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Item No. 11.4
Halifax Regional Council
September 1, 2020
Transportation Standing Committee
September 17, 2020

TO: Mayor Savage and Members of Halifax Regional Council

SUBMITTED BY: Original Signed

Brad Anguish, P.Eng., Director, Transportation and Public Works

Original Signed

Caroline Blair-Smith, Acting Chief Administrative Officer

DATE: July 19, 2020

SUBJECT: **Elimination of Pedestrian Push Button Requirement at Fully Signalled Intersections**

INFORMATION REPORT

ORIGIN

Item 13.2 of the December 13, 2018 session of the Transportation Standing Committee.

> MOVED by Councillor Mason, seconded by Councillor Cleary THAT the Transportation Standing Committee request a staff report regarding the elimination of the requirement to press a pedestrian push button to trigger a walk signal at fully signalled intersections for pedestrians throughout HRM.

MOTION PUT AND PASSED

Due to the ongoing Covid-19 pandemic, meetings of the Transportation Standing Committee have been cancelled indefinitely. Therefore, this information report is being submitted by staff directly to Halifax Regional Council.

LEGISLATIVE AUTHORITY

HRM Charter, Part XII, subsection 321(8), "The traffic authority for the Municipality has, with respect to highways in the Municipality, excluding those for which the Provincial Traffic Authority has authority, the powers conferred upon a traffic authority by or pursuant to the Motor Vehicle Act."

Nova Scotia Motor Vehicle Act, Part V, subsection 89(1), "…traffic authorities in regard to highways under their respective authority may cause appropriate signs to be erected and maintained designating business and residence districts and railway grade crossings and such other signs, markings and traffic control signals as may be deemed necessary to direct and regulate traffic and to carry out the provisions of this Act."

BACKGROUND

Traffic signals are designed to assign right of way to vehicle and pedestrian movements at an intersection with the objective to balance demand, minimize delay and provide the necessary information for all users to safely navigate through the intersection.

HRM currently operates 272 traffic signals using three approaches to signal control:

1. Fixed Time – this type of signal operation uses a fixed timing plan for all intersection approaches which do not change, regardless of demand. There can be different timing plans for different times of the day, but there is no vehicle detection and pedestrian phases come up automatically with the parallel vehicle phase. Depending on the location, push buttons may be present to activate Accessible Pedestrian Signals (APS) for the visually impaired.

2. Semi-Actuated – this type of signal operation uses detection on the minor side street to allow for increased green time to be given to the busier major street but will provide service to the side street when demand is detected either by a pedestrian push button or vehicle detection. The pedestrian signal for crossing the minor (side) street is typically automatically displayed while the main street crossing is activated via the push button. This type of control reduces overall user delay at an intersection and allows for more flexibility to service heavier volume major streets while still serving lower volume side streets.

3. Fully-Actuated – this type of signal operation uses detection on all intersection approaches and provides the most flexibility to serve all movements (pedestrian and vehicle) based on demand. The use of pedestrian push buttons and vehicle detection provides the ability to adjust the time provided for individual movements based on demand and skip movements with no demand, freeing time for higher demand movements.

Of the 272 signalized intersections, 217 have pedestrian push buttons to activate the pedestrian signals for one or more of the crossing directions during part or all of the day and 4 locations have push buttons to activate accessible pedestrian signals only. The remaining 55 signalized intersections that do not have push buttons, are all located within the former Halifax city limits, with the exception of three.

In total, 94 intersections are currently set to automatically display the pedestrian walk signal during part or all of the day. All signalized intersections on the Halifax Peninsula, with the exception of three locations, make up the largest portion (74 locations) with the remaining 20 intersections located throughout Dartmouth, Bedford, Mainland Halifax and Westphal.

Attachment 1 included with this report, provides a list of HRM's signalized intersections and indicates the following:

- If push buttons are present or not;
- Push button type (standard or for accessible pedestrian signals);
- If the push button is only for activating the accessible pedestrian signal;
- If the pedestrian signal is set to be automatically displayed (pedestrian recall);
- Time of day when intersections with push buttons are set to automatically display the walk signal;
- Potential wait time if operated in pedestrian recall (represents the maximum potential wait time associated with the timing plan with the longest cycle length if a pedestrian arrived just at the beginning of the flashing don't walk signal).

DISCUSSION

The use of push buttons as part of traffic signal design and operations has been common practice for decades. Prior to amalgamation, the former City of Halifax was the only jurisdiction now part of HRM that was not using push buttons as part of their traffic signal system. The reason for this was that Halifax deployed a traffic control system that used in-ground detector loops and a central system to monitor and adjust signal timing based on vehicle demand. There were no push buttons and pedestrian phases came up automatically, however the time pedestrians had to wait to get their signal was dependant on the amount of vehicle traffic on the various intersection approaches and there was no ability to provide any sort of priority for activating a pedestrian signal.

Since amalgamation and with the advancement of various traffic signal technologies, improved detection and push buttons became part of the suite of tools used when designing traffic signals throughout HRM to help provide an efficient system to manage user demand within the transportation network. Building on this, in 2014 a project was initiated to replace the aging central control system from the former City of Halifax with a new updated system that will incorporate all signalized intersections and allows for better monitoring and control which will help the system be more responsive to intersection demands and reduce overall delay and congestion. The initial roll-out of the system was completed in 2017 with approximately 90 intersections, primarily on the Halifax Peninsula, connected to the system. Work to install necessary equipment to incorporate the remainder of HRM's traffic signals into the system is currently on-going. To date, a total of 190 of HRM's 272 traffic signals have been incorporated into the system. Of the remaining 82 intersections, 50 are scheduled to be completed in 2020/21 with the remaining to be completed in 2021/22.

Further to the above, in December 2017, Regional Council adopted the *Integrated Mobility Plan. The IMP* provides policy direction of applying a Complete Streets lens to our transportation network. This approach considers, "a holistic, flexible and context sensitive approach to street design and maintenance which aims to reflect a multi-modal approach to mobility that aims to embed the IMP pillars into street design." This means that streets should be designed for their intended function in the overall transportation network. Therefore, consideration of operational changes to the transportation network have to be considered holistically to ensure all modes (pedestrians, bicyclists, transit, and vehicles) are accommodated appropriately and needs are balanced.

