City `Fat' Street Gets Makeover with First Road Diet

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Abstract

Located in the City of Waterloo, Ontario and constructed in the late 1970's, Davenport Road is a 2km long, Major Collector road strategically linking area communities to Regional Shopping Centre and the city's primary transit terminal. Four lanes of fast moving traffic, restricted sight lines and lack of pedestrian and cycling facilities make it challenging to access the services by means other than the car. A traffic study identified high operating speeds, high number of collisions and lack of safe crossing locations.

The study objective was to support the use of other travel modes resulting in a recommendation to redesign the road under a `Road Diet', which conforms to the city's' developing `Complete Streets' approach to roadway planning and design. The reduction in travel lanes from 4 to 2 would provide space for on-street bike lanes, landscaped medians, pedestrian refuge islands and dedicated traffic turn lanes.

For monitoring purposes the following targets were established:

- Reduction in average operating speed to 50km/h.
- A 20% reduction in left-turn type collisions (comparable 5 yr period).
- A 20% reduction in rear-end type collisions (per above).
- A 20% reduction in non-fatal injury collisions (per above).
- A 20% increase in pedestrian and cycling numbers.

Used effectively across North America the Road Diet approach:

- Provides space for turn lanes benefitting road capacity as through traffic is not stuck behind turning traffic.
- Prevents traffic weaving between travel lanes.
- Provides dedicated space in the roadway for bike lanes thereby providing safer travel option for cyclists.
- Provides space for landscaped medians and pedestrian refuge islands providing traffic calming and safer crossing opportunities.
- Reduces collision numbers and severity of injury collisions due to reduction in speed between road users.

At time of preparation of this paper the project was at the tender stage, therefore, while it was impossible to draw any conclusions, the intent of the project was to improve Davenport Road for all users but focused predominantly on the active transportation user and through extensive post construction monitoring the results, successes and failures, including rationale can be presented through a follow up paper.

While the individual focus is on the project targets, there is a wider objective to achieving success with this project. Through comparison of the Davenport Road future AM peak mode shares against the targets established under the Transportation Master Plan, the city can quantifiably determine if the road diet and complete streets approach to planning and designing its roadways was justified.

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Introduction

The City of Waterloo in South West Ontario, operates under a 2-tier structure within the Regional Municipality of Waterloo, which also includes the cities of Cambridge and Kitchener along with a number of townships. The majority of the higher trafficked roads and intersections in the city are under the jurisdiction of the Region including Northfield Drive (Regional Road 22). Davenport Road and Lexington Road are City Major Collector class roadways under jurisdiction of the City of Waterloo.

Davenport Road is a 2km four lane Major Collector roadway built in the late 1970's that strategically connects travelers between Northfield Drive and Lexington Road to the adjacent community of Colonial Acres and the Regional Shopping Centre of Conestoga Mall (fig. 1). Owing to the spacing of north-south arterials in Waterloo, Davenport Road is an attractive connection as an alternative to these arterials.

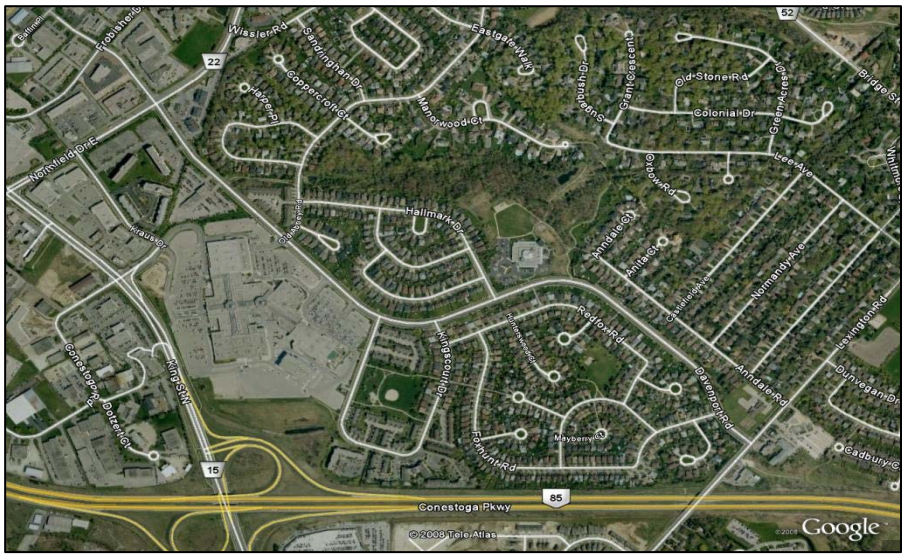

Fig.1, showing Davenport Road between Regional Road #22 Northfield Drive and Lexington Road

Conestoga Mall is one of only two malls to be classed as Regional Shopping Centre within the Region of Waterloo. It has recently undergone a significant expansion with increased number of facilities and services including an expansion of the city's primary transit terminal. This terminal is the origin of a number of high rider ship services such as i-Xpress to destinations such as the uptown core, adjacent municipalities and other high employment areas (fig. 2). In addition, it is a key service connecting students and faculty staff to the local universities.

