



Ottawa Light Rail

## Transforming Our Nation's Capital



Rideau



Campus



## The Benefits of Light Rail



**Ottawa Light Rail Transit Project**  
*Phase I - Tunney's Pasture to Blair Station*

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## Introduction

From its humble origins as a logging town, the City of Ottawa has grown into one of the largest cities in Canada. As our nation's capital continues to grow, we need to ensure that its growth is both economically sustainable and environmentally responsible.

For Ottawa, like any large city, long-term economic and environmental well-being will depend to a large degree on its transportation system. To be competitive economically and to reduce harmful emissions cities must ensure that people, goods and services can move freely and efficiently and that cleaner transportation options are both available and attractive to users.

It is clear that Ottawa is facing a transportation challenge. The existing transit system's ability to get people to and from the City's most popular and important destination—the downtown core—is already being pushed to the breaking point. There is just no room to put more buses on the downtown sections of the Bus Rapid Transitway.

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***This \$2.1 billion project offers much more than the solution to our long-term transit needs — it will also generate significant economic, environmental, cultural and social benefits for the people and City of Ottawa.***

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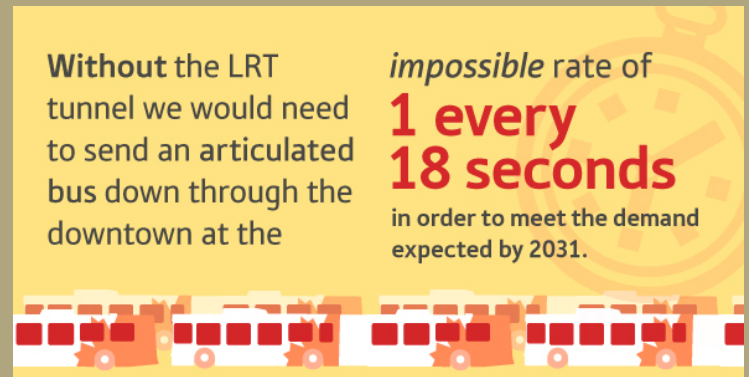
It is expected that the downtown part of the system will reach its limit by 2018. The quality of public transit in the downtown will deteriorate shortly after, with significant negative impacts on the system's overall reliability and ridership levels.

The City has been preparing to address this growing problem for several years, through the development of a long-term strategy known as the Transportation Master Plan (TMP).

Because of its growing impact on the reliability of the entire public transit system the first priority of the TMP is the elimination of the bottleneck that is impeding transit growth through the downtown core. To do this the TMP calls for a Light Rail Transit (LRT) system with a tunnel beneath the downtown to eliminate congestion on the streets above.

This major \$2.1 billion project is the best and most cost-effective solution to our long-term transit needs. It also fulfills many priorities set out in the City's vision for sustainability: generating significant economic, environmental, cultural and social benefits for the people of the City of Ottawa.

Based on Transit Services' *10-Year Transit Tactical Plan* and the OLRT *Updated Business Case* this booklet provides a summary of the many benefits that will be provided by the construction and implementation of the LRT project.



The City of Ottawa is a world leader in both public transit and pedestrian and cycling infrastructure.

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*To be competitive economically and to reduce harmful emissions, cities must ensure that people, goods and services can move freely and efficiently, and that cleaner transportation options are both available and attractive to users.*

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## Background

The current Bus Rapid Transit (BRT) system, which we know as the Transitway, consists of 47 kilometres of bus-only roads and bus-only lanes along the shoulders of major thoroughfares. This system was launched in 1983 and since 2001 has been complemented by the O-Train that runs along an eight-kilometre route between Greenboro and Bayview Stations. The system has provided excellent service for many years, allowing the City to achieve high levels of transit ridership. In fact, a greater proportion of people in Ottawa use public transit than in any other city of comparable size in North America.<sup>i</sup>



The O-Train now carries more than 11,500 people a day, nearly twice as many as expected when the line first went into service.

Today, however, the system is quickly becoming a victim of its own success. Public transit in the downtown area is approaching its capacity, leading to congestion problems and reliability issues, especially in the winter months.

This lack of transit capacity in the downtown area has been a topic of discussion for many years. In fact, the idea of a tunnel under downtown Ottawa was considered as long ago as 1915. A tunnel was looked at again when the Transitway was being developed in the 1970's and 80's, and has been discussed in successive TMPs since then.



Repeated consideration of a tunnel has been due to the recognition that eventually the City would need to find a way to keep rapid transit and other traffic from interfering with one another in the downtown core. This can only be achieved with a "grade-separated" system, where transit vehicles run above or below city streets. It is this same separation of transit from other traffic that has made the Transitway such a reliable and efficient system.

