

HIGHWAY 97A & SMITH ROAD INTERSECTION REVIEW

Presented by:

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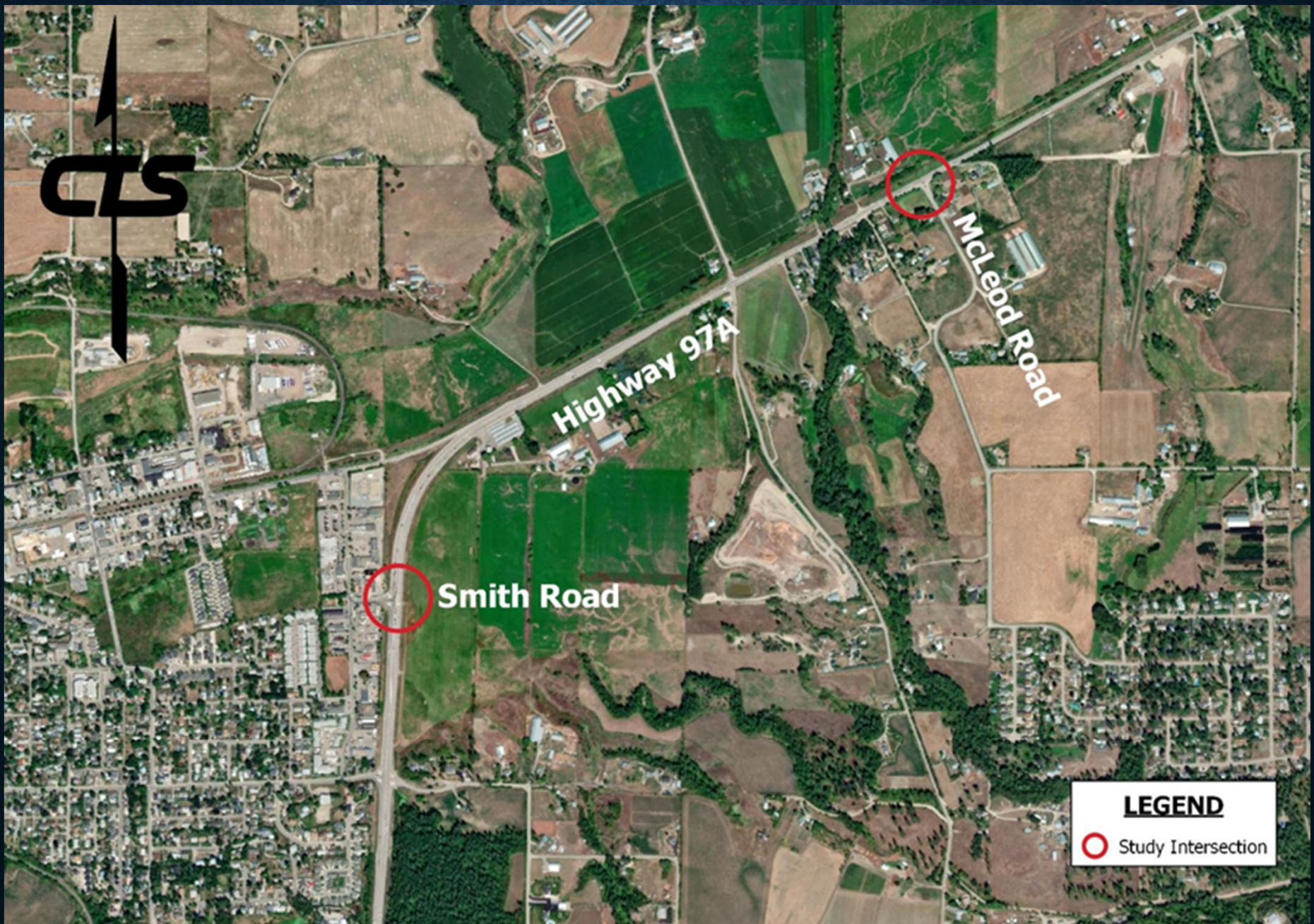
OUTLINE

- Objectives of Review
- Background
- Traffic Volume Trends
- Collision History
- Site Visit and Field Notes
- Key Findings
- Key Recommendations
- Questions?



OBJECTIVES OF REVIEW

1. To review historical traffic volume trends on Highway 97A;
2. To document existing conditions;
3. To assess the proposed changes by the Ministry of Transportation & Infrastructure (MOTI) and how it may affect the surrounding municipal road network; and
4. To prepare a brief report.



