall toll policy on bridges.
- The concept behind congestion pricing is that vehicles entering the roadway should be charged for the extra congestion they cause when they decide to travel. This differs from simple road pricing, where users are charged a flat rate for the maintenance, environmental, administrative, and other costs that they incur. Congestion pricing includes this as well, but adds a variable element based on the number of vehicles already travelling.

Present Status

- There is currently no road pricing or congestion pricing policy concerning the NCR.
- Congestion pricing is being investigated as part of the Champlain Bridge Environmental Assessment study.

Action

- A feasibility study of the measure should be undertaken, taking into account public opinion concerning the principle, as well as experience in other areas.
- Implementation must be done very carefully, to ensure a smooth transition. Gathering public support will be crucial for implementation.
- New automatic toll collection schemes may have to be developed further to ensure successful operation.

Agencies Involved

Public Agencies:

STO, OC Transpo, municipalities, MTQ, MTO.

Cost - Low (toll revenue should cover capital and operating costs).

IDENTIFICATION OF TDM MEASURES

As directed in the Terms of Reference, the TDM measures identified were broken down into the following categories:

1. **Enhanced Options** - Competitive alternatives to the single occupant automobile, including but not restricted to transit service, carpooling and ridesharing programs, walking and cycling provisions.
2. **Incentives** - Incentives that offer travel time savings like high occupancy vehicle (HOV) lanes, transit priority treatment, and preferential parking strategies and statutes, road pricing.
3. **Work Management** - Alternative work arrangement strategies that shift travel demand to less congested time periods, including flexible work hours, modified work week, work at home options.
4. **Land Use** - Modified urban form, employment locations, transit friendly residential development.

Based on these categories and the literature review, the following list of TDM measures was developed. The listings in parentheses following each measure indicate the literature source.

1. Enhanced Options

- **Promotion of Ridesharing** (Transport 2021, 1993; TRAFIX/TEMS, 1994; Higgins, 1990; Turnbull *et al*, 1990; Jewell *et al*, 1990; Apogee Research, Inc., 1994; Macrae, 1994)
Measures that encourage Single Occupant Vehicles (SOV) drivers to carpool or vanpool. These include financial incentives, preferential parking treatment, implementation of High Occupancy Vehicle (HOV) lanes, and developing a system of rewards for commuters who rideshare. These measures can be implemented either by municipal agencies or employers.
- **Promotion of Transit** (Transport 2021, 1993; TRAFIX/TEMS, 1994; Higgins, 1990; Turnbull *et al*, 1990; Jewell *et al*, 1990; Apogee Research, Inc., 1994; Macrae, 1994)
Measures that encourage commuters to use public transit. These include giving operational priority to transit, increasing subsidies, providing express service, implementing new and improved services, and providing employees with transit fare subsidies.
- **Promotion of Non-Motorized Modes** (Transport 2021, 1993; TRAFIX/TEMS, 1994; Higgins, 1990; Jewell *et al*, 1990; Apogee Research, Inc., 1994; Macrae, 1994)
Measures that encourage commuters to use alternate modes, such as bicycling and walking. These include improving amenities for cyclists and pedestrians, providing improved bicycle parking facilities (possibly through by-laws), and the installation of

employee showers and lockers at worksites. These could be implemented either by municipalities or by employers.

- **General Traffic Improvements** (Turnbull *et al*, 1990; Apogee Research, Inc., 1994)
Measures that will improve roadway efficiency for all users. These include miscellaneous improvements in signal timing and traffic flow, and creating a Traffic Management Center (TMC) to allow for improved incident management.
- **Improved Information and Education** (Transport 2021, 1993; TRAFIX/TEMS, 1994; Apogee Research, Inc., 1994; Macrae, 1994)
Measures that provide commuters with information about transportation conditions, and help them to make more informed decisions. Also measures that increase commuters' education and awareness and their transportation options. These include information about transit and ridesharing alternatives, and possible crossovers between emerging Intelligent Transportation Systems (ITS) technologies and TDM measures.

