

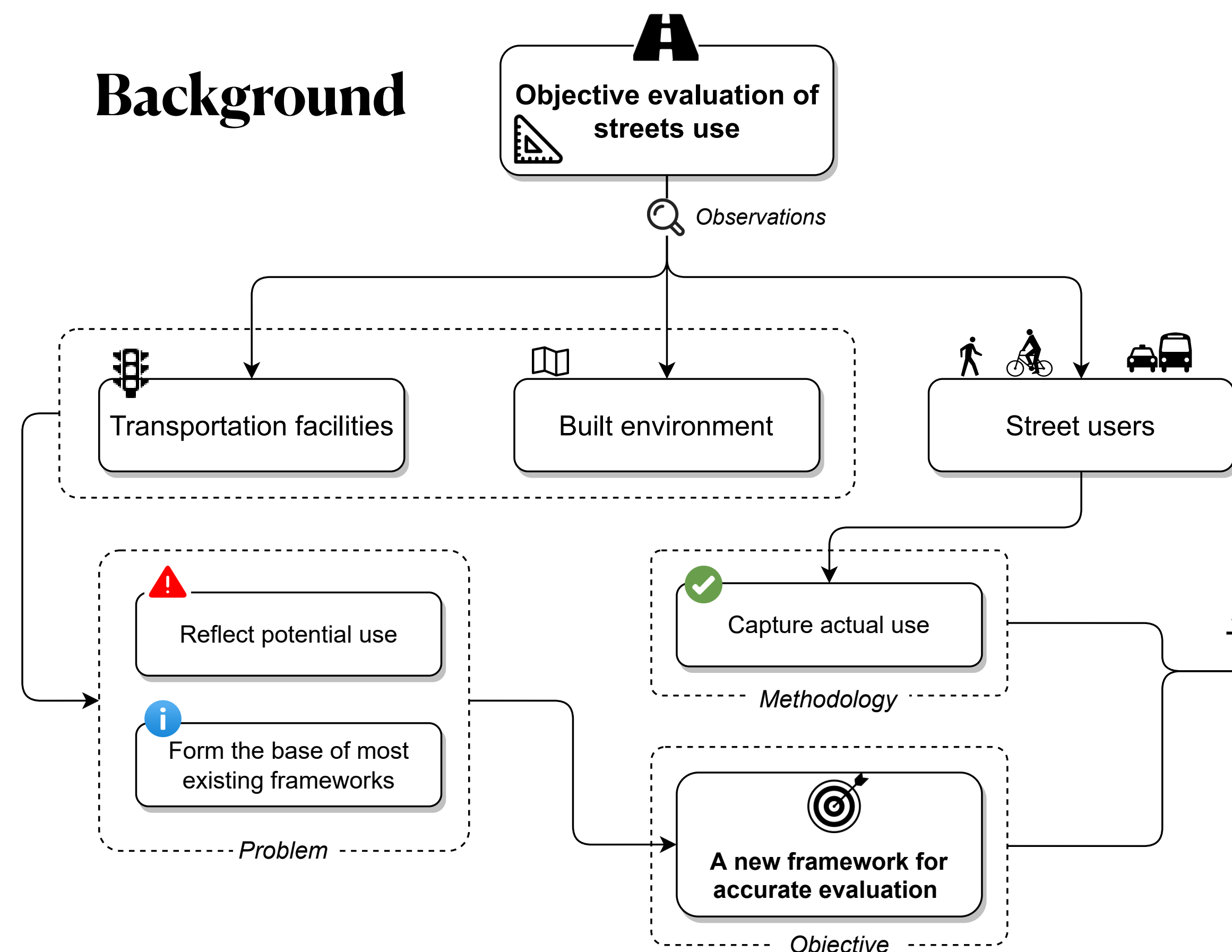


# Street Functions and Road Safety: A Case Study of Speed Bumps in