Fig. 2, Conestoga Mall and city's main transit terminal on west side of mall

The community of Colonial Acres to the south and east has developed over several decades and consists primarily of low and medium height residential, schools, places of worship, restaurants, coffee shops, parks and trails. The potential for walking and cycling within the community and specifically to the mall and transit terminal is high. A Rapid Transit system is currently undergoing the Environmental Assessment (EA) process and Conestoga Mall has been identified as a potential future Station.

Traffic volumes for a four lane roadway could typically be between 30,000 and 35,000 vehicles per day (vpd). Actual traffic volumes on Davenport Road sit around 10,000 to 12,0000 vpd. The corridor is a transit route and sidewalks are continuous on both sides of the road. Rotary KidsAbility School, a special needs school for children, fronts Davenport Road at Hallmark Drive. Three sets of traffic signals control the flow of traffic at the primary intersections of Northfield Drive, Lexington Road and Old Abbey Road. A further 4 residential streets and a number of driveways to commercial developments (fig.3) interconnect with Davenport and operate under side street stop control. A number of walkways and trails exit onto the Davenport Road corridor.

Fig.3, Davenport Road looking north, Conestoga Mall is to the west and the signalized intersection at Old Abbey Road is located in the distance.

Background

Following complaints by area residents citing high traffic speeds, the City of Waterloo retained consultant Paradigm Transportation Solutions Limited (Paradigm) to undertake a traffic study to substantiate any traffic issues along the Davenport Road corridor. The study followed a Schedule `B' Class Environmental Assessment [1] (EA), a requirement of the EA Act at that time. The report "Davenport Road Functional Analysis Study Class EA, Final Report", April 2006 [2] identified a number of traffic and transportation related issues and concluded that:

- The most significant issue on Davenport Road is the speed of traffic and resulting safety concerns given the curvature of the road leading to short sight distances. Traffic speed is leading to most of the safety concerns and collision experience in the area. In particular, speeding is a significant concern in the area of the Rotary KidsAbility Centre where 85th percentile speeds are in the order of 67-70km/h.

  Much research has been undertaken on the subject of traffic speed and severity of injury resulting from a collision. For the vulnerable road users such as cyclists and pedestrians the consequences can be significantly greater. Basically, the higher the speed of the vehicle the greater chances of a fatality when an impact occurs with a pedestrian or cyclist (see fig. 4).

- Traffic volumes are not unusually high for a major collector road. Operationally, all intersections have ample capacity to handle the existing traffic volumes.

- Collision experience in the area is considered to be higher than for a normal collector road and is thought to be caused by the speed of traffic and horizontal curvature of the road.

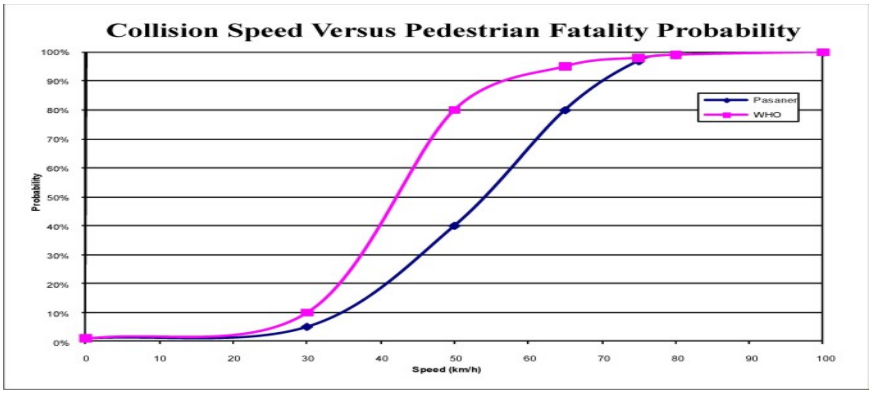

Fig.4, Graphic determining Collision Speed Versus Pedestrian Fatality Probability

Based upon the function of the road, evaluation process, stakeholder, agency and public input, the study recommendations (fig.5) included the following features:

- Conversion from a 4 lane undivided cross-section south of Old Abbey Road to a 3 lane cross section, including on-street bicycle lanes and dedicated turn lanes (a road diet).
- Redistribution of lane widths north of Old Abbey Road, but retention of the 4 lane cross section.
- Dedicated turn lanes at the intersection of Davenport Road and Old Abbey Road.
- Flush crosswalk with median islands.

