RWR 4015

Traffic Simulation for Planning Applications

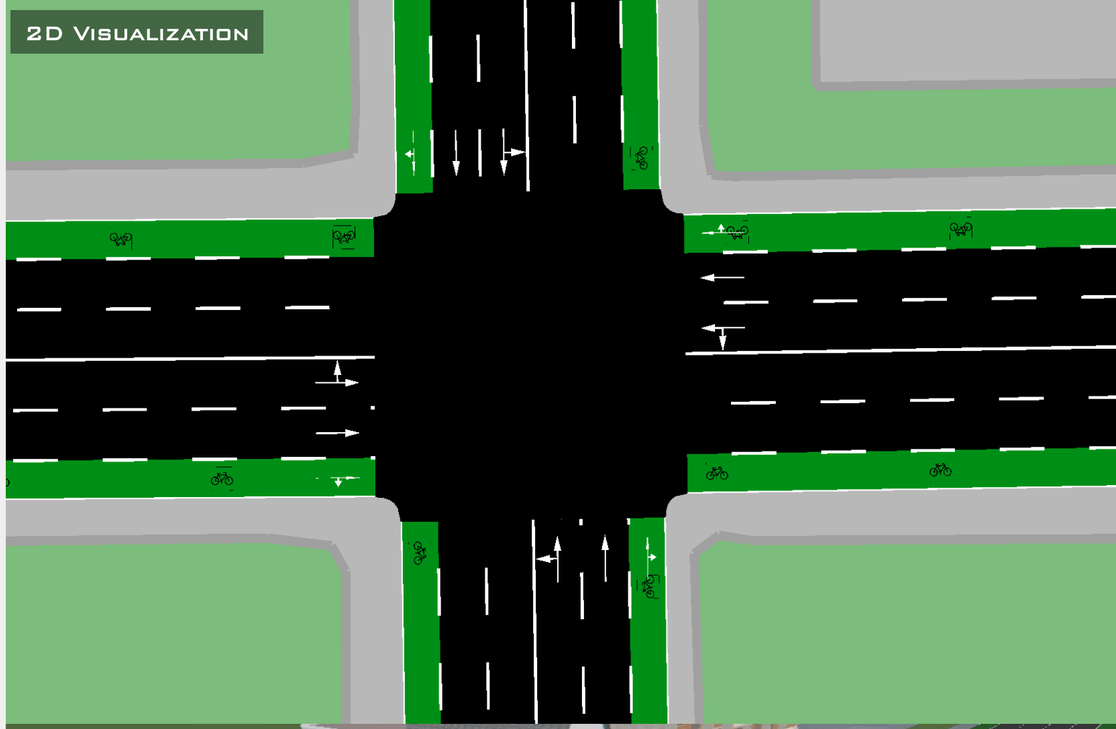
Dr. Ahmad Mohammadi

Week 9 | Lecture:
Artificial Intelligence in
Intelligent Transportation Systems

Fall 2026

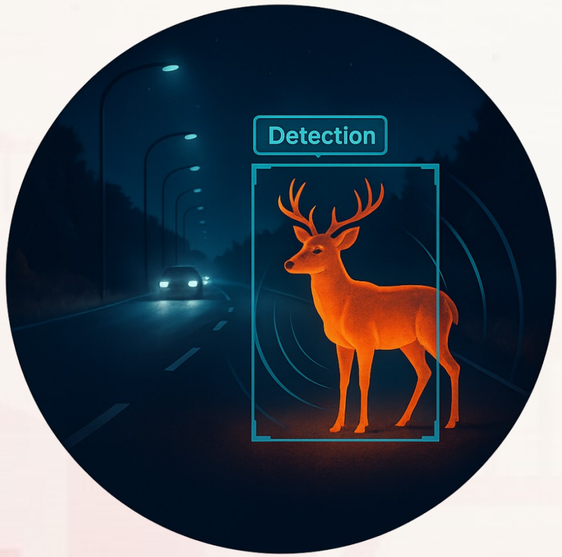
RoadwayVR

roadwayvr.github.io/TrafficSimulationforPlanningApplications



Agenda

Real-Time Wildlife Detection System in British Columbia



Real-Time Automated Speed Enforcement Cameras in Ontario

Smart Transportation Systems

1. Detection

Computer Vision
Radar, Lidar
Sensors

2. Algorithms

Data Processing
Machine Learning
Optimization

3. Decisions

Traffic Flow Control
Route Optimization
Emergency Response

Reference:
https://blogs.sw.siemens.com/simcenter/engineering-sense-think-act-for-reliable-autonomous-vehicles

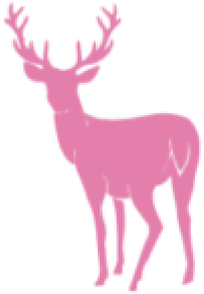
The Next Generation of Real-Time Wildlife Detection System

Wildlife -Vehicle Collisions

- Ontario: 12,000 wildlife collisions per year: (about one every ~ 44 minutes)
- British Columbia: 5,700 wildlife-vehicle collisions per year on B.C. provincial highways (about one every ~ 92 minutes).
- Canada: 474 human deaths between 2000 – 2014

Wildlife Maximum Speed

72 km/h
20 m/s

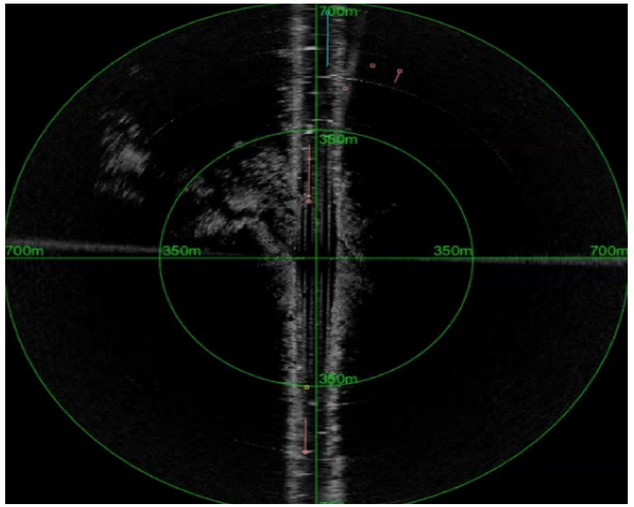


64 km/h
17 m /s

48 km/h
13 m/s

Real-Time Wildlife Detection System

1



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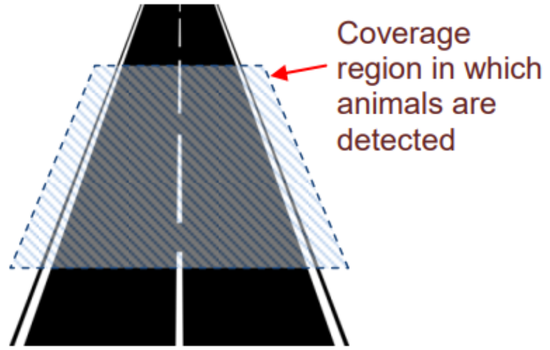


3

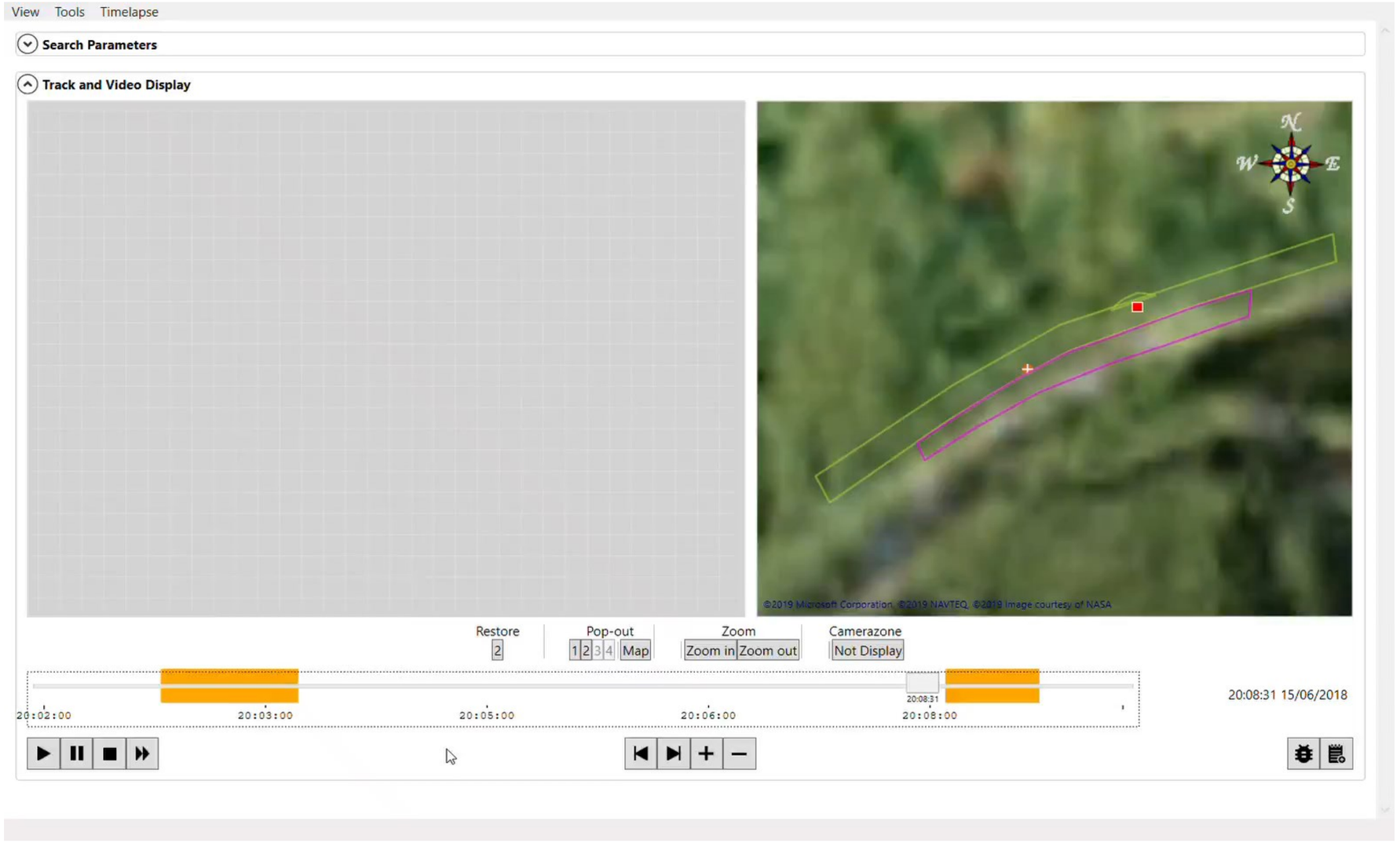
Study Area: Real-Time Wildlife Detection System in BC

❑ **Location:**

1.4 km of Trans-Canada Highway 1 in Glacier National Park, BC.