Highway 97A

McLeod Road

Smith Road

LEGEND
○ Study Intersection

BACKGROUND

- Highway 97A is a numbered Provincial Highway that connects Highway 97 in Vernon with Highway 1 (Trans-Canada) in Sicamous. Communities located along Highway 97A include Vernon, Spallumcheen, Armstrong and Enderby.
- Of note, Highway 97A is the most direct route between the Okanagan Valley to the south and Highway 1 to the north for motorists destined to or coming from the east. As such, Highway 97A is heavily used by long distance vehicle traffic including those from Alberta.



BACKGROUND CONT.

- MOTI has been investing in twinning Highway 97A from 2 to 4 lanes from Vernon northwards. The current 4 lane section terminates at Lansdowne Road which is located between Smith Road and McLeod, and which was constructed in 2011.
- In 2018, MOTI engaged Urban Systems Ltd. to undertake a conceptual planning and preliminary engineering study to design the extension of the 4 laning northwards for 6.7 km from Lansdowne Road northwards.

BACKGROUND CONT.

On 25 March 2019, Urban Systems issued their final report titled “Highway 97A & Mountain View Road Protected “T” Intersection Improvements Preliminary Design Report:

1. That use of traffic signals, roundabouts or minor road stop control are not appropriate solutions as an interim step towards the ultimate four laning of Highway 97A;
2. That to address safety and mobility issues, the intersections of Highway 97A & McLeod Road and that of Highway 97A & Creamery Road are to be closed and the existing local traffic is to be rerouted to Mountain View Road further east; and
3. That the intersection of Highway 97A & Mountain View Road is to be converted to a protected “T” intersection.

BACKGROUND CONT.

On 17 April 2020, Urban Systems issued a follow up report to the previous one titled “Highway 97A Lansdowne Road to Stepney Cross Road, McLeod Neighbourhood Access Alternatives Memo”. The report was prepared as improved access to the McLeod neighbourhood was identified as a high priority by stakeholders. The follow up study looked at 6 alternative access options and then recommended the following:

1. Option B (Lansdowne Left Turn Protected and No Local Road Fortune Creek Crossing) was recommended. This consisted of an unsignalized intersection permitting left and right turns off Highway 97A onto Lansdowne Road while restricting Lansdowne traffic to right out only on Highway 97A.

BACKGROUND CONT.

- Residents of the McLeod neighbourhood would still have to access Highway 97A via the reconstructed intersection of Mountainview to the northeast.
- With Option B, Urban Systems is forecasting significant time savings by the year 2042 for motorists on McLeod to use Mountain View Road although it is unclear in the report how the time savings from 10.5 min in intersection delay is reduced to 0.4 min in intersection delay given that most motorists will have to drive an additional 3.5 km to access Highway 97A.

BACKGROUND CONT.

- Traffic volume forecasts provided in this report are only for the weekday afternoon peak hour for the year 2042 (summer). No information was provided in the report how the traffic volume forecasts were estimated.
- Urban Systems is forecasting by the year 2042 for base conditions (i.e. do nothing) that the right turn volume from the south on Highway 97A will be 144 veh/hr onto McLeod Road. At the same time, 43 vehicles are forecast to be making a left turn off McLeod Road to travel south on Highway 97A. Of note, Urban Systems is using a heavy vehicle percentage of 14% for Highway 97A at this intersection, which is high.

BACKGROUND CONT.

