

“Transportation Demand Management: Past, Present and Future”

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Abstract

Sustainable mobility has not always been part of the site development process. We used to look at transportation demand through a traffic impact assessment lens; analyzing how many cars would be accessing a site and how it would impact the level of service on existing streets. Now, transportation demand management (TDM) programs and initiatives are a key component of site-level analysis and are frequently used to reduce the number of trips by single-occupancy vehicle. What does the future hold for site-level TDM - what can we do to continue reducing traffic impacts?

This presentation will describe current, cutting-edge TDM measures being used to manage transportation demand in a proactive way, drawing on the example of Lansdowne Park in Ottawa. MMM Group was retained by the City of Ottawa to carry out a comprehensive community transportation study and to develop transportation operational plans for the redevelopment of Lansdowne Park, a facility in the downtown core that is home to Ottawa’s CFL football team and hosts special events of up to 40,000 attendees. The recommended transit and shuttle services were fully implemented as part of the first CFL season at the new Lansdowne Park, and were paired with a customized marketing and communications program. We will describe how this unique, comprehensive and proactive TDM Plan was created and implemented to achieve a game-day transit/shuttle mode share of more than 50%. We will demonstrate how the integration of services and program delivery is successfully being used to increase the use of sustainable modes and reduce traffic impacts within the existing community.

The presentation will conclude with a vision of the future of TDM at the site level. Building on the current best practices employed by Lansdowne Park, we will present TDM 2.0 – a more user-focused approach to managing transportation demand and encouraging behaviour change, using technology, partnerships and customization to better meet the needs of individual users.

Introduction

What is Transportation Demand Management? It is essentially:

- A tool used to influence travel demand through the encouragement of alternative modes of transportation and reduce the number of single occupancy vehicle (SOV) trips made for utilitarian purposes.
- A method which more efficiently uses the existing transportation network.

TDM has been part of North American travel for over 100 years. It has evolved from sharing rides to formal car pool programs and onto a wide range of social marketing to encourage behavior change. Below is a summary of the evolution of TDM.

Year	Description
1914	Jitney services were introduced in Los Angeles as a recession began, allowing car owners to off-set the cost operating their cars by taking on passengers along Streetcar routes. The term jitney came from the five cent fare (a Jitney) that was charged, which was the same as the streetcar fare.
1941	Prior to the United States entering World War II, rationing, including petroleum, was already underway. While ridesharing was promoted heavily, the level of use is not known as there is virtually no data available.
1970's	The Oil and Energy Crises resulted in shortages and rationing of gasoline which led to the promotion of carpooling. The Federal government allowed state governments (for the first time) to use highway funds for rideshare demonstration projects.
1990 - 2000's	Proliferation of online ridematching services which has increased the use of carpooling.
1990 - 2000's	Development of programs to support and promote TDM and professionals providing services to encourage the use of sustainable modes and reduce the number of vehicular trips.

As TDM has evolved, so has how it is applied. Encouraging sustainable mobility is now included in new developments, schools, worksites, online, etc., reaching a wider audience. There are a number of programs which are being used to encourage this, including:

- The creation of transportation demand management (TDM) positions and programs within municipalities, regional transportation agencies and other levels of government;
- The development of individualised travel planning programs for households;
- The development of workplace programs to encourage the use of sustainable modes (initially it was mainly car and van pools and transit) for their daily commute or alternative work schedules and arrangements;
- On-line ridematching programs that include transit, walking and cycling buddy connections, travel tracking as well as car pool matching; and
- Creation of Transportation Management Associations which bring together information on travel options and provide support for workplaces and their employees.

How TDM is being applied to New Developments

Some would argue that TDM is not being applied to new developments and that potential transportation analysis is based on anticipated travel demand and measures that include proximity to transit, on-site secure bicycle parking, locker and shower facilities for workers and little requirement for the development and implementation of a site-specific TDM Plan. Others would say that having infrastructure for sustainable modes is sufficient and that the adage – “if you build it, they will come” will prevail. What should we be doing and has TDM been successful at specific sites?