Detected Animal on Roadside

Recorded Video

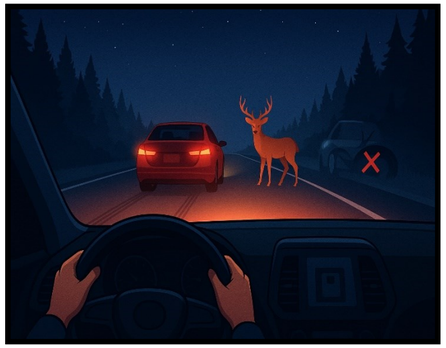


BC Ministry of Transportation Tips

Be extra cautious at dawn, dusk, and night (peak movement times)

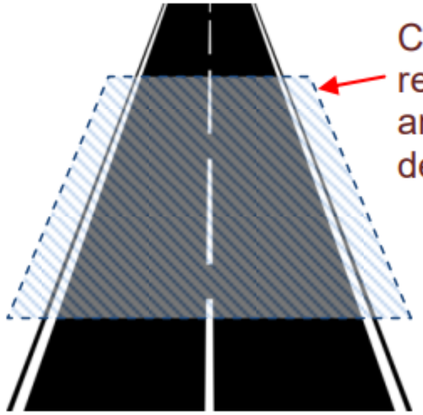
Animals travel in groups, if see one, slow down until you are well past

Never swerve suddenly to avoid an animal, this can lead to a more serious collision - brake firmly and stay in your lane



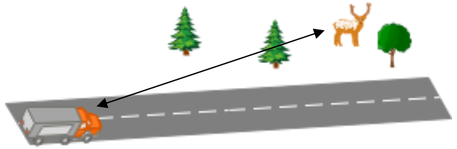
Reference:
https://www2.gov.bc.ca/gov/content/transportation/driving-and-cycling/traveller-information/routes-and-driving-conditions/wildlife

Weakness and Potential Improvement

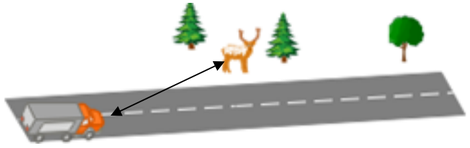


A. Vehicle is approaching to the animal

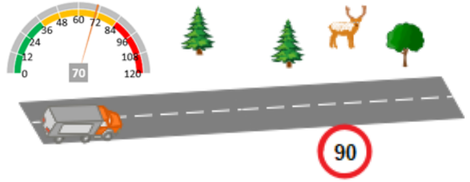
B. Vehicle is moving away from the animal



C. Animal is far from the vehicle



D. Animal is close from the vehicle

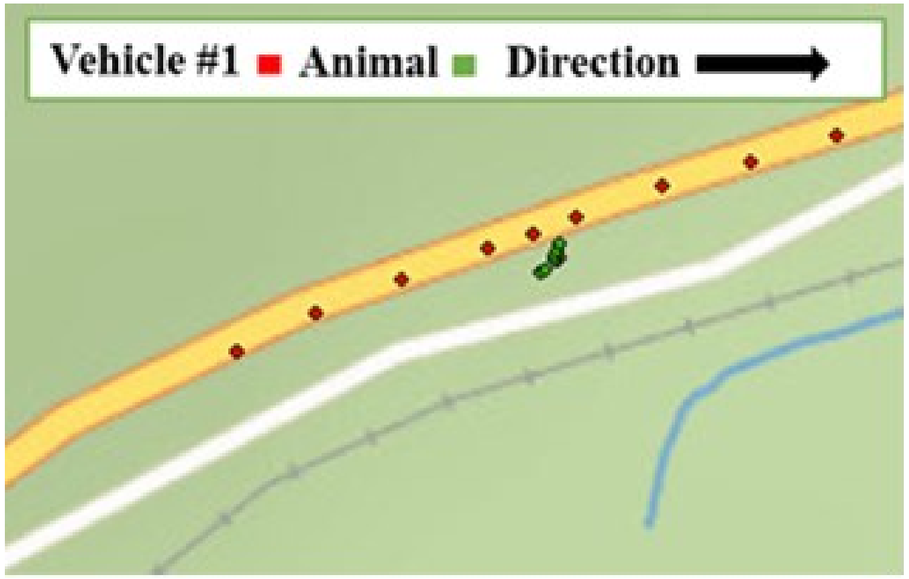


E. Driver is cautious

F. Driver is speeding

Data Collection

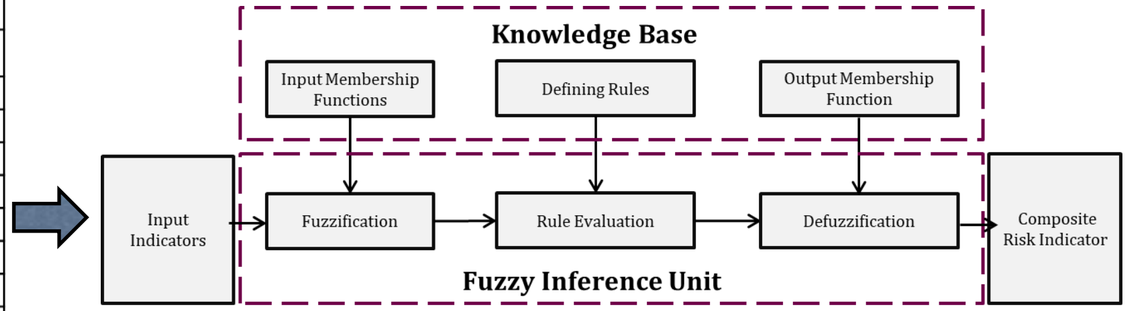
- Dates: June 6–9, June 15, July 11, 2018 (6 days total)
- Detections: 344 moving objects286 vehicles58 animals



Input						Output
Time	Car ID	Indicator 1	Indicator 2	Indicator 3	Indicator 4	Composite Risk Indicator
9:19:05	1001	30.65	8.45	26.97	0.10	?
9:19:06	1001	0.84	8.39	26.98	0.06	?
9:19:07	1001	32.34	25.24	27.00	0.05	?
9:19:08	1001	58.63	37.33	26.15	0.04	?
9:19:09	1001	85.88	48.65	26.96	0.10	?
9:19:10	1001	113.95	59.49	27.57	0.19	?
9:19:11	1001	141.87	69.02	26.93	0.29	?
9:19:12	1001	170.22	78.66	27.65	0.39	?
9:19:13	1001	198.07	87.43	24.98	0.49	?

AI Algorithms: Rule-Based Algorithm

Input						Output
Time	Car ID	Indicator 1	Indicator 2	Indicator 3	Indicator 4	Composite Risk Indicator
9:19:05	1001	30.65	8.45	26.97	0.10	?
9:19:06	1001	0.84	8.39	26.98	0.06	?
9:19:07	1001	32.34	25.24	27.00	0.05	?
9:19:08	1001	58.63	37.33	26.15	0.04	?
9:19:09	1001	85.88	48.65	26.96	0.10	?
9:19:10	1001	113.95	59.49	27.57	0.19	?
9:19:11	1001	141.87	69.02	26.93	0.29	?
9:19:12	1001	170.22	78.66	27.65	0.39	?
9:19:13	1001	198.07	87.43	24.98	0.49	?



AI Algorithms: Learning-Based Algorithm

Unsupervised Learning

Input						Output
Time	Car ID	Indicator 1	Indicator 2	Indicator 3	Indicator 4	Composite Risk Indicator
9:19:05	1001	30.65	8.45	26.97	0.10	?
9:19:06	1001	0.84	8.39	26.98	0.06	?
9:19:07	1001	32.34	25.24	27.00	0.05	?
9:19:08	1001	58.63	37.33	26.15	0.04	?
9:19:09	1001	85.88	48.65	26.96	0.10	?
9:19:10	1001	113.95	59.49	27.57	0.19	?
9:19:11	1001	141.87	69.02	26.93	0.29	?
9:19:12	1001	170.22	78.66	27.65	0.39	?
9:19:13	1001	198.07	87.43	24.98	0.49	?

K-Means

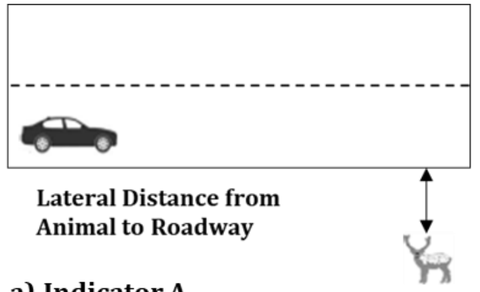
Supervised Learning

Input						Output
Time	Car ID	Indicator 1	Indicator 2	Indicator 3	Indicator 4	Risk
9:19:05	1001	30.65	8.45	26.97	0.10	Low
9:19:06	1001	0.84	8.39	26.98	0.06	High
9:19:07	1001	32.34	25.24	27.00	0.05	?
9:19:08	1001	58.63	37.33	26.15	0.04	?
9:19:09	1001	85.88	48.65	26.96	0.10	Medium
9:19:10	1001	113.95	59.49	27.57	0.19	?
9:19:11	1001	141.87	69.02	26.93	0.29	?
9:19:12	1001	170.22	78.66	27.65	0.39	?
9:19:13	1001	198.07	87.43	24.98	0.49	?