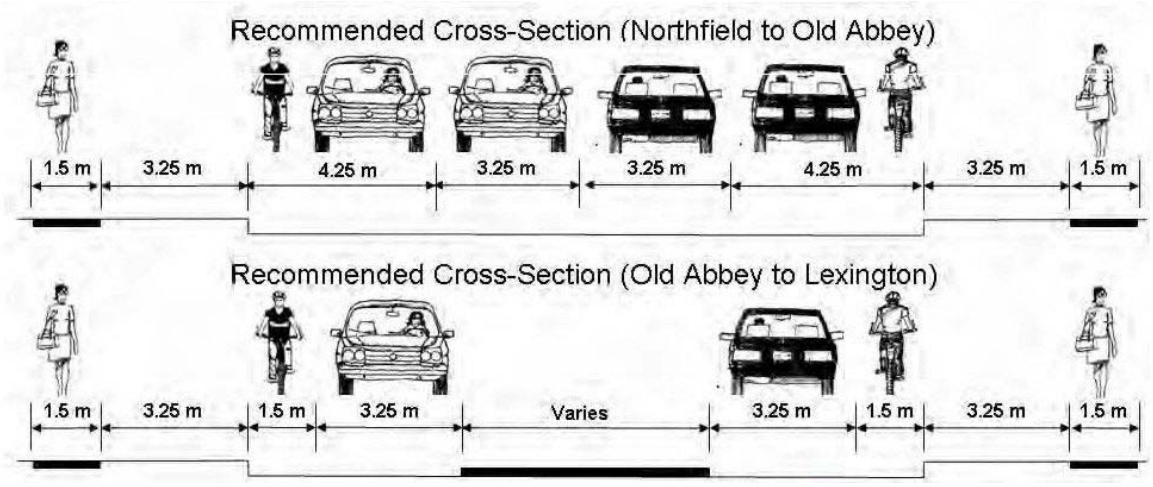

Fig.5, 2006 Class EA study approved cross sections for Davenport Road

By reducing the cross section from 4 lanes to 3 and reworking the overall space meant the existing curbs could be maintained in place at a considerable cost saving. The cost to implement was estimated between $300,000 and 425,000 and although approved by City Council in 2006 the measures were never implemented due to a constrained budget.

An opportunity presented….

In 2008, a joint funding initiative between the federal and provincial governments lead to creation of funds to help stimulate the economy through the investment of municipal infrastructure and thus created the Build Canada Fund program. In response to this, City Council directed staff to develop the recommendations of the Paradigm traffic study into a business case to meet the funding criteria of the BCF Communities Component, Local Road Infrastructure category. The criteria placed considerable emphasis on improving road safety and encouraging trips by alternative modes of transportation.

Based upon the generally accepted theory that a reasonable distance pedestrians are prepared to walk to a desirable destination is 1km to 2km, the proximity of the mall, transit terminal and surrounding commercial land use was potentially accessible to a high number of residents. Using the mall at the centre of a 1km radius (fig.6) provides an understanding of the potential catchment area by walking. The crossing of Highway 85, (Conestoga Parkway), provides a challenge to active transportation users and therefore, a reasonable approach was to assume the majority of any potential converted trips would be from the neighbourhoods to the east and southeast. With acceptable distances for cycling to a desirable destination being up around 8km and the City of Waterloo being only approximately 7.5km wide, Conestoga Mall is accessible by bicycle to the majority of the city.

Staff undertook the development of the business case for the Davenport Road project using the principles and majority of recommendations of the Paradigm traffic study, culminating in the application being titled “Davenport Road Multi-Use Corridor Improvement” [3]. The intent of the business case was to broaden the overall significance of the use of the corridor to the neighbouring and wider community by both physical and visual enhancement thereby creating a safer and more desirable streetscape for all users. While engineering road safety was a major component of this project an emphasis was placed on the needs of the active transportation and transit user.

Fig.6, north east Waterloo showing 1km walking radius from Conestoga Mall

In developing the business case it was first important to understand the wider social issues in order to determine why the corridor saw little pedestrian and cycling activity. In addition to the issues referenced in the Paradigm traffic study, the following social problems were identified that provided staff with an understanding of the big picture:

- An inadequate number of safe crossing locations for pedestrians and cyclists over the length of the corridor. Only three locations exist on Davenport, at the signalized intersections of Northfield Drive, Old Abbey Road and Lexington Road. There are no mid-block crossing locations over the 2km length even though there are a number of walkways and trails that connect to Davenport. The distance between crossing locations deters pedestrian and cyclist movement laterally across the corridor. Distances between signalized intersections are as follows:

  - Northfield Drive to Old Abbey – approx. 500m.
  - Old Abbey to Lexington Road – approx. 1.4km.

- Rotary KidsAbility School (fig.7) is a special needs school located at the Hallmark Drive intersection and fronts Davenport Road. There is no opportunity to make an east-west crossing for approx. 500m north and over 700m south.

