Fathom

40 King St.
Dartmouth, NS
B2Y 2R4

902-461-2525

Screen Nova Scotia
Suite 403, 1869 Upper Water Street
Halifax, Nova Scotia, B3J 1S9

November 29, 2023

Project Number
23-085

Screen Nova Scotia - Sound Stage Development
Transportation Impact Statement

To whom in may concern:

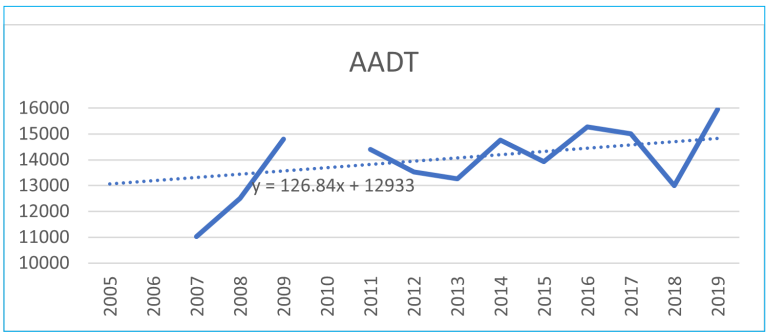
Fathom studio has prepared a transportation impact statement for the proposed Screen Nova Scotia sound stage development located just south of Exhibition Park and immediately east of Prospect Road (Route 333), in the community of Goodwood, HRM, NS. The intent of this letter is to summarize the anticipated operational, geometric and safety impacts of the proposed development on the surrounding transportation networks (roadways, active transportation, goods movements and transit).

EXISTING CONDITIONS

The existing property is a wooded undeveloped land parcel with identified wetland areas along its east side (furthest from Prospect Road), southeast sides and a smaller wetland area adjacent to Prospect Road.

Proposed site access will be from two driveways to Prospect Road, which is a two-lane undivided rural roadway with two, 3.5 meter lanes, ~1.8 meter asphalt paved shoulders with gravel edging, and ditches along both sides of the road. The road has a posted speed limit of 80 km/h with minimal vertical grades, though has a number of horizontal curves in the vicinity of the development (discussed in further detail below).

Figure below shows traffic volume data extracted from the Nova Scotia "Traffic Volumes - Provincial Highway System" open data portal for the years between 2005 and 2019. The counts were taken approximately 1 and 0.43 kilometers west of Highway 3 (St. Margaret's Bay Road), which represent locations just east and just west of the Ragged Lake Business Park. The Average Annual Daily Traffic Volumes (AADT) do not appear to change significantly at the two locations. The chart to the right shows traffic conditions for a 14 year period between 2005 and 2019. The estimated trend-line represents an average growth rate of about 0.9% over the past 14 years. The provincial data set also shows a relatively high truck traffic volumes on Prospect Road ranging from about 9% to 15% for years where data was available.



In addition to the Provincial Traffic data, an intersection turning movement count was completed at the intersection of Prospect Road and Ragged Lake Drive in October 2023 using Miovision automated traffic data collection technologies.