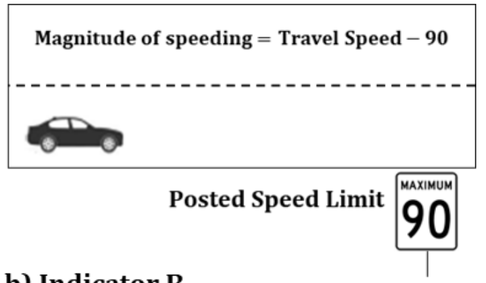
Artificial Neural Network

Development of AI Algorithm

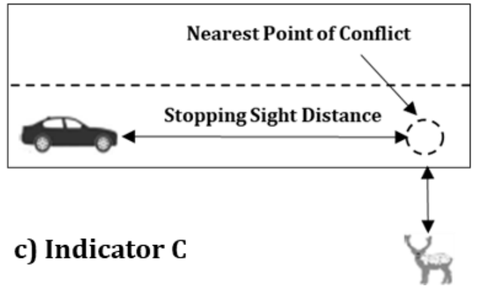
Input



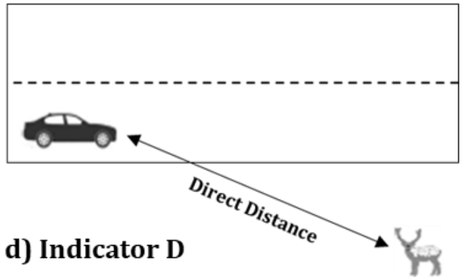
a) Indicator A



b) Indicator B

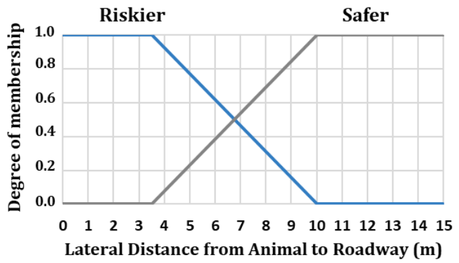


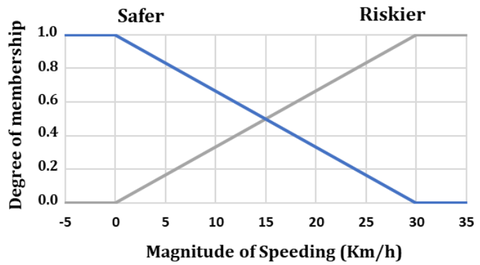
c) Indicator C

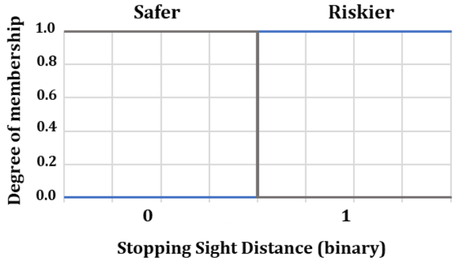


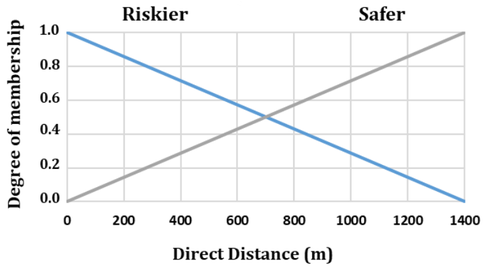
d) Indicator D

Output



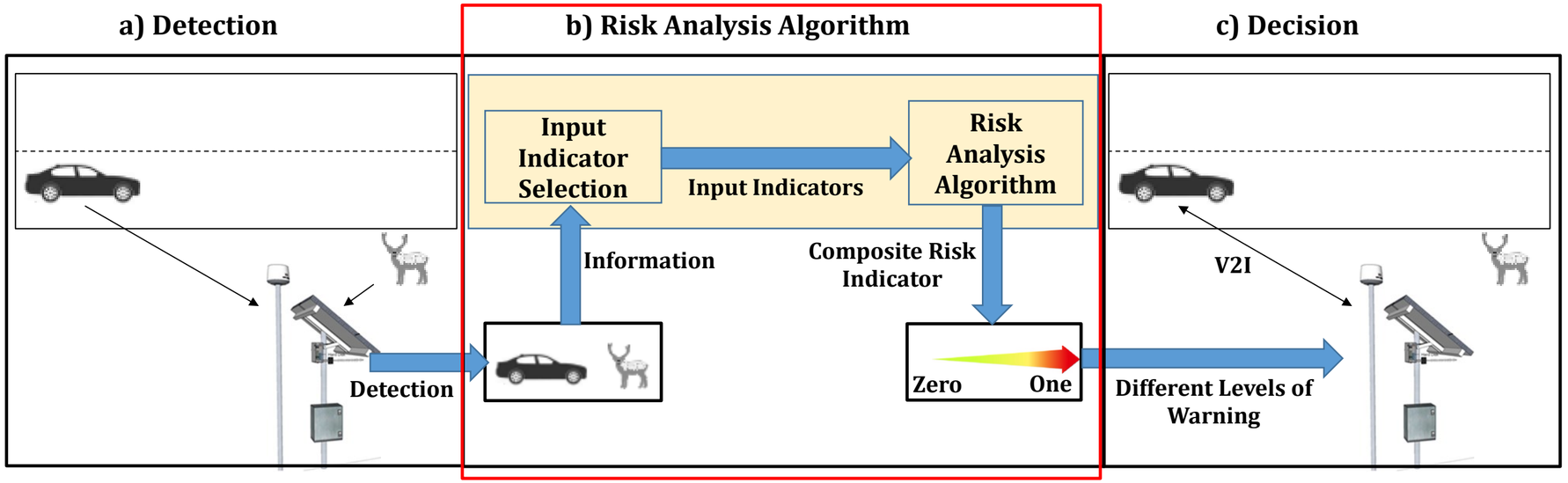


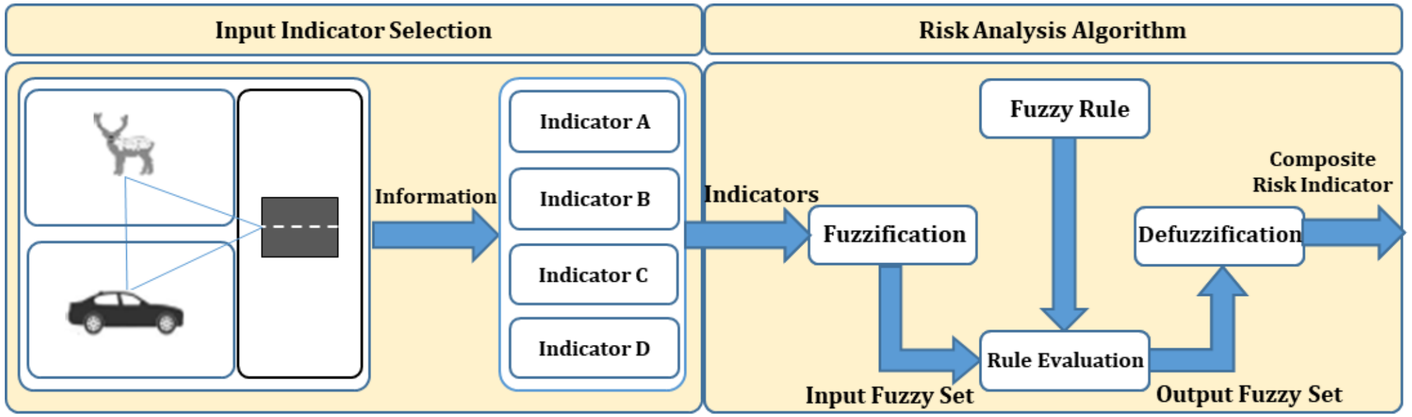




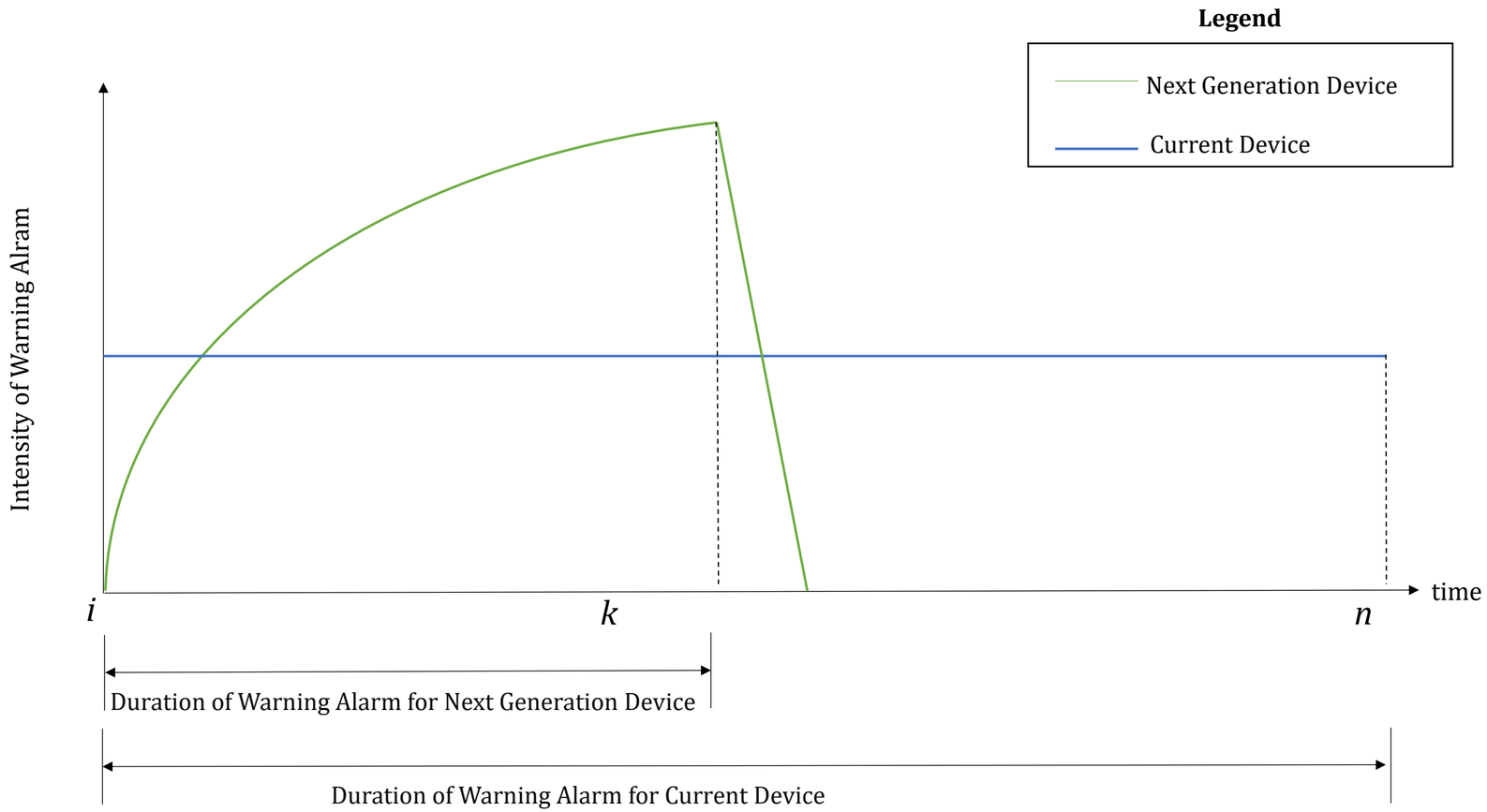
Rule ID	$Indicator_A$	$Indicator_B$	$Indicator_C$	$Indicator_D$	Composite Risk Indicator
1	Safer	Safer	Safer	Safer	Very Low
2	Riskier	Safer	Safer	Safer	Low
3	Safer	Riskier	Safer	Safer	Low
4	Safer	Safer	Riskier	Safer	Low
5	Safer	Safer	Safer	Riskier	Low
6	Riskier	Riskier	Safer	Safer	Intermediate
7	Riskier	Safer	Riskier	Safer	Intermediate
8	Riskier	Safer	Safer	Riskier	Intermediate
9	Safer	Riskier	Riskier	Safer	Intermediate
10	Safer	Riskier	Safer	Riskier	Intermediate
11	Safer	Safer	Riskier	Riskier	Intermediate
12	Riskier	Riskier	Riskier	Safer	High
13	Riskier	Safer	Riskier	Riskier	High
14	Riskier	Safer	Riskier	Riskier	High
15	Safer	Riskier	Riskier	Riskier	High
16	Riskier	Riskier	Riskier	Riskier	Very High

Proposed Framework





Result



t = i

t = k

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YORK UNIVERSITÉ UNIVERSITY

More Information

The Institution of Engineering and Technology WILEY

ORIGINAL RESEARCH PAPER

Developing a situation and threat assessment framework for a next generation roadside animal detection system

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[2] Intelligent Systems Division, A.U.G. Signals Ltd, 73 Richmond Street West, Suite 103, Toronto, Ontario M5H 4E8, Canada

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Department of Civil Engineering, York University, 4700 Keele Street, Toronto, Ontario M3J 1P3, Canada.
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Abstract