Fig. 7, The Rotary KidsAbility School located near the Hallmark Drive intersection

- Although there are a good number of sidewalks, on-road bicycle routes and trails in the proximity that interconnect with Davenport Road there are no dedicated on or off-road bicycle facilities along the corridor to complete the journey safely.
- The road corridor bisects the community of Colonial Acres (fig.8). The wide cross section, high vehicle speeds and lack of pedestrian crossing facilities make the roadway a physical and psychological barrier to the community to access adjacent and nearby services, particularly vulnerable road users such as elderly residents, children and persons with disabilities.

Fig. 8, Davenport Road looking south to the Hallmark Drive intersection. The Rotary KidsAbility School is in the far distance (on left)

- There is no encouragement for residents to access the green spaces, parks and recreational facilities located either side of the community, thereby restricting their activities and movements.
- The corridor is all back-lotted homes, provides very little landscaping, no shade trees or benches for pedestrians and with high vehicular traffic speeds gives the user the sense that the auto is the dominant mode in this corridor. There is an imbalance in the various modes of transportation that reduces the overall efficiency of the system.
- Although a transit route with 14 stops, no transit shelters exist along the 2km corridor length to facilitate protection for users from the elements. The majority of stops do not have a concrete pad which provides a challenge to users in inclement weather as they must access the bus across the boulevard area.

Fig.9, deteriorating pavement condition along many sections of Davenport Road

- Constructed in the late 1970's the pavement structure had deteriorated over the past decade and was identified in the city's Pavement Management Application (PMA) system as a road in need of resurfacing. The road condition is particularly hazardous to cyclists and motor cyclists (fig.9).
- A total of 79 collisions, including 1 fatality, 20 non-fatal injury, 16 rear end, and 14 left-turn type collisions occurred in the 5 year history of 2004 to 2008. The signalized intersection of Davenport Road and Old Abbey Road (fig.10) was identified as the third worst collision intersection in the city's 2008 Collision Report [4] with 18 collisions in the same 5 year period.

Table 1. Accidents Per Year

Year	Classification of Accident		
	Fatal Injury	Non-Fatal Injury	Property Damage Only
2004	0	1	10
2005	0	9	13
2006	1	5	6
2007	0	4	12
2008	0	1	17
Totals	**1**	**20**	**79**

Fig.10, Davenport Road is wide and straight with sight distances in excess of those required onto intersection. Identified as third worst collision intersection in city in 2008

Looking at the problem from a different perspective….

Armed with a more comprehensive understanding of the issues facing the Davenport Road corridor, city staff was able to build upon the recommendations of the Paradigm traffic study, which was essentially the elements of a `road diet'. Used successfully in a number of North American municipalities including the George Street [5] project in Toronto, some of the benefits seen are:

- slower vehicle speeds.
- addition of dedicated turn lanes assist in traffic flow.

- provision of dedicated road space for cyclists.
- centre islands help reduce speed and provide pedestrians and cyclists with safer crossing opportunities.
- removes the opportunity to change lanes at undesirable speeds.

Running concurrently with this project, the city had been developing its first Transportation Master Plan (TMP)[6] and had brought forward the philosophy of `complete streets', which is essentially consideration of all users within the planning and design of new or redeveloped roadways. Although only in a draft format, the complete streets philosophy (fig.11) was applied in developing the business case for Davenport Road. The project objective was to establish a multi-modal corridor by raising the awareness, importance, equity and needs of the pedestrian, cyclist and transit user through reallocation of the available roadway space, thereby providing safer, alternative travel options to the auto.

Fig.11, the City of Waterloo's Draft Complete Streets Policy Framework

A road diet on Davenport Road would support the implementation of on-street bike lanes and safer and increased opportunities for pedestrians and cyclists to cross the road and therefore this approach would support the complete streets philosophy the city has been advocating for.

By adopting the road diet approach the following goals would be achievable:

- Slower vehicular traffic speeds through reduction in the overall roadway cross-section and implementation of physical traffic calming measures.
- Reduction of the roadway cross section using the `road diet' concept and provision of dedicated turn lanes.
- Improved pedestrian environment through safer and protected road crossings at strategic locations and slower traffic speeds through the implementation of physical traffic calming

measures in addition to a significantly enhanced visual environment through median and boulevard landscaping opportunities.

- Bridge the gaps in the active transportation infrastructure to the local and main transportation network by completing the connections and providing access to and from adjacent communities.
- Improved cycling environment through allocating dedicated on-road bicycle lanes.
- Improved and more efficient transportation system that optimizes travel choices, provides multi-modal options and decrease the number of single occupancy vehicles from local and adjacent communities to the surrounding services and facilities, thereby supporting community development.
- Improved multi-modal corridor that provides for and encourages active transportation trips to the city's main transit terminal, thereby reducing overall vehicle trips to destinations within and outside of the city and helping to maintain a sustainable transportation system.
- Removal of the image of a physical and psychological barrier to the community through development of a safer and more attractive pedestrian and cycling environment.
- Encourage users of all abilities and disabilities to access the abundant number of facilities and services what are within walking and cycling distance to the community and encourage interaction and access to adjacent green spaces, parks and the off-road trail system.

