

# 3.0 PROJECT NEED AND JUSTIFICATION

The need for the DOTT project is based on the acknowledgment that the existing rapid transit system through Ottawa’s downtown is nearing its capacity, is increasingly affected by delays and does not have sufficient additional capacity to meet future transit ridership demands.

*Sections Include:*

- 3.1 Overview of Current Situation
- 3.2 Policy Direction
- 3.3 Prior Planning Work
- 3.4 Ridership on the DOTT Line
- 3.5 Benefits of the DOTT Line





### 3.1 Overview of Current Situation

The existing OC Transpo Bus Rapid Transit service through downtown accommodates over 10,000 riders, per direction, during peak hours. Currently, this transit service is limited to approximately 180 buses an hour per direction as the on-street BRT operation in the downtown is limited by the capacity of the signalized intersections along the corridor. These intersections must satisfy competing demand for buses, vehicular traffic, pedestrians and cyclists travelling along and across the corridor. Increasingly, downtown Ottawa's transit system is plagued by delays due to general traffic, conflicts, accidents and emergency response, inclement weather and special events. The unreliability of transit downtown ripples through the system, causing unpredictable traffic patterns, increased degradation of journey times, increased pollution, and rider dissatisfaction. The 2008 TMP concluded that the system will no longer be able to expand service to meet the projected demand for transit beyond 2018.

In addition to OC Transpo service, Société de transport de l'Outaouais (STO) buses also use the road network in Ottawa's downtown core and operate in mixed traffic on Wellington Street and within exclusive bus and general traffic lanes on Rideau Street. This service currently amounts to approximately 120 buses in the peak direction during the afternoon peak hour, carrying as many as 4,400 passengers per hour. Similar issues with service levels and reliability have been reviewed by STO staff and ridership continues to grow to fill any capacity created.

A major part of the work completed during the City of Ottawa's 2008 TMP update was the resolution of these existing and future issues. The TMP outlines the transportation infrastructure needed to support the City's projected population and employment levels for the year 2031. In the first phase of the plan, which extends out to the year 2021, the City of Ottawa will invest in 40 km of new light rail transit (LRT) and vehicles to service these lines, as well as bus rapid transit technology and additional bus lanes.

The priority project, identified in the TMP, is to convert the existing Bus Rapid Transit service to electric light rail transit between Tunney's Pasture Station to Blair Station using the existing dedicated Transitway alignment east and west of downtown, and constructing a new transit tunnel underneath the downtown core.

### 3.2 Policy Direction

Ottawa is Canada's fourth-largest city and Ontario's second-largest city, with a population in mid 2009 of over 900,000 and an area of 2,796 square kilometres. In addition to being the nation's capital, Ottawa is also one of the urban centres most favoured by immigrants leading it to become one of the country's most multi-cultural cities. The two universities plus many other post-secondary educational institutions make Ottawa one of Canada's high technology research hubs and one of the top five telecommunications research and development centres in the world. Projections of Ottawa's long-term growth are fundamental to the City's planning of land use and infrastructure needs. In 2003, the City released Ottawa 20/20 as its growth management strategy "for managing growth over the next 20 years in ways that will reinforce the qualities most valued by the city's residents: the availability of high-quality services; its reputation for innovative economic development and exciting job opportunities; liveable communities; diverse artistic and cultural life; varied housing forms; green and open spaces; and the heritage landmarks and landforms that distinguish Ottawa from all other cities."

Based on the following principles, the Ottawa 20/20 vision became the foundation of a series of growth management plans to guide the City's growth in physical development ([Official Plan](#)), economic development ([Economic Strategy](#)), people development ([Human Services Plan](#)), cultural development ([Arts and Heritage Plan](#)), and ecological development ([Environmental Strategy](#)):

- A Caring and Inclusive City
- A Creative City Rich in Heritage, Unique in Identity

- A Green and Environmentally Sensitive City
- A City of Distinct, Liveable Communities
- An Innovative City Where Prosperity is Shared Among All
- A Responsible and Responsive City
- A Healthy and Active City

Specific to the "city of distinct, liveable communities" principles, further development of the rapid transit system would encourage growth in new areas at higher densities and with a greater mix of uses than has been typical of Ottawa's suburbs in the past. New housing and other land uses will also be encouraged to locate along rapid-transit corridors and in areas that can be serviced with quality transit, creating a built-in ridership for transit and reducing the need for car travel.

### 3.3 Prior Planning Work

As noted in Section 2.0, the new Provincial Regulation for Transit EA studies permits the City to rely on prior planning work to focus the study and move forward with design and construction. Prior planning work undertaken for this project consists of the TMP update and the project planning phase for the DOTT Planning and Environmental Assessment Study, which was initiated in June, 2008 and completed in January, 2010 with Ottawa City Council approval of the Recommended Plan (functional design) for the project. The following section outlines the work undertaken as part of the TMP update, while the remaining sections of this report deal with the work undertaken as part of the project planning phase for the DOTT project.