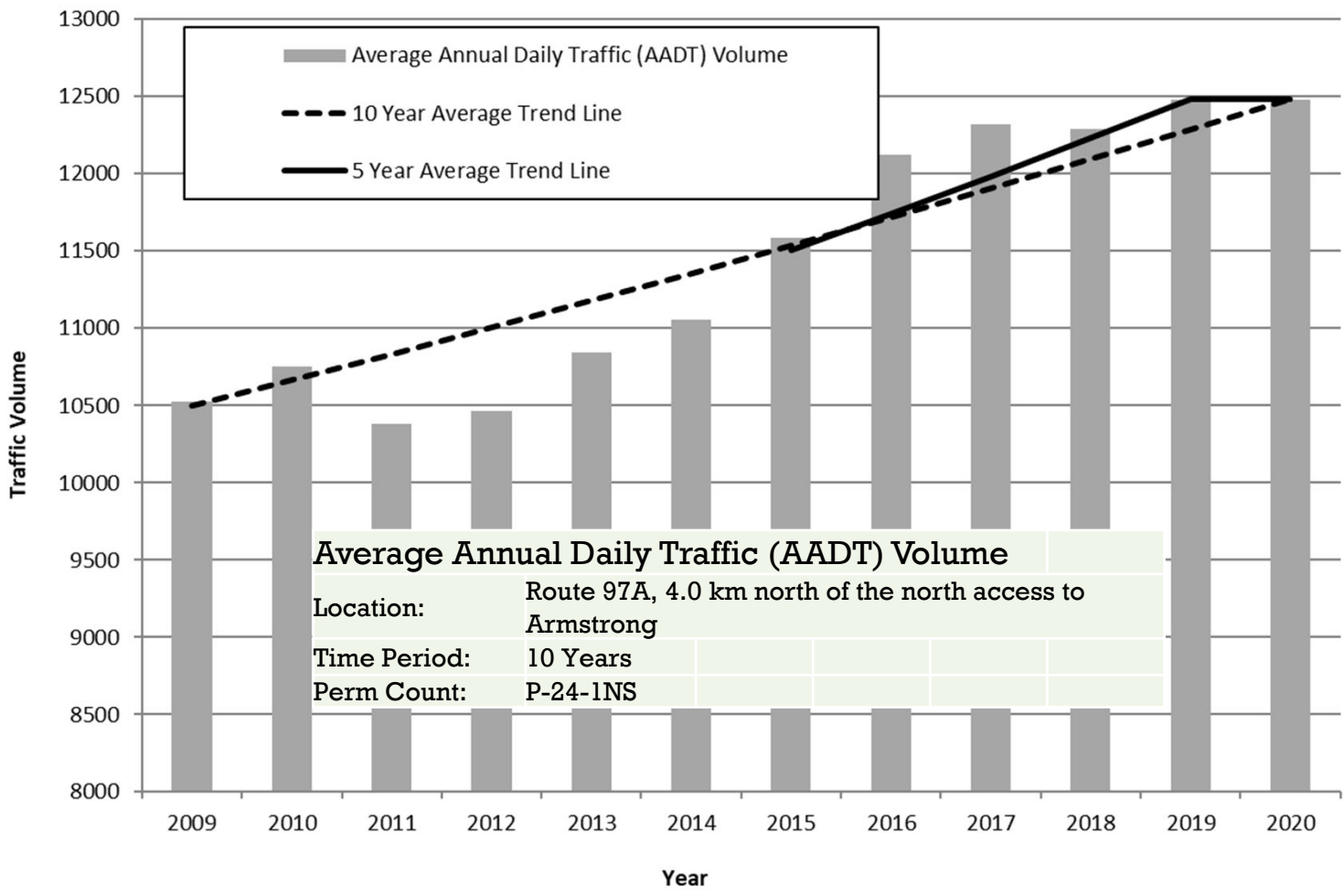
- Urban Systems is forecasting by the year 2042 for base conditions an eastbound left turn volume off Smith Road onto Highway 97A northbound of 321 veh/hr, which is normally at a volume where dual left turn lanes are required.
- However Urban Systems is not identifying any improvements at this location.
- Of note, Urban Systems is only using a 2% heavy vehicle percentage for all movements at this intersection including Highway 97A, which is considered low.