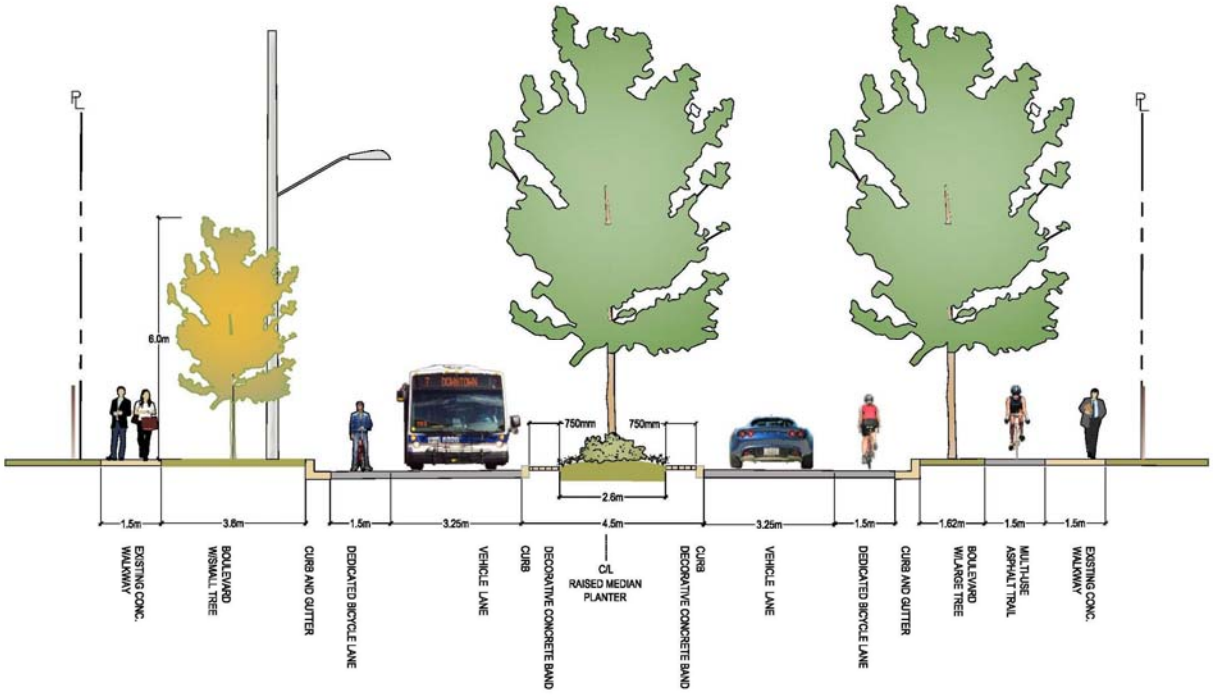

Fig.12, a vision for Davenport Road between Lexington Road and Old Abbey based on the road diet approach

Establishing realistic project targets….

To provide quantitative context to the overall objectives of the project, based upon a reconfigured roadway under a road diet, and including traffic calming measures, dedicated on

road bicycle lanes and turn-lanes, the following project targets were considered to be achievable:

- Reduction in average operating speed to 50km/h.
- Reduction in left-turn collisions by 20% in comparable 5 year period.
- Reduction in rear end collisions by 20% in comparable 5 year period.
- Reduction in non-fatal injury collisions by 20% in comparable 5 year period.
- Increase of 20% pedestrian and cyclist volumes along and across Davenport Road over pre-construction volumes in the short term. In addition, mid and long term targets to equal or better target mode shares as identified in table (2)

In addition to the individual project targets, the city's TMP identified target mode shares to two planning horizons (i) Year 2016 and (ii) year 2031. Table 2 identifies the existing and future AM peak hour mode share targets and percentages.

Table 2
AM Peak Hour Trips Within City of Waterloo

Mode	Year 2006		Year 2016		Year 2031	
	Number of Trips	Mode Share	Number of Trips	Mode Share	Number of Trips	Mode Share
Auto Driver	57,787	82.70%	65,573	80.30%	77,920	79.80%
Transit	2,998	4.30%	6,374	7.80%	8,332	8.50%
Bike	1,266	1.80%	1,462	1.80%	1,706	1.70%
Walk	7,786	11.10%	8,312	10.20%	9,771	10%
Total Internal Trips	**69,837**	**100%**	**69,837**	**100%**	**97,729**	**100%**

Project gets a green light….

In 2009, Waterloo was informed by the Build Canada Fund it had been successful in its application and progressed the project by retaining consultant The Walter Fedy Partnership (Kitchener, Ontario) to develop the Paradigm traffic study recommendations into a full and detailed design. Their traffic engineering sub-consultant was Paradigm and the landscaping sub-consultant was The GSP Group (Kitchener, Ontario).