Collisions involving large animals are a serious safety, economic and ecological concern. Some North American jurisdictions have installed a roadside animal detection system (RADS) that can warn the possible presence of large animals on rural highway sections. This study provides a conceptual framework for developing a next generation (NG) RADS. This study focuses on developing a process that can estimate the varying levels of threat posed by animals on the roadway using real-time data on animal and vehicle positions. To estimate the level of threat, the study used a fuzzy rule-based algorithm that integrates four input indicators (e.g., physical distance between animal and vehicle). The methodology was tested using real-world traffic and animal data collected from a conventional RADS in British Columbia, Canada. The NG RADS has significant advantages over the conventional RADS. In particular, the NG RADS can disseminate varying levels of warning according to the estimated level of the threat rather than the constant level of warning generated by a conventional RADS. The NG RADS can also use a Vehicle-to-Infrastructure communication technology to establish direct wireless communication with vehicles at risk, for instance, to automatically control a vehicle's speed to avoid a collision with a large animal.

❑ This project was funded by Defense Research and Development Canada (DRDC).

Airborne Underwater Geophysical Signals

A.U.G. Signals Ltd.

Presentation #2

Automated Speed Enforcement Cameras in Ontario: Use of Generative AI to Analyze Driver Complaints

Introduction

- **Automated Speed Enforcement Cameras (ASE):**

  Automatically Detect Speeding Vehicle and Issue Tickets

- Firstly used in Netherlands in 1997.
- Widely used Australia and United Kingdom
- Firstly used in Ontario in December 2019

Automated Speed Camera System

1. Detection

Radar/Lidar Gun captures speed data; Camera captures Images image of vehicle & license plate,

2. Algorithm

Compares speed to legal li; OCR reads license plate; Cross-relerences vehicle database

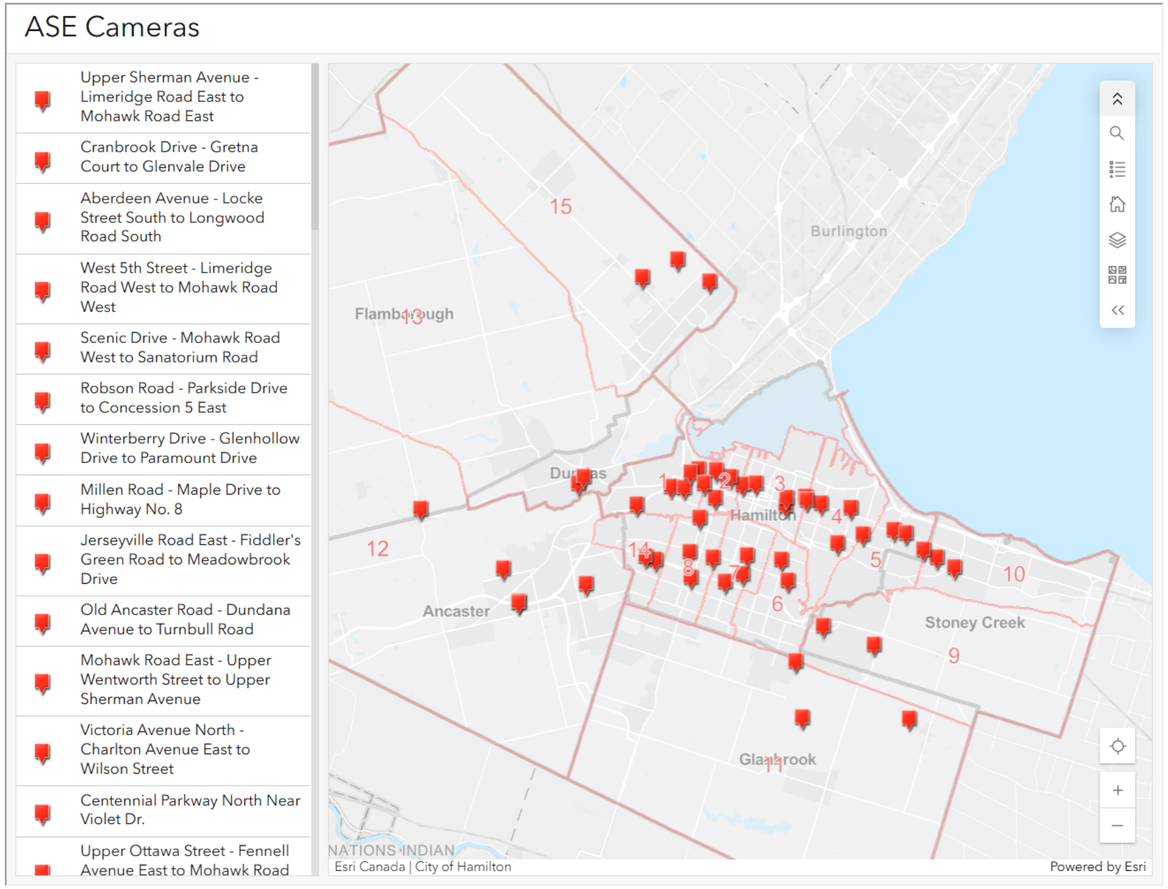
3. Decision

Generates violation reord; Issues fine/warning; Stores evidence

ASE Locations in Hamilton

- From 2019 to 2025, over 700 cameras have been installed in 40 municipalities across Ontario

Automated Speed Enforcement Locations



Benefit

Toronto (250 school zones, Jul 2020–Dec 2022):

- 45% fewer vehicles speeding
- −10.7 km/h in 85th-percentile speed
- 88% fewer vehicles ≥20 km/h over the limit

Complaints and Negative Sentiment

Toronto:

- One camera issued 65,000+ tickets
- $7M revenue (≈ $107 CAD per ticket)