At the municipal level, there are both long-term and short-term approaches to including TDM within the development process. Inclusion of policies in official plans, community plans, secondary plans and transportation master plans that require TDM be applied at a macro and micro level has been occurring for a number of years. Most municipalities have included TDM policies within their land use plans, however, they are often high level and generally require that TDM be supported or a TDM Plan or Program be developed. For example, Halifax Regional Municipality recently updated its Regional Municipal Planning Strategy and the following (and only) policy related to TDM was included:

T-1

The Halifax Transportation Demand Management (TDM) Functional Plan (June 2010) shall provide guidance for future strategies and programs to further the transportation objectives of this Plan

Other municipalities have developed policies that have a more directed approach to implementing TDM programs and reducing automobile dependence. York Region’s Official Plan states:

Policy 7.1

7. To require new development applications to demonstrate how the proposed development is transit-oriented. The York Region Transit-Oriented Development Guidelines provide guidance on how to address this policy.

8. To work with developers to provide all new-home buyers with information on available pedestrian, cycling and transit facilities and carpooling options within the community, including local transit routes and schedules.

9. To require that new institutional, commercial and industrial development applications include a Transportation Demand Management strategy that considers preferential carpool parking, bicycle facilities, employee transit passes and alternative work arrangements.

10. To work with institutional, commercial and industrial employers to undertake Transportation Demand Management strategies to encourage preferential carpool parking, bicycle facilities, employee transit passes, and alternative work arrangements.

The transportation master plans which municipalities develop provide policies related to TDM programs, activities and trip reduction targets. For example, the City of London’s

TMP looks at mobility and sustainability with an overall objective of providing more options for residents and reducing automobile usage. Within section 3.2, within Direction 1: Strengthening Policy Support of *Smart Moves: A New Mobility Transportation Master Plan for London*, the following is stated:

Integrating TDM within the City's development review and approval process is also important for facilitating sustainable travel.

However, these and other policies are still vague. Policies that require the drafting of a TDM plan for development applications and include monitoring and implementation of activities are required to ensure that the application of TDM to the development approvals process results in real change. To demonstrate how a site can support and implement TDM measures, the Lansdowne Park revitalization included a TDM plan, which will be described below.

Case Study – Lansdowne Park

Brief History

Lansdowne Park is located along the Rideau Canal, an UNESCO World Heritage Site, just south of downtown Ottawa. The site was acquired by the Ottawa Agricultural Society in the 1860's for agricultural fairgrounds as it was located outside of the urban section of the City. Over the next 40 years several changes occurred including:

- The site being named Lansdowne Park;
- The Ottawa Electric Railway extending south down Bank Street;
- The construction of the Queen Elizabeth Driveway (along the Canal, abutting Lansdowne Park); and
- The purchase of the site by the City of Ottawa.

Further changes occurred when the Department of National Defence took over the site during both world wars; after which, it was returned to civilian use. Lansdowne's heyday was during the 1950's and 1960's with a lot of activity and the construction of Frank Clair Stadium. However, by the 1970's, buildings were removed to make way for more parking, which was seen as the beginning of the decline for the park. With the failure of two Canadian Football League (CFL) franchises, activity decreased with only the Ontario Hockey League team – the Ottawa 67's, trade shows and the Central Canada Exhibition (which left after the 2010 fair) using the site.



With the decline of the site, the City of Ottawa entered into a partnership with a group of businesses (Ottawa Sports and Entertainment Group (OSEG)) to redevelop Lansdowne

Park. The group had been awarded a new CFL franchise, and intended to have the new team play at Lansdowne, where football had been played for decades. Despite some setbacks and legal challenges, the mixed-use development, urban park and stadium construction was initiated in 2012. The revitalization of the park was a model of an urban form where people can walk, cycle and enjoy various on-site amenities without having to use their personal vehicles to access the site.

Transportation at Lansdowne

As part of the overall transportation planning for the site, three operational plans were developed. The intent of the plans was to mitigate the impacts of the new development on the surrounding community, to alleviate the concerns over traffic volumes and speeds, parking and noise which could impact the quality of life for the residents.

Three operational plans were developed to mitigate transportation issues – Transportation Demand Management Plan, Transit and Shuttle Service Plan and Traffic and Parking Management Plan. The three plans contain detailed strategies to create programs and provide services to encourage the use of transit and shuttle services for large events; parking and traffic management plans and programs and services within the TDM Plan to encourage the use of sustainable modes.

The Transportation Demand Management Plan

The Transportation Demand Management Plan (TDM Plan) focuses on the delivery and encouragement of sustainable transportation options to workers, residents and visitors to the site for both special events and daily activities. As a mixed use development, the TDM plan provides options for those who will work and shop in the stores and offices, for the residents of the condominiums and the visitors to the park for sporting events and other activities. It provides a unique opportunity to integrate sustainable transportation programs into the development, from the early stages of planning. This can reduce the potential impact of movements to and from the site and create a sustainable community that can be showcased as a model elsewhere in Ottawa and across the country. The institutionalization of a formal TDM program as part of the Lansdowne Park Revitalization was deemed necessary to ensure continued use and future growth in the proportion of travelers choosing sustainable travel modes.

