



# 'Slow Down' or 'Not to Slow Down' A Before-after study on effectiveness of SLOWS trailers in Calgary



Surendra Mishra, M.Sc., P. Eng.  
Traffic Engineer, The City of Calgary

Tony Churchill, P. Eng.  
Sr. Traffic Engineer, The City of Calgary

# Outline

- Introduction
- Before-after speed study
- Methodology
  - Speed data collection
  - Analysis of results
- Conclusions
- Next Steps/Further Research
- Lessons Learned from Calgary

# Introduction

- Vehicle Activated Traffic Calming Signs (VATCS)
- Speed Limit Observation and Warning System (SLOWS)
- SLOWS vs iSLOWS
- City of Calgary's SLOWS trailers rotation program



iSLOWS



SLOWS Trailer



# Before-after speed study

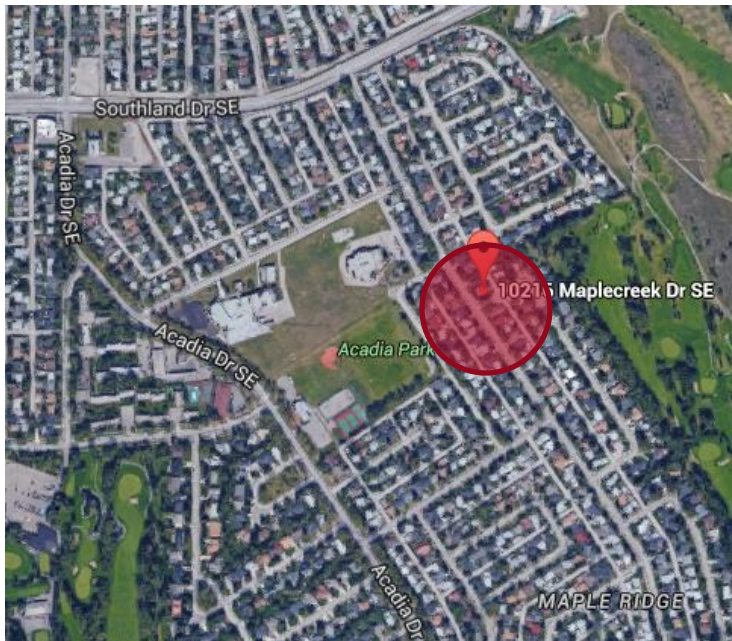
## Objectives:

- To evaluate the effectiveness of SLOWS trailers in reducing speed during rotation
- To evaluate if there is any lasting effect

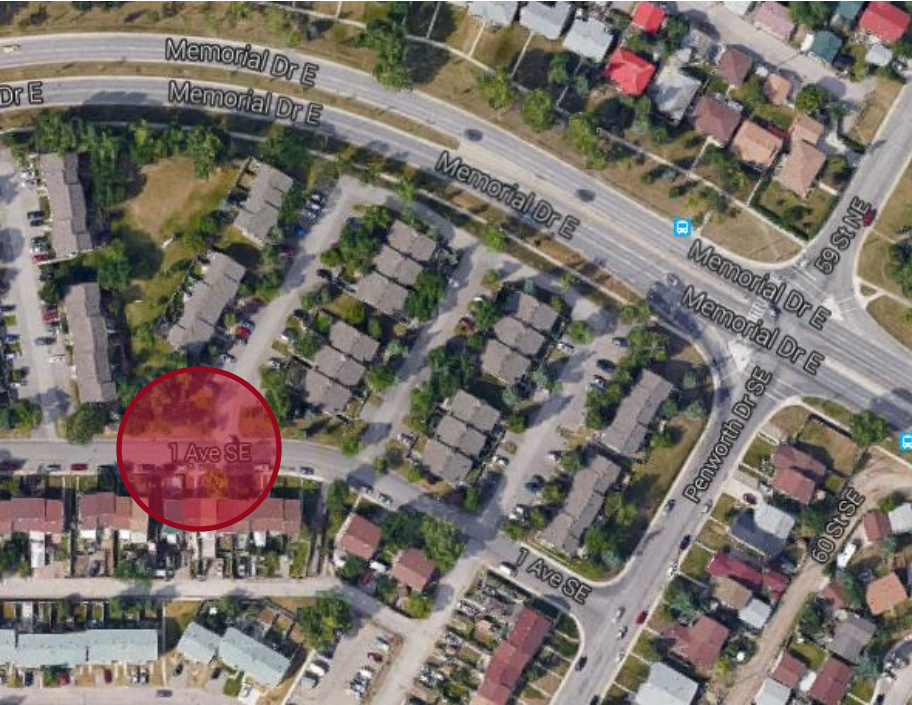
## Study locations:

Location 1 – Maple Creek Drive & Maple Ridge Cres. SE, Calgary  
(Speed limit: 50 km/h)

Comparison site: 20 Street & 29 Av SW (Speed limit: 50 km/h)



Location 2 – 1 Avenue & Penworth Drive SE, Calgary (Playground Zone)







# Methodology

## Data Collection:

- 24 hour speed data collected using rubber tubes
- Connected to automated counter
- 1-2 weeks before, during installation and 2 weeks after removal of the SLOWS trailers

## Location 1: (Speed Limit 50 km/h)

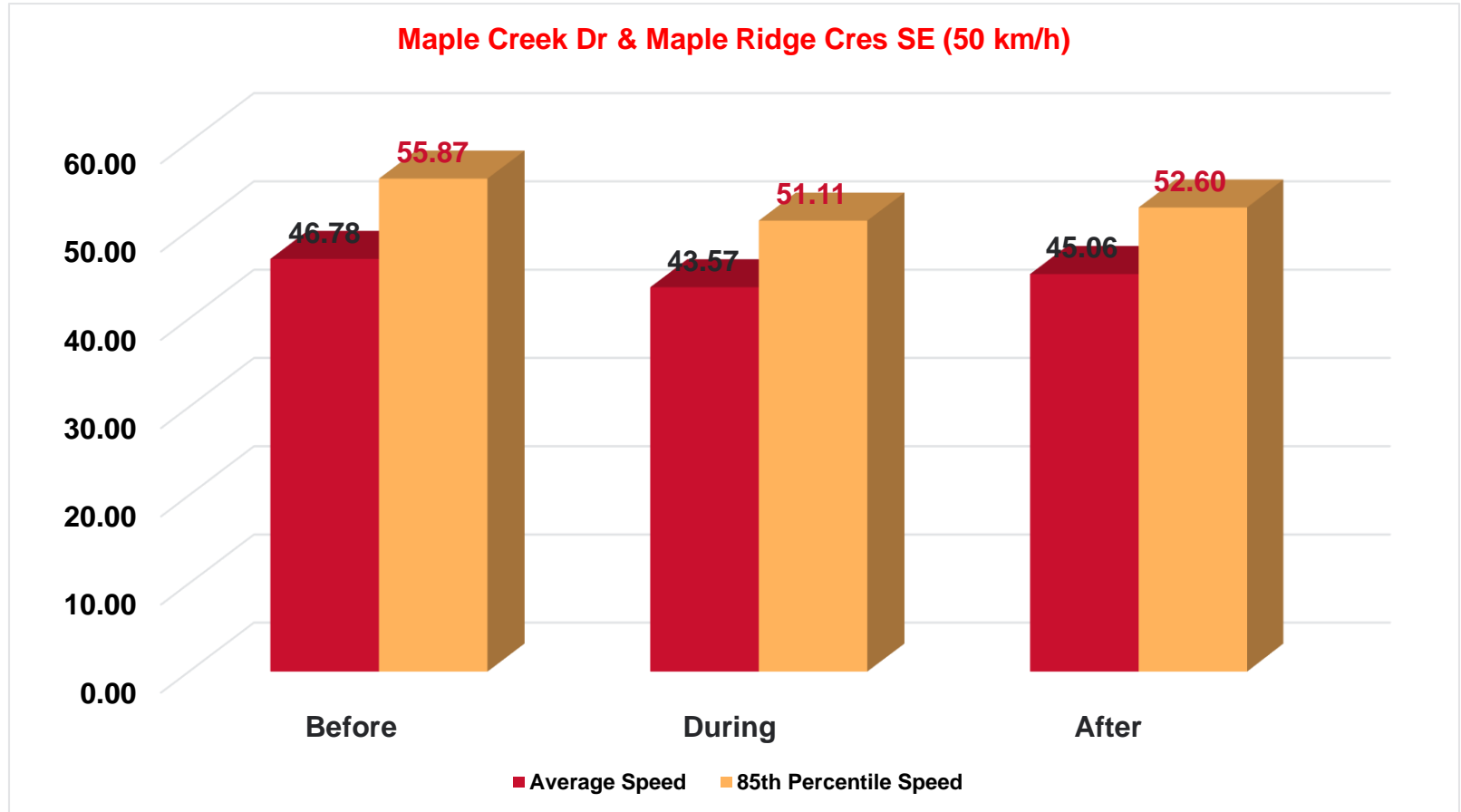
Statistic	Before	During	After
Mean Speed (km/h)	46.78	43.57	45.06
85 <sup>th</sup> Percentile Speed (km/h)	55.87	51.11	52.60
Standard Deviation	9.97	8.42	7.77