#### 3.3.1 Transportation Master Plan

The Council-approved 2008 TMP update and its supporting documents, addresses major issues such as project need, corridor development (including surface versus tunnel), and technology assessment (such as bus versus train). The conclusions of this work were based on an analysis of future travel demand to the year 2031 based on project growth in population and

employment and policies designed to promote intensification and encourage transit use.

### Growth Projections

As part of the 2008 Transportation Master Plan update, extensive modelling of travel demand has been undertaken to develop projections out to the 2031 horizon year. The model development begins with the City's approved population and employment growth projections and the related land use planning principles. Available serviced land, assumptions about in-fill development and the types of development allowed under the Official Plan were used to create a distribution of population and employment. This distribution is then used to forecast City-wide travel demands for 2031.

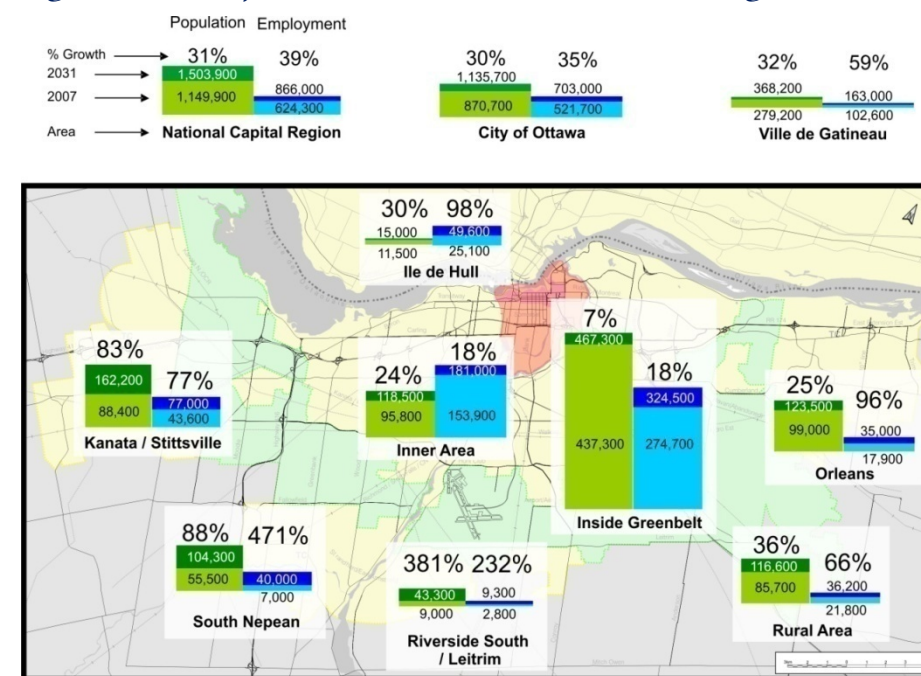
### Population and Employment Growth Projections within the Downtown: 2031

The City's current 2031 growth projections considered the Greater Ottawa-Gatineau Area and predicted a 2031 population of 1,136,000, with employment levels projected to increase to 703,000. Overall, the geographic distribution of the growth in both population and employment levels across the planning regions is depicted in Figure 3-1, and is summarized as follows:

- The population growth projected for areas inside the Greenbelt (52,700 persons) will be relatively evenly split between the Inner Area and the remaining urban areas inside the Greenbelt. This suggests increasing intensification within the Inner Area and reflects the aging of the resident population and lower average number of persons per household.
- Employment growth across the City will be split between areas inside the Greenbelt (42%) and urban centres outside the Greenbelt (50%). Both the Ottawa and Gatineau core areas will continue to accommodate, on a proportional basis, equal percentages of the total employment located in each of the cities (26% of the

projected 2031 employment for Ottawa within the Inner Area and 30% of employment for Ile de Hull when compared with all employment across the Outaouais in 2031).

Figure 3-1: Major Growth Areas - 2031 Planning Horizon



### Travel Demand Forecast: 2031

Forecasting growth in travel requires a pattern of travel and a set of assumptions about how people make travel choices. The basic assumptions are tested using current population, employment and travel demand information and are then applied to the future population and employment pattern with the assistance of the long-range planning model (TRANS Model). The travel behaviour used in the current model is based on the information identified in the 2005 Origin-Destination (O-D) Survey. This survey provides insight into how people make their travel decisions.