Key to the achievement of the goals of the transportation plans is the ongoing development and support for TDM programs and their coordination, marketing and monitoring. To accomplish this, the TDM Plan included a requirement that an individual be hired and located on-site to undertake the ongoing role and responsibility of a TDM Coordinator who would focus on developing the TDM programs and ensuring their long-term success.

The types of programs that will be available have been separated into three areas – Household, Workplace and Special Event Programs and Services. As there will be residential units onsite, household TDM programs were developed to encourage residents to use modes such as transit, car-share, carpools, cycling and walking. To encourage the use of transit, the initial purchasers of each condominium unit will be

provided with one pre-paid annual transit pass. After one year, it is hoped that a significant number of the residents will continue to use it for their travels. The residents will also be encouraged to purchase passes for other family members. Individualised travel planning programs are also recommended to be implemented for the residents to provide them with information and support that is tailored to their unique needs and lifestyles. Research has indicated that individualised travel planning results in a greater likelihood of participants switching their mode of travel and changing travel behaviours. The earlier that these programs are initiated, the more likely the use of sustainable options will occur, resulting in the private automobile not being the presumed mode of choice for these households.

Encouraging workers to use sustainable modes will also be part of the long-term plans for Lansdowne. The introduction of retail and office space to the site will result in more people using the transportation network during peak travel times. As the site will cater to a number of businesses the TDM Plan set out a framework for developing a Transportation Management Association (TMA) to provide programs, support and information to those working on the site. Of particular concern, is the variability in the hours for businesses on site, which could lead to an increase in the level of automobile use. Initially the TMA would be led by the TDM Coordinator with membership consisting of representatives from businesses, who in turn would be able to provide coworkers with information about sustainable travel options. It is hoped that by being proactive the modal shares that were identified in the Transportation Plan (as shown in the table below) will be attained.

Modal Split Targets

	Retail	Office
Private Vehicle	50%	45%
Transit	15%	20%
Non-motorised	25%	25%

Workplace travel behaviour can be influenced through the availability of carpool programs and priority parking; discounted travel passes; and end-of-trip infrastructure such as showers, secure bicycle parking and locker rooms.

For those visiting the site for daily activities, information can be made available to them to encourage the use of sustainable modes. The community expressed concern over potential increases in traffic and on-street parking in residential areas as a result of the new uses on the site. Therefore, providing information on how to travel sustainably to Lansdowne in order to discourage the use of the private automobile and ensuring the reduction in the volumes of traffic in the area.

Lansdowne has long been a venue for special events of all types and sizes. There has been hockey and football as well as trade shows and concerts over the years. With the renovations at the stadium, improvements to the arena, and the creation of the urban park, special events will continue to be held at Lansdowne which require careful planning for bringing people to the site and ensuring they get home efficiently and with the least amount of impact on the surrounding neighbourhoods. To accomplish this, a

number of transportation options were introduced to decrease the number of people driving to the area and increase the use of sustainable modes.

Accommodating the various types of special events that could take place at Lansdowne required planning that involved a number of modes to alleviate traffic and parking concerns. Below is a table outlining the transportation services for events of different sizes, as well as day-to-day activities.

Transportation Services for Various Event Attendance Levels

Transportation Service	Day-to-Day	Arena Events	Stadium Events		
		less than 10,000	less than 15,000	15,000 to 25,000	40,000
Transit Service	Routes 1&7 with minor increased service	Additional service on Route 1 extended to Hurdman		Supplementary service on regular route network (as required)	
				Special services focused on suburban Park & Ride lots (like 400 series to Scotiabank Place)	
Satellite Parking Requirements	No requirement		Parking at Carleton University with supplementary service on Route 7 (Carleton to Lansdowne)	Parking at Carleton University, Canada Post and Vincent Massey Park	Parking at Carleton University, Confederation Heights, City Hall and new Trade Show Centre, etc (More than 3,500 spaces)
			(up to 500 parking spaces)	(500 to 3,500 spaces)	
Shuttle Service	No requirement		Special shuttle services to Lansdowne		

To encourage the use of sustainable modes, the costs of the transit service; shuttle and satellite parking services; and the temporary bicycle parking are included in the price of a ticket to an event at the park, ensuring that the cost is not borne by the users and increase the modal share toward these services. Providing enhanced transit and shuttle services will reduce the need and/or desire to travel by private car. The services were designed to efficiently move people to and from the site. Enabling event attendees to safely travel to and from the site via active modes was also an important part of the plan. The site is located next to pathways and walkways that can encourage the use of sustainable modes. Over time, improvements to the cycling network and a bridge connecting the Old Ottawa East community (east of the site and the canal) to the west side of the canal will be constructed enabling this community direct access to Lansdowne and the Bank Street business area.