2. Incentives

- **Parking Management** (Transport 2021, 1993; TRAFIX/TEMS, 1994; Higgins, 1990; Turnbull *et al*, 1990; Jewell *et al*, 1990; Apogee Research, Inc., 1994; Macrae, 1994)
Measures that manage the supply of parking in congested areas, and attempt to reduce the number of cars that travel to and park in those areas. These include increased rates and taxes for parking spaces, reductions in employee parking subsidies, reductions in available parking supplies, and revisions to zoning codes to reduce the maximum and minimum number of parking spaces required at developments.
- **Promotion of High-Occupancy Vehicles** (Transport 2021, 1993; TRAFIX/TEMS, 1994; Turnbull *et al*, 1990; Apogee Research, Inc., 1994; Macrae, 1994)
Measures that encourage commuters to use high-occupancy modes, including transit and carpooling. These include preferential treatment for HOVs (ramp metering bypasses, preferential parking), the construction of HOV lanes, both on freeways and arterials, and the construction of park and ride lots for carpoolers and transit users.
- **Trip Reduction Programs (voluntary / mandatory)** (Transport 2021, 1993; TRAFIX/TEMS, 1994; Turnbull *et al*, 1990; Apogee Research, Inc., 1994; Macrae, 1994)
Measures that reduce the number of trips that are made by employees to their employment site. These measures can be either voluntary on the part of the employer, or made mandatory by government regulation (i.e. California's Regulation XV) and are generally aimed at increasing Average Vehicle Ridership (AVR). These include incentives for ridesharing, transit pass subsidies, and the designating of a transportation coordinator for a worksite. There is also the possibility of creating Transportation Management Agencies (TMAs), which help to implement TDM measures over large employment centers.

- **Road/Congestion Pricing** (Transport 2021, 1993; TRAFIX/TEMS, 1994; Apogee Research, Inc., 1994; Macrae, 1994)

Measures that require road users to pay all or part of the costs of using the roads. These costs include maintenance and operation costs, environmental and social costs, and some measure of the costs that they are imposing on other travellers by deciding to travel on that road. Congestion pricing increases this payment when the roads are congested, such that commuters pay more when they use the road at peak hours. These sometimes take the form of tolls levied on major links into and out of downtown, or of a cordon line around the downtown area, where every car crossing the cordon must pay. Recent advances in Automatic Toll Collection have made these measures more attractive and feasible.

- **Increase in Convenience for Non-SOV Commuters** (Transport 2021, 1993; TRAFIX/TEMS, 1994)

Measures that would help to alleviate some of the inconveniences that are suffered by non-SOV commuters. These include attempts to provide better basic services to employees at their worksites (dining, shopping, etc.), or give them a way to complete their errands without having to bring their own cars. Another measure would be to provide a Guaranteed Ride Home (GRH), such that employees who must miss their carpool or bus will still be able to get home. These measures could be implemented either by municipalities or employers.

3. Work Management

- **Flextime** (Transport 2021, 1993; TRAFIX/TEMS, 1994; Higgins, 1990; Jewell *et al*, 1990; Apogee Research, Inc., 1994; Macrae, 1994)

Measures that allow employees to work non-traditional hours, and allow them to travel at non-peak hours and avoid congestion. In addition, this measure allows for greater efficiency in road usage. These include allowing employees to arrive or leave earlier or later than normal, or work weekends or nights.

- **Compressed Work Week** (Transport 2021, 1993; TRAFIX/TEMS, 1994; Apogee Research, Inc., 1994; Macrae, 1994)

Measures that allow employers to work longer hours, but fewer days. These reduce the number of work trips being made, and also give employees the chance to complete errands during less congested parts of the day. These include working forty hours in four days, or eighty hours in nine days.

- **Telecommuting** (Transport 2021, 1993; TRAFIX/TEMS, 1994; Jewell *et al*, 1990; Apogee Research, Inc., 1994; Macrae, 1994)

Measures that allow workers to work either at their homes, or at locations that are closer to their homes than traditional worksites. These include using modern communications and computer technologies to allow employees to work at their homes, or construction

of neighbourhood telework centers to reduce the lengths of employees' commutes. This helps to reduce congestion and encourage use of alternate modes.