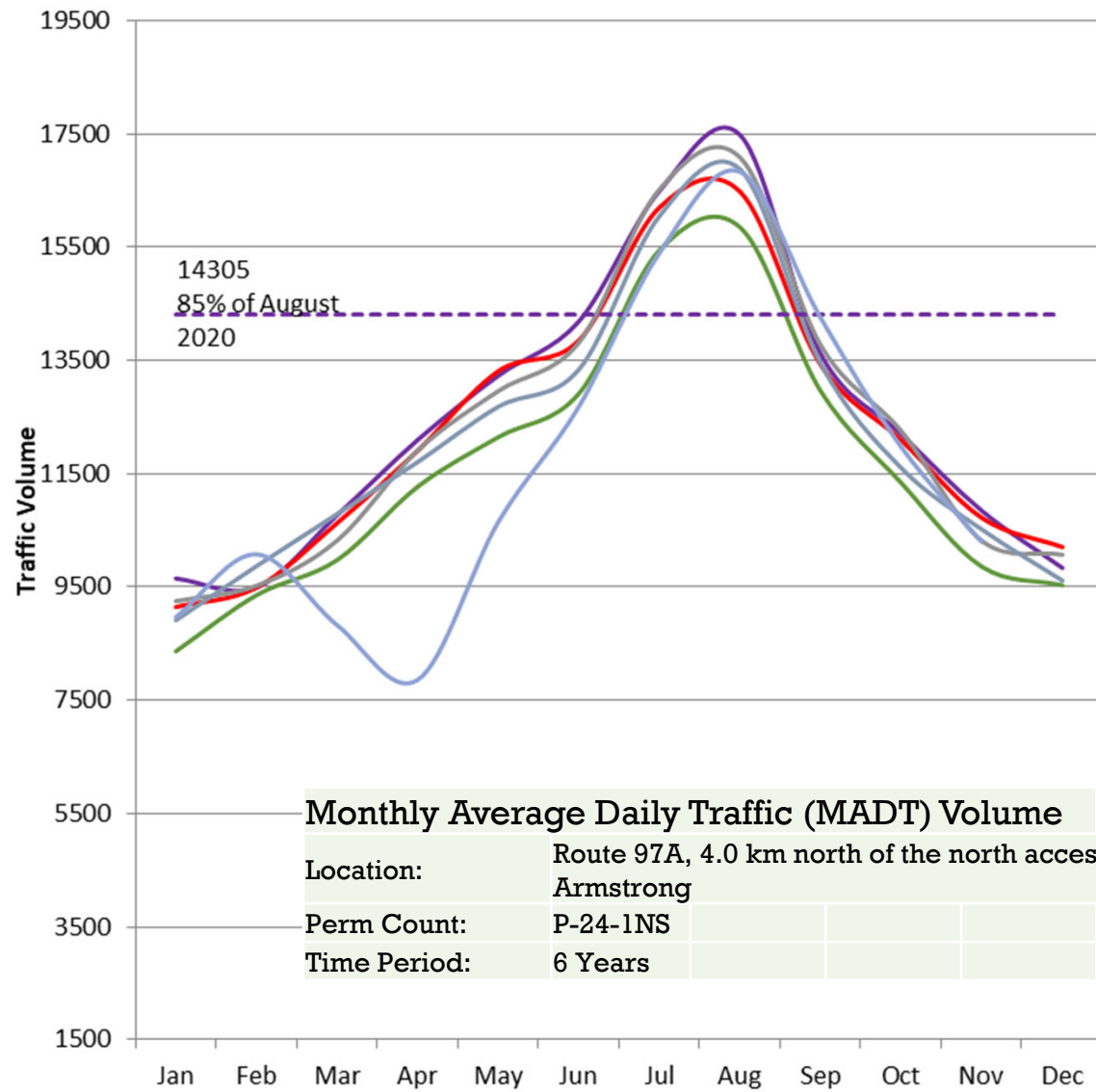
BACKGROUND CONT.

- The Township of Spallumcheen has advised CTS that full buildout of the McLeod neighbourhood could be up to an additional 100 single family homes.
- As McLeod Road is the primary vehicle entry / exit point for the McLeod neighbourhood and the proposed closure of the Highway 97A & McLeod Road intersection will increase the driving distance for those residents by an average of 3.5 km to access Highway 97A at Mountain View Road and wish to travel to or from the south,
- CTS was engaged by the Township of Spallumcheen to review the proposed road network changes.

TRAFFIC VOLUME TRENDS

- MOTI has a permanent traffic count station located on Highway 97A 4 km north of town
- Average Annual Daily Traffic (AADT) and Monthly Average Daily Traffic (MADT) are key indicators of trend lines
- 2020 data is incomplete at this time and Covid impacted
- Last 10 years (to 2019): AADT has grown by 1.6%/year
- Last 5 years (to 2019): AADT has grown by 2.1%/year





Monthly Average Daily Traffic (MADT) Volume

Location: Route 97A, 4.0 km north of the north access to Armstrong
 Perm Count: P-24-1NS
 Time Period: 6 Years

- 2019
- 2018
- 2017
- 2016
- 2015
- 2020
- 85% of August 2019

COLLISION HISTORY

- CTS obtained historical collision data from ICBC to analyse the number of ‘recorded’ collisions involving vehicles at the two study intersections.
- ICBC publishes data for the last 5 years on a rolling basis and the initial timeframe analysed was from 2015 to 2019 inclusive.
- The 2020 collision data was recently made available and this is included as well.

Road Segment	Specific location / Intersection	Collision Frequency by year					
		2015	2016	2017	2018	2019	2020
Hwy 97A	Whole stretch within Armstrong, excluding intersections	21	29	37	32	47	24
McLeod Rd	Unspecified	0	2	1	2	0	
Smith Dr	Unspecified	6	2	4	4	2	1
Smith Dr	Pleasant Valley Rd		1	3		1	
Smith Dr	Fletcher Ave			2	1	1	1
Smith Dr	Rosedale Ave			1			1
Hwy 97A	Pleasant Valley Rd	1	3	1	1	2	1
Hwy 97A	McLeod Rd		1		1	1	1

COLLISION HISTORY CONT.

