

# The Impact of Lowered Speed Limits on Safety and Traffic Flow in Urban Areas

Advantages of modelling speed limits and changing perspectives



the mind of movement

PTV

VISSIM



Traffic Simulation



# Surrogate Safety Assessment Model (SSAM)

# SSAM

- Time-to-collision (TTC). Units: seconds.
- Speed differential (DeltaS): is the difference in vehicle speeds as observed at tMinTTC. Units: m/s
- Maximum vehicle velocity change had the event proceeded to a crash (MaxDeltaV). Units: m/s:



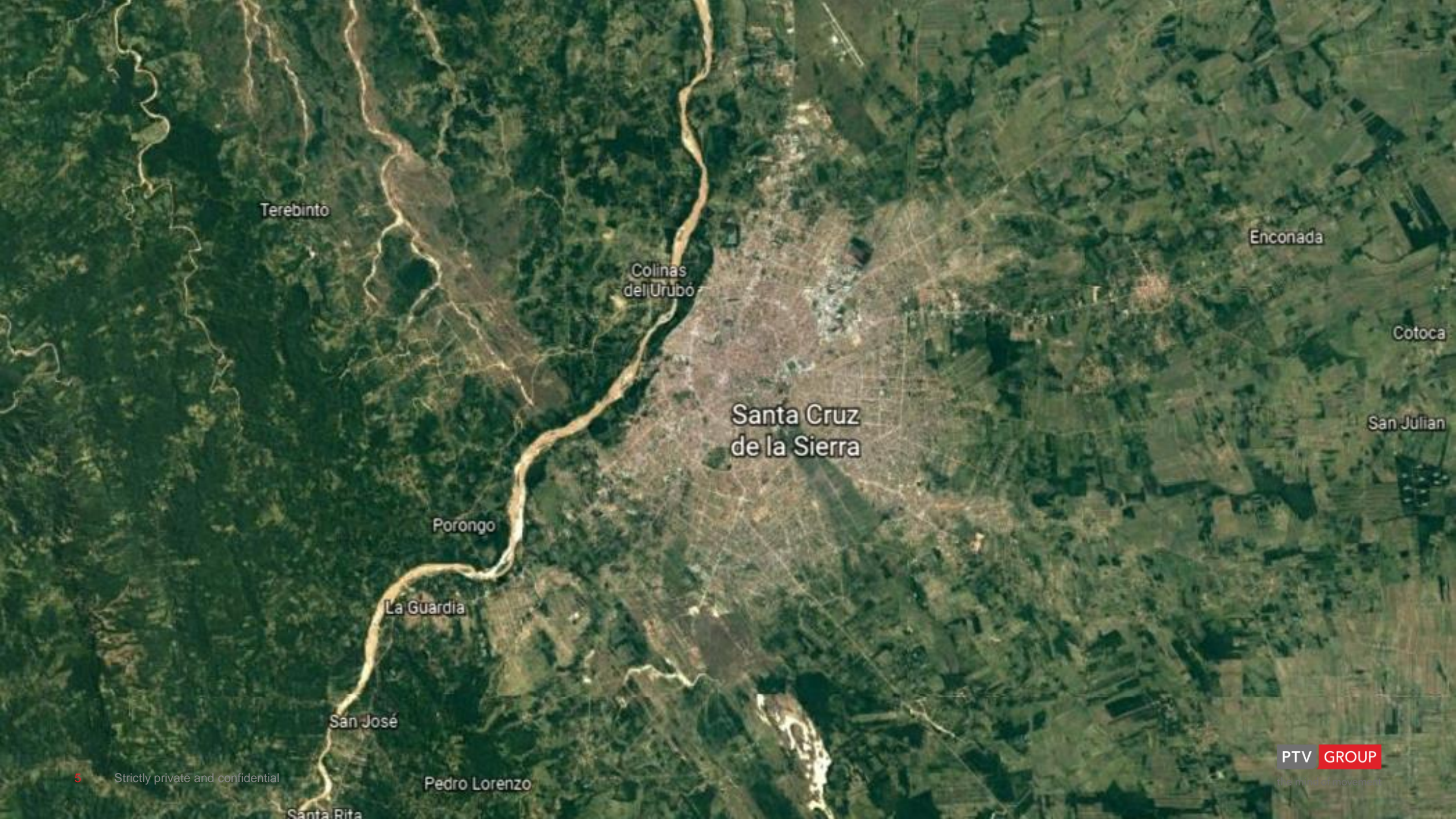
Surrogate Safety Assessment Model (SSAM), Version 3.0