Realizing that the time had come to take a very serious look at applying this same logic to the downtown part of the transit system, and after extensive public consultation and support, Council approved plans for the Downtown Ottawa Transit Tunnel (DOTT) Planning and Environmental Assessment Study in November 2007.

The downtown  
Ottawa Transit  
Tunnel will be

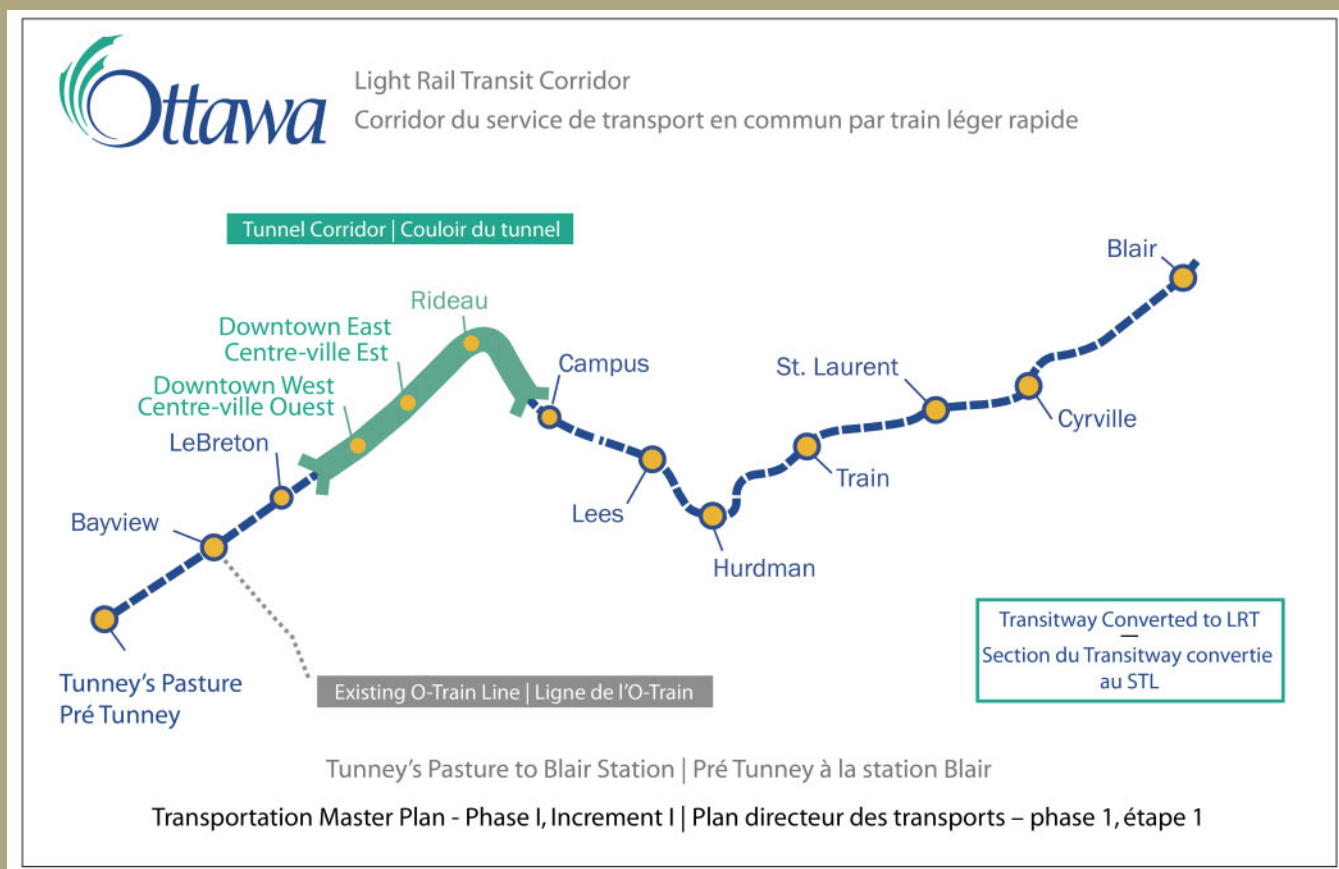
2.5  
kilometres long

2.5 km

The 2.5 kilometre Downtown Ottawa Transit Tunnel provide fast and reliable commuting independent of surface congestion.

This study, completed in the fall of 2009 and approved by City Council in January 2010, recommends that the City proceed with converting the Transitway from bus to light rail between Tunney's Pasture and Blair Road, with trains running through a 2.5 kilometre tunnel beneath the downtown core.

The system will feature high-capacity integration with local buses and Bus Rapid Transit (BRT) service, as seen in Toronto, Madrid, Paris and other leading cities around the world.