4. Land Use

- **Changes in Land Use** (TRAFIX/TEMS, 1994; Apogee Research, Inc., 1994; Macrae, 1994)
Measures that encourage land uses that reduce demand for automobile travel, and encourage alternate modes (transit, bicycling, walking). These include changes in zoning codes that would encourage the development of a more compact urban form and emphasize development in more easily serviced corridors.
- **Encouragement of Neo-Traditional Neighborhood Development (NTND)** (TRAFIX/TEMS, 1994)
Measures that encourage greater densities of housing and usage of alternate modes, and allow for a greater mix of uses. These mainly consist of changes to zoning codes to allow more diverse, higher density development. These are also known as Traditional Neighbourhood Development and Transit Friendly Development.

References

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EVALUATION CRITERIA

In parallel with the identification of TDM measures, the literature review also produced a listing of the criteria that have been used to evaluate TDM measures. What follows is a synthesis of these criteria. The listings in parentheses following each measure indicate the literature source.

- **Performance of Current TDM Activities** (Turnbull *et al*, 1990; Apogee Research, Inc., 1994)
The current performance of any TDM measures that are already in place. This allows planners to see what has worked in the past, and make informed decisions based on that information. (Note: This criteria applies only to possible expansions of existing measures, not to completely new ones.)
- **Potential for Impact** (Turnbull *et al*, 1990; TRANS Committee, 1994; TRAFIX/TEMS, 1994)
The potential that a measure has to change travel demand. Potential impacts would be measured on a qualitative scale, such as high, medium, low and negligible. This would be based on factors such as capacity that the measure could produce, and the number of people who are likely to be affected by it.
- **Marketing Potential** (TRAFIX/TEMS, 1994)
The marketability of the measure to the travelling public. This would be measured in terms of how difficult it will be to market the attractiveness of each measure.
- **Costs** (Turnbull *et al*, 1990; TRANS Committee, 1994; TRAFIX/TEMS, 1994; Transport 2021, 1993)
Both the short-term and amortized capital costs, as well as the long-term operating costs. Lower capital and operating costs are both favored, since funding is scarce for construction as well as for operation.
- **Acceptability** (Turnbull *et al*, 1990; TRANS Committee, 1994; Transport 2021, 1993)
The acceptability of the measure, both to the general public, and to planners and political decision-makers. This would include whether the measure fits in with existing regional plans, and whether the public will find the measure unacceptably disruptive.
- **Feasibility/Implementability** (Turnbull *et al*, 1990; TRANS Committee, 1994; TRAFIX/TEMS, 1994; Transport 2021, 1993)
The difficulty involved in implementing the measure, from a technical, financial and social point of view. Also the legislative requirements that would need to be met, as well as the degree of coordination that would be required among different agencies. Measures that are financially, technically and politically easier to implement would score better.

- **Benefits to Users** (TRANS Committee, 1994; TRAFIX/TEMS, 1994; Transport 2021, 1993)
A relative measurement of the benefits that would be provided to users by each measure. These benefits could include reduced travel times, improved travel-time reliability, and reduction in travel costs.
- **Environmental Impacts** (TRANS Committee, 1994; TRAFIX/TEMS, 1994; Transport 2021, 1993; Apogee Research, Inc., 1994)
The relative degree to which each measure will positively or negatively affect the environment. Impacts include reduction in emissions, reduction or mitigation of land consumed by transportation infrastructures, reduction in energy consumption (particularly fossil fuel), and improved aesthetics.
- **Economic Impacts** (TRAFIX/TEMS, 1994; Transport 2021, 1993)
The economic benefits that will be realized by the implementation of this measure. This includes the value of infrastructures built, of reduction in travel times, and of reduction in emissions.
- **Time Frame** (TRAFIX/TEMS, 1994; Transport 2021, 1993)
The number of years that are required to implement each measure. This includes planning, approval, financing and construction. Measures which can be implemented more quickly are more desirable.
- **Benefits to Transportation System** (Transport 2021, 1993; Apogee Research, Inc., 1994)
Relative benefits that will be provided to the transportation system itself. These include greater efficiency, congestion reduction, increases in passenger throughput, reduction in VkmT, and reduction in number of trips.