As the project commenced the project team began to consider the specific design features that would be required to achieve the vision for the street and targets established in the application. These features would ultimately decide how successful the project would become in terms of speed control and improving the environment for cyclists, pedestrians and transit users of all abilities.

Taking the opportunity when presented….

Although the original approved EA study recommended maintaining the 4-lane cross section between Old Abbey Road and Northfield Drive, continuation of the on-road bike lanes to Northfield Drive were promoted by the project team and local interest groups. This approach was supported by the City of Waterloo Bikeways and Trails plan approved back in 2000 and that

on-road bike lanes were identified in the Region of Waterloo's 2004 Cycling Master Plan[7] for Northfield Drive (Regional Road 22). Continuation of the bike lanes would provide cyclists with a complete on-road system throughout the 2km corridor and provide the vital connection to other routes in the network. With a trail connecting to the east side of Davenport approx. mid-way between the Old Abbey and Northfield intersections, an additional pedestrian refuge island was advocated to assist safer crossing of the roadway.

Given the project was relying on maintaining the existing curbs in place, the only way this could be achieved was to take space from the traffic lanes as per the road diet approach to the south section of Davenport.

Ensuring future growth is not compromised….

The data from the original traffic study was taken in 2004 and 2005, therefore it was first essential to establish current traffic volumes. The next step was to identify the future traffic that would be generated from the city population and employment growth areas to ensure the road diet layout remained a valid approach. Under the city's Official Plan[8] update, Waterloo's population was to grow by around 50% to almost 150,000 by year 2031. Through development of the city TMP, the traffic model was assessed to determine traffic conditions along the Davenport Road corridor to year 2031 planning horizon based upon area development.

Based upon the TMP traffic model roadway planning capacities of between 650 and 900 Vehicles/Lane/Hour, Davenport Road would operate at a good Level of Service of <0.85 Vehicle/Capacity (V/C) throughout the 2km corridor to year 2031. To achieve this LOS, two (2) northbound lanes would be required between Old Abbey Road and Northfield Drive to maintain AM and PM peak outbound capacity at the Northfield intersection.

City approach is to typically assess the 10 year planning horizon for intersection Level of Service, however, the year 2031 horizon was used based upon existing trip distribution. The analysis determined that all 3 intersections would operate at LOS C or better.

EA Addendum Required….

Given the 3 lane layout for the north section would be a significant change from the 2006 approved EA study, an EA Addendum was considered necessary even though there was a potential for the project to be delayed. The project team considered the continuation of bike lanes and an additional pedestrian refuge island in the north section essential to the success of the project and presented the recommended changes to the public and instigated the EA Addendum process. Although there were concerns raised by some members of the community with the belief that vehicular capacity would be compromised, no Part II Orders were received.

Ensuring current philosophies and best practices….

The specific design features to be incorporated into the final design would determine the level of success of this project. Given the most fundamental problem with the existing condition was the speed of traffic, it was essential that the design features used would reduce traffic speeds and support the road diet approach to provide a safer roadway for all users including the auto driver. The following provides an overview of the main design features:

- ***Landscaped medians and pedestrian refuge islands***

Description: a physical median island positioned within the roadway to separate traffic flows and provides pedestrian/cyclists a safe zone when crossing at mid-block locations (Fig. 13).

For this project the majority of the pedestrian refuge islands were incorporated within the landscaped medians. The lengths of medians vary between 12m (min) and 90m, the width varies between 3.5m and 4.2m which accommodate a bicycle and trailer as well as a double-stroller. Based upon the median island, the benefits include a physical separation of vehicles and pedestrians/cyclists crossing the road and a shorter overall crossing distance.

Fig. 13, example of a pedestrian refuge island incorporated within a landscaped median

- ***Urban smart channel***

Description: a physical separation and direction of vehicles and pedestrian movements into defined paths through use of roadway features, signs and pavement markings.

Fig. 14, example of an urban smart channel used elsewhere in the City of Waterloo

Based upon the right-turn channelized layout, the urban smart channel has a significant benefit over its predecessor in that the driver entrance angle to the intersecting road is around 70 degrees, thereby providing the driver with a much clearer view of the cross traffic and pedestrians. In addition, the angle also forces vehicles to slow down to make the turn.

There are benefits to both pedestrians and drivers. Pedestrians are far more visible to the driver and the island provides a reduced overall crossing distance. For drivers the entrance angle means drivers don't have to turn their head so severely to spot the gaps in traffic.

- ***Zebra striping***

Description: highly visible striped pavement markings at intersection crosswalks.

The zebra striping is gaining popularity in urban settings to help emphasize the presence of pedestrians at the crosswalk and within the vicinity of the intersection in general. It also provides clear delineation of the crosswalk and highlights the location of the intersection for approaching drivers.

