



THE EFFECT OF SIGNALIZATION ON ROAD ACCIDENTS IN HELSINKI, FINLAND

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RESEARCH QUESTIONS

- What is the effect of signalization on accident counts and accident types?
- What is the effect of signal operation (signal deactivation, number of phases) on traffic safety?
- What is the effect of new signalization technology on traffic safety?

FACTS ABOUT HELSINKI

- Helsinki has an average of 2600 road accidents a year.
- Crashes in signalized intersections account for approximately 33 % of total accidents.
- In the end of year 2009 there was a total number of 460 signalized intersections and approximately 5200 unsignalized intersections in Helsinki
- 600 000 inhabitants
- Vehicle ownership density: ~ 400 cars / 1000 inhabitants

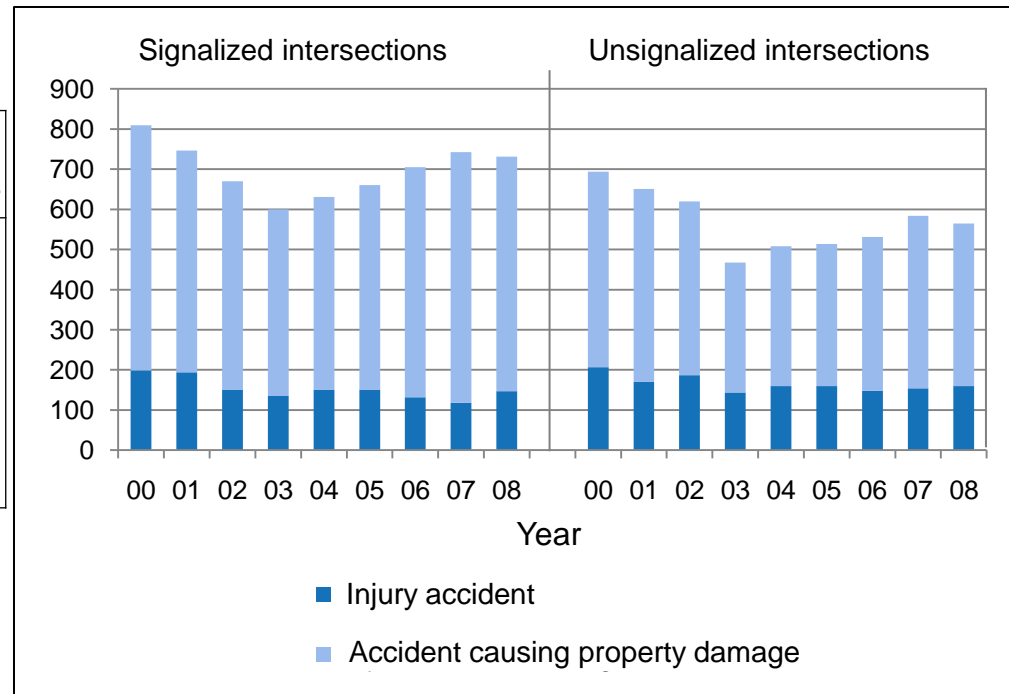
RESEARCH MATERIAL

- **Data collection**

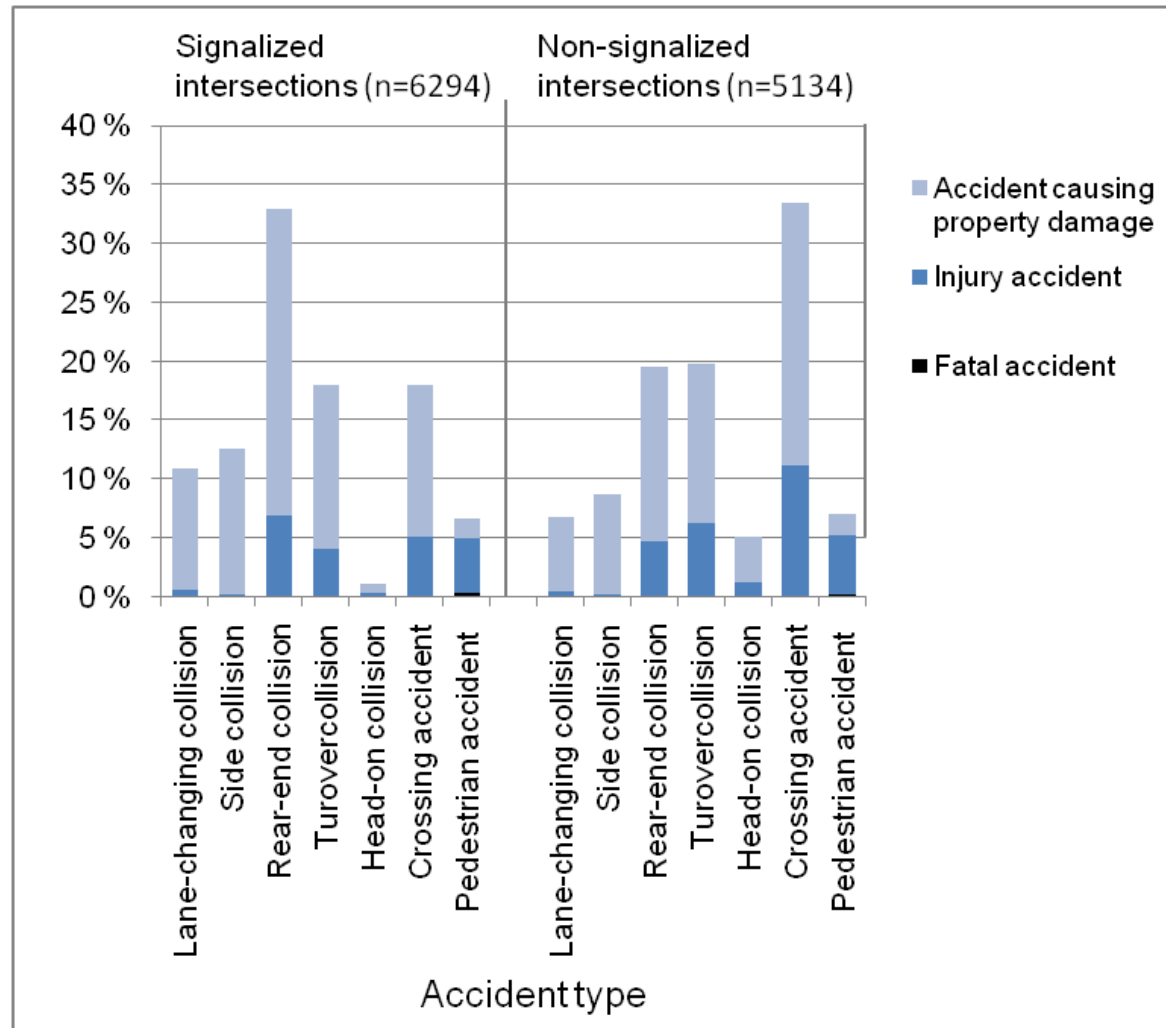
- Accident data were collected for all signalized and unsignalized intersections in the city of Helsinki.