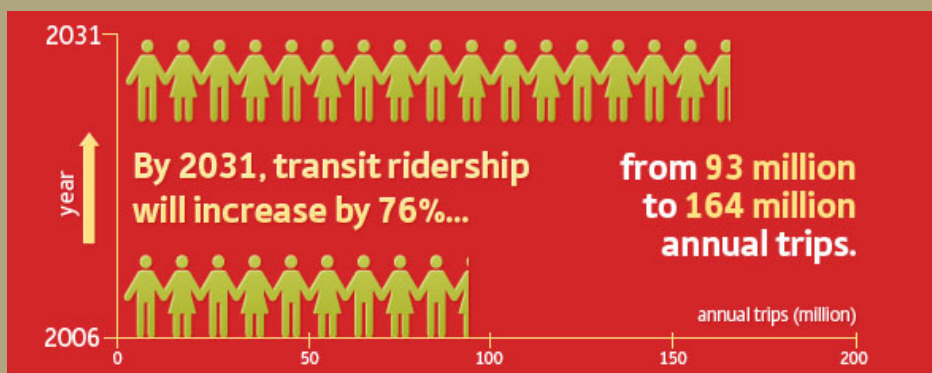




The LRT line has been designed to accommodate future growth, as city-wide demand increases.

## LRT - The Right Transit System for Now and the Future

By 2031 the City's population is projected to grow by 30 percent, with urban communities outside the Greenbelt projected to accommodate 68 percent of new residents and 42 percent of new jobs. This will place an increased demand on Ottawa's overall transportation system, especially during the morning rush hour. In order to avoid the projected future levels of congestion and their unacceptable implications for Ottawa's quality of life, the TMP sets an ambitious objective for 2031 of carrying 30 percent of motorized person-trips during the morning rush hour. Transit will carry 51 percent of motorized person-trips to and from Ottawa's Inner Urban Area.<sup>ii</sup> Coupled together, these factors are expected to increase overall transit ridership by 76 percent, from 93 million trips a year to 164 million trips a year in 2031.<sup>iii</sup>



This increase in ridership, which far exceeds the current capacity of the transit system, can be accommodated by adding LRT and the downtown tunnel to the system — a change that will allow the transit system to serve the City's transit needs for decades to come.





## Getting Where You Want To Go

While the introduction of LRT will certainly make travel in and out of downtown much more efficient, it will also lead to improvements in other parts of the City's transit system. Since public transit through the downtown will no longer have to compete with other traffic, the transit system as a whole will become substantially more dependable and reliable.

In addition, having three underground LRT stations in downtown Ottawa creates the potential for direct underground connections to major downtown office developments and other key downtown landmarks, further improving convenience and comfort. Improving transit connections to key destinations for both work and play contributes to the appeal of an underground LRT system.

The 12.5 kilometre East-West LRT line is designed with the potential for growth in mind. These design features will help to ensure expansion of the system, such as a future north-south LRT service that could include a direct connection to the airport from downtown, can be done as cost-effectively as possible.

LRT will not just accommodate more riders. Its combination of speed, comfort and reliability will also encourage more people to use public transit. Studies suggest the introduction of LRT will lead to a 9 percent increase in ridership; that means 4.6 million new trips in the first year alone.<sup>iv</sup> That number will rise to 34 million new trips a year by 2031 for a cumulative total of 156 million new trips.<sup>v</sup>

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### ***Saving You Time***

Although the current Transitway provides a high quality of service, growing congestion in the downtown area is affecting the reliability of the whole system. The congestion is not just the result of heavy traffic; buses travelling along the downtown Transitway have to deal with 14 sets of traffic lights. Getting rid of just that one constraint (there would be no traffic lights in the tunnel) will provide a major improvement in speed and cut several minutes from the time it takes to get into, out of, or through the downtown. As well, LRT running beneath downtown eliminates any conflicts with surface traffic, including pedestrian and cycling traffic. It also means drastically reduced weather-related delays. This is no small consideration for a frequently snowbound city like ours.



The underground LRT tunnel will allow rapid transit through the downtown, independent of surface traffic. With LRT, a 12-minute trip will take 12 minutes.

Right now, it's supposed to take 17 minutes to cross downtown by bus but because of congestion, it often takes 5 and even 10 minutes longer.<sup>vi</sup> Delays are too common and many people are already in the habit of allowing extra time for their trip. By avoiding the majority of the conditions that cause delays and congestion, LRT riders who travel across the downtown core will experience the largest time savings and can expect to save approximately 10-15 minutes from their daily commute. In addition to improved reliability, LRT offers another benefit for transit users: with the LRT system, every train is your train — no more waiting around for "your" bus.