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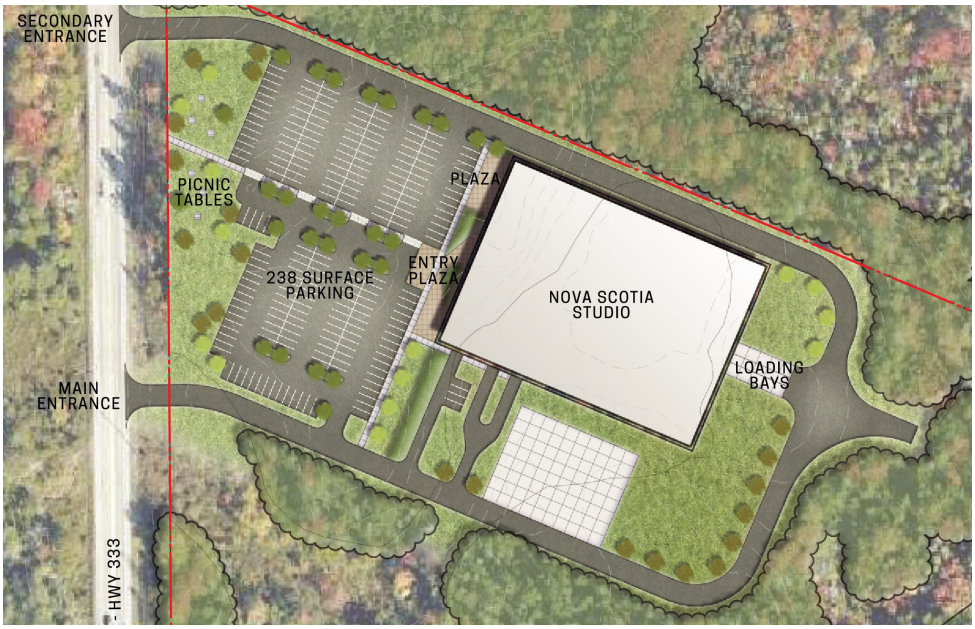
PROPOSED DEVELOPMENT

The proposed development is the province's first purpose-built film and television sound-stage. The development will have a limited number of permanent on-site staff, with site usage anticipated to include a variety of short to mid-term (estimated between 1 month and 8 months) facility rentals for the creation of various audio and visual productions.

The proposed development is located immediately south of the existing Halifax Exhibition Center, and is positioned toward the northwest corner of the site due to existing wetland areas to the southeast. The site is expected to be serviced through two access driveways located toward the north and south sides of the development as shown in the conceptual figure below.



The site can accommodate up to about 238 parking spaces located between the building and Prospect Road and includes loading bays at the rear of the building supported by a truck access roadway along the periphery of the site. Access points, internal circulation, and turning areas should be deigned to accommodate these larger vehicles. The above figure shows a conceptual layout well suited to accommodate these truck movements with minimal impact to on-site circulation of regular day traffic.

TRIP GENERATION and OPERATIONAL CONSIDERATIONS

There are no direct trip generation estimate rates for specialized developments such as this, though the nature and size of the development provides for some insight as to the number of trips that may be expected to enter and exit the sight during specific periods of time. The following key points were developed in conjunction with the project's experienced development group in order to provided a reasonable estimate of trips that may be expected to and from the site:

- While the site includes up to 238 parking spaces, it is anticipated full use of the parking lot will be very infrequent (estimated between 1 and 4 times per year at most) and would require a large scale facility rental to generate such volumes.
- As the development is not "event based" (i.e. it does not draw the general public to the facility for events), traffic coming to and from the site are expected to be distributed throughout the day. Many staff (for the renters of the facility) typically work shifts up to 12 hours in length and often arrive and depart outside of typical roadway peak hours.

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- The facility will often operate 7 days a week, though volumes to and from the site are generally significantly lower on weekends and more spread out through the day.
- Traffic patterns are expected to be relatively consistent throughout any given rental period, though may change significantly from one rental period to the next.
- Truck traffic to and from the site is expected to be regular, though volumes will be low. Most or all of this truck movement is expected to occur outside of typical peak hours of traffic.
- Active transportation traffic to and from the site is expected to be minimal given the nature and location of the development.

Based on the October 2023 count data, AM peak volumes near the development are in the range of 300 - 350 vehicles per hour (vph) in the outbound (southbound) direction, and 800 - 900 vph in the inbound direction. During the PM peak hour, outbound volumes are about 750 to 850 vph, with inbound volumes of 500 - 600 vph.

A basic Synchro/SimTraffic Model was prepared at the development's intersection to better understand operational impacts of various traffic loading scenarios on the development. Worst case traffic loading scenarios were evaluated for the AM peak (most development traffic entering the site) and the PM peak (most traffic exiting the site). For the purposes of analysis, it was assumed that 75% of all entering or exiting traffic coincides with the peak hour of traffic on Prospect Road.