- Years 2000-2008 were chosen for the data collection, since accident counts in the long-term are not necessary comparable due to changes in traffic regulations, speed limits, attitudes, the financial situation, vehicle stock etc.
- Only accidents considered relevant for this study were included in the study

ACCIDENTS IN SIGNALIZED AND UNSIGNALIZED INTERSECTIONS 2000-2008.

	Accidents	
	Signalized intersections	Unsignalized intersections
All accidents	6294	5134
Injury accidents	1378 (21,9%)	1490 (29%)
Fatal accidents	19 (0,3%)	18 (0,4%)
Number of intersections	458	5164



ACCIDENT TYPES



BEFORE-AFTER ANALYSIS

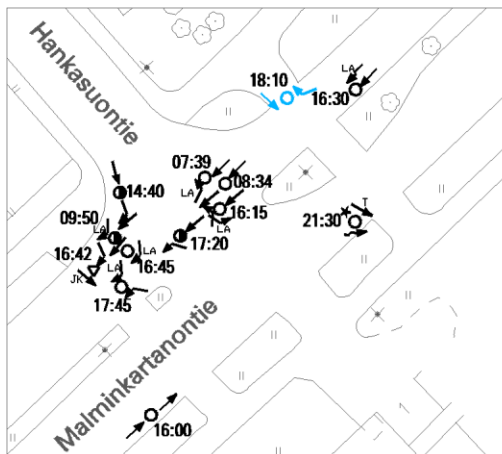
- Comparison of accidents before and after the installation of traffic signals

BEFORE-AFTER ANALYSIS

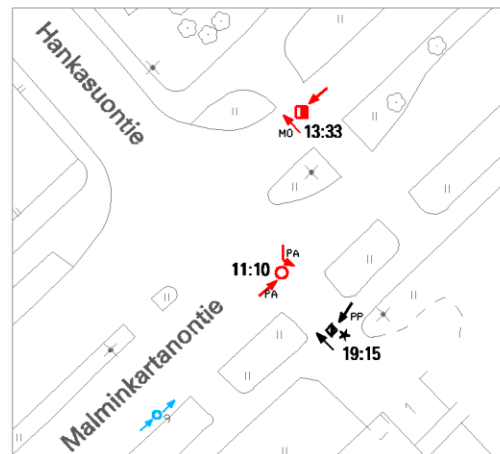
- Comparison of accidents before and after the installation of traffic signals
- Average number of accidents decreased slightly at T-intersection
- No remarkable changes in four-legged intersections

The geographical location of accidents in the "before" and "after" periods in an T-intersection.