In addition to the criteria that are listed above, a number of criteria were developed to assess the suitability of various TDM strategies to the National Capital Region (TRAFIX/TEMS, 1994). These criteria need to be looked at both in terms of the TDM measures that are being considered, and in terms of the characteristics of the National Capital Region. They are presented here in addition to the general criteria, to provide a more complete listing of the characteristics that need to be considered.

- Metropolitan area population
- Geographics
- Jurisdictions
- Degree of urbanization
- Investment potential
- Public acceptability of measures
- Enforcement / compliance
- Potential public & private transportation network characteristics

References

Turnbull, K.F.; Pratt, R.H.; Kuzmyak, J.R.; Schreffler, E.; 1990, "Development of a Short-Range Travel Demand Management Program: The I-35W Experience"; *Transportation Research Record*; Vol. 1280; pgs. 30-38.

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APPENDIX C1
REPORT ON THE FOCUS GROUPS

APPENDIX C2
REPORT ON THE WORKSHOPS

**Transportation Demand Management for
Interprovincial Travel in the
National Capital Region
Report on the Focus Groups**

Introduction

One of the most important steps in evaluating the proposed TDM measures was the consultation process. This involved two distinct stages: focus groups with members of the general public, and workshops conducted with representatives from community organizations and government agencies. This report provides an overview of the process and results of the focus groups, which were held to determine the public acceptability of some potentially controversial measures.

Description of the Focus Groups

Four focus groups were held in early June, two each for both English and French speaking members of the public. Although this language breakdown was intended mainly to simplify administering the focus groups, it also resulted in a de facto geographical separation. The focus groups were performed by RANA Process Technologies Limited. RANA ensured the participation of a representative sample of the population, in order to obtain valid results. The focus groups included commuters using a wide variety of modes: public transit, private car, carpoolers, cyclists, and pedestrians.

The focus groups were conducted by Ronald Desroches, an experienced facilitator from RANA, with the consultant available for technical help. The focus group participants were presented with six of the twelve TDM measures:

- Local ridesharing programs
- Conversion of existing bridge lanes to HOV lanes
- Congestion pricing on bridges
- Parking management
- Congestion bypasses at bridge approaches
- Transit priority at traffic lights

Only these six measures were presented in order to reduce the complexity of the focus groups. Certain measures, such as ridesharing, were presented in order to check their apparent popularity, while others, such as congestion pricing and lane conversion, were presented in order to get reaction to their controversial nature.

The comments that were made over the course of these focus groups were recorded by the facilitator as they were made. Participants were asked for the perceived advantages and disadvantages of each measure, and were also encouraged to make

suggestions for improvement. The results of these discussions were quite interesting and helpful, and RANA's report on them is included as Appendix 1.

In order to obtain a qualitative analysis of participants' opinions of the various measures, a Pareto vote was taken for each group. Under this system, participants are asked to vote for their three favorite TDM measures, giving their first choice a score of 3, their second choice a score of 2, and their third choice a score of 1. The scores are then added up for each measure, to provide a ranking of all of the measures. Participants were asked to score the measures both for their individual preference and for their perceived contribution to the common good. Although this process is by no means objective, if enough people participate in the voting process, then the aggregate results provide a reasonably accurate measure of public opinion. Almost 50 people participated in these focus groups, which means that the aggregate Pareto scores should provide an accurate representation of public perception of the TDM measures. The Pareto vote results for the individual focus groups are shown in Tables 1 - 4, while the synthesis of the voting is shown in Table 5.

Table 1: Pareto Vote for First English Focus Group (1995/06/06)

| Measures | Preferences | |
|--|-------------|----------------------------|
| | Individual | Related to the Common Good |
| Local Ridesharing Programs | 18 | 15 |
| Conversion of Existing Lanes to HOV Use on Bridges | 12 | 11 |
| Congestion Pricing | 3 | - |
| Parking Management | - | 1 |
| Congestion Bypasses Near Bridges | 15 | 15 |
| Transit Priority Light Cycles | - | - |