Montreal, Canada

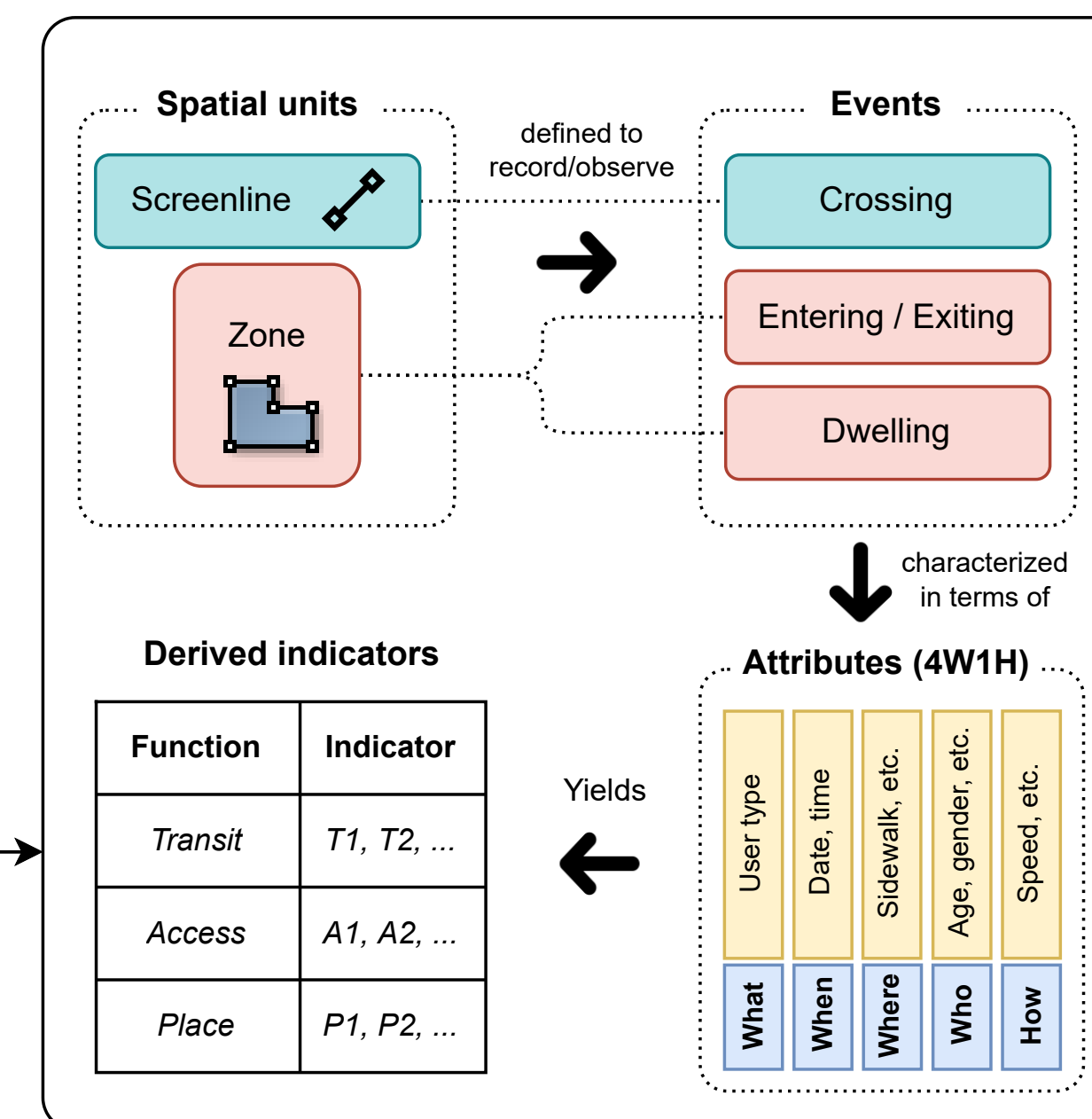
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## Background