The modeling exercise under these scenarios suggests that movements on Prospect Road continue to operate a good levels of service (about 40% capacity utilization and minimal delays or queueing) and the exit movements from the development would be expected to experience average delays in the range of 30 seconds per vehicle, at a capacity ratio of just over 0.50 (50% of theoretical capacity).

This analysis suggests that the development will operate at good levels of service during other scenarios with less traffic, and with limited impacts to traffic on Prospect Road.

SIGHT DISTANCES

Intersection sight distances were evaluated from both proposed driveways to the NS Studio site. Prospect Road in this area has minimal vertical grades though the driveways are located between two horizontal curves north and south of the site that limit sight distances. The Transportation Association of Canada's Geometric Design Guide (Case B - Intersections with Stop Control) suggests required intersection sight distances as shown in the table below.

	Left Turns (To the South)		Right Turns (To the North)	
	Cars	Trucks	Cars	Trucks
Required Sight Distance	188m	288m	163m	263m
Available - North Driveway	352m		189m	
Available - South Driveway	290m		287m	

The table also includes the available sight distances assuming that low level vegetation within the road right-of-way is cleared to provide sight lines around the inside of the horizontal curves.

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The table shows that sight distances at the south driveway meet all required intersection sight distances (though values are close) for car and truck traffic. The north driveway meets sight distances for cars, though not for trucks making left turn movements from the driveway. Additional discussion in provided in the recommendations in this regard.

LEFT TURN AND SIGNAL WARRANTS

The need for left turn warrants were calculated for the development using the Ontario Ministry of Transportation (MTO) left turn signal warrant procedures. The figures to the right show warrant results for the AM (Red) and PM (Blue) peak hours using advancing and opposing volumes taken from October 2023 peak hour traffic counts. The upper warrant uses a design speed of 80 km/hr and the lower figure uses a 90 km/h design speed.

Exhibit-9A-15

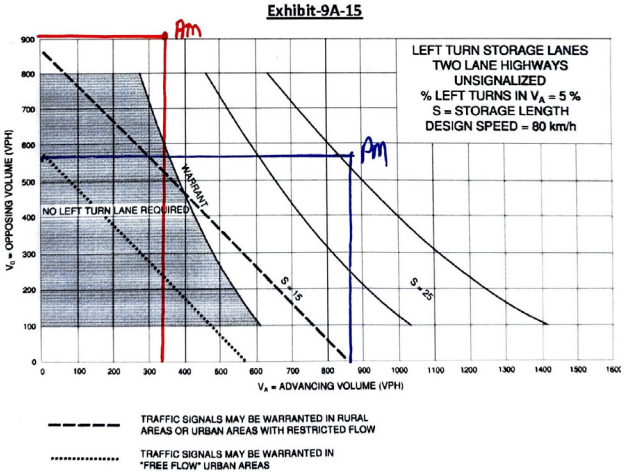
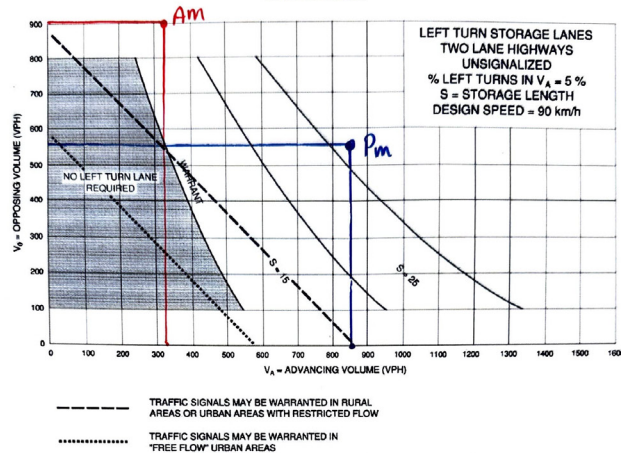


Exhibit-9A-19



Both figures suggest that a left turn lane is warranted to accommodate southbound left turn movements from Prospect Road into the development. The figures also suggest consideration of traffic signals therefore a traffic signal warrant analysis was also completed as discussed below.