Making transit faster, more reliable and increasing its capacity in the core adds up to a transit system that is more appealing, which in turn leads to increased transit ridership. Combined with zero-emission electric LRT, the projected increase in transit ridership offers a host of benefits, including environmental benefits that will be felt for generations to come.

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***The time savings OLRT will bring to Ottawa commuters will total more than \$1.5 billion by 2040.***

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Automobile users will also benefit from the introduction of the LRT. Transportation planning analysis indicates that there will be 13,750 fewer vehicles on the road, leading to substantial savings for automobile users.<sup>vii</sup>

By 2031, the OLRT project will result in total time savings of over 17 million hours for Ottawa commuters each year.<sup>viii</sup>

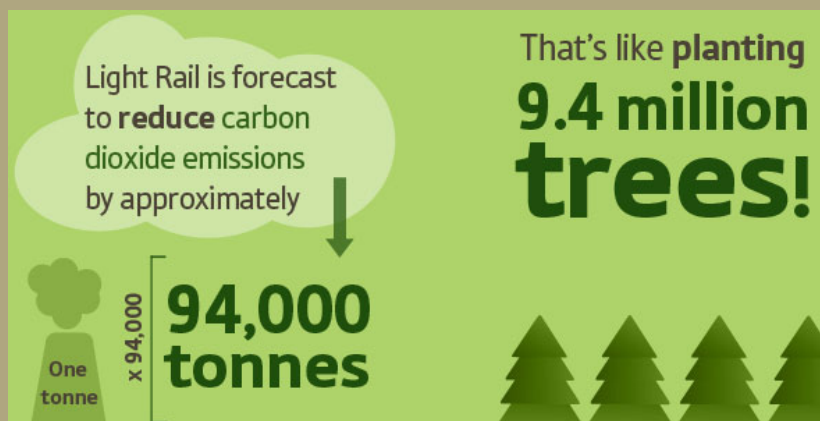


## The Environmental Benefits Greenhouse Gas Reductions

The transportation sector is a significant contributor of greenhouse gas emissions, in which automobiles are a primary source of emissions. The OLRT project will provide a great environmental benefit as it will reduce emissions of carbon dioxide, the major greenhouse gas, by approximately 94,000 tonnes in 2031. It will also reduce emissions of criteria air contaminants such as carbon monoxide, volatile organic compounds, nitrous oxides, sulphur oxides and particulate matter by approximately 4,600 tonnes in the same year. The monetary value of these environmental benefits has been reported at \$36 million annually.<sup>ix</sup>

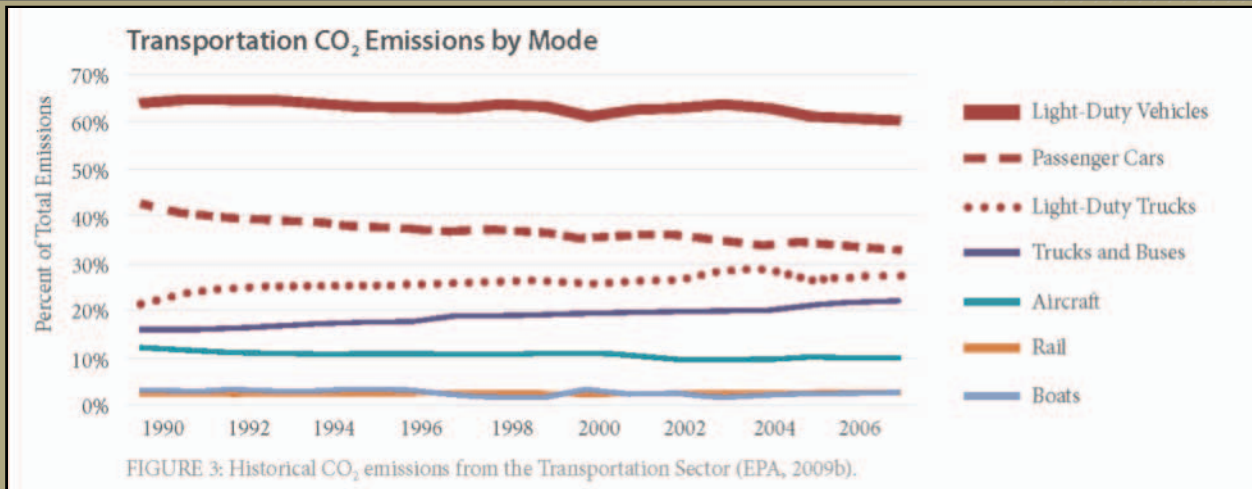
These benefits are achieved in two ways. First, by replacing diesel-fuelled bus trips with electric trains, emissions from transit vehicles themselves are reduced. Replacing diesel-fuelled buses with electric LRT means the City will burn 10 million fewer litres of diesel fuel a year.<sup>x</sup> That means not just lower emissions, but lower costs as well.