The software is re-written by New Global Systems for Intelligent Transportation Management Corporation.

SSAM 3.0 is an Open Source Software by GNU Affero General Public License (<https://www.gnu.org/licenses/agpl-3.0.en.html>). By using the software, the user agrees the terms and conditions in GNU Affero General Public License.

The software is developed under contract with US DOT, Contract No. SBIR DTRT5715C10005.

The original SSAM versions (2.16 and prior) were developed by Siemens traffic Solutions for the Federal Highway Administration.



Terebinto

Colinas del Urubó

Enconada

Cotoca

San Julian

Santa Cruz de la Sierra

Porongo

La Guardia

San José

Pedro Lorenzo

Santa Rita



## The Network

- Av. Cristo Redentor, Santa Cruz, Bolivia
- Identified to be a highly conflicted avenue
- ~1km
- 2 signalized intersections
- 13 non signalized turns

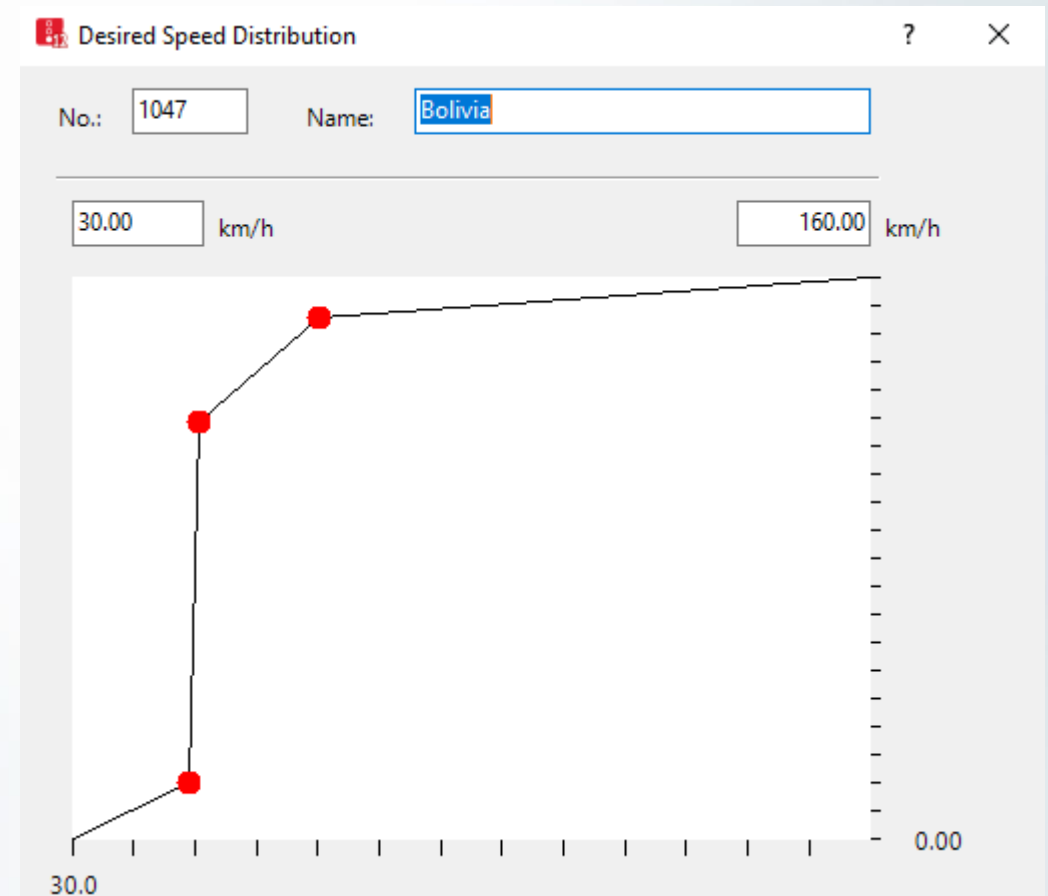
# Signalized Intersections

- 4 Lanes for straight traffic
- 1 lane for left turn
- Right turn without dedicated lane



# Speed Limits: 4 exercises of Desired Speed distribution

Case 1: “not enforced 50 km/h speed limit”





# Speed Limits: 4 exercises of Desired Speed distribution

Case 2: “not enforced 40 km/h speed limit”



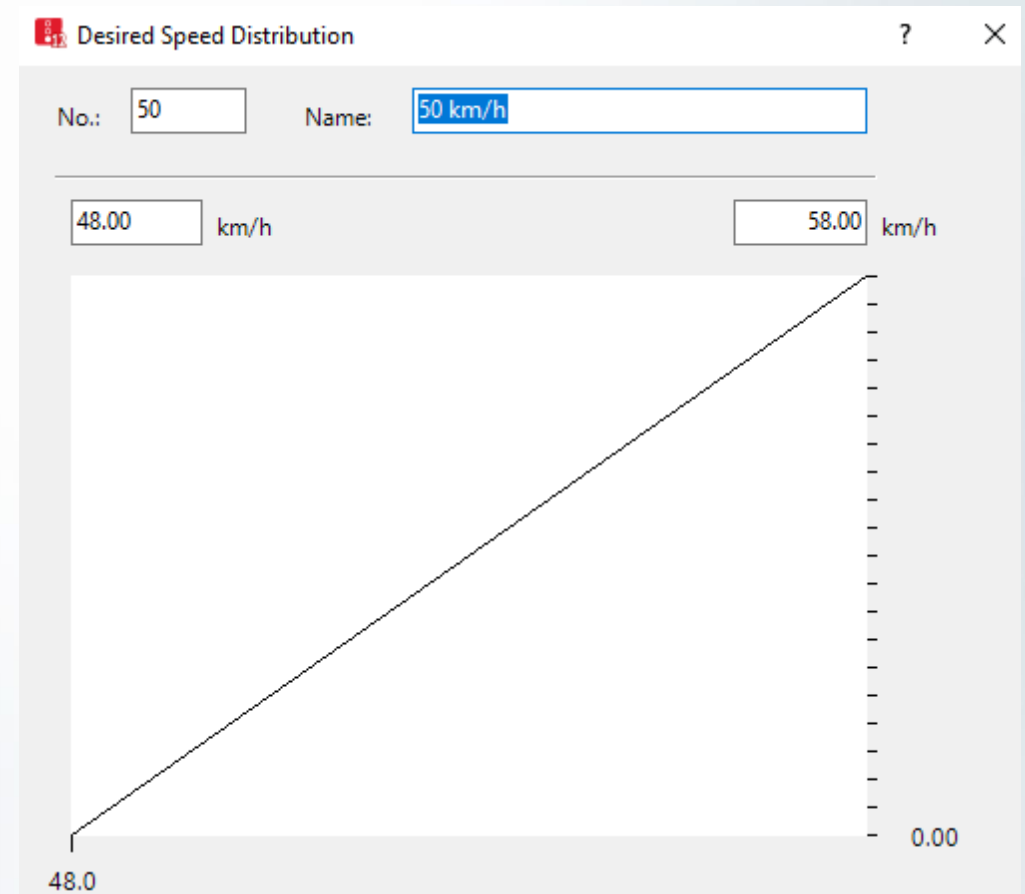
# Speed Limits: 4 exercises of Desired Speed distribution