TRAFFIC SIGNAL WARRANT

The Transportation Association of Canada (TAC) traffic signal warrant analysis procedures were used to evaluate the potential need for signals at this development. The warrants are based on AM, Noon and PM peak hour volumes and included 2023 count volumes on Prospect Road and estimated volumes for turn movements into and out of the development.

Most periods of significant traffic to and from the site are expected to occur during off peak hours, the analysis assumes peak hour volumes account for employ, delivery and other miscellaneous trip during the day. Based on this assumption, the warrant analysis results in about 50 priority points out the 100 points typically required to recommend signals be considered.

Halifax Regional Municipality - Traffic Signal & Pedestrian Signal Head Warrant Analysis

Main Street (name)	Prospect Rd (Hwy 333)	Direction (EW or NS)	NS	Road Authority:	Halifax Regional Municipality
Side Street (name)	NS Studio Driveway	Direction (EW or NS)	EW	City:	HRM
Quadrant / Int #	1	Comments	Prospect Road and Driveway Intersection with Assumed NS Studio Traffic	Analysis Date:	2023 Oct 27, Fri
for Warrant Calculation Results, please hit 'Page Down'	CHECK SHEET			Count Date:	2023 Oct 25, Wed
				Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Th-RT-LT	Th & RT	Excl RT	RT Channelization (y/n)	Upstream Signal (m)	# of Thru Lanes	LT Phase Type	RTOR Allowed (y/n)	Actuated Thru Phase
Prospect Rd (Hwy 333)	NB				1			N	9,999	1			
Prospect Rd (Hwy 333)	SB				1			N	9,999	1			
NS Studio Driveway	WB				1			N	9,999	1			
NS Studio Driveway	EB							N		0			

Saturation Flow Rates (if not default) (vphpl)		Default Saturation Flow Rates (vphpl)
Left Turn		1,650
Through		1,800
Right Turn		1,500

are the NS Studio Driveway WB right turns significantly impeded by through movements? (y/n) n
the Prospect Rd (Hwy 333) NB right turns significantly impeded by through movements? (y/n) n
the Prospect Rd (Hwy 333) SB right turns significantly impeded by through movements? (y/n) n

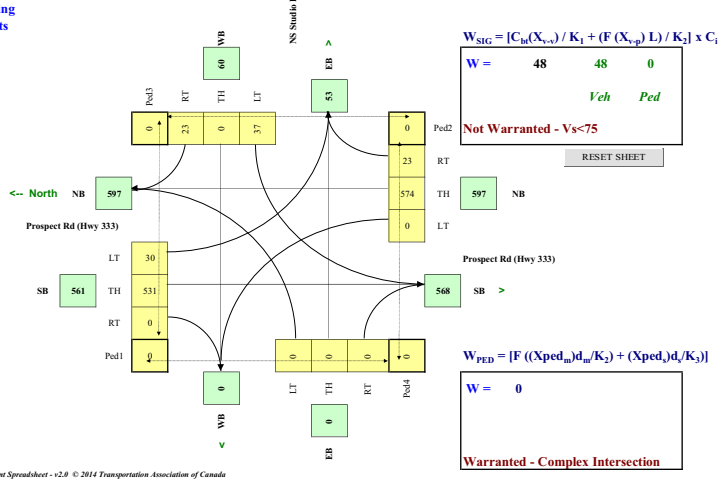
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	400,000
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Prospect Rd (Hwy 333)	NS	80	2.5%	n	0.0
NS Studio Driveway	EW		0.0%	n	0.0