Key findings from this high level collision review are as follows:

1. Frequency of recorded collision data from the available ICBC database is low in the study area.
2. The primary item of concern was the significant increase in reported collisions in 2019.

SITE VISIT AND FIELD NOTES

- CTS staff conducted site visits on both 3 February 2021 and 6 February 2021 of both intersections and noted the following:

SITE VISIT CONT.

Highway 97A & Smith Road

- Motorists travelling northbound on Highway 97A for the most part had a “continuous green” signal display as the marked crosswalk from Smith Road does not connect to existing pedestrian facilities or trails on the east side of Highway 97A. This in turn likely contributed to the observed high operating speeds of northbound traffic as motorists do not regularly need to stop at this intersection.
- Frequent queuing was observed on Smith Road for vehicles wishing to enter Highway 97A

SITE VISIT CONT.

Highway 97A & McLeod Road

- Operating speeds on Highway 97A were observed to be high with a posted speed limit of 100 km/h.
- Motorists wishing to make a left turn off McLeod Road and travel south on Highway 97 were regularly observed to be making aggressive movements to enter Highway 97A in part due to the speed of traffic on Highway 97A and in part due to the lack of suitable gaps in the traffic flow.
- The intersection is not illuminated and there is a missing Checkerboard sign on the westside of Highway 97A facing McLeod Road.

SITE VISIT CONT.

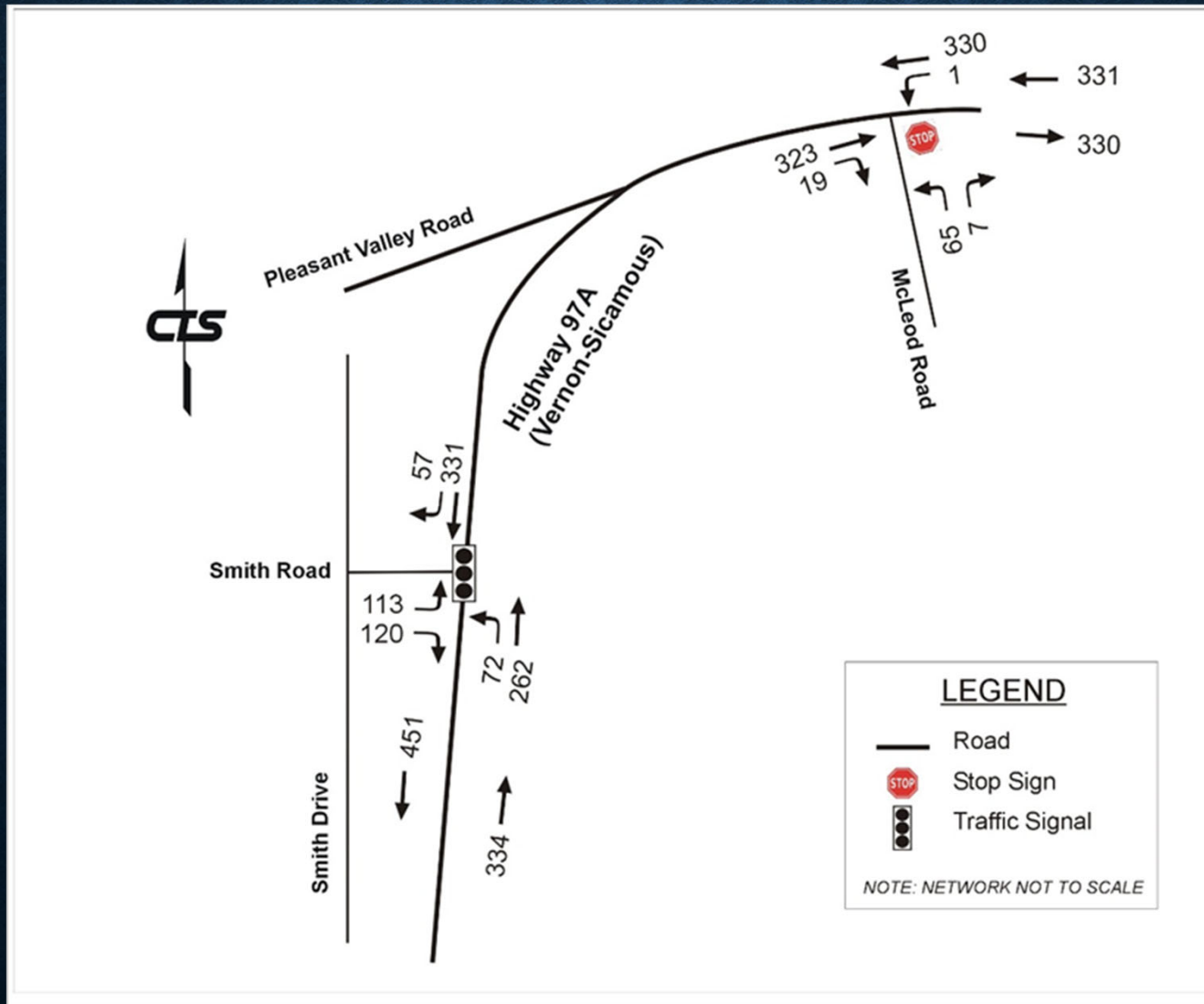
- AT CTS, we always let the “data” tell the story