A review of the forecast motorized travel demand for the City of Ottawa indicates that a significant portion of the growth will be accommodated by public transit. City-wide growth in public

transit ridership is forecast to increase substantially. The major changes include increases in the mode split, or percentage of motorized trips taken by transit, and growth in population and employment. For instance mode split is predicted to increase from:

- 28% to 36% of all trips originating in the City's Inner Area (the area bounded by the O-Train corridor, the Rideau River and the Ottawa River, including the CBD),
- 25% to 33% of all trips originating inside the Greenbelt, and
- 24% to 29% of all trips originating outside the Greenbelt,
- 46% to 55% for trips destined to the Inner Area
- 28% to 36% of all trips destined to inside the Greenbelt, and
- 9% to 19% of all trips destined outside the Greenbelt.

When these increases in mode split are combined with the increases in population and employment overall transit ridership is expected to increase, over current ridership levels, by 76% and 85% percent for the National Capital Region (including travel to and from the Quebec side of the Ottawa River).

### Regional Travel Desire Lines

While the overall demand for travel is important, it is also necessary to understand future regional travel patterns. These patterns can be easily seen when looking at the major travel desire lines between sectors of the City. The figure below gives a graphical representation of travel demand based on future demographic patterns, including projected increases in employment and population. Travel desire lines between planning districts were identified and categorized based on their magnitudes as follows:

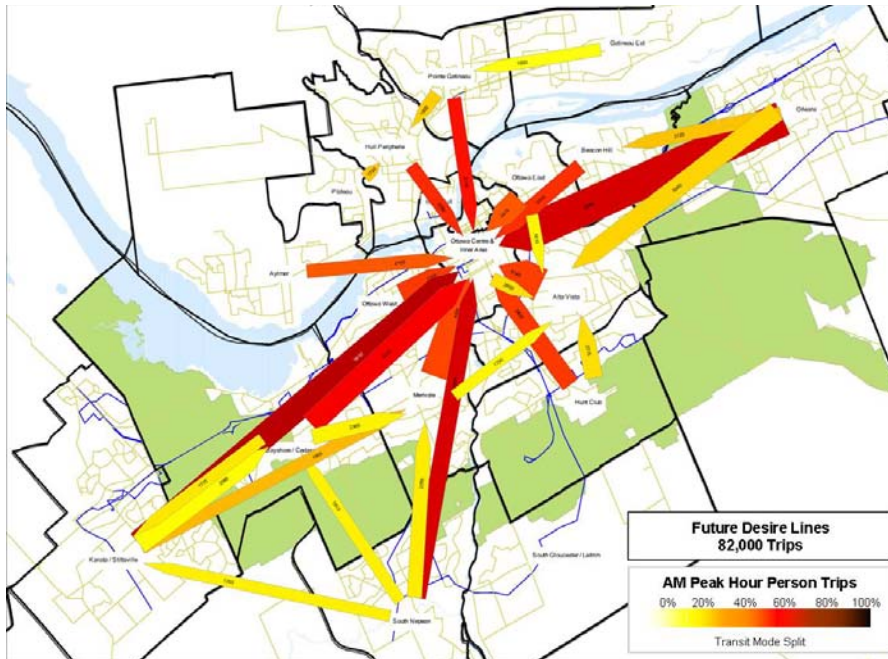
**Primary Travel Desire Lines** – those with a threshold of 1,700 district to district trips per hour (a.m. peak hour person travel),



**Secondary Travel Desire Lines** – those which capture between 1,100 and 1,700 district to district trips per hour, and **Tertiary Travel Desire Lines** – those which capture between 500 and 1,100 district to district trips per hour.

Figure 3-2 illustrates the future major travel desire lines, highlighting both the number of trips between districts as well as the transit mode split. The width of arrow indicates the magnitude of travel (number of a.m. peak hour person trips) and the colour of the arrow indicates the transit mode split (higher mode splits are represented by increased colour tones and shading).

**Figure 3-2: Future Growth in Primary Desire Lines**  
(District to District OD pairs greater than 1,700 a.m. peak hour person trips)



The assessment demonstrates that Ottawa’s Inner Area is the most significant destination for travel during the a.m. peak. Major employment nodes located within Ottawa’s Inner Area include not only the central business district (CBD) but also Carleton and Ottawa Universities and the federal employment

complex in the Carling/Booth area. Just west of the Inner Area, the federal employment node at Tunney’s Pasture and the Ottawa Hospital Civic Campus also have a direct influence on Inner Area travel demands.

Once the patterns are known, the model can assign those trips to the transit network. The bus routes, including the Transitway, are used to generate Figure 3-3, which is a graphical representation of the a.m. peak transit travel demand generated by the TRANS model. The width of the line indicates the number of trips, and illustrates that by 2031 the majority of transit trips converge in the downtown, being principally fed by the East and West Transitways, as well as from Gatineau.