Second, and more significantly, trips made by car are replaced by transit trips resulting in a substantial reduction in greenhouse gas emissions per vehicle kilometre. That's because LRT will not just carry more people per train, it will attract more people by offering speed, comfort, convenience, and reliability.



That's been proven right here in Ottawa. When the O-Train first entered service its ridership quickly grew to double what was expected. It now carries 11,500 passengers a day.<sup>xi</sup>





Historic CO<sub>2</sub> Emissions from the Transportation Sector (EPA, 2009)<sup>xii</sup>

## Energy Source and Air Quality

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One of the Government of Ontario's commitments as part of its Renewable Energy Initiative is the phase-out of coal-fired electricity generation in Ontario by 2014. This means that when the LRT system goes online it will be powered by cleaner energy sources. What's more, as part of the LRT project, City engineers will be looking to make the system as energy efficient as possible, including exploring the possibility of harnessing renewable energy to reduce the system's reliance on the electrical grid.

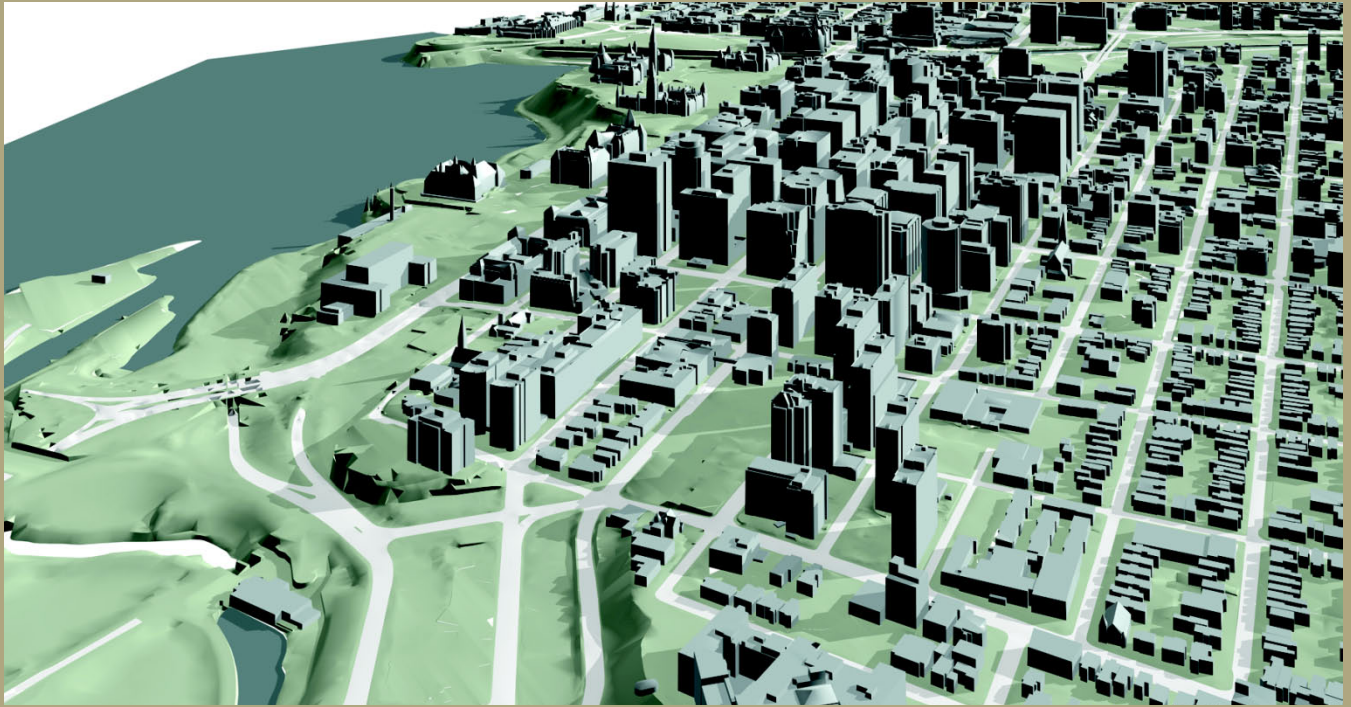
Burning less fossil fuel and using more clean electricity and clean renewable energy means better air quality. Better air quality goes hand-in-hand with better health. That is an obvious social benefit and it is also a significant economic benefit. Better health means reduced health care costs and less lost time from work. Better air quality is not just good for people; it's good for every living thing, from our pets and farm animals to the plants in our gardens, urban forests and the trees that line our streets.