CTS conducted detailed seven (7) hour intersection counts on Friday, 5 February 2021 at both Highway 97A & Smith Road and at Highway 97A & McLeod Road to document baseline conditions in the study (and without tourist traffic) for the following time periods:

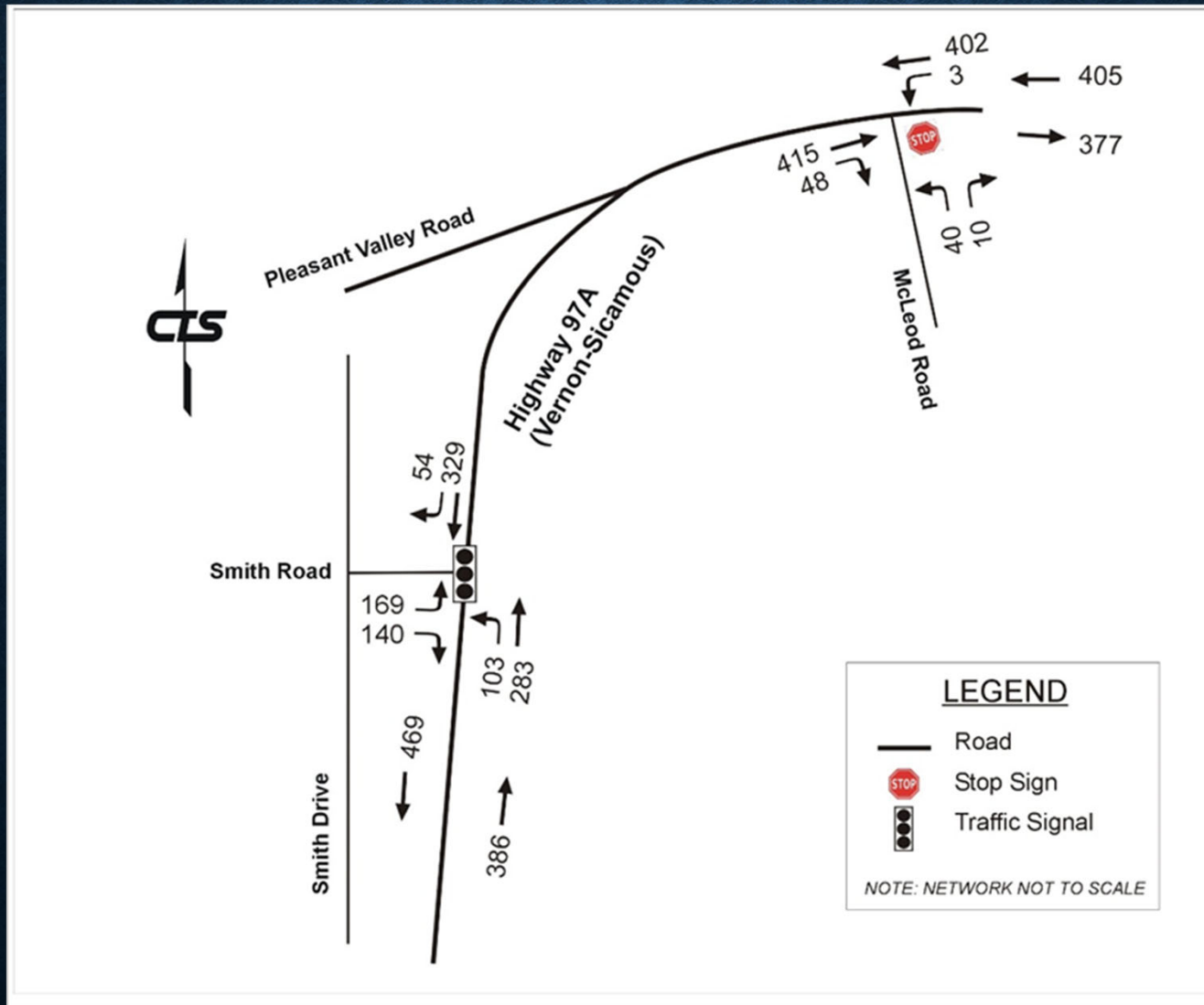
- 7:00 AM to 9:00 AM
- 11:00 AM to 1:00 PM
- 3:00 PM to 6:00 PM