Before (67 months)

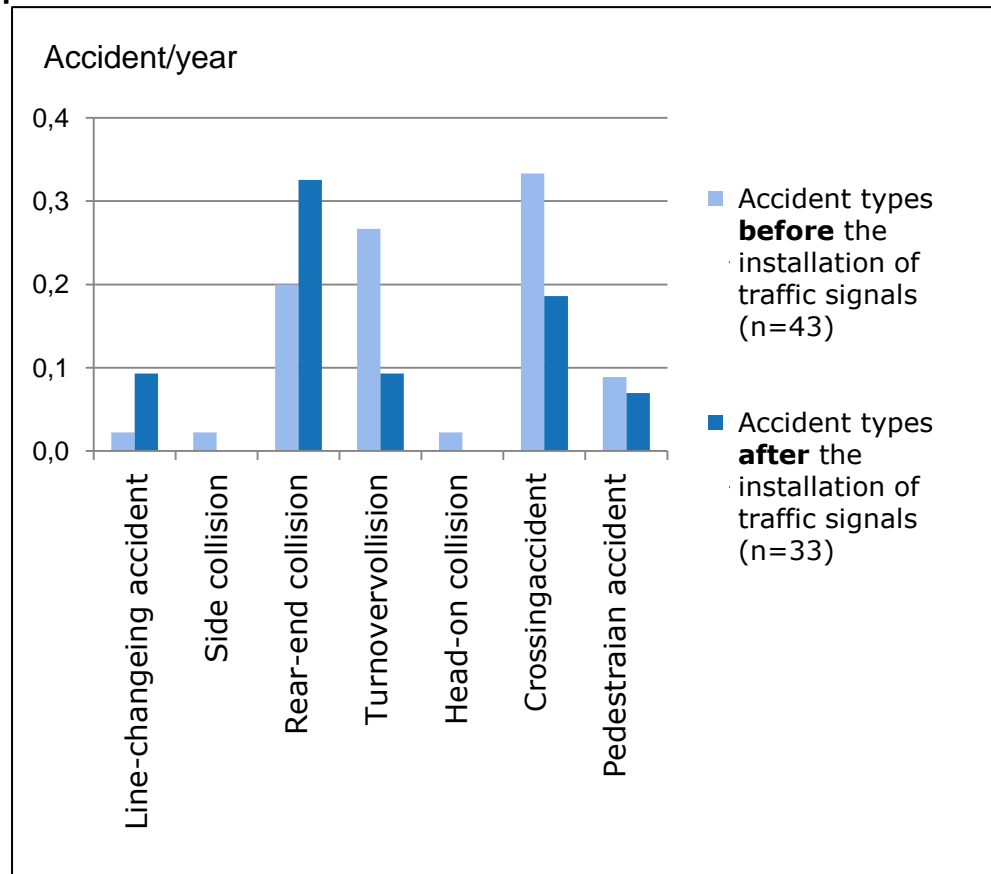


After (41 months)