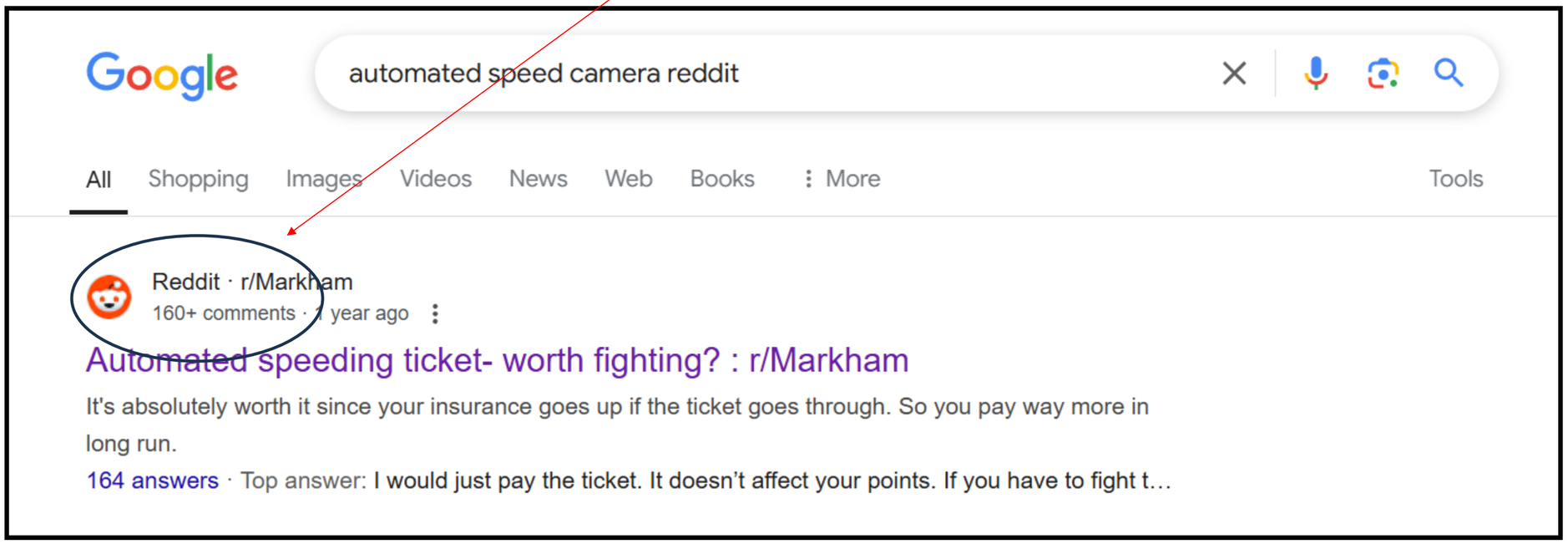
Vaughan:

- 30,000+ tickets in ~3 weeks after ASE launch
- Program halted

Problem Statement

❑ Many discussions in social media ➡ ❑ Lack of knowledge about the rules and tips

❑ +160 Comments



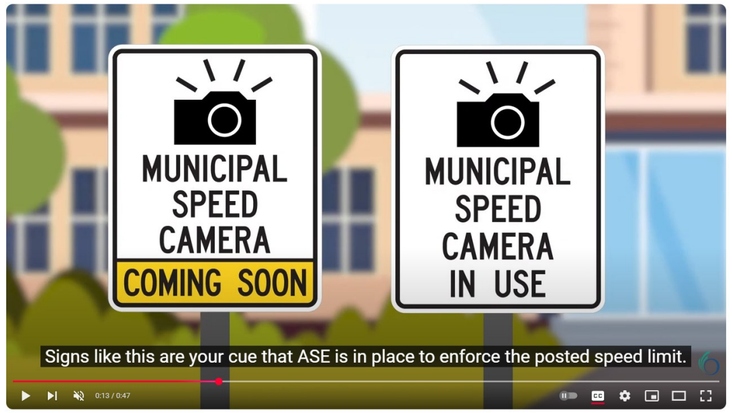
https://www.reddit.com/r/Markham/comments/176wqyv/automated_speeding_ticket_worth_fighting/

Educational Videos To Increase Driver Awareness

- Several municipalities created one or two YouTube videos to promote ASE programs

BRAMPTON

Ottawa



Automated Speed Enforcement in Ottawa

City of Ottawa
10.7K subscribers
Subscribe

11 Share Download Save

Newmarket

See one example:
https://www.youtube.com/watch?v=hZZMFkjO4Lo

Study Goal and Objectives

Study Goal:

- ❑ Identify common driver errors occurring at ASE sites and develop targeted educational videos that promote safer driving behavior.

Study Objectives:

- ❑ Collect and Analyze social media data to identify and categorize frequent driver errors related to automated speed camera locations.
- ❑ Develop and design educational videos aimed at increasing driver awareness and preventing the recurrence of these errors in the future.

Methodology: Social Media Data as Road Safety Data

- **Method:** National Transportation safety board in US reviewed news media-reported e-scooter (66 fatalities) and e-bike (55 fatalities) fatal collision information between 2017 and 2021.

- **Goal:** Providing recommendations to National Highway Traffic Safety Administration, Federal Highway Administration, and US Consumer Product Safety Commission.

November 14, 2022 Safety Research Report SRR-22-01

Micromobility: Data Challenges Associated with Assessing the Prevalence and Risk of Electric Scooter and Electric Bicycle Fatalities and Injuries

Abstract: This safety research report examines the data collection and analysis challenges associated with two of the most common types of micromobility devices: electric scooters (e-scooters) and electric bicycles (e-bikes). To do this, the National Transportation Safety Board (NTSB) conducted a scientific literature review; held discussions with subject matter experts; performed an independent analysis of e-scooter and e-bike crashes, fatalities, and injuries in the United States between

- **Method:** Reviewing 38 vidoes including 203 events from YouTube platform to investigate vehicle to vehicle collision contributing factors.

- **Goal:** Understanding the advantages and limitations of user generated contents for pre-collision analisys.

TRAFFIC INJURY PREVENTION
https://doi.org/10.1080/15389588.2020.1829920
Taylor & Francis
Taylor & Francis Group
Check for updates
SHORT COMMUNICATIONS FROM THE AAAM 64TH ANNUAL SCIENTIFIC CONFERENCE

Video from user-generated content as a source of pre-crash scenario naturalistic driving data

Schuyler St. Lawrence, Jason Hallman, and Rini Sherony

Toyota Motor North America, Inc., Washington, District of Columbia

ABSTRACT

Objective: The objective of this study was to investigate the use of public video from internet user-generated content as a means of collecting naturalistic driving data.
Methods: A convenience sample of 38 videos comprised of 203 events was extracted from publicly available channels on the YouTube™ platform. Each event was manually reviewed and pseudo-coded according to a subset of current CRSS variables. Pre-crash scenarios were coded using categories developed for prior NHTSA analysis.
Results: Crashes represented 67% of the reviewed cases. Collisions with motor vehicles accounted for 84% of all crashes in the sample. Pre-crash scenarios were able to be determined for all crashes and near-crashes. The most prevalent pre-crash scenario types in the video data were Crossing Paths (41%), Rear End (21%), and Lane Change (17%). The top pre-crash scenarios from Swanson et al. were Rear End (31%), Crossing Paths (21%), and Lane Change (12%). The most

KEYWORDS
Naturalistic driving; user-generated content; pre-crash scenarios; video data

Methodology: Collect and Analyze Social Media Data

- ❑ Develop a Data Collection Algorithm to Collect Social Media Data from Reddit
- ❑ Develop a Generative AI–Based Regex Miner Algorithm (GARMA)
- ❑ Develop AI-Generated Demonstrations of Incorrect vs. Correct Behaviour
- ❑ Design Educational Vidoes

Step 1: Data Collection Algorithm Result

Table 1. 39 identified Ontario-related communities in Reddit

Communities	Weekly Visitors*	Communities	Weekly Visitors	Communities	Weekly Visitors
Ontario	620K	Barrie	45K	Northbay	12K
Toronto	469K	Windsorontario	44K	Newmarket	11K
LegalAdviceCanada	363K	Vaughan	40K	Sudbury	11K
Ottawa	294K	Guelph	35K	Cambridgeont	8.5K
Waterloo	95K	Brantford	30K	Sarnia	8.2K
Markham	89K	Thunderbay	28K	Stratfordontario	7.8K
Kitchener	86K	Brampton	26K	Stthomasontario	5.6K
Hamilton	81K	Durham	26K	CornwallOnt	5.5K
Londonontario	76K	Niagara	18K	Orillia	5.3K
Mississauga	61K	Peterborough	17K	Owensound	4.6K
Oakville	57K	Oshawa	15K	Woodstockontario	4.2K
Kingstonontario	53K	Richmondhill	14K	Pickering	3.7k
BurlingtonON	46K	Belleville	12K	SaultSteMarie	3.1K