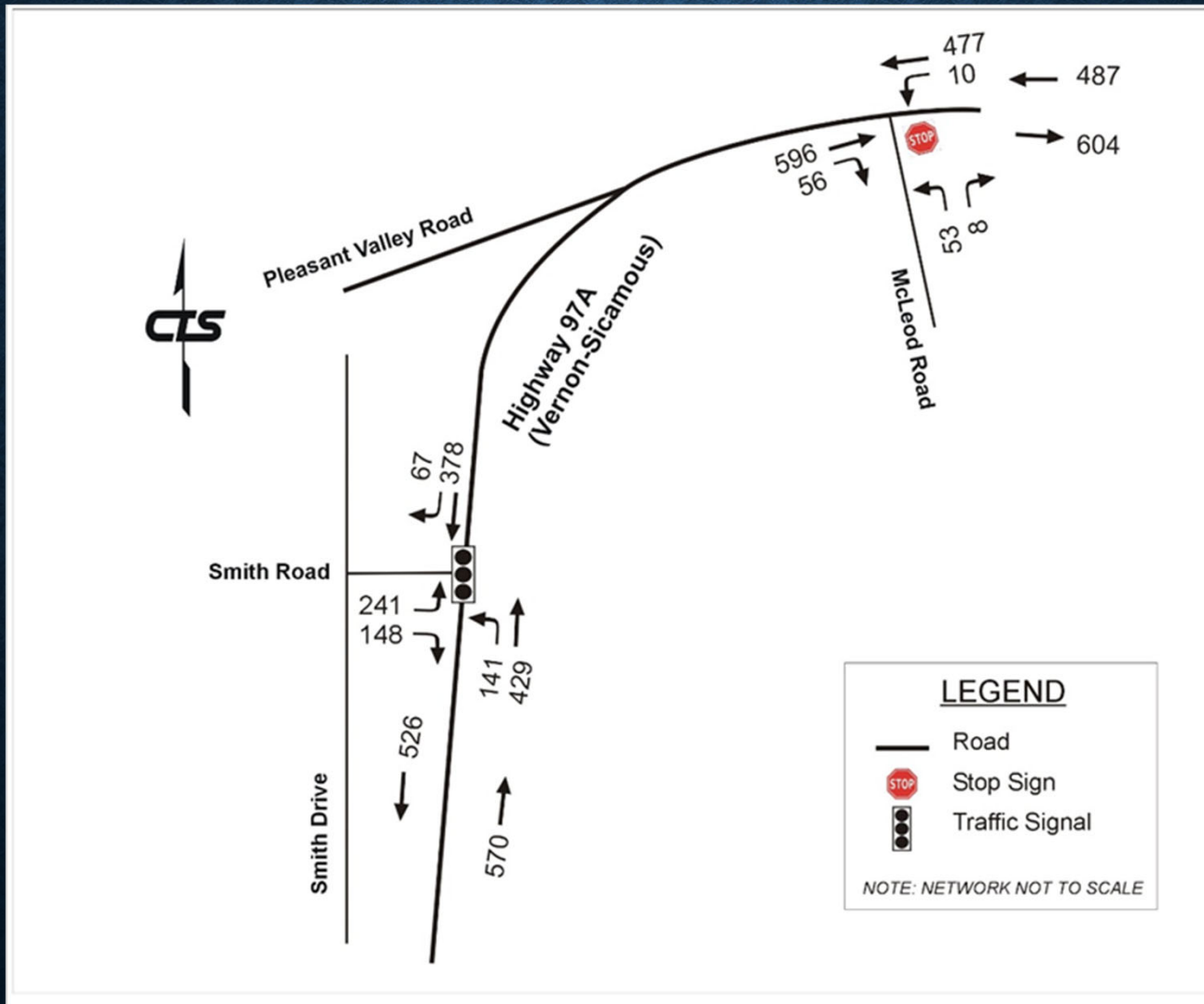
FRIDAY AM PK HOUR



FRIDAY MIDDAY PK HOUR



FRIDAY PM PK HOUR



SITE VISIT CONT.