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
7:00 - 8:00	0	905	30	40	327	0	50	0	10	0	0	0	0	0	0	0
8:00 - 9:00	0	628	30	40	427	0	50	0	10	0	0	0	0	0	0	0
11:30 - 12:30	0	400	10	10	400	0	10	0	30	0	0	0	0	0	0	0
12:30 - 1:30	0	400	10	30	400	0	10	0	10	0	0	0	0	0	0	0
4:00 - 5:00	0	529	30	30	870	0	50	0	40	0	0	0	0	0	0	0
5:00 - 6:00	0	582	30	30	763	0	50	0	40	0	0	0	0	0	0	0
Total (6-hour peak)	**0**	**3,444**	**140**	**180**	**3,187**	**0**	**220**	**0**	**140**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Average (6-hour peak)	**0**	**574**	**23**	**30**	**531**	**0**	**37**	**0**	**23**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Actual Pedestrian Crossing Distance (m)													10.0	10.0	15.0	0.0

Average 6-hour Peak Turning Movements



$W_{SIG} = [C_{bt}(X_{v,v}) / K_1 + (F (X_{v,p}) L) / K_2] \times C_i$

W = 48 48 0
Veh Ped

Not Warranted - Vs<75

RESET SHEET

$W_{PED} = [F ((Xped_m)d_m/K_2) + (Xped_s)d_s/K_3)]$

W = 0

Warranted - Complex Intersection

Traffic Signal Warrant Spreadsheet - v2.0 © 2014 Transportation Association of Canada

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CONCLUSIONS AND RECOMMENDATIONS

This Impact Statement was prepared to develop and understanding of the potential transportation impacts associated with the new Screen Nova Scotia sound stage located on the east side of Prospect Road (Route 333), in the community of Goodwood, HRM, NS. The proposed development not an “event based” facility and is generally expected to have trips to and from the site distributed throughout the day with only a portion of those trips coinciding with peak hour volumes on Prospect Road.

The majority of the time, volumes to and from the site are expected to have relatively low peaking characteristics and will primarily be focused on staff, occasional visitors, and a limited number of truck deliveries. While these lower volume periods may coincide with peak hour traffic volumes, the driveway intersections are expected to operate at good levels under all analysis scenarios. Under worst case traffic loading conditions, average delays are expected to be in the range of 30 seconds per vehicles for short periods of time, with capacity utilization at the driveways of less than 50%.

As noted in the signal warrant section, signals are not recommended at this location due to the infrequency of significant delay at the driveway intersection, combined with the potential negative safety impacts such an installation may generate. To facilitate movements to and from the site, a left turn lane should be provided at one of the entry point based on warrant calculations. This will require a localized widening of Prospect Road on either side of the driveway and should be addressed during the detailed design of the roadway. Consideration should be given to providing this turn lane near the center of the horizontal curves on Prospect Road to maximize sight distances.

With respect to truck traffic, volumes are expected to be low, through must be accommodated in a safe and efficient manner. Given the sight distances limitations on Prospect Road for truck movements exiting the site, it is recommended that all truck movements enter and exit the site from the south driveway near the middle of the two horizontal curves on Prospect Road.

Exhibition Park is currently progressing through a planning and development process, and could have further impacts on Prospect Road north of this development, though it is anticipated to have limited impact at this specific location as most traffic will be destined to and from the north of the site. That said, some other corridor wide modifications may be warranted such as a reduction in the posted speed limit through this area, potential signalization at an Exhibition Park intersection, or other improvements to accommodate that development. Other more significant combined alternatives such as a shared access location or service roadway options may also be worth exploring as these developments proceed.

Should you have any questions or comments regarding this report, please feel free to contact the undersigned.

Sincerely,

[redacted]

Roger Boychuk, P. Eng.
Senior Transportation Engineer
roger.boychuk@fathomstudio.ca
p: 902-233-1152