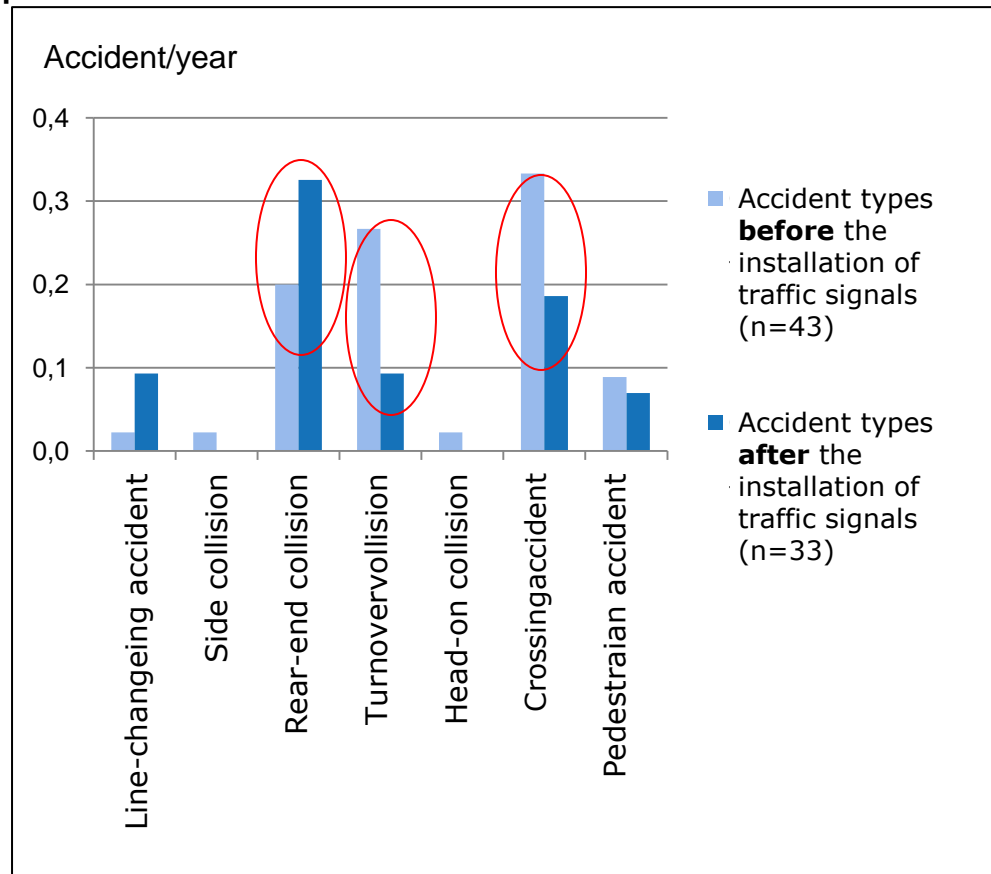
BEFORE-AFTER ANALYSIS

- Accident types before and after the installation of traffic signals



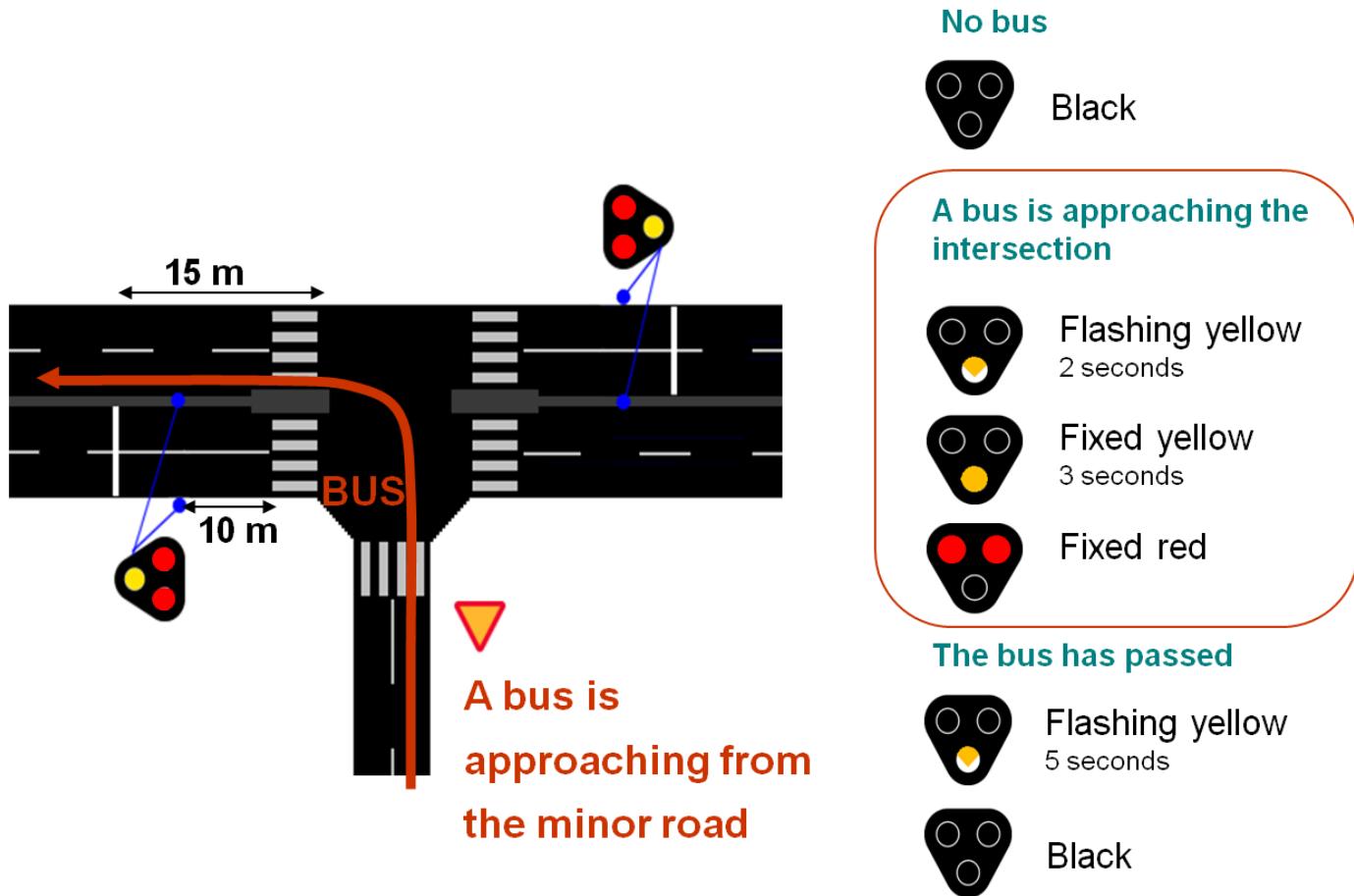
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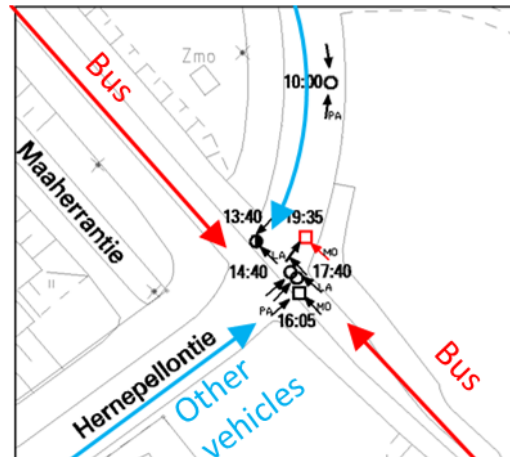
- Jokeri signals – public transport prioritization



BEFORE-AFTER ANALYSIS

- Jokeri signals – public transport prioritization
- The safety effect of Jokeri signalization varied in different environments.