Table 2: Pareto Vote for First French Focus Group (1995/06/07)

| Measures | Preferences | |
|--|-------------|----------------------------|
| | Individual | Related to the Common Good |
| Local Ridesharing Programs | 15 | 14 |
| Conversion of Existing Lanes to HOV Use on Bridges | 10 | 12 |
| Congestion Pricing | - | 3 |
| Parking Management | - | - |
| Congestion Bypasses Near Bridges | 14 | 11 |
| Transit Priority Light Cycles | 27 | 26 |

Table 3: Pareto Vote for Second English Focus Group (1995/06/08)

| Measures | Preferences | |
|--|-------------|----------------------------|
| | Individual | Related to the Common Good |
| Local Ridesharing Programs | 15 | 25 |
| Conversion of Existing Lanes to HOV Use on Bridges | 23 | 15 |
| Congestion Pricing | 4 | 1 |
| Parking Management | 5 | 7 |
| Congestion Bypasses Near Bridges | 13 | 12 |
| Transit Priority Light Cycles | - | - |

Table 4: Pareto Vote for Second French Focus Group (1995/06/12)

| Measures | Preferences | |
|--|-------------|----------------------------|
| | Individual | Related to the Common Good |
| Local Ridesharing Programs | 15 | 14 |
| Conversion of Existing Lanes to HOV Use on Bridges | 4 | 4 |
| Congestion Pricing | 1 | 1 |
| Parking Management | 1 | 1 |
| Congestion Bypasses Near Bridges | 1 | 1 |
| Transit Priority Light Cycles | 8 | 9 |

Table 5: Synthesis of Pareto Vote Results

| Measures | Preferences | |
|--|-------------|----------------------------|
| | Individual | Related to the Common Good |
| Local Ridesharing Programs | 63 | 68 |
| Conversion of Existing Lanes to HOV Use on Bridges | 49 | 42 |
| Congestion Pricing | 8 | 5 |
| Parking Management | 6 | 9 |
| Congestion Bypasses Near Bridges | 43 | 39 |
| Transit Priority Light Cycles | 35 | 35 |

The Pareto votes show some results that were expected, such as the popularity of ridesharing, and the unpopularity of congestion pricing and parking management. However, some of the results were unexpected, particularly the popularity of the conversion of regular traffic lanes to HOV use. Questions can be raised about the validity of the results, but in the end there is really no choice but to accept these preferences at face value, and attempt to integrate them into the evaluation process. Overall, the results of the focus groups were quite interesting, and provided valuable input into the study process.

**Transportation Demand Management for
Interprovincial Travel in the
National Capital Region
Report on the Workshops**

Introduction

One of the most important steps in evaluating the proposed TDM measures was the consultation process. This involved two distinct stages: focus groups with members of the general public, and workshops conducted with representatives from community organizations and government agencies. This report provides an overview of the process and results of the workshops, which attempted to achieve consensus as to which measures should be pursued and which should be discarded.

Description of the Workshops

Two workshop sessions were organized, the first for representatives of community organizations, the second for representatives from various government agencies. The workshops were intended to gather informed opinions about the measures, from representatives with a demonstrated interest in transportation issues. It was felt that between these two groups, it would be possible to determine which measures would be the most politically and socially acceptable.

Workshop I - Community Organizations

More than thirty English and French organizations were invited to send representatives to the first workshop, which was held the night of July 28. Approximately fifteen indicated that they intended to send someone, and in the end, eight participants attended, representing seven organizations:

- Association des Citoyens pour le Transport et l'Environnement (ACTE)
- Association des Résidents des Hautes Plaines
- Auto-Free Ottawa
- Citizens for Safe Cycling
- City of Ottawa Environmental Advisory Committee
- Federation of Ottawa-Carleton Citizens' Associations
- Greater Ottawa Ecology

Four of the representatives were from organizations from the Ontario side of the river, three were from the Quebec side, and one represented interests on both sides. In addition, two members of the steering committee were present as observers, but did not participate in the discussion.