Jurisdictional Scan

As noted above, the use of push buttons as part of traffic signal operations is a common approach widely used by many jurisdictions. In an effort to identify best practices related to the use of pedestrian push buttons, a jurisdictional scan was undertaken via a survey sent out through the Traffic Operations & Management Committee (TOMC) of the Transportation Association of Canada (TAC). This committee is made up of representatives from the public and private sector from across Canada and the US. Survey responses were received from ten jurisdictions from across Canada and are summarized in the following table.

Jurisdiction	Push Buttons Used	Used at All Intersections	Active at All Times	Does the Button Provide Priority
Quebec Ministry of Transportation	Yes	No	Yes	Not always
NSTIR	Yes	Yes where pedestrian crossings exist	Yes	No
Alberta Transportation	Yes	No, dependent on pedestrian demand	Yes	Unsure
City of Fredericton	Yes	No, not used in downtown core	Yes	No

Province of Ontario	Yes	Yes where pedestrian signals are located	Yes	No
City of Dieppe	Yes	Yes	Yes	No
BC Ministry of Transportation	Yes	Yes	Yes	no
City of Red Deer	Yes	No, not used in downtown core	Yes	No in coordinated signal corridor, yes in non-coordinated corridor or isolated location
City of Toronto	Yes	No, not used in locations with pre-timed signal operation	No, some locations (68/2376 locations) operate on pedestrian recall during peak periods	No
City of St John's	Yes	Yes	No, some locations operate on pedestrian recall during peak periods	No
HRM	Yes	No	No	No

From the responses received, it shows that all jurisdictions currently employ the use of push buttons for at least some of their signalized intersections. Half of the respondents indicated that push buttons were used, but not in all locations. Based on the information provided, those jurisdictions that do not use push buttons at all signalized intersections, the primary consideration appears to be pedestrian demand (i.e. downtown core locations with high pedestrian volumes). The information obtained from the survey also shows that where push buttons are used, all but two jurisdictions require the push button to be activated at all times in order to get a walk signal. Toronto and St. John's use pedestrian recall (i.e. pedestrian signal comes up automatically) for some locations during peak times, but outside the specified time the button would need to be pressed to activate the walk signal. The final question asked from the survey intended to determine if those jurisdictions who used pedestrian push buttons provided any sort of higher priority call for the pedestrian signal once the button was pressed. The City of Red Deer was the only respondent that indicated that their signals were set to provide a priority call for the pedestrian signal when the button was pressed, but only at isolated signal locations or where a signal was not operating in coordination with other signals.

In comparison to those jurisdictions who responded to the survey, HRM's current approach to the use of pedestrian push buttons would be consistent with that found across the country. For example, there are many signalized intersections that have push buttons, but where it is known that pedestrian demand is high, the signals are set to automatically bring up the pedestrian signal during the high demand pedestrian times, whether the button is pushed or not. Since it is known that the demand for pedestrian crossings will be consistent, this approach is typically used in the downtown core or near high pedestrian generators.

Signal Operations Impacts

As indicated previously, many of the signalized intersections that lie within the boundary of the former City of Halifax, and specifically within the downtown core area of the Halifax Peninsula, do not have push buttons because of the older control system that was used. These intersections received upgraded signal controllers and communications equipment as part of the initial roll-out of the new signal management system, however these intersections still lack the necessary equipment and configuration to allow for the addition of features such as transit priority, accessible pedestrian signals and even protected vehicle phases. In some cases, additional phases can be added but without the necessary detection, addition of new phases typically requires increased signal cycle times which ultimately results in increased delay for all users, including pedestrians, and increased congestion.

In order to achieve the most flexibility for signal operations, any new traffic signal installations or signal upgrade / rehabilitation projects typically involve the use of fully actuated signals. As indicated in the background section of this report, fully actuated traffic signals include detection for all approaches / movements and include push buttons for pedestrian movements.

Using a fully actuated setup provides the flexibility to operate the signals in the most efficient manner to manage demand at the intersection and reduce overall delay for all users. The ability to detect demand for a particular movement at a fully actuated traffic signal provides the ability for the signal to reduce the time given to movements with low demand or even skip a phase that has no demand. This frees up time and allows the signals to more quickly serve those movements, pedestrian, transit, and vehicle, where there is identified demand.

The use of push buttons for pedestrian signals helps to reduce overall delay by allowing the traffic signals to reduce the time given to low demand movements or skip serving approaches where there is no demand. This is similar to the operation of some protected vehicle phases where detectors are used to indicate to the signal controller that there is demand for that phase. If no vehicle is detected, the phase is skipped and that time is saved by allowing the signals to serve subsequent phases quicker. The ability to skip phases where there is no demand is beneficial to all users, including pedestrians.

Road User Impacts

Operating a traffic signal where the pedestrian phase always comes up automatically for all approaches, even when there is no demand, forces all users to wait because the traffic signals will cycle between the main street and side street continually, regardless of demand. The impact associated with the continuous cycling of the traffic signals would be especially noticeable to all users at locations where side street volumes are lower and at times outside peak periods. During these times, drivers and pedestrians would encounter red lights more often and with no conflicting traffic on the other approaches. This often creates unnecessary delay and congestion that increases vehicle idling and emissions, delays other modes such as bicycles, transit and pedestrians, and could lead to increases in unsafe behaviours as users could begin to ignore the signals as they see no conflicting traffic.

Minimum time for a pedestrian phase is much longer than what is required for a minimum vehicle phase because of the time needed for pedestrians to complete their crossing. Therefore, during certain traffic conditions, when a pedestrian signal is displayed in one direction, even though there are no pedestrians crossing, those wishing to cross in the other direction must wait longer to get their signal. Similarly, when pedestrian signals are displayed regardless of demand, pedestrians travelling along the main street are much more likely to be forced to stop and wait at side street crossings even though there are no vehicles or pedestrians being served by the side street phase. Use of push buttons to activate low demand pedestrian movements helps to reduce unnecessary intersection delay for all users, including pedestrians.