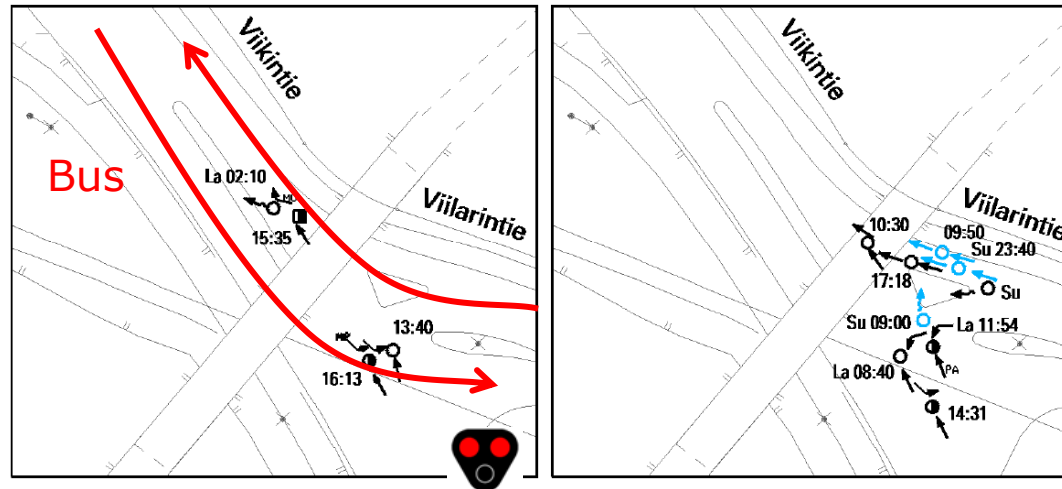
An example of accidents in an intersection with public transport prioritization:



BEFORE-AFTER ANALYSIS

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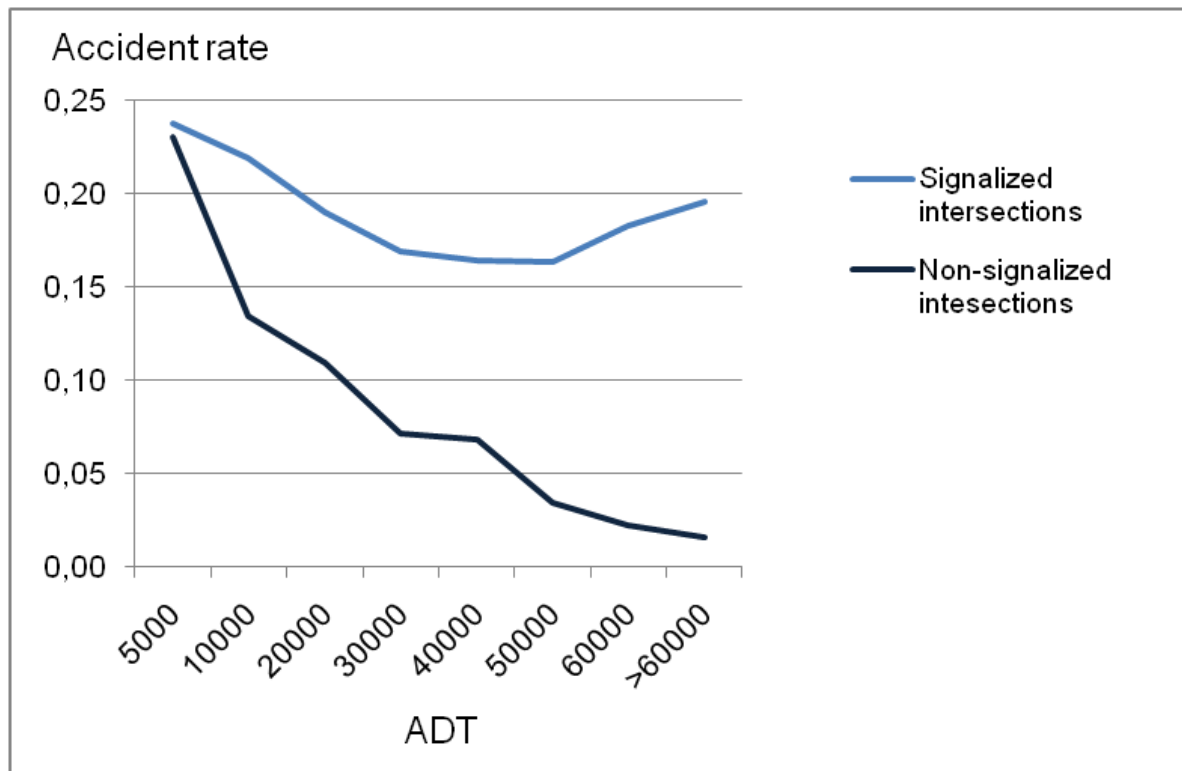
An example of accidents in an intersection before and after the installation of public transport prioritization:



ACCIDENT RATES

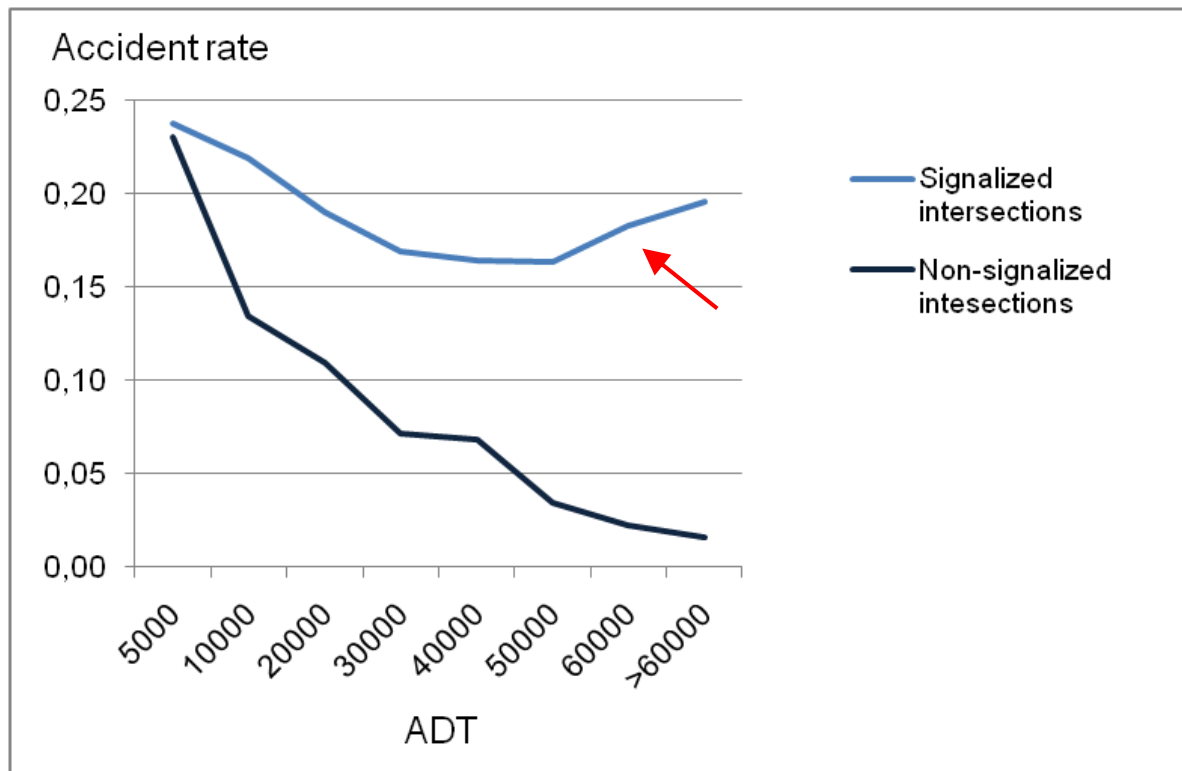
ACCIDENT RATES

- Accident rates for different traffic volumes in signalized and unsignalized intersections:



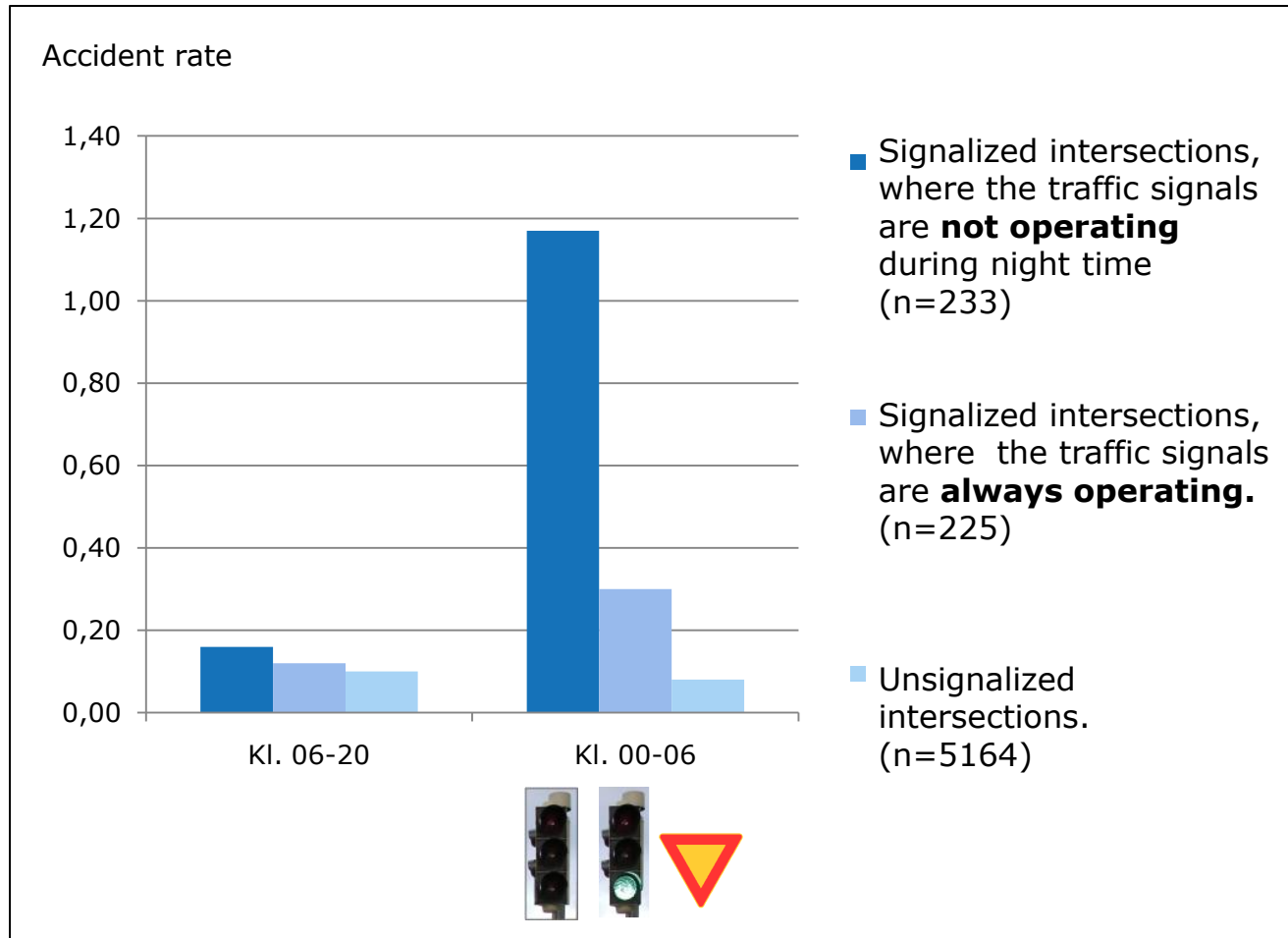
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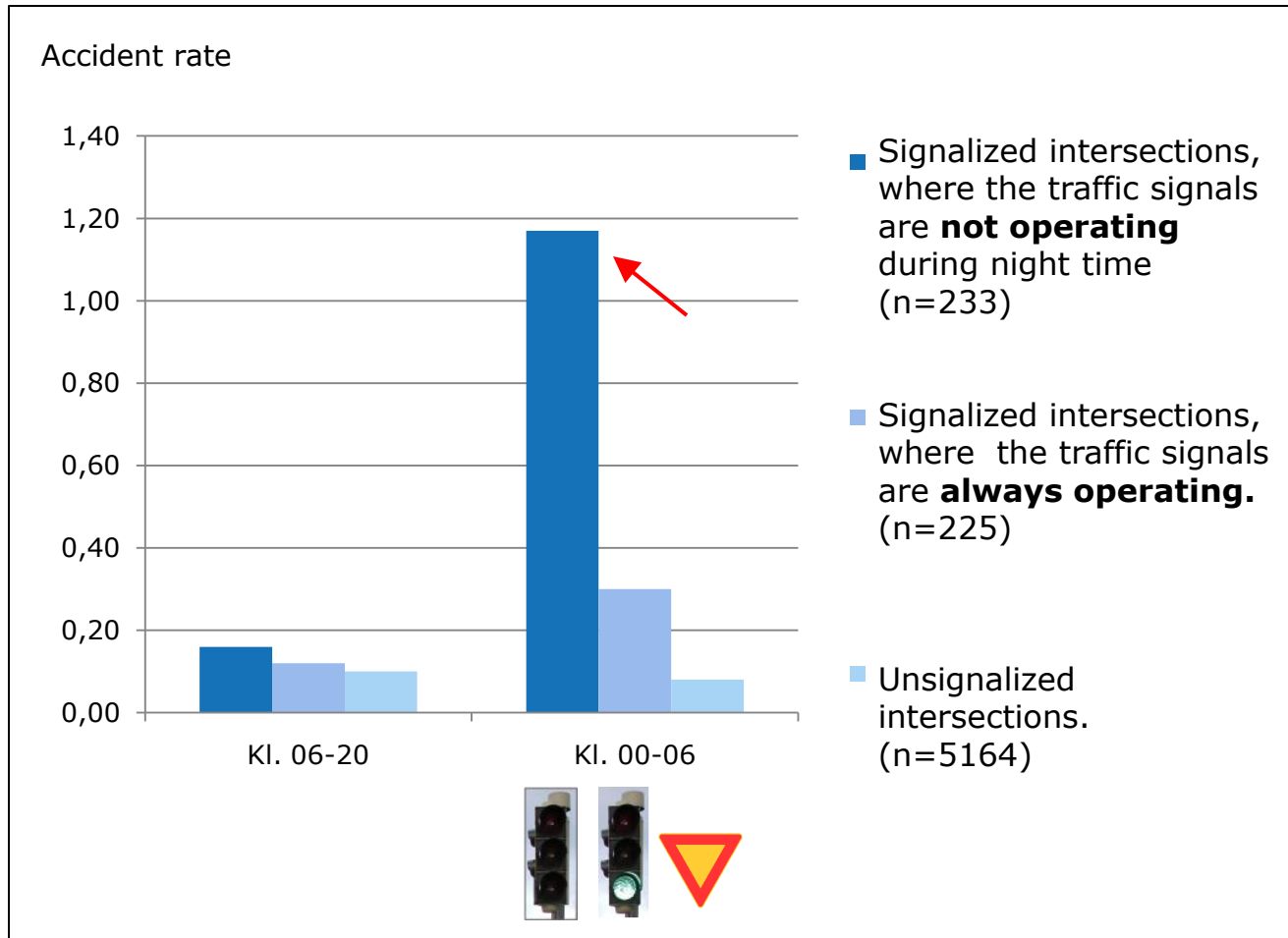