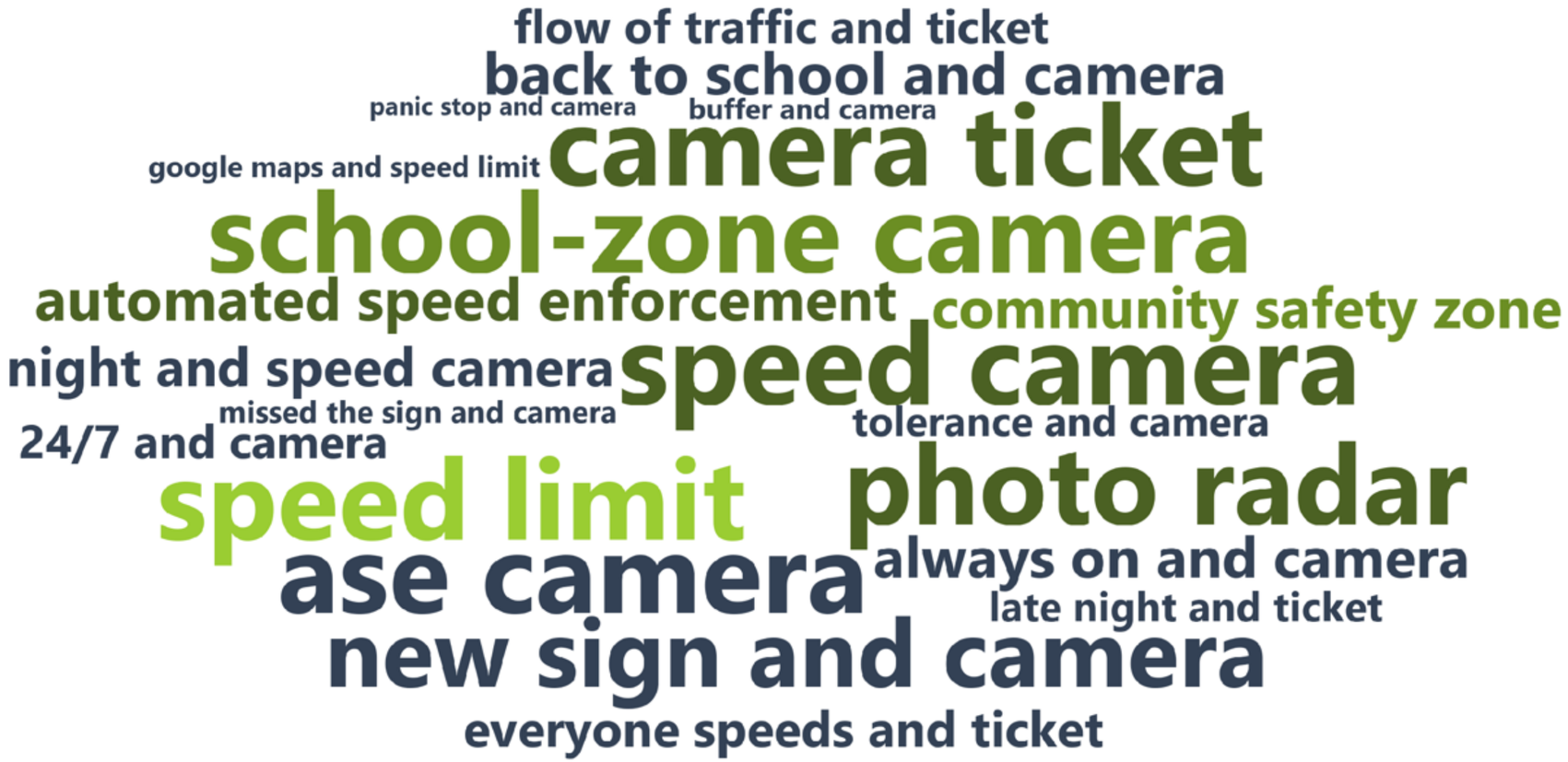
*Weekly Visitors as of Nov 2025

Step 1: Data Collection Algorithm Result

- Collected 4,333 comments

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	type	id	subreddit	created_ut	permalink	author	score	parent_id	link_id	title	body	clean	geo_hint	created	
1165	comment	kxr64sf	hamilton	1.71E+09	https://red	-dwight-	1	t3_1btyh4c	1btyh4c	Hamilton p	I'd like to se	I'd like to see a study where they put a blinking light on the sign warning drivers about the		2024-04-02 20:49	
1166	submissio	1by3q34	SaultSteM	1.71E+09	https://red	poutineish	17		1by3q34	The million	A very click	The million-dollar plan to catch speeding Saultites A very click baity and leading headline		2024-04-07 12:49	
1167	comment	kylmrvo	SaultSteM	1.71E+09	https://red	InfinityTub	2	t1_kyhjx84	1by3q34	The million	As someor	As someone who is regularly a tourist, speed cameras don't even crack the top 100 on th		2024-04-08 10:47	
1168	comment	kyln10d	SaultSteM	1.71E+09	https://red	InfinityTub	1	t1_kyh6l19	1by3q34	The million	Speed can	Speed cameras might address the issue of you getting a response to a break in. Why sho		2024-04-08 10:49	
1169	comment	kz2hyre	niagara	1.71E+09	https://red	Recognitio	1	t3_16vm6k	16vm6kk	Speeding T	I spotted a	I spotted an automated Speed	Thorold	2024-04-11 12:51	
1170	submissio	1c337s4	kingstonon	1.71E+09	https://red	kotacross	31		1c337s4	Kingston	looks to drive	Kingston looks to drive forward with speed limit reductions, photo radar		2024-04-13 14:27	
1171	comment	kze31uc	kingstonon	1.71E+09	https://red	groogs	56	t3_1c337s	1c337s4	Kingston lo	Speed limi	Speed limits and photo radar... Also known as "oops, we forgot to design this street prop		2024-04-13 15:01	
1172	comment	kzf5ds7	kingstonon	1.71E+09	https://red	model-alic	13	t3_1c337s	1c337s4	Kingston lo	Photo rada	Photo radar is almost always designed to line the city's pockets.		2024-04-13 18:42	
1173	comment	kzggtsy	kingstonon	1.71E+09	https://red	lonelyfatol	3	t3_1c337s	1c337s4	Kingston lo	I am whole	I am wholeheartedly against photo radar except in school zones, playground zones, and		2024-04-13 23:19	
1174	submissio	1c48mpx	sudbury	1.71E+09	https://red	Mel_Behav	46		1c48mpx	Garson spe	There are c	Garson speed camera missing There are drag marks down the grass to the street and the		2024-04-15 0:20	
1175	comment	kzmmsnv	sudbury	1.71E+09	https://red	jakovasaur	9	t3_1c48mp	1c48mpx	Garson spe	It was foun	It was found in a bushy area ne Sudbury		2024-04-15 3:12	
1176	comment	kznfl60	kingstonon	1.71E+09	https://red	glx89	1	t3_1c337s	1c337s4	Kingston lo	I'd	I'd support photo radar if no money ever went to the municipality/province or private com		2024-04-15 8:11	
1177	comment	kzpkotl	sudbury	1.71E+09	https://red	Mel_Behav	6	t1_kzpjyeh	1c48mpx	Garson spe	What	What makes you think itâ€™s the freedom convoy destroying the speed cameras? Have t		2024-04-15 17:46	
1178	comment	kzq9fr6	sudbury	1.71E+09	https://red	northerner	6	t1_kzpo8kj	1c48mpx	Garson spe	I don't disa	I don't disagree with what you're saying but I dnt understand what relevance it has to the		2024-04-15 20:04	
1179	submissio	1c5cu3g	sudbury	1.71E+09	https://red	Fancy_Pre	2		1c5cu3g	New speec	Does anyo	New speed cameras? Does anyone know the date the new speed cameras are supposed		2024-04-16 10:35	
1180	comment	kztixto	sudbury	1.71E+09	https://red	KittyMeow	13	t3_1c5cu3	1c5cu3g	New speec	The speed	The speed camera in Garson apparently has been dragged away by some nefarious vigila		2024-04-16 12:23	
1181	submissio	1cakz6v	Barrie	1.71E+09	https://red	Inside-Tun	10		1cakz6v	INFURIATIN	- Autom	INFURIATING - Automated Speed Enforcement System - Not accepting online payment		2024-04-22 20:14	
1182	submissio	1cbn907	guelph	1.71E+09	https://red	VisualPers	0		1cbn907	speed cam	Is there a n	speed camera on stone road Is there a new speed camera/ ASE along Stone Road East b		2024-04-24 2:32	
1183	comment	l10t2wj	guelph	1.71E+09	https://red	NoBotsHe	4	t3_1cbn90	1cbn907	speed cam	Guelph	Guelph only has speed camera	Guelph	2024-04-24 9:56	
1184	comment	l126n5y	guelph	1.71E+09	https://red	VisualPers	2	t1_l10t2wj	1cbn907	speed cam	Specificall	Specifically in front of the Village of Arbour Trails retirement home. I did think there were		2024-04-24 15:50	
1185	comment	l13wcb9	niagara	1.71E+09	https://red	GregsterM	1	t3_16vm6k	16vm6kk	Speeding T	It is	It is probably not worth the hassle of fighting the ticket - they are not so large youâ€™d hire		2024-04-24 21:31	
1186	submissio	1cgt2a3	sudbury	1.71E+09	https://red	Left-Ad-67	140		1cgt2a3	Speed cam	Lively spee	Speed camera down! Lively speed camera finally down lol, whoever did this. Youâ€™re m		2024-04-30 13:38	
1187	comment	l1y9fon	sudbury	1.71E+09	https://red	78513	32	t1_l1y7gzl	1cgt2a3	Speed cam	I said it	I said it before and I'll say it again. Speed cameras are used for the following reasons Poo		2024-04-30 15:21	
1188	comment	l1yaebf	sudbury	1.71E+09	https://red	Poopy_Par	24	t3_1cgt2a	1cgt2a3	Speed cam	"Hey, that l	"Hey, that hawk flying in the sky is going WAY too fast" -this speed camera probably		2024-04-30 15:26	
1189	comment	l1ybvt6	sudbury	1.71E+09	https://red	[deleted]	6	t1_l1ybg1b	1cgt2a3	Speed cam	You mean l	You mean like passing someone in the left lane because they are going slowly in the right		2024-04-30 15:35	
1190	comment	l1yohnr	sudbury	1.71E+09	https://red	78513	5	t1_l1ya981	1cgt2a3	Speed cam	Blame all	Blame all the individuals, it's always the individuals fault and never the system. Found the		2024-04-30 16:45	
1191	comment	l22tl6a	sudbury	1.71E+09	https://red	Embarrass	1	t1_l21smk	1cgt2a3	Speed cam	No one ask	No one asked for this, they arent put up by police you can call the non emergency line an		2024-05-01 11:33	
1192	submissio	1chp4pa	newmarke	1.71E+09	https://red	dracarys1(	0		1chp4pa	Speeding t	To start	Speeding ticket for going 11 over the limit To start off, I understand speeding is bad and I		2024-05-01 15:35	
1193	comment	l23wywh	newmarke	1.71E+09	https://red	Top-Proce	15	t3_1chp4p	1chp4pa	Speeding t	Unfortunat	Unfortunately in a school zone there is zero tolerance for speeding. My bosses wife got d		2024-05-01 15:55	
1194	comment	l24nxac	newmarke	1.71E+09	https://red	[deleted]	5	t1_l243s0p	1chp4pa	Speeding t	Thats wher	Thats where all the speed cameras are..... no points, nothing on the record. Just a cash f		2024-05-01 18:28	
1195	submissio	1chxk5i	mississaug	1.71E+09	https://red	Keenano1	132		1chxk5i	Creative m	No one see	Creative malton speed camera model No one seems to care to fix, been like this for wee		2024-05-01 21:18	
1196	comment	l25p60m	newmarke	1.71E+09	https://red	so-many-u	2	t3_1chp4p	1chp4pa	Speeding t	There's a s	There's a speed camera ahead sign both directions on Bathurst. Hard to miss.		2024-05-01 22:03	
1197	comment	l25udv3	newmarke	1.71E+09	https://red	dracarys1(	1	t1_l25ppcc	1chp4pa	Speeding t	Yeah defin	Yeah definitely. I have never lived near a speed camera before so I had no experience on		2024-05-01 22:36	
1198	comment	l267ero	mississaug	1.71E+09	https://red	Raspberryl	44	t3_1chxk5i	1chxk5i	Creative m	There was	There was a speed camera outside my son's high school for months and he'd always tell		2024-05-02 0:03	
1199	submissio	1ci459l	Barrie	1.71E+09	https://red	Tylerinther	11		1ci459l	Speed cam	I noticed	Speed cameras I noticed driving by Ardagh today the speed cameras are down, signage I		2024-05-02 2:10	
1200	comment	l28drgb	mississaug	1.71E+09	https://red	Spasticate	1	t1_l267ero	1chxk5i	Creative m	Martingrov	Martingrove collegiate? That speed camera lasted about 2 months		2024-05-02 12:00	
1201	comment	l28oer7	sudbury	1.71E+09	https://red	[deleted]	1	t3_1cgt2a	1cgt2a3	Speed cam	Hey speed	Hey speed camera! Yer drunk! Seriously though, I hate people who speed, in my opinion		2024-05-02 13:18	
1202	comment	l294hx4	mississaug	1.71E+09	https://red	nooblife95	5	t3_1chxk5i	1chxk5i	Creative m	Our speed	Our speed camera kept getting spray painted, they finally just removed it XD		2024-05-02 14:58	
1203	comment	l29gbla	Barrie	1.71E+09	https://red	MoocowR	2	t1_l289ppz	1ci459l	Speed cam	>Still	>Still seems shady to me. Feels like entrapment 100%, school zones/hours have always		2024-05-02 16:05	
1204	comment	l2aqsen	mississaug	1.71E+09	https://red	40ishlady	2	t1_l2779xn	1chxk5i	Creative m	Politician	Politicians didn't come up with speed cameras! It's a community safety initiative that wa		2024-05-02 20:24	
1205	submissio	1citua8	Barrie	1.71E+09	https://red	tinkymyfink	0		1citua8	Barrie spe	Itâ€™s inte	Barrie speed cameras on the r	Barrie	2024-05-02 23:16	
1206	comment	l2c7dl4	newmarke	1.71E+09	https://red	PasiAltone	1	t3_1chp4p	1chp4pa	Speeding t	Use Waze	Use Waze for a heads up on speed cameras		2024-05-03 2:04	