Other Considerations

Aside from activation of the pedestrian walk signal, push buttons are also used to activate accessible pedestrian signals (APS). APS installation is part of HRM's standard for all new traffic signal installations and are also included in all signal upgrade / rehabilitation projects, which aligns with the Provincial Interim Accessibility Guidelines. The devices are used to provide an audible tone to identify when the walk signal is displayed and then provide guidance along the crossing to those individuals who are blind or visually impaired. There are some older installations in the downtown area (e.g. Spring Garden Road at Barrington Street) where there are no push buttons and the APS comes on automatically with each pedestrian phase. Introduction of specialized push buttons as part of signal upgrades has provided the ability to only bring up the audible signal, when required, by pressing the button. Prior to the use of the new APS buttons, staff often received complaints from residents living near signals with APS devices regarding the continual noise created by the signal tones because the audible signal was only needed when a blind or visually impaired individual was crossing. The new buttons allowed for a compromise in that the audible signal was available but was only activated when needed.

Similarly, the use of push buttons to activate pedestrian signals provides for a more balanced approach to operating a signalized intersection. The pedestrian signal is provided when it is needed, and at some times automatically because of high demand, but is not activated when not needed, thereby minimizing impacts to other users. A widespread approach to eliminate the requirement for pedestrians to push a button to get a walk signal would have significant operational impacts and would affect all users, including pedestrians.

The information provided above would still be applicable when considering the current situation with COVID-19. As indicated in this report, intersections in the busiest pedestrian areas of HRM are already automatically displaying the pedestrian phase for all or most of the day. As HRM moves into the recovery stage of the pandemic, even with reduced traffic volumes, a widespread implementation of pedestrian signal recall at signalized intersections would result in a significant impact, by way of increased delay, to all road users. Many businesses have moved to delivery and curbside pick-up options, and so are more reliant on an efficiently operated transportation network. Transit is beginning to see increases to ridership and service levels and rely on efficient operation of traffic signals to be able to ensure schedule adherence and reliability for their passengers.

Staff consulted with counterparts from other jurisdictions across the country to discuss and identify approaches to deal with pandemic response as it relates to operation of transportation networks. When considering programming traffic signals to automatically display the pedestrian phases, only a small number of jurisdictions actually implemented widespread changes to their signal networks to eliminate the need for push buttons to be used and the City of Guelph reversed this decision after implementation because of significant negative public feedback related to the impact it had to the network It was also noted in the information received that use of a pedestrian push-button would be no different than using a door knob, elevator button or hand railing while out in a public space so the buttons did not pose a significant risk.

Adjustments have been made to traffic signals throughout the municipality in response to changes in travel demand related to the pandemic and social distancing needs. Signal timings have been adjusted to reduce the cycle length and times when certain corridors operate in coordination. These changes result in the signals changing quicker, which reduces the time pedestrians must wait to get a walk signal, thereby reducing the potential for increased numbers of pedestrians queuing at a location while they wait to cross. This approach is consistent with those being used by other jurisdictions as they respond to the current pandemic situation.

Summary and Next Steps

In summary, the use of push buttons generally helps to provide a more balanced and efficient way to operate a signalized intersection by serving those movements, pedestrian and vehicle, that have associated demand.

Staff believe providing appropriate controls at an intersection based on the conditions and demands at the location, through the application of sound transportation engineering principles and in keeping with best practices, is the most appropriate means of providing a safe and efficient transportation network.

The Integrated Mobility Plan strives to use design features to improve walkability, particularly on pedestrian priority routes in urban areas. Design features such as curb extensions and refuge medians can be used to provide an enhanced pedestrian crossing. To provide a more balanced approach to the operation of HRM's traffic signals and in alignment with the *Integrated Mobility Plan*, staff are committed to undertaking the following:

1. Assessing locations where pedestrian volumes are high to consider implementing pedestrian recall for certain times of the day;
2. Assessing locations where pedestrian volumes are high that may be appropriate to implement fixed signal timing which would include pedestrian recall;
3. Assessing corridors with coordinated signal operation to determine if the coordination period can be shortened to allow more flexible timing plans that would provide better responsiveness of pedestrian push buttons to activate walk signals;

4. Investigating the potential for programming changes that could allow for the push button to provide priority to the pedestrian call, allowing the pedestrian signal to be held longer or be brought up quicker; and,
5. Investigating technologies that could allow for automated pedestrian detection.

Items 4 and 5 will be undertaken immediately. Staff will begin testing in-house to determine if programming can be implemented that will allow for push buttons to provide priority calls for pedestrian phases. Also, staff currently investigate new technologies through interaction with equipment vendors and participation in technical associations like the International Municipal Signal Association (IMSA) and Institute of Transportation Engineers (ITE) in order to ensure they are aware of new and emerging technologies associated with traffic signal systems.

Undertaking items 1 to 3 will require time and resources to gather the necessary traffic and pedestrian data, review existing signal timings, assess impacts related to proposed changes and implementation of new signal timings (where determined appropriate). Given current resources, the time required to assess potential changes would vary from approximately 2 weeks for assessment of an isolated location for implementation of pedestrian recall or timing changes (Items 1 and 2 above) to several months for assessment of an entire corridor (Item 3 above).

Within HRM's network of 272 traffic signals, 23 coordinated signal corridors are currently operated, each of varying length and number of traffic signals. There are currently three Traffic Signal Analyst positions that are responsible for the programming and monitoring of this infrastructure. Given typical work loads, it is assumed that it would take approximately three months for one corridor to be assessed, so one Traffic Signal Analyst could potentially assess four corridors per year for a total of 12 corridors for all three Traffic Signal Analyst positions. Based on this estimate, the 23 coordinated corridors would take a minimum of two years to assess should this approach be undertaken. It should be noted that this is a very optimistic estimate as timeframes would also be dependant on available resources (staff, equipment and funding) for the necessary data collection.