Following introductions and preliminary activities, the consultant presented the TDM measures for discussion. During the course of these discussions, a number of general comments were made about the TDM concept, the focus of this study, general travel problems in the region, and the consultation process itself:

- A few people challenged the entire concept of TDM in the National Capital Region, saying that there were more pressing transportation issues that needed resolution. It was felt that the road network itself was incomplete, and needed to be finished before any TDM measures should be implemented. TDM was seen as a band-aid solution, that would cover up and lessen problems, but never truly solve them.
- One representative felt that commercial traffic was the real problem, and that it should be solved before passenger traffic is even considered.
- Some felt that this type of consultation process was outdated, and should be replaced with a more open process, where citizens were consulted from the beginning, with planners and engineers used as resources to achieve the goals articulated by the community. In general, it was felt that more citizen input was needed at an earlier stage. It was suggested that the internet or the OC-Freenet could be used to aid this process.
- It was mentioned that an increasing number of people, such as consultants, need to use their cars on a regular basis throughout the day, and they should not be unfairly punished for this.
- One representative mentioned that although the majority of the cross-river bridges were built by Public Works Canada, that agency was not represented anywhere in this study, either on the steering committee or in the consultation process.
- Many people felt that it was necessary to have a true feel for the regional transportation demand before any plan was undertaken, so that the proposed measures could be evaluated in the context of the total regional travel needs.

As each of the TDM measures were presented, a lively debate was generated about the merits of each one. These discussions were quite constructive, and the input provided was very helpful in prioritizing the measures. What follows is a listing of the comments generated by each measure:

- **Ridesharing programs**
 - Consider ridesharing outside of work-hours (for social or cultural events).
 - Does the NCR have the critical mass of people and worksites necessary for successful ridesharing?
 - Consider using the internet or the OC-Freenet as an extra tool for rideshare matching.
- **Preferential HOV parking at worksites**
 - If use of HOV parking increases the real supply of parking spaces, then some spaces need to be removed from use, or else this will only encourage more driving.
 - Incentives could also be put in place at the non-work locations (shopping, cultural).
- **Voluntary employer-based incentives**
 - There was doubt as to effectiveness, but the idea itself was liked.

- **Park & Ride facilities**
 - The STO has already started to build these on the Quebec side of the river.
- **Parking management**
 - It is important that business-people who drive in the course of the day not be unfairly punished by this.
 - Short-term parking (2 1/2 - 3 hrs) should be encouraged, while long-term parking (all day) should be discouraged.
 - Allow for reduction in mandated minimum number of parking spaces.
- **Congestion bypasses for HOVs at bridge approaches**
 - Attempts should be made to devise an electronic solution to this, in order to minimize the amount of new pavement construction necessary.
- **Conversion of existing lanes to reserved HOV lanes**
 - Enforcement is a major issue, particularly in the hazy jurisdictional area of the interprovincial bridges.
 - Possibility of having an HOV-only bridge, or a bridge that was completely reversible with one lane completely HOV.
- **Government supported incentives**
 - Incentives must be based on citizen consultation and input, or they will not be successful.
- **Congestion pricing on bridges**
 - Suggestion of making one bridge free for HOVs, and selling the excess capacity to SOVs
- **Improvements to the public transit system**
 - It was felt that a number of improvements were possible to improve public transit in the region.
 - More buses and higher frequencies.
 - Better connectivity and coordination between the two public transit systems.
 - Better regional connectivity, with more service to popular destinations and through-routing of cross-river lines.
 - Possible extension of transitway service across the river and through Hull.
 - Provide better transit access for the elderly, those with packages, or with young children (possibly paratransit or low-floor buses).
 - Include cost of transit pass in property taxes, so that all residents will automatically have a pass (this is done somewhere in Colorado).
- **Operational priority for transit at traffic lights**
 - Possibly also give some sort of priority or advance cycle for pedestrians and cyclists.
- **Information and Education Program**
 - Could be done in schools.
 - Need training for planners and engineers, to teach them how to listen to citizens and incorporate their ideas into the planning process.