## Salt Use

*Better air quality goes hand-in-hand with better health. That is an obvious social benefit, and it is also a significant economic benefit—better health means reduced health care costs and less lost time from work.*

An additional environmental benefit will come from reduced need for road salt along the converted Transitway in the winter months. Each year, LRT will reduce the City's road salt usage by 5600 tonnes (almost as much as the City of Kingston used in the 2009-10 winter season), improving water and soil conditions for healthier vegetation and wildlife.

All of these environmental benefits contribute to one of the core principles that guide the development of the rail project — sustainability.



## A Downtown Transformed

Once LRT and the downtown tunnel are in place, the number of OC Transpo buses travelling through the downtown core will be reduced by greater than 50 percent.<sup>xiii</sup> With LRT expected to increase transit ridership by an average of 9 percent (13 percent during peak hours) the number of vehicles in the core will be reduced even further. By ensuring that the capacity freed up is dedicated to other mobility needs, this project has the potential to transform our downtown neighbourhoods, making them more pedestrian- and cycle-friendly.

An important component of planning and implementing LRT in the City will be an urban design study to guide this transformation. This urban design study will help us understand and better plan for the ways the downtown stations will improve not just the way people move through downtown, but how they connect with businesses and other downtown attractions.

This transformation is not just about commuting — it's about reclaiming downtown spaces for people. It's about creating a downtown where neighbourhoods are communities, our air is cleaner, and our public spaces are greener. A downtown where people will want to work, live and play.

### Pedestrians and Cyclists in the Downtown

Over the last couple of years, Ottawa City Council has passed two landmark plans: the *City Cycling Plan* and the *City Pedestrian Plan*. These plans set out ambitious targets to develop and implement cycling and pedestrian pathways that connect our City in new ways, promote healthier lifestyles, and reduce harmful emissions. The implementation of LRT will make a significant contribution toward achieving these goals. The downtown LRT stations, for example, will be designed to integrate with cycling and pedestrian pathways to ensure a seamless transition between these two modes of transit.





Stockholm's LRT System, nicknamed "The Longest Art Gallery in the World", provides a stunning example of what can be achieved when public art is considered in the early stages of project planning. (Photo: Steph McGlenchy)

## Public Art

The City of Ottawa has a policy that requires all major capital projects in the City to devote funds to public art to beautify the newly constructed public space. For the LRT and downtown tunnel project, this means that the City will be making a significant investment in new public artworks.



*Barren Ground Caribou*, by Joyce Wieland, adorns Toronto's Spadina Station.

A plan for public art is being developed to ensure this transformative project leads to the creation of memorable public spaces through the integration of arts and culture. This could include combining the opening of the new LRT stations and the unveiling of new public artworks with the City's celebration of Canada's 150th birthday; taking advantage of an excellent opportunity to showcase Ottawa's LRT as both a world-class transit system and a world-class attraction.



Investment in rapid transit can have a positive impact on property values in the general area of a new rapid transit line, and especially in areas that are close to transit stations.

### ***Downtown Development and Managed Growth***

A study on LRT for the City of Hamilton, which reviewed the experience of cities around the world, found that investment in rapid transit can have a positive impact on property values in the general area of a new rapid transit line, and especially in areas that are close to transit stations. The study also found that the type of rapid transit makes a difference. The positive impact on property values is higher for rail systems than any other transit mode.

For example, the study shows that having an LRT station nearby can add as much as 6 percent to the value of residential properties in the area. The value of commercial properties near LRT stations can increase by as much as 14 percent.<sup>xiv</sup>

A major reason for this beneficial effect of light rail is accessibility; a key factor in deciding where to locate a business. Faster and more reliable access to downtown and other major employment centres will encourage existing businesses in the core to expand, and encourage transit-oriented development of new businesses and attractions in both the downtown and other places along the line. LRT stations will act as hubs for future development, supporting the City's plans for managing future residential and commercial growth.

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By encouraging new employment and residential clusters around stations, the LRT system will also encourage more people to use the system to travel to and from work. This will help the City achieve its ridership, re-urbanization and intensification targets, as well as protecting agricultural and environmentally sensitive areas.



## Return on Investment

A critical element of the LRT project is its social, cultural, economic and environmental sustainability. LRT will make our City's economy more competitive and dynamic and will generate real savings for the City and for taxpayers.