Recognizing that pedestrian volumes are highest in the downtown core areas, and that the Halifax Peninsula intersections are already set for pedestrian recall, staff will focus on completing assessments for those intersections and corridors located within the downtown area of Dartmouth and other high pedestrian areas first.

FINANCIAL IMPLICATIONS

There are no financial implications associated with this report. Shorter timelines, for items 1-3 identified in the Summary and Next Steps section, may be achieved with additional resources. Funding for additional resources; staff / contractors, equipment and supporting data processing functions would require Council approval.

COMMUNITY ENGAGEMENT

Community engagement was not required as this report deals with a request to amend internal processes related to the operation of traffic control devices.

ATTACHMENTS

Attachment 1 – Inventory of Signalized Intersections

A copy of this report can be obtained online at halifax.ca or by contacting the Office of the Municipal Clerk at 902.490.4210.

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Attachment 1

Intersection	District	Push Buttons Present	Push Buttons Crossing Main Street	Push Buttons Crossing Side Street	Botton Type (Navagator-N / Standard-S)	Button For APS Only	Pedestrian Recall	Time of Day for Pedestrian Recall	Potential Wait Time
Agricola Street at Almon Street	8	Y	Y	Y	N	N	Y	6 am to 11 pm	83 sec
Agricola Street at North Street	8	N	N	N	-	-	Y	-	83 sec
Agricola Street at Young Street	8	Y	Y	Y	N	N	Y	6 am to 10 pm	83 sec
Akerley at Joseph Zatzman	6	Y	Y	Y	S	N	N	-	92.0
Akerley at n/a Savage	6	Y	Y	Y	S	N	N	-	101.9
Akerley Blvd at Mosher Dr	6	Y	Y	Y	S	N	N	-	81.5
Alderney Dr at King St	5	Y	Y	Y	N	N	N	-	91.6 sec
Alderney Dr at Ochterloney	5	Y	Y	Y	N	N	N	-	83 sec
Alderney Dr at Portland	5	Y	Y	N	S	N	N	-	95 sec
Alderney Dr at Queen	5	Y	Y	N	S	N	N	-	83 sec
Alma Cres. at Dutch Village Road	10	N	N	N	S	N	Y	-	83 sec
Almon St at Gottingen St	8	Y	Y	Y	N	N	Y	6 am to 10 pm	83 sec
Almon St at Gladstone (Pedestrian 1/2 signal)	8	Y	Y	N	N	N	N		
Almon St at Oxford St	8	N	N	N	-	-	Y	-	83 sec
Almon Street at Connaught Avenue	9	N	N	N	-	-	Y	-	123 sec
Almon Street at Robie Street	8	N	N	N	-	-	Y	-	83 sec
Almon Street at Windsor Street	8	Y	Y	Y	N	N	Y	7 am to 11 pm	83 sec
Baker at Basswood	3	Y	Y	Y	N	N	N	-	65.3
Barrington St at Cogswell St	7	N	N	N	-	-	Y	-	65 sec
Barrington St at Cornwallis St	7	N	N	N	-	-	Y	-	91 sec
Barrington St at Duke St	7	N	N	N	-	-	Y	-	69 sec
Barrington St at Morris St	7	N	N	N	-	-	Y	-	67 sec
Barrington St at Niobe Gate	8	Y	Y	N	S	N	N	-	93 sec
Barrington St at North St	8	Y	Y	N	S	N	N	-	93 sec
Barrington St at Prince St	7	N	N	N	-	-	Y	-	73 sec
Barrington St at Sackville St	7	N	N	N	-	-	Y	-	67 sec
Barrington St at Spring Garden Road	7	N	N	N	-	-	Y	-	67 sec
Bayers Road at Connaught Avenue	8	N	N	N	-	-	Y	-	123.0
Bayers Road at Halifax Shopping Centre	9	N	N	N	-	-	Y	-	123.0
Bayers Road at Joseph Howe Drive	9	Y	Y	N	S	N	N	-	113 sec
Bayers Road at Oxford Street	8	Y	Y	Y	N	N	Y	7 am to 7 pm	103.0
Bayers Road at Pennington at Petro Canada	9	Y	Y	N	S	N	N	-	123.0
Bayers Road at Romans Avenue	9	N	N	N	-	-	Y	-	123.0
Bayers Road at Windsor St at Young St	8	Y	Y	Y	s	N	Y	7 am to 7 pm	103.0
Bayview Road at Bedford Highway	10	Y	Y	N	S	N	N	-	103 sec
Bayview Road at Clayton Park Dr. at Lacewood Dr.	10	N	N	N	-	-	Y	-	70 sec
Beaverbank Rd. at Stokil & Millwood	15	Y	Y	Y	N	N	N	-	88.2
Bedford Hwy at Bedford Place Mall North (River Ln)	16	Y	Y	Y	N	N	* (coord ph onl	6:45 am to 8 pm M/F & 11 am to 6 pm S/S	113 sec
Bedford Hwy at Bedford Place Mall South	16	Y	Y	Y	S	N	* (coord ph onl	6:45 am to 8 pm M/F & 11 am to 6 pm S/S	113 sec
Bedford Hwy at Civic #50 Bedford Hwy	10	Y	N	Y	N	N	* (coord ph onl	6:30 to 9:15 am , 11 am to 8 pm M/F & 10 am to 6 pm S/S	77 sec
Bedford Hwy at Convoy at Holland	16	Y	Y	N	S	N	N	-	89 sec
Bedford Hwy at Dartmouth Road	16	Y	Y	Y	S	N	* (coord ph onl	6:45 am to 10 pm M/F & 9 am to 9 pm S/S	113 sec
Bedford Hwy at Flamingo Dr	10	Y	Y	N	S	N	N	-	113 sec
Bedford Hwy at Hammonds Plains Road	16	Y	Y	Y	S	N	* (coord ph onl	6:30 to 8:30 am, 11 am to 8 pm M/F & 10 am to 6 pm S/S	103 sec
Bedford Hwy at Hatchery Ln	16	Y	Y	N	S	N	* (coord ph onl	6:45 am to 9 pm M/F & 10 am to 8 pm S/S	93 sec
Bedford Hwy at Kearney Lake Road	10	Y	Y	N	S	N	N	-	114 sec
Bedford Hwy at Larry Uteck Blvd (Royal Hemlocks)	16	Y	Y	Y	S	N	N	-	114 sec
Bedford Hwy at Meadowbrook	16	Y	Y	N	S	N	N	-	80 sec
Bedford Hwy at Moirs Mill Road	16	Y	Y	N	S	N	* (coord ph onl	6:30 to 8:30am, 11 am to 8 pm M/F & 10 am to 6 pm Sat, 11 am to 6 pm Sun	103 sec