The provision of services was supported by no parking being provided to the attendees of an event, unless pre-purchased in advance. The number of spaces is limited to 500.

The modal share targets for special events of 24,000 are shown below.

Modal Share Targets

Mode	TDM Share Targets	
	Person Trips	Modal Share
Shuttle	8,800	36%
Transit	4,800	20%
On-Site Parking	1,400	6%
Cycling	700	3%
Walking	2,100	9%
On-Street Parking	6,200	26%
<i>Total Target</i>	<i>24,000</i>	<i>100%</i>

(From: the Transit and Shuttle Services Plan. 2011)

Another plan was created to outline the transportation monitoring program for Lansdowne. The goal of the Monitoring Plan was to oversee the implementation of the various programs and determine how effective they are shifting travel to sustainable modes. The overall modal shares are currently still being determined; however the utilization of both the shuttle and transit services has been calculated and is shown below. As shown, for every game, the combined modal share was a minimum of 52%, which indicates the plans were successful for large events (around 24,000 attendees)

Transit and Shuttle Ridership Modal Shares (2014 CFL Football Season)

Home Game	Shuttle Utilization	Transit Users	Combined Transit & Shuttle Modal Share
July 18	22%	33%	55%
August 2	19%	34%	53%
August 15	20%	34%	54%
August 24	19%	36%	55%
September 5	18%	40%	58%
September 26	17%	35%	52%
October 3	17%	38%	55%
October 24	15%	37%	52%
October 31	14%	41%	55%
<i>Average</i>	<i>18%</i>	<i>37%</i>	<i>55%</i>

(Courtesy of OSEG, 2015)

Promotion of sustainable transportation is an important part of the operational plans. For day-to-day activities and those living at Lansdowne, car sharing, carpooling, transit, cycling and walking will be identified and promoted to encourage the use of sustainable modes. The TDM Coordinator will develop and implement programs that will support the use of these sustainable modes to workers, residents and visitors. To further encourage the use of sustainable modes, a Transportation Management Association is to be developed to encourage the use of sustainable modes for commuting purposes and also providing information on variable work hours and telework.

Prior to the start of the 2014 football season, OSEG developed a program to encourage attendees to use one of the four options to travel to Lansdowne and to leave their cars at home. Below is an image of the information that was developed to promote these modes.



(From: OSEG website: <http://www.tdplace.ca>)

Future of TDM for Site-Specific Developments

TDM programs and activities while having some success have not always resulted in long-term changes in travel behaviour. While there is insufficient evidence to determine the success of TDM programs for new and revitalized developments, it may be safe to say that this could be true for site-specific TDM programs, such as those now being implemented at the Lansdowne Park site in Ottawa.

OSEG was required to hire a TDM Coordinator to oversee all the sustainable transportation programs on-site and implement the three operational plans developed to ensure that traffic and parking issues and concerns were addressed and mitigate any potential impacts. The Travel Demand Manager has been in place for over a year and this is a significant step to providing support and information to those accessing the site and something that is not typically part of a development such as Lansdowne.

A few years ago, when this was recommended, it would have been a big step forward – having an individual whose sole responsibility was to manage transportation issues, programs and provide information to visitors, workers and residents. Much of this would have been focused on what was available not what was needed. Now we are moving forward and needing to address the needs of the transportation system's users; understand their needs, fears, motivations and experiences; know where they go, when and why; and provide information in ways that can be easily accessed. This has changed the role of the coordinator.

To accomplish this, the development of user-centric products, such as smart phone apps, personalised programs and activities is required. Before these products can be developed, users are consulted about their needs and requirements through innovative consultation techniques adopted from the world of Service Design. Service Design has been hard to define as it involves a number of tools from a variety of disciplines. It is however, directed at developing services that will be user-centric. There are a number of definitions for Service Design. Below are a few from the book - *This is Service Design Thinking*:

Service Design is an emerging field focused on the creation of well thought through experiences using a combination of intangible and tangible mediums. It provides numerous benefits to the end user experience when applied to sectors such as retail, banking, transportation, and healthcare.