Case 3: “enforced 50 km/h speed limit”

48km/h – 58km/h



100%



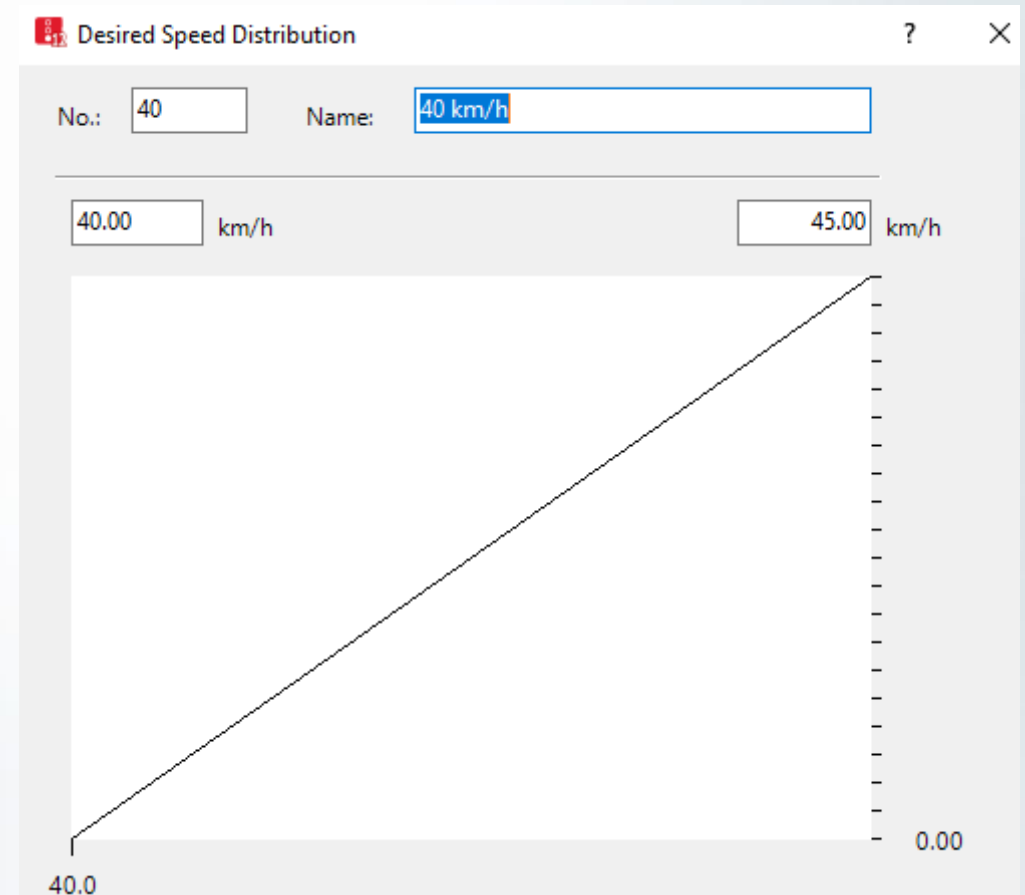
# Speed Limits: 4 exercises of Desired Speed distribution

Case 4: “enforced 40 km/h speed limit”