Intersection	District	Push Buttons Present	Push Buttons Crossing Main Street	Push Buttons Crossing Side Street	Botton Type (Navagator-N / Standard-S)	Button For APS Only	Pedestrian Recall	Time of Day for Pedestrian Recall	Potential Wait Time
Bedford Hwy at Rocky Lake Drive	16	N	N	N	-	-	Y	-	123 sec
Bedford Hwy at Southgate Rd	16	Y	Y	Y	S	N	N	-	80 sec
Bedford Hwy at Sunnyside Mall	16	Y	Y	N	S	N	* (coord ph onl	6:45 am to 10 pm M/F & 9 am to 9 pm S/S	113 sec
Bedford Hwy at Union Street	16	Y	Y	N	S	N	* (coord ph onl	6:45 am to 9 pm M/F & 10 am to 8 pm S/S	93 sec
Bell Road at Sackville St. at South Park St.	7	N	N	N	-	-	Y	-	91 sec
Bell Road at Summer at Trollope	7	Y	Y	Y	N	N	Y	7 am to 7 pm	83 sec
Brunswick St at Cogswell Street	7	N	N	N	-	-	Y	-	73 sec
Brunswick St at Cornwallis Street	8	N	N	N	-	-	Y	-	68 sec
Brunswick St at Duke St. at Rainnie Dr.	7	N	N	N	-	-	Y	-	73 sec
Brunswick St at North Street	7	N	N	N	-	-	Y	-	83 sec
Brunswick St at Prince Street	7	N	N	N	-	-	Y	-	73 sec
Brunswick St at Sackville Street	7	N	N	N	-	-	Y	-	73 sec
Burnside at Akerley	6	N	N	N	-	-	Y	-	0.0
Burnside at Commodore at Ronald Smith	6	Y	Y	Y	S	N	N	-	107.0
Burnside Dr at Wright Ave	6	Y	Y	Y	s	N	N	-	92.7
Chain Lake Dr.- Hobson Lake at Horseshoe Lake	12	Y	Y	Y	S	N	N	-	96 sec
Chain Lake Dr.- Kent at Costco Driveway	12	Y	Y	Y	s	N	N	-	88 sec
Chain Lake Dr.- Superstore Driveway	12	Y	Y	Y	s	N	N	-	88 sec
Chain Lake Dr.- Susie Lake	12	Y	Y	Y	s	N	N	-	88 sec
Chain Lake Dr. at Civic #201 (Dairy Queen)	12	Y	Y	Y	s	N	N	-	88 sec
Chain Lake Dr. at Lakelands Blvd.	12	Y	Y	Y	s	N	N	-	93.1 sec
Chebucto Rd at Connaught Avenue	9	Y	Y	Y	N	N	Y	-	123.0
Chebucto Rd at Cunard St. at Windsor St.	9	N	N	N	-	-	Y	-	83.0
Chebucto Rd at MacDonald St. at Mumford Rd.	9	Y	Y	Y	N	N	Y	6:30 am to 9 pm M/F & 9 am to 9 pm S/S	123.0
Chebucto Rd at Oxford St / North St at Oxford St	8	N	N	N	-	-	Y	-	83.0
Cobequid Rd at Zinck Ave (Medical Center)	15	Y	Y	Y	S	N	N	-	95.6
Coburg Rd at Oxford Street	7	N	N	N	-	-	Y	-	103.0
Coburg Rd at Robie St. at Spring Garden Rd.	7	Y	Y	Y	N	Y	Y	24 hours	93 sec
Cogswell St at Gottingen Street	7	N	N	N	-	-	Y	-	93 sec
Cole Harbour Rd. at Forest Hills Dr.	4	Y	Y	Y	N	N	N	-	120 sec
Cole Harbour Rd. at Hugh Allen Dr.	4	Y	Y	Y	N	N	N	-	75 sec
Cole Harbour Rd. at Otago Dr	4	Y	Y	Y	N	N	N	-	100 sec
Commodore at Brownlow	6	Y	Y	Y	s	N	N	-	83.0
Commodore at Countryview	6	Y	Y	Y	S	N	N	-	87.6
Commodore at Eileen Stubbs at Spectacle Lake	6	Y	Y	Y	S	N	N	-	71.2
Commodore at Finlay	6	Y	Y	Y	S	N	N	-	87.7
Connaught Ave at Quinpool Rd	9	Y	Y	Y	N	Y	Y	24 hours	123 sec
Connaught Ave at Windsor St	9	N	N	N	-	-	Y	-	73.0
Cornwallis St at Gottingen St	7	N	N	N	-	-	Y	-	77 sec
Countryview at McClure	6	Y	Y	Y	S	N	N	-	86.9
Countryview at Shubie	6	Y	Y	Y	S	N	N	-	87.1
Cow Bay Rd at Caldwell Rd	3	Y	Y	Y	S	N	N	-	114 sec
Cowie Hill at Herring Cove Rd	9	Y	Y	Y	S	N	N	-	95.1
Cunard Street at Robie Street	8	Y	Y	Y	N	N	Y	7 am to 7 pm	83 sec
Cutler Ave at Ikea	6	Y	Y	Y	N	N	N	-	95.0
Damascus Rd at Verdi	16	Y	Y	Y	S	N	N	-	87 sec
Damascus Rd at Walmart	16	Y	Y	Y	S	N	N	-	66 sec
Dartmouth Dr at Ridgevale	16	Y	Y	Y	S	N	N	-	99 sec
Dentith Rd at Herring Cove Road	11	Y	Y	Y	N	N	N	-	80.7