Fig. 15, an example of highly visible zebra striping at a pedestrian crosswalk

- ***Roundabout***

Description: an intersection control operating on a yield basis that requires all entering traffic to slow down and yield upon entry.

A roundabout was opened on the west side of Conestoga Mall in 2008 and has been operating very effectively, therefore at the request of the community a roundabout option was reviewed against the existing traffic signals. Given the existing collision problem identified earlier and the intent to make the mall more accessible to the community by active transportation modes, a benefit of a roundabout is the reduction in conflict points between vehicles and pedestrians. The mall draws a number of early morning mall-walkers from the neighbouring community and the roundabout option would provide a safer passage across Davenport Road.

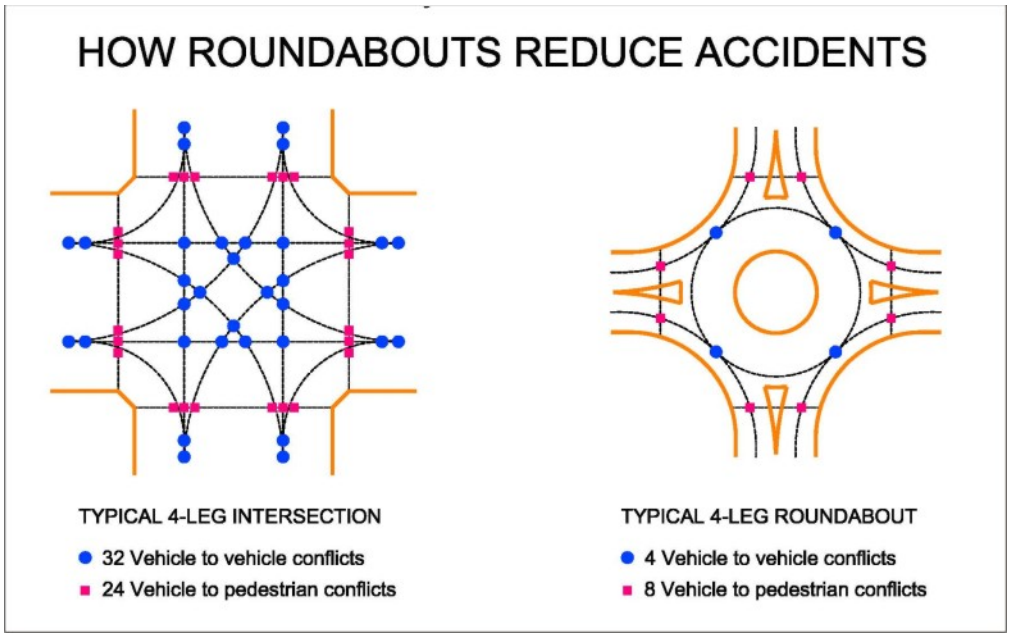

Fig. 16, showing the reduction in vehicle to vehicle and vehicle to pedestrian conflicts[9]

Three other features that define why roundabouts are typically safer for pedestrians are:

splitter islands: while providing a speed reducing effect and directing traffic the correct way through the intersection, they act as pedestrian refuge islands providing pedestrians with a reduced crossing distance, a safe zone midway across the intersection and permitting them to focus on traffic from one direction at a time.

geometry: the geometric design of a roundabout reduces both entry and exit speeds making decision-making and reaction to a situation easier for drivers. The lower operating speeds contribute to a safer intersection environment for pedestrians and cyclists.

crosswalk location: at traditional intersections, the crosswalk is located in front of the stop bar placing pedestrians in front of the approaching vehicle whose driver is simultaneously looking for gaps in traffic. The roundabout places the crosswalk typically at a cars length from the yield line, thereby separating the vehicle and pedestrian to complete their manouevre.

Fig. 17, comparing the location of pedestrian crosswalks

Over time roundabouts prove to result in a reduction in overall collision numbers, but most importantly the crash severity is reduced due to lower operating speeds. Upon completion and over the next 5 years the collision numbers will be compared against the previous to determine the roundabout's impact on collisions. The City of Waterloo has a number of roundabouts working effectively around the city and members of the community are becoming accustomed to this type of intersection control.