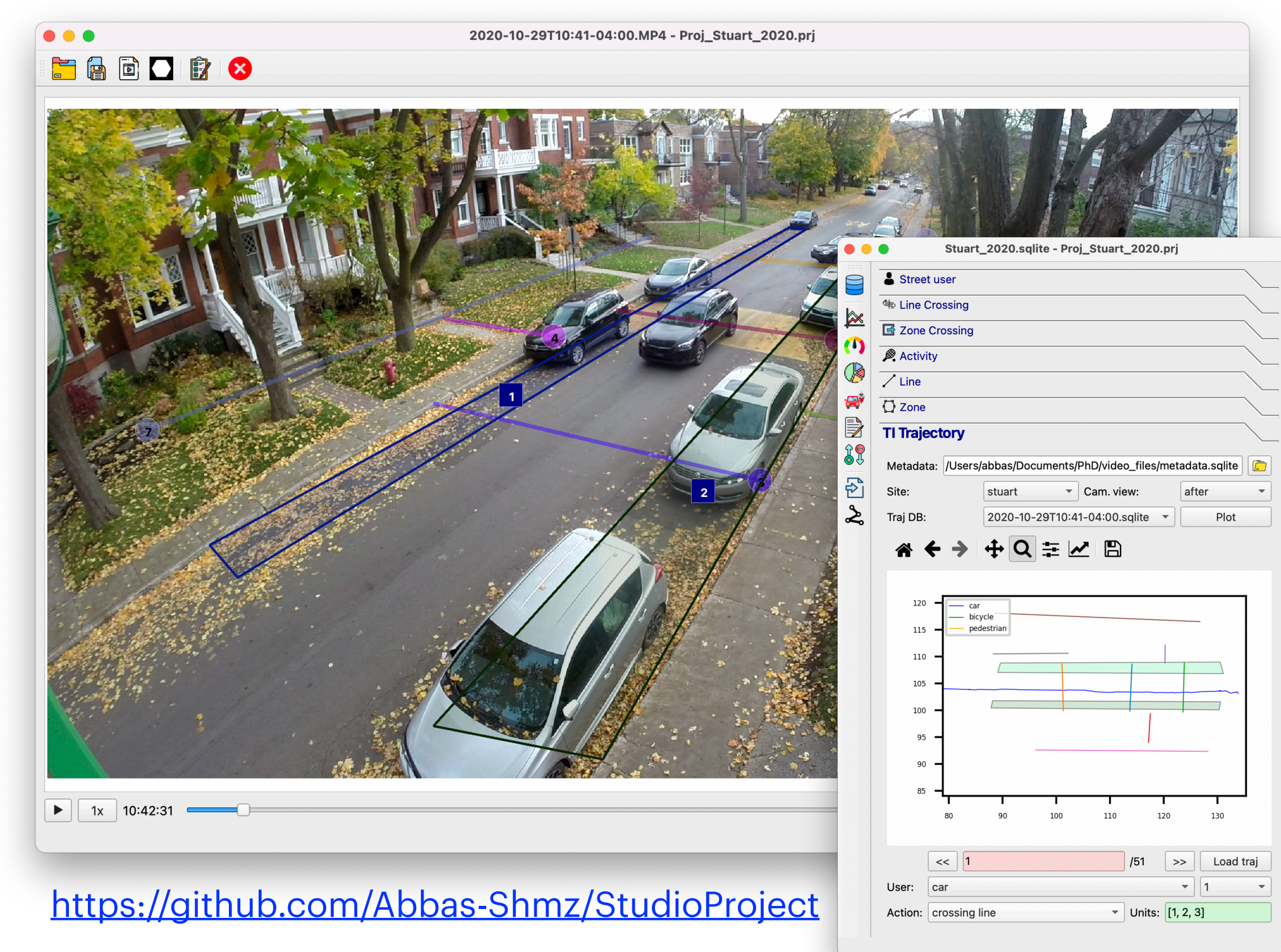
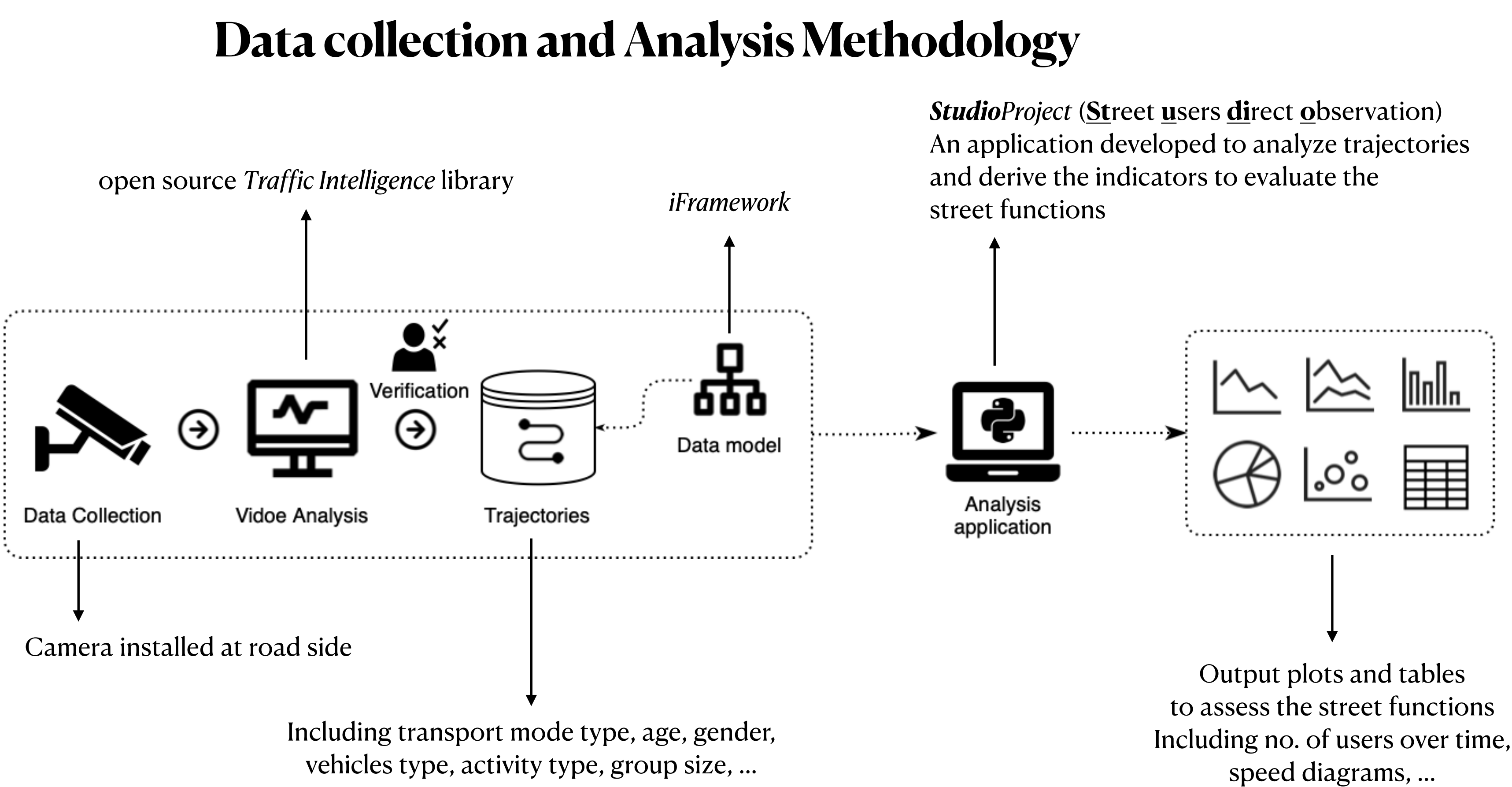
## Proposed Street Users Direct Observation Framework