## Comparison site: (Speed Limit 50 km/h)

Statistic	Before	No SLOWS trailer installed	After
Mean Speed (km/h)	47.52		47.53
85 <sup>th</sup> Percentile Speed (km/h)	53.54		54.19
Standard Deviation	6.64		7.06



Results:



## Significance tests:

T-Tests: Before & during, Before & after removal of SLOWS trailers

Null Hypothesis ( $H_0$ ): Mean Speeds before and during SLOWS trailer are equal

Reject  $H_0$ : We can say with 95% confidence that mean speeds are significantly different

Cannot reject  $H_0$ : There is not sufficient evidence to reject null hypothesis that the two mean speeds are equal

## ANOVA



## Results: Before & During SLOWS trailers

Mean speed reduced by 3.21 km/h from 46.78 km/h to 43.57 km/h

(Statistically significant at 95% confidence level:

$t \text{ Stat } 6.70 > t \text{ Critical } 1.96$ )

## Before & After removal:

Mean speed reduced by 1.72 km/h from 46.78 km/h to 45.06 km/h

(Statistically significant at 95% confidence level)

ANOVA:  $F = 24.90 > F_{\text{crit}} (2.99)$ , ( $p\text{-value} = 2.01\text{E-}11 < 0.05$ )

i.e. Null hypothesis that mean speeds were not significantly different was rejected.

85<sup>th</sup> percentile speed: Reduced from 55.87 km/h to 51.11 km/h

## Comparison site:

Mean speed: Increased from 47.52 km/h to 47.53 during the same period

85<sup>th</sup> percentile speed: Increased from 53.54 km/h to 54.19 km/h



Percentage of vehicles exceeding speed limit:

Location 1

Before	During	After
40.41%	21.08%	26.76%

Comparison site:

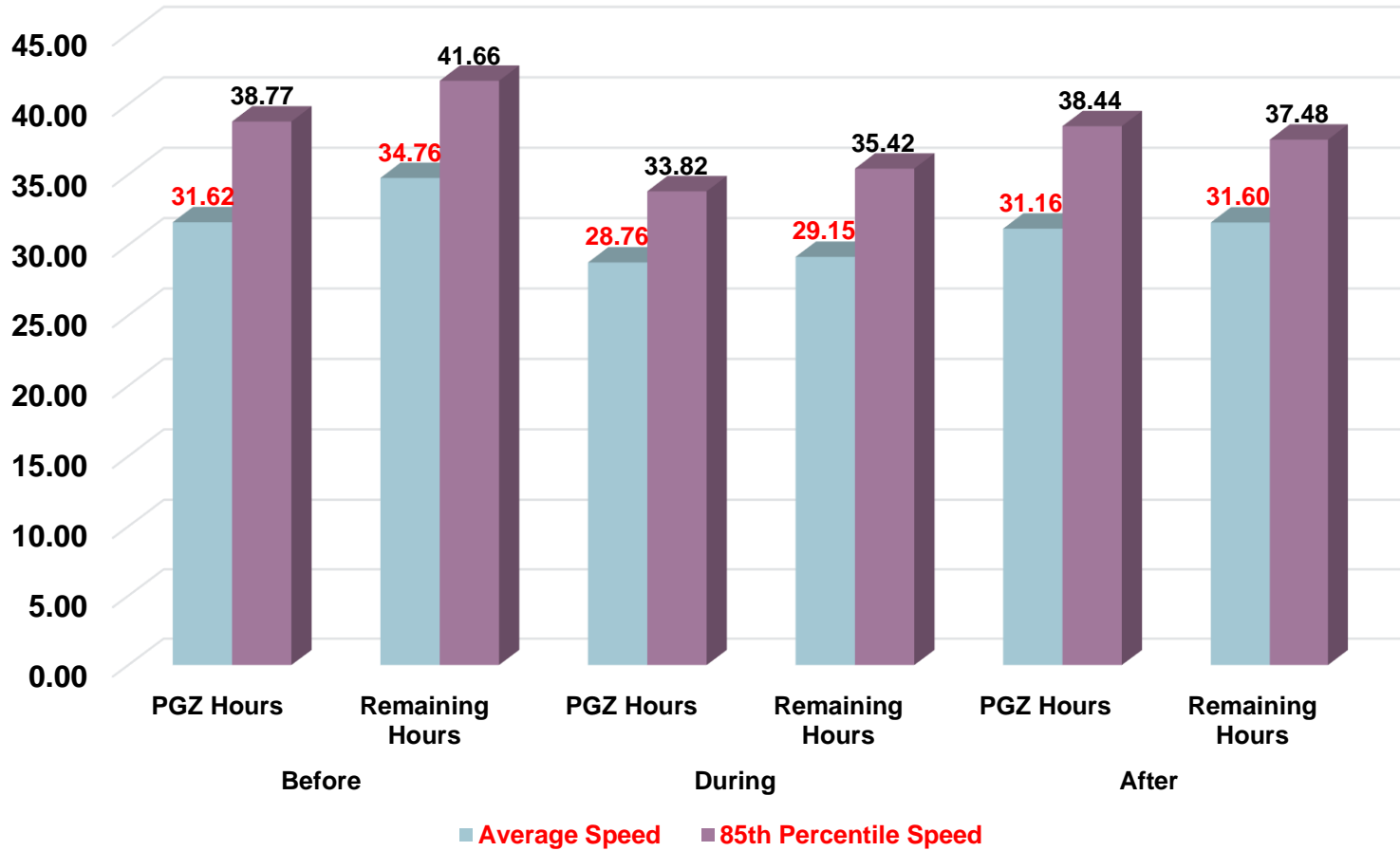
Before		After
32.36%		35.84%

## Location 2: Playground Zone

Statistic	Before		During		After	
	PGZ Hours	Remaining Hours	PGZ Hours	Remaining Hours	PGZ Hours	Remaining Hours
Mean Speed (km/h)	31.62	34.76	28.76	29.15	31.16	31.60
85 <sup>th</sup> Percentile Speed (km/h)	38.77	41.66	33.82	35.42	38.44	37.48
Standard Deviation	7.06	7.43	5.45	6.05	6.61	6.76



## 1 Av & Penworth Dr SE (Playground Zone)





## Results: Before & During SLOWS trailers

Playground zone hours: Mean speed reduced by 2.86 km/h from 31.62 km/h to 28.76 km/h (Statistically significant at 95% confidence level:  $t \text{ Stat } 4.93 > t \text{ Critical } 1.96$ )

After hours: Mean speed reduced by 5.61 km/h from 34.76 km/h to 29.15 km/h (Statistically significant at 95% confidence level:  $t \text{ Stat } 4.79 > t \text{ Critical } 1.96$ )

## Results: Before & After removal of SLOWS trailers

Playground zone hours: 31.61 km/h to 31.16 km/h

**Not statistically significant**

After hours: 34.76 km/h to 31.59 km/h

(Statistically significant at 95% confidence level)



Percentage of vehicles exceeding speed limit:

Location 2: Playground zone hours

Before	During	After
57.38%	39.24%	52.32%

After hours:

Before and after periods: Negligible

During SLOWS trailers: None

# Conclusions

- SLOWS trailers appear to be effective in reducing speeds during installation as well as after removal
- Positive effects of SLOWS trailers still remained after 2 weeks of removal, evident from the reduced mean, 85<sup>th</sup> percentile speeds and smaller percentage of vehicles exceeding speed limit
- 2.86 km/h – 5.61 km/h mean speed reduction was observed during the before-after speed study

# Next steps/Further research

- Optimal rotation period before the effect fades down,
- Multiple rotations at the same location supported with police enforcement,
- Technological upgrades: Display, data collection capability/uses/liability of such data
- Size of fleet. It's nice to have more of such devices but how much can a Municipality afford given the limited resources to purchase and move them around in a frequent basis,
- Issues with solar powered battery life: alternate power source?
- Direct request from 311 – more of PR tool than actual problem solving in some cases as often people request but there is not really a speeding issue



# Lessons learned from Calgary's SLOWS trailer rotation program

- Currently 8 SLOWS trailers for 14 wards; doesn't seem enough. Strong desire to have at least one per ward
- Optimal rotation time: 2 weeks? Seems right! Longer periods may result in non compliance
- Current fleet displays speed of an oncoming vehicle. Often, drivers seem to be speeding to test their speed. Desire to have "SLOW DOWN" message displayed instead of actual speed when speed limit is exceeded
- Issues with solar powered batteries. Often, keeps one or two units out of service because of such issues. Desire to have larger solar panels to increase battery life
- Speed data collection capability: Current fleet doesn't have this capability. Frequent requests from citizens to have the speed data recorded and passed to Calgary Police for enforcement. Desire to have this capability in new fleet.



**Thank  
you!**