40km/h – 45km/h

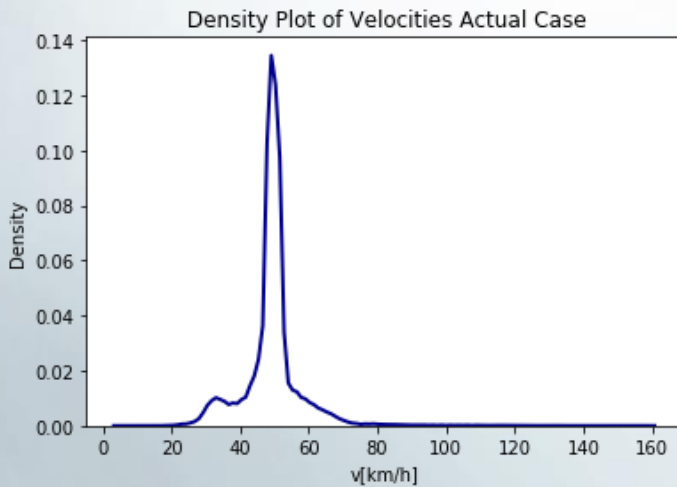


100%

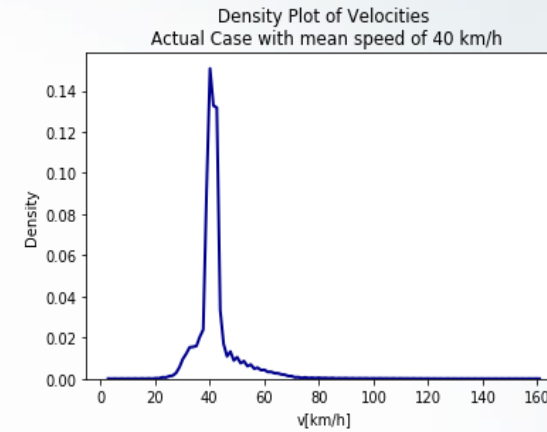


# SSAM evaluation

Case 1, Base Case: "not enforced 50 km/h speed limit"

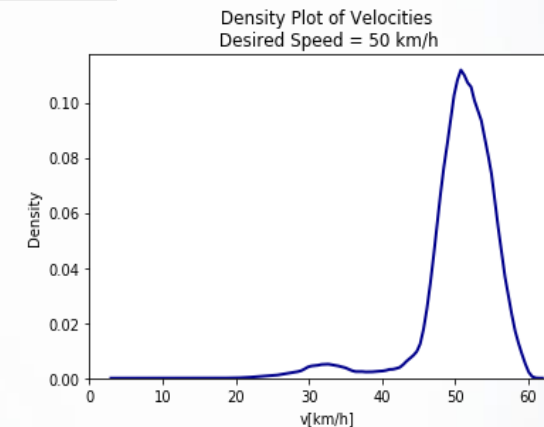


Case 2: "not enforced 40 km/h speed limit"



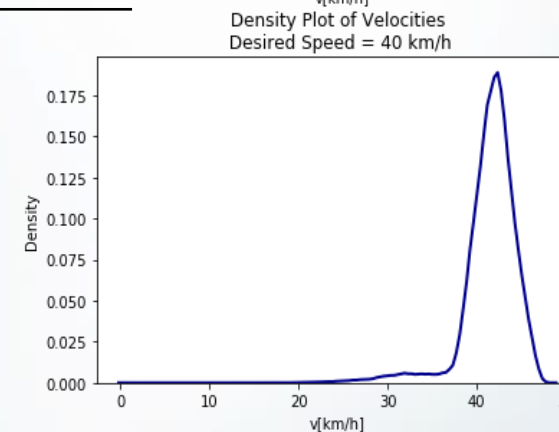
↓ 10%

Case 3: "enforced 50 km/h speed limit"



↓ 6%

Case 4: "enforced 40 km/h speed limit"