Intersection	District	Push Buttons Present	Push Buttons Crossing Main Street	Push Buttons Crossing Side Street	Botton Type (Navagator-N / Standard-S)	Button For APS Only	Pedestrian Recall	Time of Day for Pedestrian Recall	Potential Wait Time
Dentith Rd at Old Sambro Road	11	Y	Y	Y	S	N	N	-	70.5
Devonshire Ave at Duffus St. at Novalea Dr.	8	Y	Y	Y	N & S	N	Y	7 am to 7 pm	83 sec
Donaldson Ave at Dunbrack St. at Kearney Lake Rd.	10	Y	Y	N	S	N	N	-	91 sec
Dresden Row at Spring Garden Rd	7	Y	Y	Y	N	N	Y	6 am to11 pm M/F & 8 am to 11 pm S/S	64 sec
Duke St at Damascus Rd	16	Y	Y	Y	S	N	N	-	91 sec
Duke St at Hollis Street	7	N	N	N	-	-	Y	-	66 sec
Duke St at Upper Water	7	Y	Y	Y	N	Y	Y	24 hours	73 sec
Dunbrack at Radcliffe - Meadowlark	10	Y	Y	N	S	N	N	-	91sec
Dunbrack St at Farnham Gate Rd	10	Y	Y	Y	s	N	N	-	91 sec
Dunbrack St at Knightsridge at Langbrae	10	Y	Y	Y	s	N	N	-	91 sec
Dunbrack St at Lacewood Drive	10	Y	Y	Y	N	N	N	-	91 sec
Dunbrack St at Main Ave	10	Y	Y	Y	s	N	N	-	91 sec
Dunbrack St at Willett St	10	Y	Y	Y	s	N	N	-	91 sec
Dutch Village Road at Joseph Howe Drive	9	Y	Y	Y	s	N	N	-	113 sec
Eastern Passage at Bonaventure Ave	3	Y	Y	Y	S	N	N	-	105 sec
Eastern Passage at Cowbay at Shore Road	3	Y	Y	Y	S	N	N	-	101 sec
Fall River Rd at Route #2 Sobeys	1	Y	Y	Y	s	N	N	-	105.6
Finlay at McClure	6	Y	Y	Y	S	N	N	-	96.6
Finlay at Shubie	6	Y	Y	Y	S	N	N	-	86.5
Forest Hills Dr. at Canadian Tire	4	Y	Y	Y	N	N	N	-	80 sec
Forest Hills Dr. at Circassion	4	Y	Y	Y	N	N	N	-	91 sec
Forest Hills Dr. at Cole Harbour Place	4	Y	Y	Y	N	N	N	-	95 sec
Forest Hills Dr. at Taranaki at Flying Cloud	4	Y	Y	Y	S	N	N	-	80 sec
Forest Hills Parkway at Auburn Dr	4	Y	N	Y	S	N	N	-	104 sec
George St at Hollis Street	7	N	N	N	-	-	Y	-	71 sec
George St at Water Street	7	N	N	N	-	-	Y	-	73 sec
Glendale Dr at Beaverbank Rd.	15	Y	Y	Y	N	N	N	-	89.6
Glendale Dr. at Cobequid Rd.	15	Y	Y	Y	N	N	N	-	73.9
Glendale Dr. at McDougall at Sportsplex	15	Y	Y	N	N	N	N	-	110.6
Glendale Dr. at Metropolitan Ave.	15	Y	Y	Y	S	N	N	-	85.0
Glendale Dr. at Riverside Dr.	15	Y	Y	Y	S	N	N	-	97.3
Gottingen St at North Street	8	N	N	N	-	-	Y	-	83 sec
Gottingen St at Novalea Dr. at Young St.	8	N	N	N	-	-	Y	-	83 sec
Hammonds Plains at Basinview	16	Y	Y	Y	S	N	N	-	95 sec
Hammonds Plains at Gary Martin Dr	16	Y	Y	Y	S	N	N	-	105 sec
Hammonds Plains at Glen Arbour Way	13	Y	Y	Y	s	N	N	-	86 sec
Hammonds Plains at Innovation Dr	16	Y	Y	Y	S	N	N	-	106 sec
Hammonds Plains at Kingswood	13	Y	Y	Y	s	N	N	-	96 sec
Hammonds Plains at Larry Uteck	16	Y	Y	Y	s	N	N	-	83.2 sec
Hammonds Plains at Lucasville	13	Y	Y	N	S	N	N	-	129.8 sec
Hammonds Plains at Pockwock Rd	13	Y	Y	N	S	N	N	-	110.1 sec
Hammonds Plains at Westwood at Flatlake	13	Y	Y	Y	s	N	N	-	89.2 sec
Herring Cove Rd at Old Sambro Road	9	Y	Y	Y	N	N	N	-	80.2
Herring Cove Rd at Williams Lake Rd	9	Y	Y	Y	N	N	N	-	79.8
Hollis St at Morris Street	7	N	N	N	-	-	Y	-	69 sec
Hollis St at Prince Street	7	N	N	N	-	-	Y	-	71 sec
Hollis St at Sackville Street	7	N	N	N	-	-	Y	-	68 sec
Horseshoe Lake at Susie Lake	12	Y	Y	Y	S	N	N	-	115 sec
Ilsley at Ronald Smith	6	Y	Y	Y	S	N	N	-	121.0