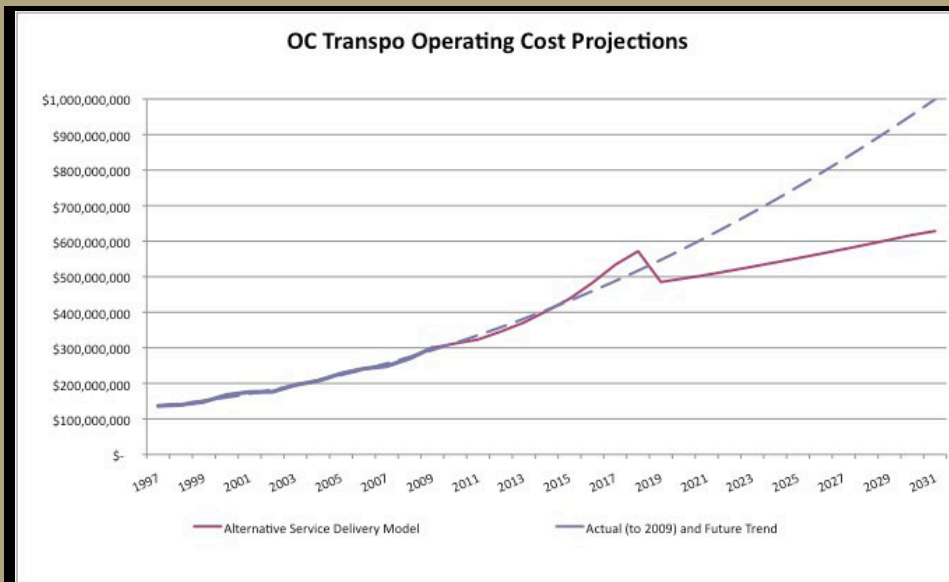
The LRT project will also help invigorate Ottawa's economy through the creation of new jobs. The investment in LRT is predicted to generate more than 20,000 person-years of direct and indirect employment, and provide a total economic output of approximately \$3.3 billion.<sup>xv</sup>

As noted earlier, LRT stations linked to area businesses promote intensification and clusters of higher-density employment uses, encouraging new investment.

The American Public Transportation Association (APTA) estimates that every \$10 million in capital investment in public transportation yields \$30 million in increased annual business sales.<sup>xvi</sup>

## Operational Savings

In 2018, LRT's first full year of service, the redesigned transit system will save the City up to \$100 million in annual operating costs.<sup>xvii</sup> Operating costs for Light Rail are much lower than buses, so those savings will grow as the rail system is expanded in the future.



APTA estimates that every \$10 million invested in public transit saves \$15 million in transportation costs for both highway and transit users.<sup>xviii</sup>

These savings will create new opportunities for the City of Ottawa to manage property tax rates or invest in improved services.

To continue with a "Business as Usual" approach to transit will result in unsustainable cost escalations. By converting to LRT, our redesigned transit system will save the City up to \$100 million in annual operating costs as of its first year of service. These savings will continue to grow over time, ensuring public transit remains affordable.

## ***Savings for Families***

Investment in public transit can have important economic benefits for families, especially those with modest incomes.

A study done by the Centre for Neighborhood Technology in the U.S. found that public transit can play a key role in helping families manage the rising cost of gasoline and other transportation costs, such as buying, maintaining and insuring a vehicle.

As these costs go up there is a disproportionate impact on families with modest incomes, which must spend an ever-greater percentage of an already limited household income on transportation. Of course, for the many families that cannot afford a car, public transit is almost always the only affordable option.



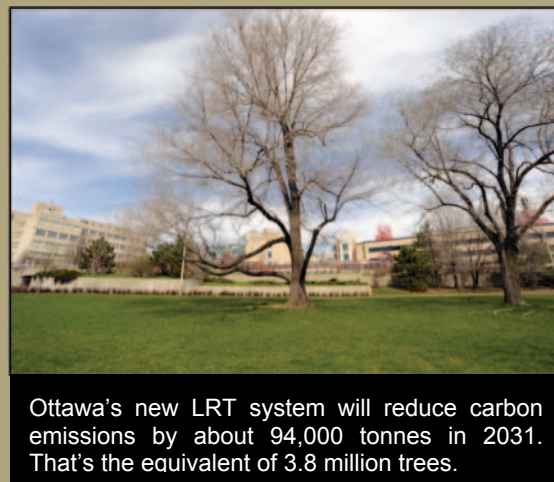
As has been shown many times, this study confirmed that public transit is a good economic choice for anyone. It found that families with two or more vehicles and who rarely use public transit spent up to 19 percent of household income on transportation. Families with above average use of public transit spent just 10 percent of household income on transportation.<sup>xix</sup>

As noted earlier, LRT will reduce travel times and, because time really is money, those time savings will also bring economic benefits. The time savings OLRT will bring to Ottawa commuters will total more than \$1.5 billion by 2040.<sup>xx</sup>

On top of that, as more people make the switch from cars to public transit, an estimated \$1.1 billion will be saved on vehicle operating costs by 2040. And, with fewer vehicles on the road there will also be fewer collisions, with further savings estimated at \$400 million over 30 years.<sup>xxi</sup>

## ***Environmental Sustainability Makes Good Economic & Social Sense***

Along with the proven link to greater health benefits, lower health care costs and less time lost in the workplace, there are other economic benefits to being environmentally sustainable. Transport Canada estimates that reducing greenhouse gas emissions has a net positive economic benefit of \$37 for every tonne that emissions are reduced. This means that implementing the LRT project will result in a positive benefit of \$68 million a year.