## Generic list of indicators related to each street function

Functions	Physical Quantities	Spatial Units
Transit	Number of persons	Screenline
	Number of persons	OD
	Instantaneous speed of a person	Screenline
	Travel time of a person	OD
	Delay of a person	OD
	Number of stopped persons	Zone
	Stop duration for a person	Zone
Access Place	Number of transport mode changes	Zone
	Number of persons entering a given destination	Screenline
	Number of persons doing a given activity	Zone
	Duration of a given activity for a person	Zone

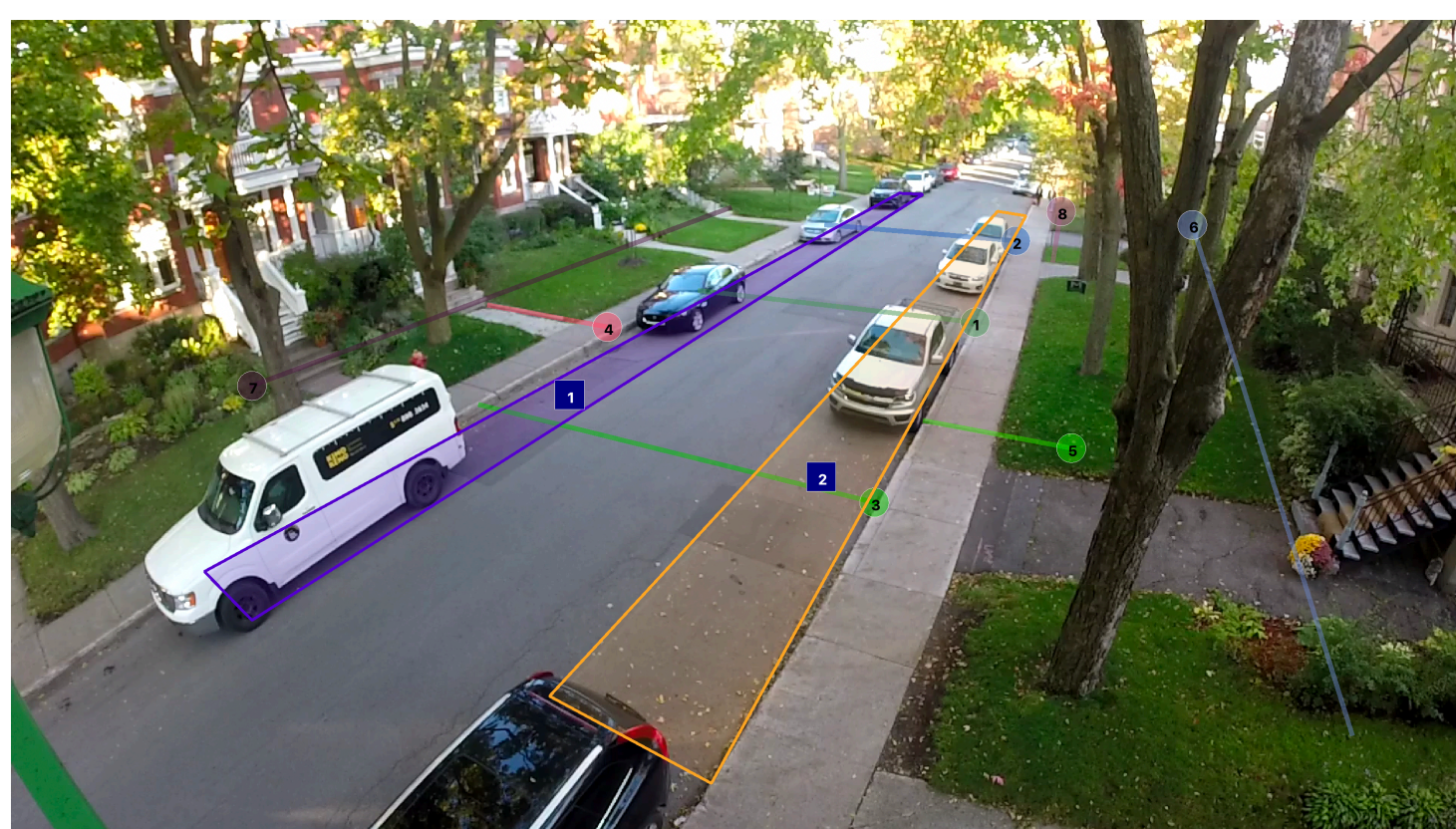