Intersection	District	Push Buttons Present	Push Buttons Crossing Main Street	Push Buttons Crossing Side Street	Botton Type (Navagator-N / Standard-S)	Button For APS Only	Pedestrian Recall	Time of Day for Pedestrian Recall	Potential Wait Time
Inglis St at Robie St	7	Y	Y	Y	N	N	Y	7 am to 7 pm M/F & 8 am to 7 pm S/S	93 sec
Inglis St at Tower Rd	7	Y	Y	Y	N	N	Y	7 am to 7 pm	73 sec
Joseph Howe Dr at Hwy #102	9	Y	Y	N	S	N	N	-	113 sec
Joseph Howe Dr at Mumford Road	9	Y	Y	Y	s	N	N	-	113 sec
Joseph Howe Dr at Scot St	9	Y	Y	N	S	N	N	-	113 sec
Joseph Howe Dr at Springvale	9	Y	Y	N	S	N	N	-	113 sec
Joseph Howe Dr at Superstore	9	Y	Y	N	S	N	N	-	113 sec
Jubilee Rd at Oxford St	7	N	N	N	-	-	Y	-	85 sec
Jubilee Rd at Robie St	7	Y	Y	Y	N	N	Y	7 am to 7 pm	93 sec
Kearney Lake Rd at Parkland Dr	10	Y	Y	Y	s	N	N	-	73 sec
Kearney Lake Rd at Castlehill Dr	10	Y	Y	Y	s	N	N	-	73 sec
Kearney Lake Rd at Larry Uteck Blvd	16	Y	Y	Y	N	N	N	-	
Kempt Rd at Young St	8	Y	Y	Y	N	N	Y	6 am to 7 pm M/F & 8 am to 7 pm S/S	83 sec
Kempt Road at Windsor Street	8	Y	N	Y	S	N	N	-	
Lacewood at Radcliffe at Bus Depot	12	Y	Y	Y	N	N	Y	6 am to 10 pm	91 sec
Lacewood Dr at Fairfax	12	Y	Y	N	S	N	N	-	91 sec
Lacewood Dr at Parkland	12	Y	Y	Y	N	N	N	-	91 sec
Lacewood Dr at Sobeys at McDonald's	12	Y	Y	N	S	N	N	-	91 sec
Lacewood Dr at Stratford Way	12	Y	Y	Y	N	N	N	-	91 sec
Lacewood Dr at Willett St	12	Y	Y	Y	N	N	N	-	91 sec
Lady Hammond Rd at Robie Street	8	N	N	N	-	-	Y	-	68 sec
Larry Uteck at Broad Street	16	Y	Y	Y	N	N	N	-	86.0
Larry Uteck at Southgate	16	Y	Y	N	S	N	N	-	80 sec
Main Ave at Titus Street	10	N	N	N	-	-	Y	-	93 sec
Main Ave at Willett St	10	N	N	N	-	-	Y	-	83 sec
Main St at Caledonia at Woodlawn	6	Y	Y	Y	S	N	N	-	123.0
Main St at Forest Hills Dr	4	Y	Y	Y	N	N	N	-	123 sec
Main St at Hartlen	6	Y	Y	Y	N	N	N	-	123.0
Main St at Lake Major	4	Y	Y	Y	s	N	Y	6 am to 9 pm	95.1 sec
Main St at Major -Gordon	6	Y	Y	Y	S	N	N	-	123.0
Main St at Montague	4	Y	Y	Y	s	N	N	-	123 sec
Main St at Panavista Dr	4	Y	Y	N	S	N	N	-	123 sec
Main St at Ridgecrest	6	Y	Y	Y	S	N	N	-	93.0
Main St at Westphal Trailer Park	4	Y	Y	Y	s	N	Y	6 am to 9 pm	95 sec
Main St at Weyburn	6	Y	Y	N	S	N	N	-	123.0
Metropolitan Ave. at First Lake Dr.	15	Y	Y	Y	S	N	N	-	63.0
Micmac Blvd at Glen Manor	5	Y	Y	Y	s	N	N	-	93.6 sec
Micmac Blvd at Kent Store Driveway	5	Y	Y	Y	s	N	N	-	55.9 sec
Micmac Blvd at Mall Entrance (Brookdale)	5	Y	Y	Y	s	N	N	-	97.1 sec
Morris St at South Park St. at University Ave.	7	N	N	N	-	-	Y	-	67 sec
Mount Hope at Baker	3	Y	Y	Y	S	N	N	-	76.0
Mumford Rd at Hfx. Shopping Centre at West End Mall	9	N	N	N	-	-	Y	-	93.0
Mumford Rd at Romans Avenue	9	N	N	N	-	-	Y	-	93.0
Nantucket Ave at Sportsplex	15	Y	Y	N	N	N	N	-	133 sec
North St at Oxford St (see Chebucto St at Oxford St)	8	N	N	N	-	-	Y	-	83 sec
North St at Robie Street	8	N	N	N	-	-	Y	-	83 sec
North St at Windsor Street	8	N	N	N	-	-	Y	-	83 sec
Northwest Arm Dr at Old Sambro Rd	11	Y	Y	Y	S	N	N	-	90.4
Ochterloney St at Maple	5	Y	Y	N	S	N	N	-	83 sec