Service Design as a practice generally results in the design of systems and processes aimed at providing a holistic service to the user. (The Copenhagen Institute of Interaction Design, 2008)

When you have two coffee shops right next to each other, and each sells the exact same coffee at the exact same price, service design is what makes you walk into one and not the other. (31 Volts Service Design, 2008)

Quotes taken from: This is Service Design Thinking. Strickdorn and Schneider, 2010.

Determining user needs can be accomplished through a number of tools to assist in understanding the types of users, their needs, lifestyles and desires. A tool box can be created in which a number of the approaches can be defined and explained. Examples of some of the tools that can be applied to improving services include:

- Customer Journey Maps (a visualisation of a user's experiences – i.e. traveling to work)
- Contextual Interviews (undertaking interviews within the context that the service is occurring. It allows for observations to take place as well – i.e. at a train station)
- Storyboards (a series of pictures that show a series of events to show how a service may be used or implemented)
- Personas (profiles that are developed to represent a specific demographic – i.e. can define groups of people by where they live, age, lifestyle, family, etc.)
- Product Idea Testing (developing ideas for products collaboratively)
- Co-creation (the core of the Service Design approach. Involves a number of people working together to develop, innovate and improve a service – i.e. – collaborative consultation activities and workshops which include transportation users, service providers and decision makers). *(taken from: This is Service Design Thinking, Strickdorn and Schneider, 2008)*

Applying these tools will lead to an understanding of user needs at a particular location. This is beneficial in determining the services that will meet demand and result in the use of sustainable mobility options. Learning about the needs of the user can provide insight into the types of services that would be most beneficial to the users; enable programs to be created to provide information and support; and develop products that will be useful and usable to the users.

The question that needs to be answered is: what does this mean for a specific site, such as Lansdowne? The answer is: traffic issues can be mitigated; the user is put in the center and their needs are made the priority; reduction in the number of private automobiles accessing the site and in the surrounding community. For Lansdowne and other mixed use infill sites, learning about the users will ensure that the programs and plans are not only successful but accepted.

As Lansdowne evolves, there will be a need to go beyond the existing programs and provide residents, workers and visitors with more individualized and technology-enabled products and services. It is the next phase of TDM or TDM 2.0. TDM 2.0 includes more user-focused products, services and programs that will allow for the long-term use of sustainable transportation options and behaviour change by travelers of today and in the future (the Traveler of the Future picture below). Not only will TDM 2.0 be used by those accessing Lansdowne, but the surrounding community as well. Providing for unique applications of programs and services will ensure the long term effectiveness of a TDM program.



For Lansdowne, products can be developed that will address the transportation needs of the community. Such products could include real time updates on car and bicycle parking availability, transit service delays, car and bike share availability, and updates on personal and workplace travel plans. To accomplish this, technology is used and will incorporate design solutions to meet needs and lifestyles of the transportation system's users. By learning about the users through collaborative consultation techniques such as those described above, service providers can gain insight into the users and develop tailored solutions.

Traveling to Lansdowne can be made much easier through technology. Updates on buses running directly between suburban park and ride lots to Lansdowne will be

instantaneous and no one will miss a football game kick-off or the beginning of a concert. One provider (or entity such as the City of Ottawa, using technology can provide information about a variety of modes in real time to ensure that delays can be dealt with and other modes accessed. For example, if an individual is traveling to Lansdowne to shop along the Trillium Line and a delay occurs, the provider can alert the user to get off the train and take another mode such as a carshare vehicle located at the next station. It would be reserved for that person and then they can make their way to Lansdowne where a parking space will be available for them. Seamless travel would be enabled through technology and user-centred transportation services.

Conclusions

While the implementation of the TDM Plan is still in the early stages, there have been some successes. As we move forward, the use of the site-specific TDM plan for new developments will be an important component to the development approvals process. These plans will provide guidance, ideas and most of all, the requirement to have people on site that can implement, encourage and support the programs and those who are using them. Most of all, they need to be set out so that they can be implemented and monitored and not be just a policy or part of an assessment to show that the development will not have an impact on the surrounding neighbourhoods. We must do more than just “build it and they will come” if we are to see changes in the travel behaviour of residents, workers and visitors to these developments.

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