## StudioProject Application



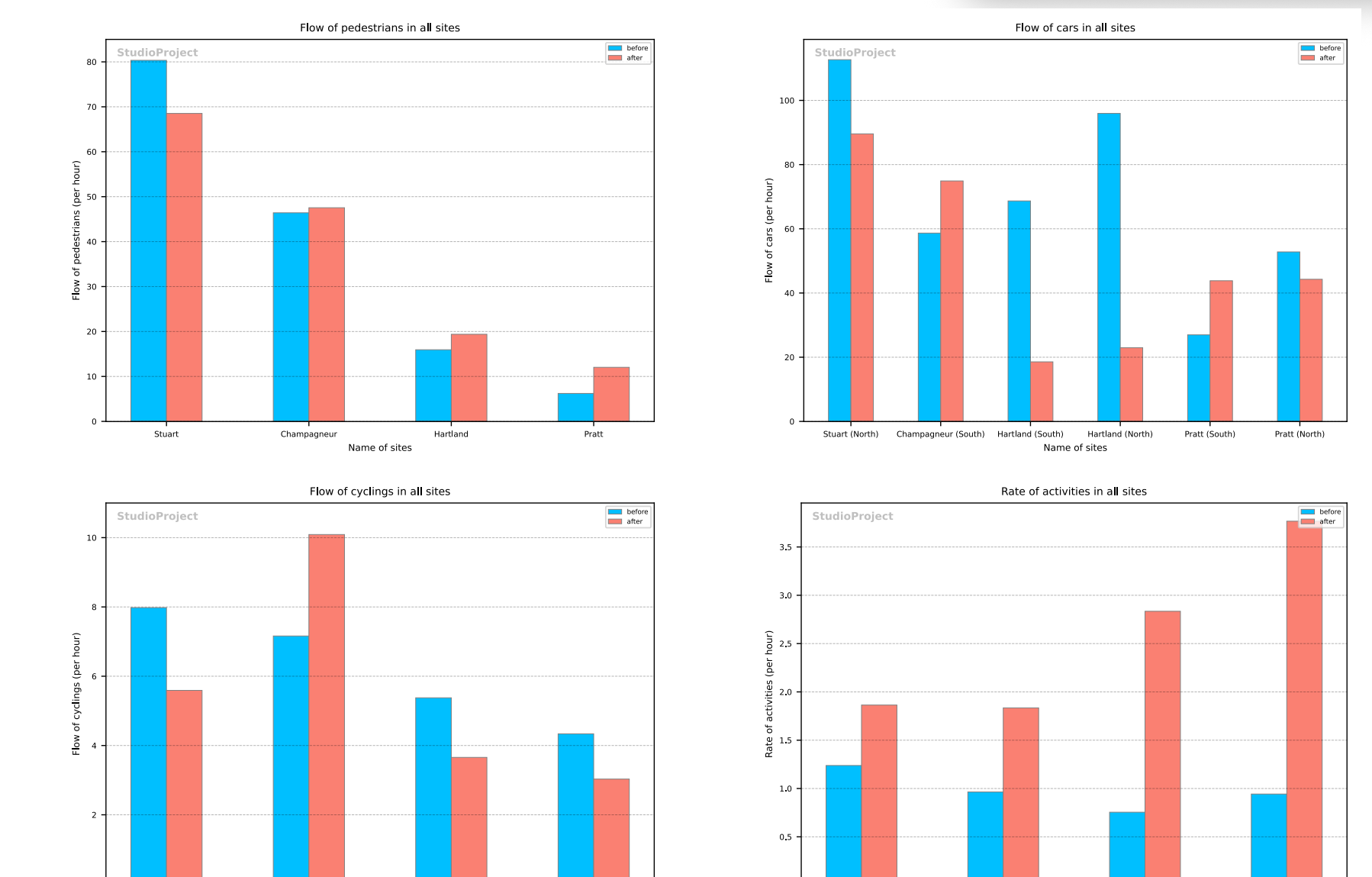
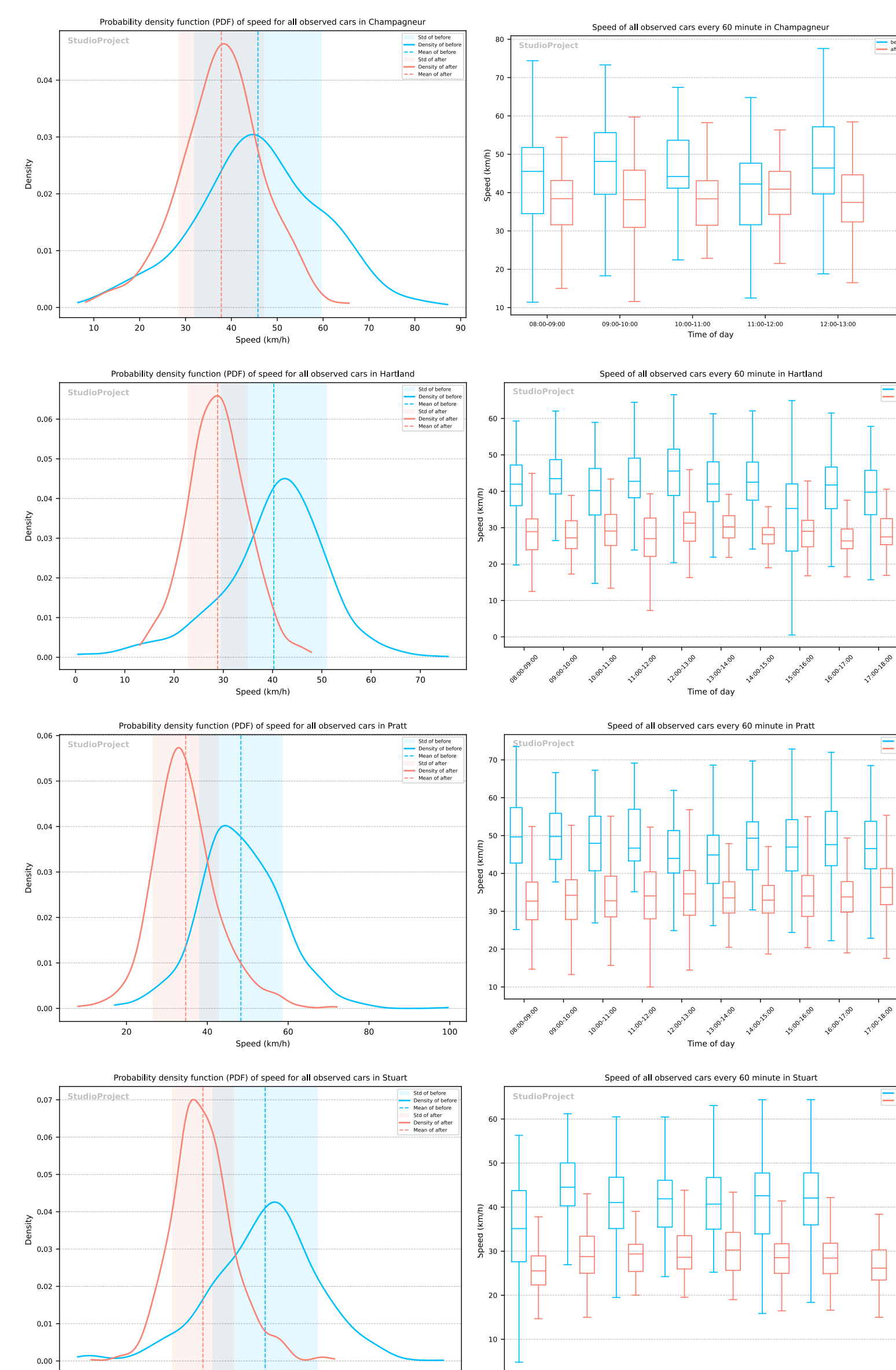
## Case Study: Numerical results

Evaluating the effect of installed speed bumps on four residential streets in Montreal, by analyzing about 80 hours of video data collected before and after the speed bump installation.

Before (Oct. 2019)



After (Oct. 2020)



Relative variation of the indicators with respect to the before situation (2019)

Site	# Vehicles	# Pedestrians	# Cyclists	# Activities	Speed
Hartland	-74%	17%	-39%	262%	-29%
Pratt	10%	98%	-28%	310%	-29%
Champagneur	30%	11%	42%	71%	-17%
Stuart	-22%	-20%	-25%	143%	-29%

## Conclusion

The results of these sites show how street use changes over time and possible tradeoffs between uses, e.g., transit and place, even if it is difficult to attribute the changes to the possible factors. The direct user observation revealed different changes such as changes in vehicular flow and speed, but also increases in activities in these sites. Such information will help transportation agencies and urban planners to manage streets/public spaces so that they fulfill their expected functions while minimizing the negative impacts.