At the request of the participants, three measures were added to the list. It was felt that certain concepts were missing from the study process, and needed to be included:

- **Improve network and infrastructure for alternative modes**
 - Improve infrastructure for bicycles and pedestrians.
 - Create more good bicycle lanes
 - Possibly provide better bicycle lane clearance during the winter.
 - Implement paratransit modes, such as jitneys, collective taxis, or a cross-river shuttle buses.
 - Improve ability to transfer between alternative modes and public transit.
 - Better bicycle parking facilities.
 - Allow carrying of bikes on buses (inside or outside)
- **Land-use management**
 - Design an urban form that is less dependent on private cars, and more transit and alternative mode friendly.
 - Encourage developments near major transit hubs, and discourage development in the outer areas of the region.
 - Ensure that this type of land-use planning is included in the regional master plan currently under revision.
- **Resident-assisted transportation planning**
 - Involve citizens early in the process, so that planning is done according to their wishes and desires, not just those of the government.
 - Planners, architects, and engineers act as a resource to accomplish the goals of the citizens, but do not make the main decisions.
 - Care must be taken to ensure that no single interest group takes control and corrupts the process.

Once the discussion of the TDM measures was complete, the workshop participants were presented with the results of the focus groups that had been held previously. There was some concern that presenting these results would bias the results of the workshop itself. In the end, it was decided that since the goal of the workshop was to achieve consensus on which measures to implement, it was important that the participants know the opinions of the general public.

Once all the data had been presented, it was necessary to find some way of agreeing on which measures should be pursued in the near future. To do this, the workshop participants were asked as a group to consider each measure in terms of its potential impact, and the schedule on which it could be implemented. They were then asked, again as a group, to assign each to one of four groups, with Group I indicating that the measure could be implemented quickly and would have a large impact, down to Group IV indicating that it would be difficult to implement, and would have a low impact. Based on this process, the following priorities were developed:

Priorities

(according to scheduling and impacts)

| | |
|-----------|---|
| Group I | <ul style="list-style-type: none"> • Ridesharing programs • Preferential HOV parking at worksites • Park & Ride facilities • Congestion bypasses for HOVs at bridge approaches • Conversion of existing lanes to reserved HOV lanes • Operational priority for transit at traffic lights • Information and Education Program • Land-use management • Resident-assisted transportation planning |
| Group II | <ul style="list-style-type: none"> • Voluntary employer-based incentives • Parking management • Congestion pricing on bridges • Improvements to the public transit system • Improve network and infrastructure for alternative modes |
| Group III | <ul style="list-style-type: none"> • Government supported incentives |

These priorities were developed on a consensus basis, meaning that it was necessary that each participant in the workshop agree to the ranking that each measure was given. These ranking were meant to take into account both the opinions of the individuals present, the collective opinions of the groups they represented, and the opinion of the general public as represented by the results of the focus group. As can be seen, no measure was put into Group IV, indicating that no measure stands out as being particularly bad. Once these results were obtained, the workshop was complete, and the participants were thanked for their time and input.

Workshop II - Government Agencies

A second workshop was held the morning following the first workshop, on July 29. Participants included representatives from various municipal agencies in the NCR, as well as members of the steering committee. The purpose of this workshop was to take the results of all the previous TDM research and consultation, and develop a consensus as to which measures should be recommended in the action plan.

All the representatives present at this workshop were already familiar with the measures under consideration, so it was not necessary to present the measures themselves. Instead, the first part of the workshop consisted mainly of a discussion of the previous consultation results, including the Pareto scores from the focus groups and the comments

from the workshop the night before. In addition, the three newly added measures were presented to the participants, so that they could include them in their evaluation process.

The second part of the workshop consisted of a presentation of the priorities that were developed during the first workshop, and discussion of them. Based on this discussion, the results of the previous TDM research and consultations, and the experience and knowledge of those present at this workshop, a new list of TDM priorities was developed. These priorities were grouped in a similar fashion as the previous list, and again, no measure was placed in Group IV:

Priorities

(according to scheduling and impacts)

| | |
|-----------|--|
| Group I | <ul style="list-style-type: none"> • Ridesharing programs • Preferential HOV parking at worksites • Park & Ride facilities • Congestion bypasses for HOVs at bridge approaches • Conversion of existing lanes to reserved HOV lanes • Operational priority for transit at traffic lights |
| Group II | <ul style="list-style-type: none"> • Voluntary employer-based incentives • Parking management • Government supported incentives • Improvements to the public transit system • Information and Education Program • Improve network and infrastructure for alternative modes • Land-use management • Resident-assisted transportation planning |
| Group III | <ul style="list-style-type: none"> • Congestion pricing on bridges |