Step 1: Word-cloud Keywords



Step2: Develop an AI Algorithm

#	Theme Title	Explanation
1	Speed-Camera Thresholds Vary—Don't Count on an "Extra Buffer"	Some speed cameras give you a small allowance, but others will catch you immediately. Don't take chances — always drive at or below the posted speed.
2	Don't Go with the Traffic Flow—Stick to the Posted Limit	Many drivers believe that matching the flow of traffic keeps them safe and avoids tickets — but speed cameras and laws don't see it that way - Stick to the posted limit
3	Some Cameras Are Always On	In the absence of anything on the sign advising of the time of day, speed limits apply 24/7 —even at night when roads look empty.
4	Some Cameras Are Partially On	Some school-zone ASE cameras are switched off over summer break but turn back on when classes resume. Don't assume they're always inactive—slow to the posted limit whenever school is in session.
5	Avoid Last-Second Braking Near Speed Cameras	Braking hard at the last second can cause a crash if someone's following you. Drive at or below the posted speed so you can slow down smoothly—and avoid both tickets and accidents
6	Speed Limits May be Recently Updated	Local Speed limits can drop—e.g., some streets shifted from 40 km/h to 30 km/h. If you rely on old memory, you'll still get caught. Always check the posted sign before you pass a camera.
7	Don't Rely on App Camera Alerts	Navigation apps can miss cameras or give no warning. Always watch and obey the posted speed limit signs to avoid tickets.
8	Trust the Signs — Not the App	Roadside signs set the legal limit; mobile apps can be wrong. Obey the posted limit written in roadside signs to avoid a camera ticket.

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Step2: Develop an AI Algorithm

#	Theme Title	Frequency	Percentage
1	Speed-Camera Thresholds Vary—Don’t Count on an “Extra Buffer”	121	50
2	Don’t Go with the Traffic Flow—Stick to the Posted Limit	49	20
3	Some Cameras Are Always On	27	11
4	Some Cameras Are Partially On	18	8
5	Avoid Last-Second Braking Near Speed Cameras	14	6
6	Speed Limits May be Updated Recently	5	2
7	Don’t Rely on App Camera Alerts	5	2
8	Trust the Signs — Not the App	1	1
Total		240	100%

Step3: Incorrect vs. Correct Behaviour

- **Studies show that making or seeing an error followed by corrective feedback is a valid approach for learning and retention ("errorful learning") (Metcalfe et al., 2017: Mera et al., 2022).**

Theme #	Incorrect Behavior	Correct Behavior
1	Driver is running late and assumes "few km/h over speed limit is fine" and moves accordingly	Driver is running late; but moves under posted speed limit and passes the cameras calmly.
2	Driver says "lets move with traffic flow speed" and follow the traffic flow speed	Driver says "I should follow the speed limit" and stays at the posted limit, passing cameras calmly.
3	Driver says "It's 1 a.m - let's go fast," and accelerates above the posted speed limit.	Driver says "It's 1 a.m., but safety comes first," and stays at the posted limit.
4	Driver ignores the date/time restriction and continues at the usual speed.	Driver checks the date/time restriction and drives at the posted limit.
5	Driver brakes hard right in front of the speed camera zone.	Driver slows gradually, reaching the posted limit before the camera zone.
6	Driver follows the old posted speed limit from memory.	Driver notices the updated sign and adjusts to the new posted limit.
7	Driver relies on mobile-app camera alerts to set speed.	Driver relies on the posted speed limit.
8	Driver follows the app's speed limit.	Driver follows the posted speed limit on the roadside sign.

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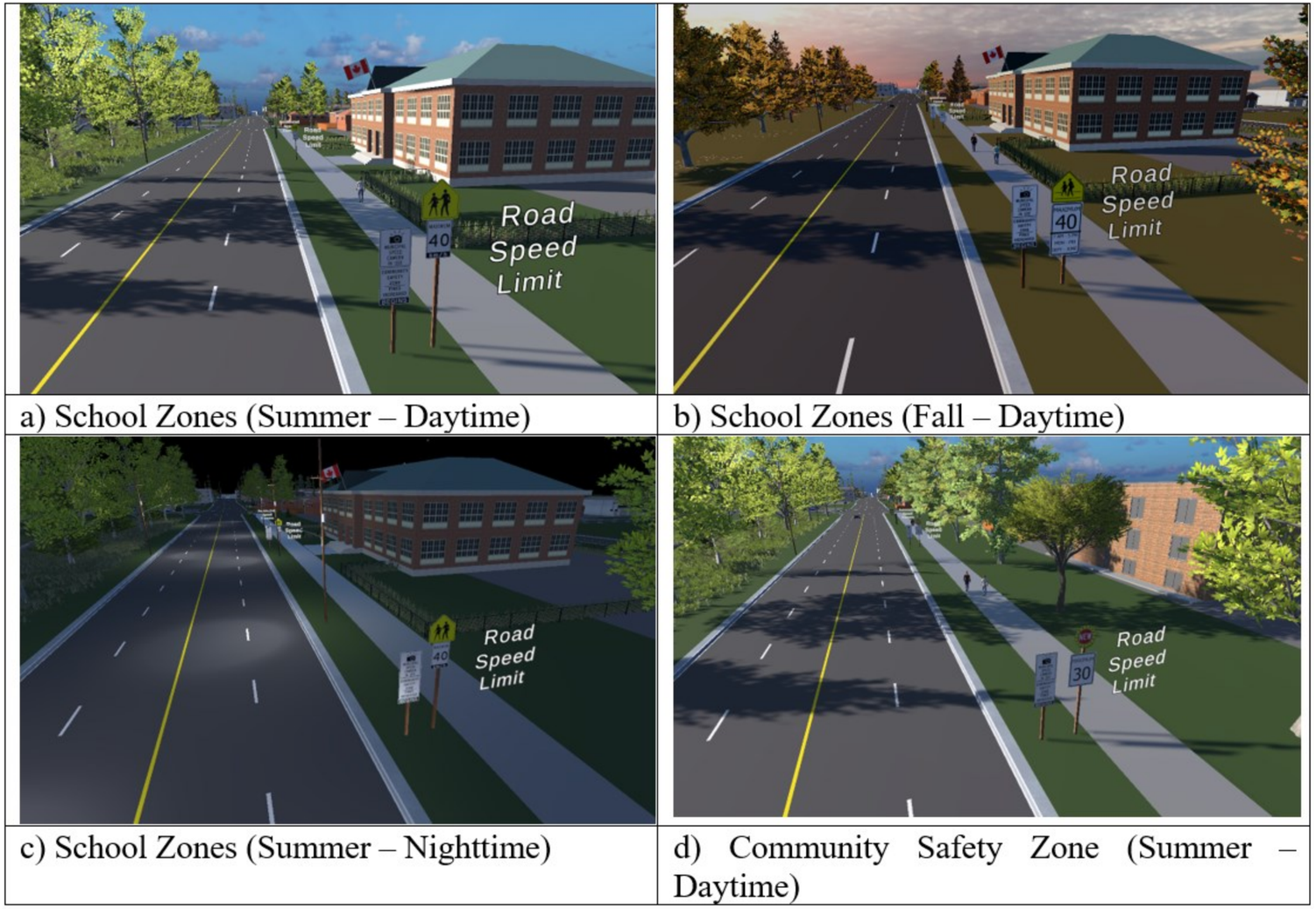
Step 4: Design Educational Vidoes



a) School Zones (Summer – Daytime)

b) School Zones (Fall – Daytime)

c) School Zones (Summer – Nighttime)

d) Community Safety Zone (Summer – Daytime)