**Figure 3-3: 2031 Transit Trip Assignments**



*Future Transit Ridership in the Downtown*

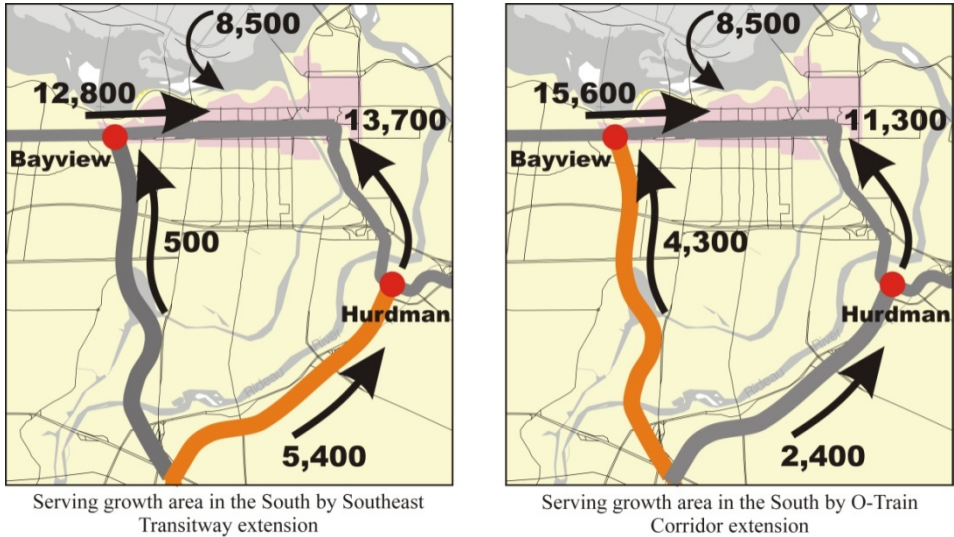
In order to determine the future transit service levels in the downtown, it was first necessary to identify the peak passenger load points on those segments of the rapid transit network that lead into the downtown. These peak load points identify the maximum passenger volumes that must be carried during the

a.m. peak hour. Using the travel demand data discussed in the previous section, the two network options to serve the southern growth areas were analyzed separately. The results are outlined in Table 3-1, which identify that the extension of Light Rail in the O-Train corridor to serve Riverside South shifts the peak passenger load point from east of Ottawa’s downtown to the west side (just west of the downtown) and shown in Figure 3-4, which highlights the difference brought about by which corridor is chosen to carry the majority of customers from the southern growth communities.

**Table 3-1: Network Impacts on Downtown Peak Passenger Load Point Forecasts**

Light Rail Services the South Through	West of CBD (LeBreton)	East of CBD (Hurdman)	From Gatineau
Southeast Transitway Corridor extension	12,800	13,700	8,500
O-Train Corridor extension	15,600	11,300	8,500

**Figure 3-4: 2031 Downtown Transit Demands**



### 3.4 *Ridership on the DOTT Line*

The project was designed to respond to the growth of the City, and provide increased transit capacity into the city core. The need for the project is based on the Transportation Master Plan analysis which indicates that over the planning period:

- Population will increase 30%
- Employment will increase by 35%
- Mode split will increase from 23 to 30%, and
- Transit ridership will increase by 76%, or 91.5 million to 161 million annual trips.

By providing greater transportation choice, and adding more capacity, riders will see:

- Reduced travel times,
- Reduced congestion downtown,
- More efficient transit operations, and
- Improved levels of comfort and convenience.

The DOTT project will provide a substantial increase in carrying capacity through the core and will contribute to significant ridership increases. Ridership estimates from the Transportation Master Plan indicate that:

- Total system ridership is expected to increase from 91.5 million to 161 million trips per annum,
- Ridership on the DOTT line is estimated at;
  - 51 million trips in 2021, and
  - 76 million trips in 2031.
- The TMP model indicates that there will be a ridership uplift of 9% through the introduction of LRT. This translates to;

- 4.6 million new trips in the opening year,
- 29 million new trips per year in 2031, and
- Cumulative 627.4 million new trips between an opening in 2019 and 2038.

More than 40% of all transit trips taken in the City will use the DOTT project for all or part of their journey, with the downtown stations predicted to handle more than 50 million annual trips in 2031.

### 3.5 *Benefits of the DOTT Line*

While ridership and improved mobility are the prime benefits of the project, there are additional benefits as the project is forecast to reduce carbon dioxide emissions by approximately 38,000 tonnes in 2031. It will also reduce criteria air contaminant emissions by approximately 1750 tonnes in the same year. Similarly vehicle kilometres of travel will be reduced, reducing overall vehicle operating costs, accident costs and road network congestion. Section 10.2 provides more detail on the benefits of the DOTT project.

The DOTT project will also allow for redevelopment and transit-integrated development in the downtown. This will help the City achieve its targets for increased reurbanization and intensification and the protection of agricultural and sensitive environmental areas against urban population and expansion pressure.