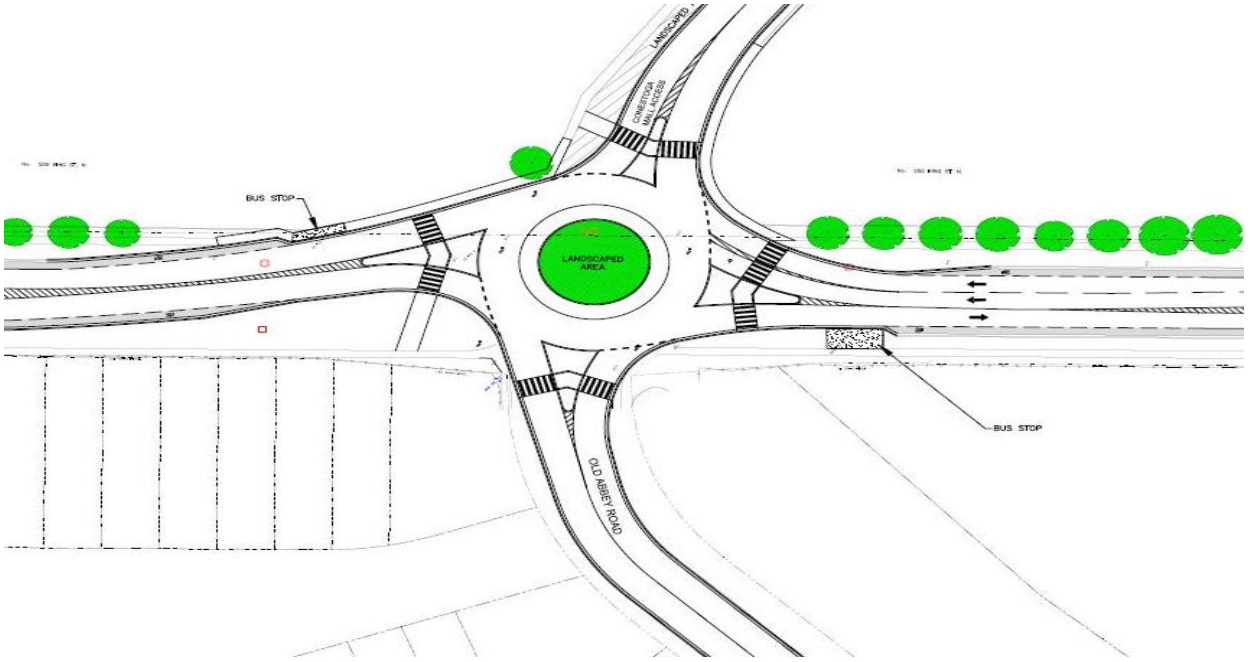

Fig. 18 - a draft layout of the roundabout for the Davenport Rd and Old Abbey Road intersection

- ***Cycle lay-by***

Description: a dedicated area in the boulevard for on-road cyclists to pull out of the bike lane and wait for a gap in traffic before making a left-turn. The design permits this action without having to dismount and aligns the cyclist with their destination, thereby making the manouevre much safer for the cyclist. These features are typically used at side streets and crossing points.

Fig. 19, example of cycle lay-by at an intersection

- ***Bike box***

Description: a dedicated space for cyclists in front of queuing traffic at a signalized intersection. This design feature permits cyclists to start their manouevre ahead of the driver and are typically used where cyclists must cross a heavy stream of vehicle traffic. The 4.0m recommended depth[10] is achieved on the Davenport Road project.

Fig. 20, example of bike box at an intersection

Planned monitoring program….

Under the requirements of the Build Canada Fund program, the city had to identify a monitoring program to determine level of success against the targets established in the business case. In order to effectively compare before and after cases, AM and PM peak hour pedestrian, cycling and vehicular counts were taken at the start of the project. In addition to the intersections, all walkways and trail connections were counted for pedestrians and cyclists. The same locations will be counted post construction and every 2 years to year 2016 and then every 5 years to 2031 to assess what level of increase in active transportation has occurred, and to determine if traffic volumes have changed.

Similarly, a review of the collision numbers, types and severity will be compared to pre-constructed data to determine any impact.

In addition, the city undertakes a rigorous speed monitoring program on its streets using Automatic Traffic Recorders (ATR's). Again, before speeds were taken and will be reviewed every 2 years to compare before and after speeds at the same locations.

The city also identified the need to liaise with the Region of Waterloo to determine any increase in transit ridership along the Davenport corridor. While there would be many factors to why transit ridership may increase, a short questionnaire for local transit riders could determine if the city's road diet approach for Davenport Road was a contributing factor.

Conclusion

At time of preparation of this paper the project was at the tender stage, .therefore, while it was impossible to draw any conclusions, the intent of the project was to improve Davenport Road for all users but focused predominantly on the active transportation user and through extensive post construction monitoring the results, successes and failures, including rationale can be presented through a follow up paper.

While the individual focus is on the project targets, there is a wider objective to achieving success with this project. Through comparison of the Davenport Road AM peak mode shares in years 2016 and 2031 against the targets established under the Transportation Master Plan, the city can quantifiably determine if the road diet and complete streets approach to planning and designing its roadways was justified.

With reference to this years Transportation Association of Canada conference theme “Adjusting to New Realities” is the significance to the city’s rationale to looking at a more sustainable and cost effective approach for maintaining its transportation network. The city maintains around 1000 lane-kilometres at an annual operating cost of around $5.5m. With a change of planning focus towards active transportation and transit users and a design approach to use existing roadway space more effectively, essentially reduces the number of travel lanes to maintain and therefore permits the city to direct funding to other appropriate infrastructure needs.

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