Figure 1. The Built Canadian Street Scenes

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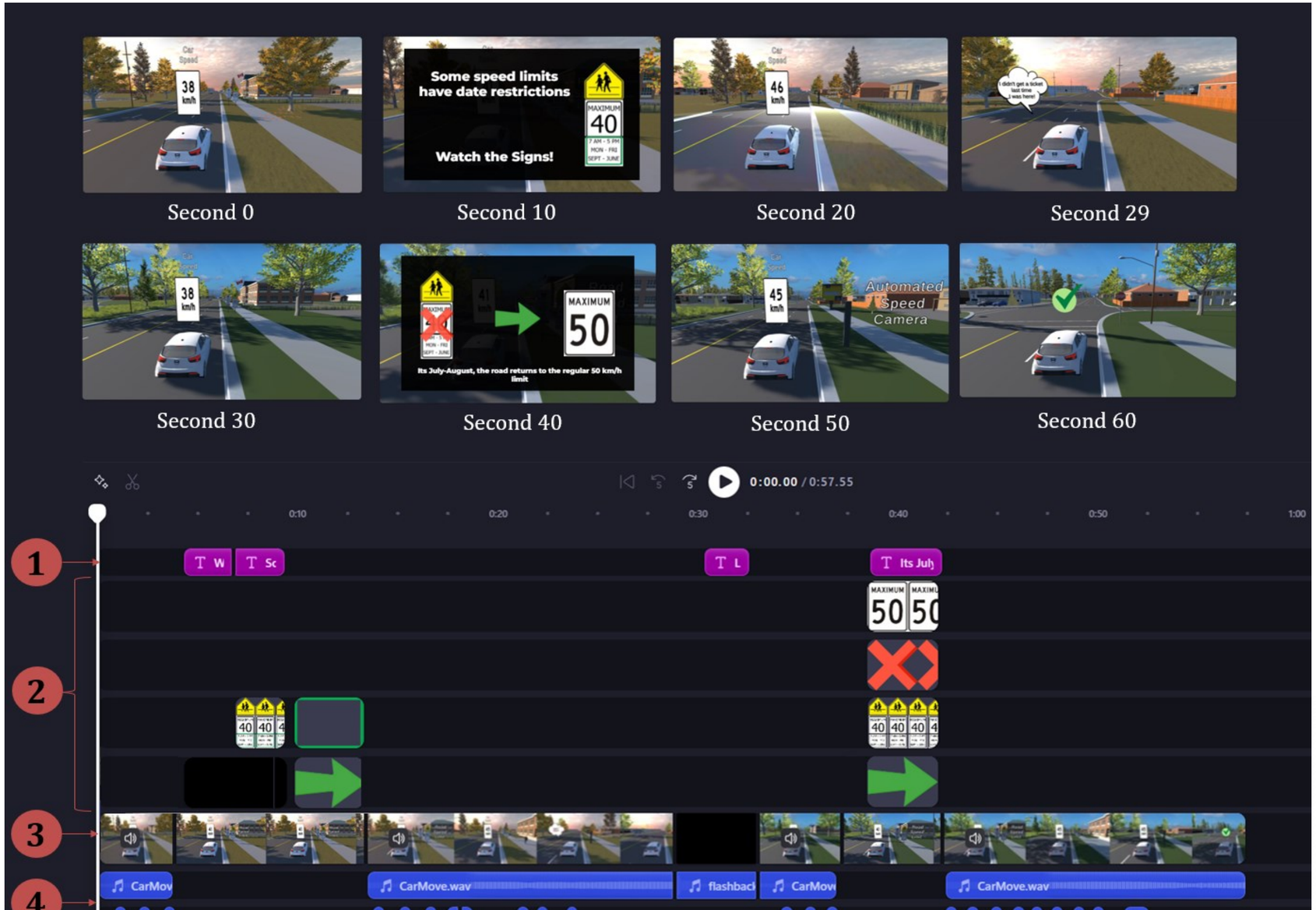
Step 4: Design Educational Vidoes



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Theme 3: Some Cameras Are Always On

Link to the video:

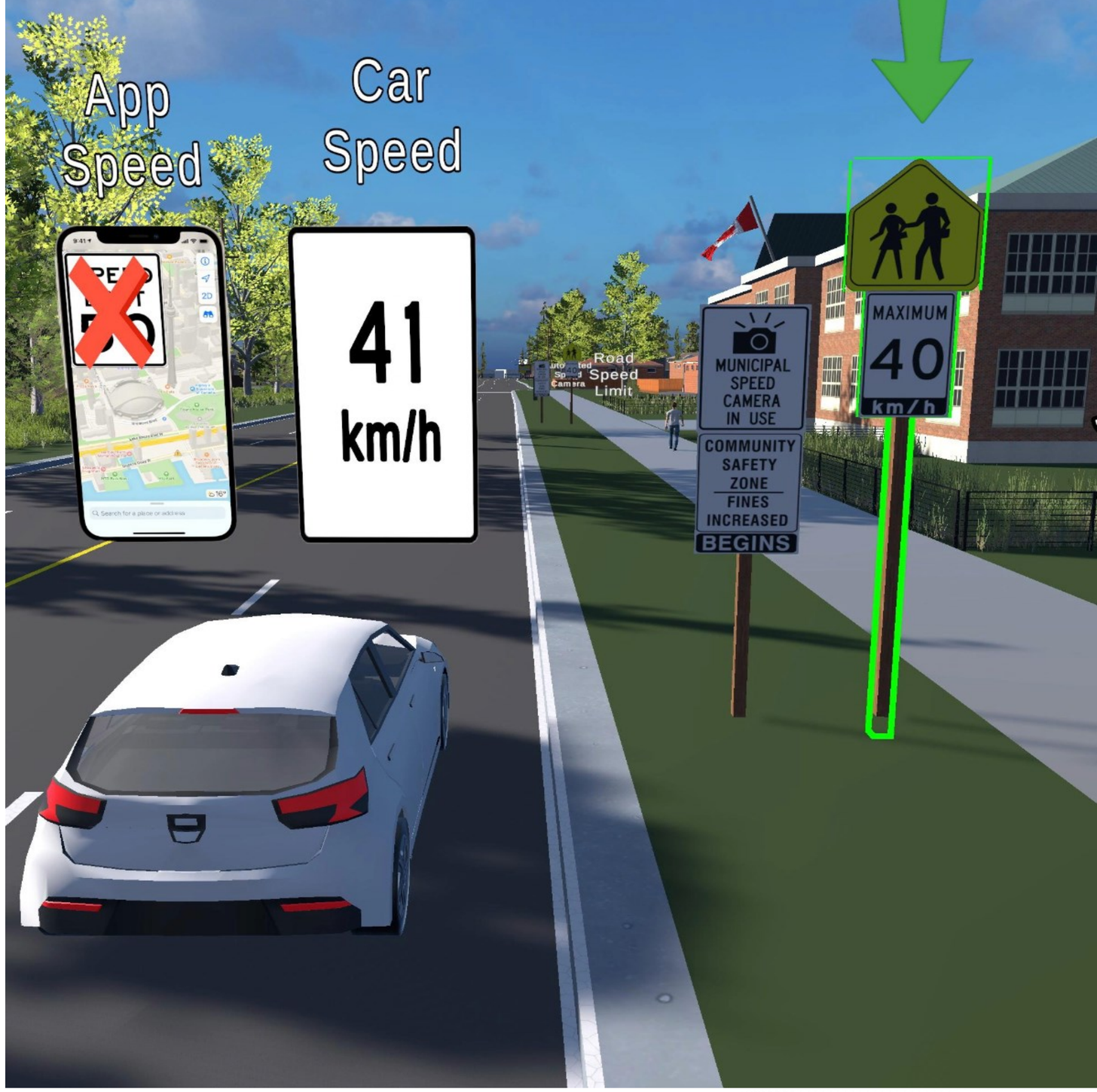
https://youtu.be/H3Do2MvopZY

Theme 4: Some Cameras Are Partially On

Link to the video:

https://youtu.be/RO96ScRhbEA

Theme 8:
Trust the Signs
Not the App



Link to the video:

https://youtu.be/kQ5FwQXkAs8

More Information

❑ This project is funded by Transport Canada

Q&A

Quiz

Q1 (Multiple choice)
Smart transportation systems are commonly described in three phases.
Which option matches your framework?
A) Planning → Construction → Operation
B) Detection → Algorithms → Decisions
C) Sensing → Enforcement → Revenue
D) Data → Storage → Visualization

Q2 (Multiple choice)
When driving and you encounter wildlife on or near the road, what is the safest response?
A) Slow down and stay alert because animals often travel in groups.
B) Avoid swerving suddenly; instead brake firmly and stay in your lane.
C) Continue cautiously until you are well past the area where the animal was seen.
D) All of the above.

Quiz

Q3 (Calculation / short answer)
Ontario reports about 12,000 wildlife collisions per year.
Approximately how often is that, in minutes?
A) About every 14 minutes
B) About every 44 minutes
C) About every 58 minutes
D) About every 93 minutes

Q4 (Short answer)
Give two examples of technologies used in the “Detection” phase?

Q5 (Short answer)
Name one similarity and one difference between the wildlife detection system and ASE cameras?