## Economic Uplift

Light Rail Transit is a proven force for economic growth. The OLRT project will contribute to the regeneration of the economy in Ottawa's central area by:

- Creating jobs associated with the construction, operation and maintenance of the LRT system
- Increasing employment in the downtown core, where offices can be more efficiently serviced

The improved access to station areas will promote intensification and the clustering of higher density employment areas which should also result in more residents choosing to travel to work by public transit.<sup>xxii</sup>



Arlington's metro rail project has spurred 40 million square feet of development so far. Notice the high density development around each of the transit stations.

### YORK BENEFITS CASE

A Benefits Case completed in June 2009 by Metrolinx for the planned north extension of Toronto's Yonge-University-Spadina line predicts a substantial increase in development and land value, provided municipal planning and zoning support the development. The incremental value of land development is estimated at between \$500 million to \$1.2 billion for Option 1 (6 underground stations) with slightly lower values for Option 2 (5 underground stations). Under Option 3 (surface BRT) much less land uplift is expected, only between \$32 and \$65 million.<sup>xxiii</sup>

This doesn't just work in theory. Cities across North America have seen major economic development as a result of implementing Light Rail:

- In the 10 years after implementing the light rail-based Dallas Area Rapid Transit system in 1999, development in the city attributed directly to the new system totalled \$4.26 billion.<sup>xxiv</sup>
- In Minneapolis, the Hiawatha Light Rail line had 11,931 housing units and 1,054,436 square feet of commercial space under construction or planned within a half-mile of its track—before the line even opened.<sup>xxv</sup>
- In Arlington County, Virginia, the City's metro rail system has transformed its economic base through transit-oriented development. The project has spurred approximately 40 million square feet of development so far, and the area around each station has an urban feel. From 2002 to 2006, land values in the Rosslyn-Ballston Corridor grew 84 percent, from \$2.18 billion to \$4 billion.<sup>xxvi</sup>

## **Conclusion**

The benefits Ottawa's Light Rail Transit project will bring to the City and the people who live here today and in the future are clear.

LRT will save time, money and increase investment. It will reduce emissions of greenhouse gases and air pollutants. It will mean fewer buses and other vehicles crowding and congesting our downtown streets. It will clear the way for new bikeways and walkways, promoting healthier lifestyles. It will create jobs and encourage economic growth.

There is no question that LRT is the best solution to the serious, long-term transportation challenges the City is facing. LRT and the downtown tunnel will give Ottawa a clean, modern, efficient, expandable transit system that will meet the City's needs for decades to come.

In short, LRT is about much more than a way to get from point A to point B. It is about good and prudent management. It is about smart investment and smart growth.

LRT is about making a great City even greater. It's about achieving our shared vision for a city that's cleaner, more efficient, more prosperous, and more attractive. It will improve our communities and our quality of life; making Ottawa an even better place to live, work and play. It will truly be a world-class system for a world-class City.





## Benefits Case Scorecard

Environmental	Reduction of approximately 94,000 tonnes of GHGs and approximately 4,500 tonnes of criteria air contaminants (such as carbon monoxide, nitrous oxides, sulphur oxides and particulate matter) annually by 2031. The economic value of these reductions will total \$36 million annually by 2031.
	Reduced fuel consumption by 10 million litres annually.
	Reduction of over 5600 tonnes of salt per year in winter maintenance of the Transitway.
Economic	Total economic output from the project of approximately \$3.3 billion and over 20,000 person-years of employment.
	<p>\$3 billion in present value over a 30 year analysis period for commuters, including:</p> <ul style="list-style-type: none"> <li>○ \$1.1 billion in vehicle operating savings;</li> <li>○ \$1.5 billion in time savings;</li> <li>○ \$400 million in accident avoidance savings.</li> </ul>
	\$100 million in operating savings at OC Transpo beginning in 2019.
	Broadened tax pool will result in increased tax revenue of approximately \$148 million.
Public Transit	Introduction of LRT is estimated to increase transit ridership by 9%.
	LRT will remove well over 50% of OC Transpo buses currently in the downtown core, including more than 3,000 daily bus trips along the Wellington/Rideau and Albert and Slater corridors.
	Faster speeds – due in large part to avoiding the 14 traffic lights currently located along the downtown route.
	More efficient boarding and improved levels of comfort and service.
	Will save up to 15 minutes from each rider's daily commute.
	Households that make heavy use of public transit spend approximately half what other households spend on transportation costs, an especially important fact for modest income households.

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