- The highest recorded left turn volume off McLeod Road onto Highway 97A was 65 veh/hr and this occurred during the morning peak hour. The second highest was during the afternoon peak hour at 53 veh/hr. This is equivalent to an average of approximately 1 vehicle movement per minute.
- Peak right turn volume onto McLeod Road from Highway 97A that was observed was 56 veh/hr during the afternoon peak hour. This is equivalent to an average of approximately 1 vehicle movement per minute.

- Of note, the observed northbound left turn volume on McLeod during the weekday afternoon peak hour at 53 veh/hr was 23% higher than the base Year 2042 volume forecast by Urban Systems in their follow up report at 43 veh/hr. Therefore, the base volumes used by Urban Systems in this study at this intersection should be validated.
- The highest traffic volumes on Smith Road accessing Highway 97A was during the weekday afternoon peak hour with 241 left turns and 148 right turn vehicles for a total of 389 veh/hr.

SITE VISIT CONT.

- CTS measured heavy vehicle percentages ranging from 2.2% to 5.8% at the intersection of Highway 97A & McLeod Road in February conditions with travel restrictions in place. Therefore, the use of 14% by Urban Systems in their analysis for year 2042 conditions should be validated.
- For the intersection of Highway 97A & Smith Road, CTS measured heavy vehicle percentages ranging from 3.2% to 6.1% in February conditions with travel restrictions in place. Therefore, the use of 2% by Urban Systems in their analysis for year 2042 conditions should be validated.

KEY FINDINGS

- A review of collision data from ICBC for the period from 2015 to 2020 determined that the frequency of recorded collision data from the available ICBC database is low in the study area.
- Recorded traffic volumes on Highway 97A just north of Armstrong was down 372,648 vehicles (or 9%) in 2020 for the period January to November compared to the year 2019, with most of that occurring in March, April and May of 2020 during the first wave of Covid. Of note, December 2020 data was not yet available at the time of this report

KEY FINDINGS CONT.

- Urban Systems is forecasting significant time savings by the year 2042 for motorists on McLeod to use Mountain View Road although it is unclear in their follow up report how the time savings from 10.5 min in intersection delay is reduced to 0.4 min in intersection delay given that most motorists will have to drive an additional 3.5 km to travel to access Highway 97A.
- CTS conducted detailed seven (7) hour intersection counts on Friday, 5 February 2021 at both Highway 97A & Smith Road and at Highway 97A & McLeod Road to document baseline conditions in the study (and without tourist traffic). A review of the data determined that the weekday afternoon peak hour is by far the dominant hour.

KEY FINDINGS CONT.

- Comparison was made between the measured CTS traffic volume data for McLeod Road which was collected during the pandemic and in February with the forecast base 2042 traffic volumes in the Urban Systems follow up report. It was noted that the observed northbound left turn volume on McLeod during the weekday afternoon peak hour at 53 veh/hr was 23% higher than the base Year 2042 volume forecast by Urban Systems in their follow up report at 43 veh/hr.
- A review of heavy vehicle percentages used by Urban Systems in their follow up report determined that the numbers used were too low or too high

KEY FINDINGS CONT.

- Up to an additional 100 single family homes are forecast to be built in the McLeod neighbourhood in the next 20 years. However it is unclear from the follow up report by Urban Systems that these future volumes were included in their assessment. Given that CTS measured volumes in February 2021 exiting McLeod Road were actually higher than the forecast year 2042 volumes by Urban Systems, it is likely that these additional volumes were not included.

KEY RECOMMENDATIONS

- That follow up intersection counts be undertaken at the intersections of Highway 97A & McLeod Road and that of Highway 97A & Smith Road to document peak Summer 2021 conditions, and that this data be compared to the summer 2042 volumes used by Urban Systems in their follow up report;
- That Urban Systems be requested to clarify how they forecast the year 2042 summer afternoon peak hour volumes in their follow up report and if any consideration was made by them in the potential 100 additional single family homes to be constructed in the McLeod neighbourhood;



KEY RECOMMENDATIONS

- That Urban Systems be requested to validate the heavy vehicle percentages they used in their intersection capacity analysis for the intersections of Highway 97A & McLeod Road and that of Highway 97A & Smith Road;
- That Urban Systems be requested to clarify how they determined the intersection delay savings time for the intersection of Highway 97A & McLeod Road with Option B.
- That a speed survey be undertaken of Hwy 97 at Smith Road (northbound) and at McLeod Road (both directions) and compared to the posted speeds.

QUESTIONS?

CLS