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Oxford Street at Quinpool Road	8	N	N	N	-	-	Y	-	107 sec
Pleasant St at Acadia	5	Y	Y	Y	N	N	N	-	82.2 sec
Pleasant St at Atlantic	5	Y	Y	Y	s	N	N	-	94.5 sec
Pleasant St at Everett	5	Y	Y	Y	S	N	N		80 sec
Pleasant St at Hwy111	5	Y	Y	Y	s	N	N	-	117.4 sec
Pleasant St at Imperial Oil	3	Y	Y	N	S	N	N	-	92 sec
Portland St at Prince Albert at Alderney	5	N	N	N	-	-	Y	-	95 sec
Portland St at Bus Depot	3	Y	Y	Y	S	N	N	-	113.0
Portland St at Caldwell at Dorothea	3	Y	Y	Y	S	N	N	-	100.0
Portland St at Carver at Eisener	6	Y	Y	Y	N	N	N	-	123.0
Portland St at Chestnut at Manor	5	Y	Y	Y	N	N	Y	6 am to 8 pm	98 sec
Portland St at Gaston	5	Y	Y	N	S	N	N	-	98 sec
Portland St at Hwy 111	6	Y	N	Y	S	N	N	-	123.0
Portland St at Penhorn Mall	5	Y	Y	Y	s	N	N	-	123 sec
Portland St at Pleasant	5	Y	Y	Y	s	N	N	-	110 sec
Portland St at Prince Arthur St	5	Y	Y	N	S	N	N	-	98 sec
Portland St at Regal Rd	3	Y	Y	N	S	N	N	-	113.0
Portland St at Spring at Portland Estates	6	Y	Y	Y	S	N	N	-	112.0
Portland St at Woodlawn	6	Y	Y	Y	N	N	N	-	83.0
Portland St -Sears Entrance	5	Y	Y	Y	s	N	N	-	93 sec
Preston St at Quinpool Road	8	Y	Y	Y	N	N	Y	7 am to 7 pm	123 sec
Prince Albert Rd at Hawthorne	5	Y	Y	N	S	N	N	-	85 sec
Queen St at South St	7	Y	Y	Y	N	N	Y	7 am to 7 pm	61 sec
Queen St at Spring Garden Rd	7	Y	Y	Y	N	Y	Y	24 hours	66 sec
Quingate Place at Quinpool Road at Vernon Street	7	N	N	N	-	-	Y	-	118 sec
Quinpool Rd at Beech St (Pedestrian 1/2 signal)	9	Y	Y	N	S	N	N	-	103 sec
Quinpool Rd at Harvard St (Pedestrian 1/2 signal)	8	Y	Y	N	S	N	N	-	123 sec
Robie St at South Street	7	Y	Y	Y	N	N	Y	7 am to 7 pm	75 sec
Robie St at University Avenue	7	Y	Y	Y	N	N	Y	7 am to 9 pm M/F & 8 am to 9 pm S/S	93 sec
Robie St at Young St	8	Y	Y	Y	N	N	Y	6 am to 7 pm M/F & 8 am to 7 pm S/S	83 sec
Sackville Dr at Beaverbank Rd.	15	Y	Y	Y	N	N	N	-	88.0
Sackville Dr at Downsview Mall	15	Y	Y	Y	S	N	N	-	95.0
Sackville Dr at Florence at Leaside	15	Y	Y	Y	S	N	N	-	85.1
Sackville Dr at Millwood	14	Y	Y	Y	S	N	N	-	94.9
Sackville Dr at Pinehill Dr.	15	Y	Y	Y	S	N	N	-	64.7
Sackville Dr at Riverside Dr.	15	Y	Y	Y	N	N	N	-	65.3
Sackville Dr at Sackville Cross Road	15	Y	Y	Y	N	N	N	-	59.8
Sackville Dr at Skyridge Ave.	15	Y	Y	Y	S	N	N	-	65.2
Sackville Dr at Superstore at Wallmart	15	Y	Y	Y	N	N	N	-	68.1
South Park St at Spring Garden Road	7	Y	Y	Y	N	N	Y	7 am to 7 pm	68 sec
South St at South Park Street	7	N	N	N	-	-	Y	-	61 sec
Spring Garden Road at Summer Street	7	N	N	N	-	-	Y	-	73 sec
St. Margarets Bay Rd. at Northwest Arm Dr. Connecto	11	Y	Y	Y	S	N	N	-	79.4
Starboard at Peakview	16	Y	Y	Y	S	N	N	-	85 sec
Trunk #3 at Lakeside Industrial Park	12	Y	Y	Y	S	N	N	-	96 sec
Victoria Rd at Highfield Park	5	Y	Y	N	S	N	N	-	90.8
Victoria Rd at Albro Lake	5	Y	Y	N	S	N	N	-	85.0
Victoria Rd at Boland	5	Y	Y	Y	S	N	N	-	94.9
Victoria Rd at Nantucket	5	Y	Y	Y	S	N	N	-	94.8

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Victoria Rd at Primrose	5	Y	Y	Y	N	N	N	-	65.2
Victoria Rd at Thistle	5	Y	Y	Y	S	N	N	-	84.7
Victoria Rd at Woodland	5	Y	Y	Y	S	N	N	-	93.0
Waverley at Montebello	6	Y	Y	Y	S	N	N	-	95.0
Willow Tree (Bell Road at Cogswell St at Quinpool Rd at Robie St)	7	N	N	N	-	-	Y	-	146 sec
Windmill Rd at Akerley	6	Y	Y	Y	s	N	N	-	143 sec
Windmill Rd at Albro Lake	6	Y	Y	N	S	N	N	-	64.8 sec
Windmill Rd at Princess Margaret -Yorkshire	6	Y	Y	Y	S	N	N	-	85.9
Windmill Rd at Ralston at SeaPoint	6	Y	Y	Y	s	N	N	-	143 sec
Windmill Rd at Victoria at Lynch Crt	6	Y	Y	Y	s	N	N	-	143 sec
Windmill Rd at Wright at Bancroft Dr	6	Y	Y	N	S	N	N	-	143 sec
Windmill Rd at Wyse Rd	5	Y	Y	N	S	N	N	-	54.8 sec
Woodland Ave at Micmac at Lancaster	5	Y	Y	N	S	N	N	-	116 sec
Woodlawn Ave at Athorpe Dr	6	Y	Y	Y	S	N	N	-	55.7
Woodlawn Ave at Kelly at Settle	5	Y	Y	Y	S	N	N	-	116.0
Woodlawn Ave at Mt. Edward	6	Y	Y	Y	N	N	N	-	75.2
Wright at n/a Savage	6	Y	Y	Y	**S**	N	N	-	96.3
Wright at Williams at Garland	6	Y	Y	Y	**S**	N	N	-	95.8
Wright Ave at Finlay	6	Y	Y	Y	**S**	N	N	-	74.0
Wright Ave at Ilsley at Isnor	6	Y	Y	Y	**S**	N	N	-	70.2
Wright Ave at Joseph Zatzman at Raddall	6	Y	Y	Y	**S**	N	N	-	76.3
Wright Ave at MacDonald	6	Y	Y	Y	**S**	N	N	-	90.6
Wright Ave at Wilkinson	6	Y	Y	Y	**N**	N	N	-	86.3
Wyse Rd at Albro Lake	5	Y	Y	N	S	N	N	-	91 sec
Wyse Rd at Boland Rd	5	Y	Y	N	S	N	N	-	91 sec
Wyse Rd at Nantucket	5	Y	Y	Y	**N**	N	N	-	133 sec
Wyse Rd at Thistle	5	Y	Y	Y	**N**	N	N	-	91 sec