ACCIDENT RATES DURING NIGHT TIME

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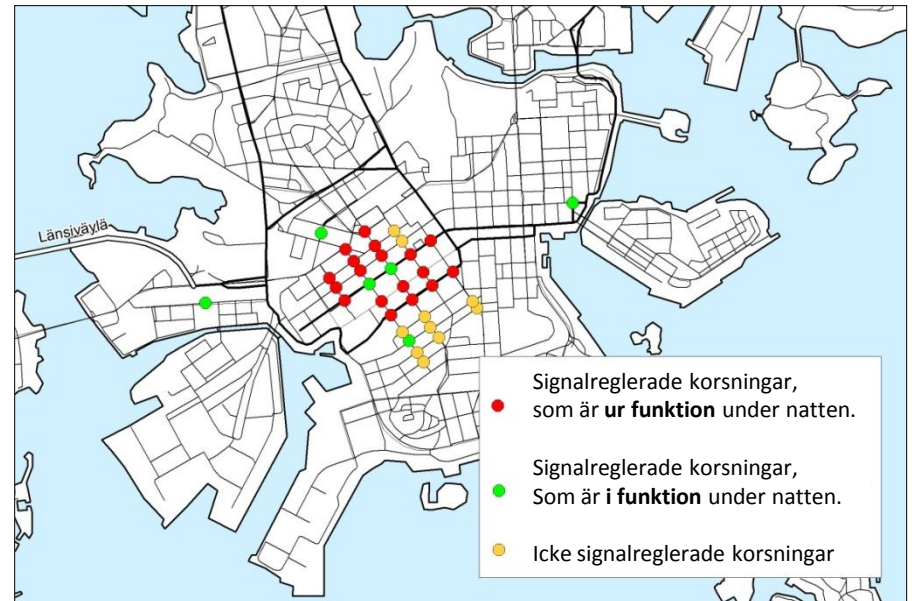


ACCIDENT RATES DURING NIGHT TIME




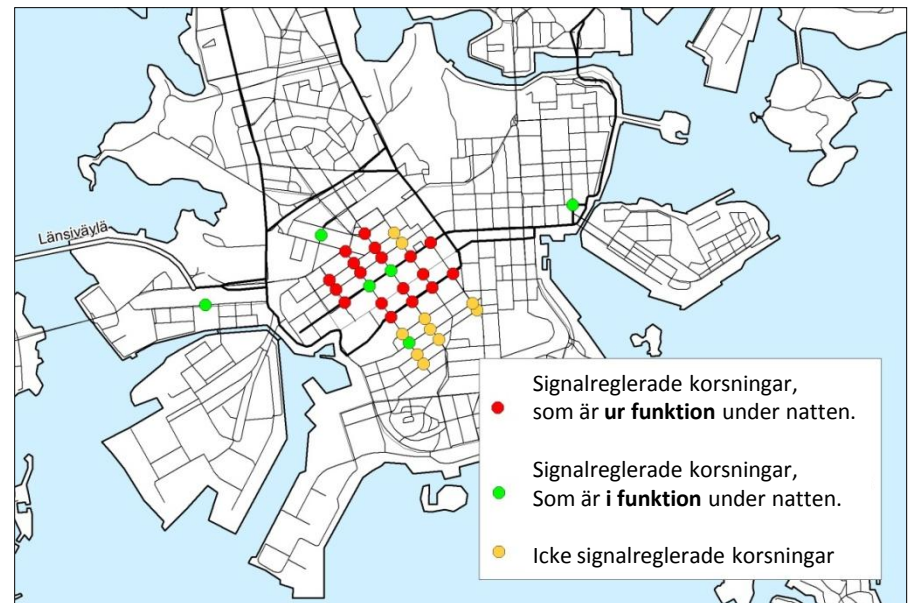
ACCIDENT RATES DURING NIGHT TIME IN HELSINKI CITY CENTRE

Intersections in the city centre	Accident rate
● Signalized intersections, where the traffic signals are not operating during night time	4,10
● Signalized intersections, where the traffic signals are always operating .	0,38
● Unsignalized intersections	0,54



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EFFECT OF NEW SIGNALIZATION TECHNOLOGY ON TRAFFIC SAFETY

- The share of rear-end collisions have not decreased since 1985.
- Rear-end collisions decreased slightly after converting incandescent bulbs to light emitting diodes (LEDs).

CONCLUSIONS

- Traffic signals should be operating around the clock
- The safety effect of Jokeri signalization varied in different environments.
- Traffic signals are not the best solution for large intersections and interseactions with high traffic volumes.
- Average number of accidents decreased slightly at T-intersection.

TACK!

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