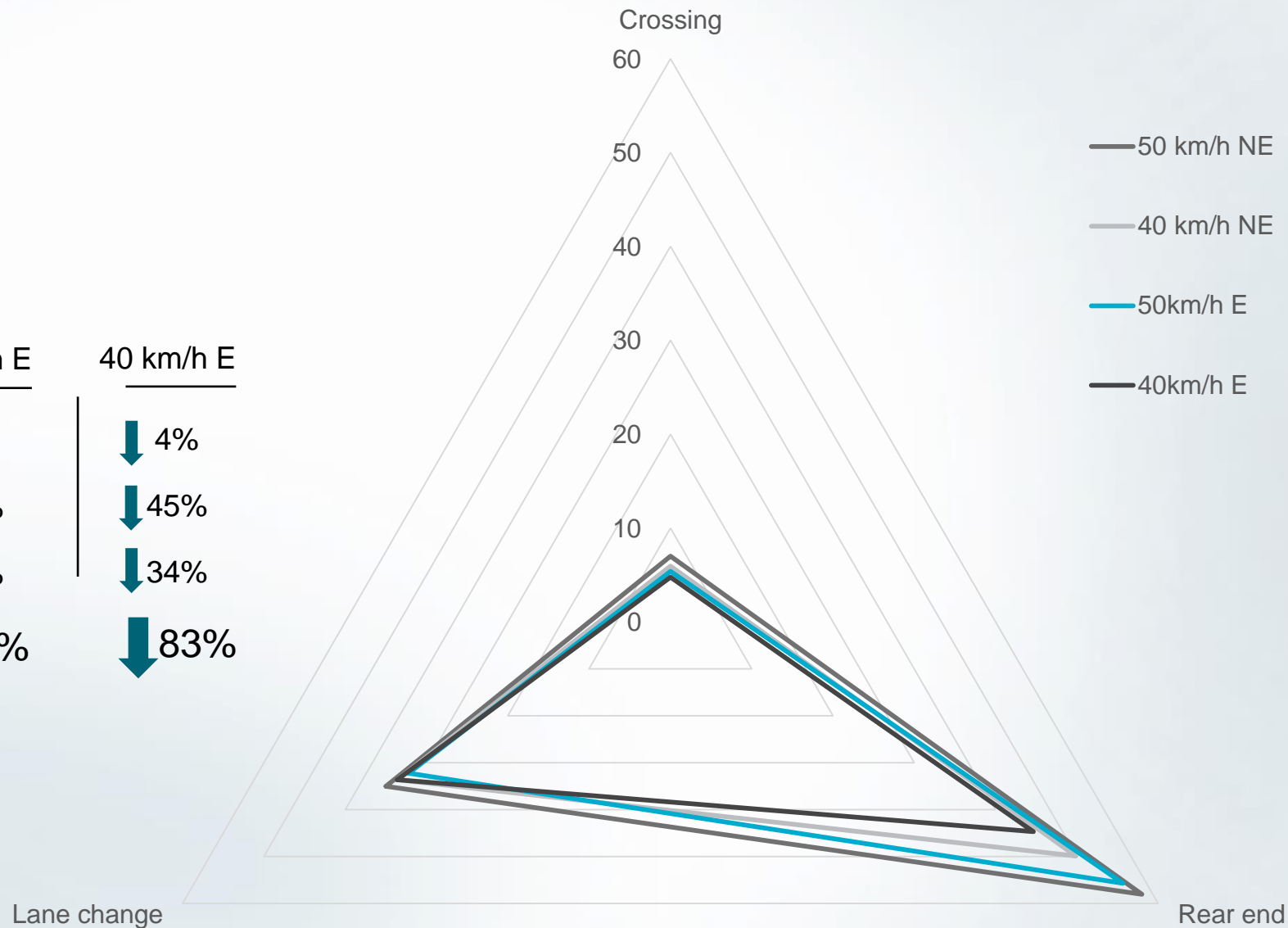
↓ 17%

\*Absolute conflict numbers from crash and near crash (TTC=0.5) scenario

# SSAM evaluation

	50 km/h NE	40 km/h NE	50 km/h E	40 km/h E
Crossing = 7%	↓ 6%	↓ 5%	↓ 4%	
Rear end = 58%	↓ 50%	↓ 56%	↓ 45%	
Lane change = 35%	↓ 34%	↓ 32%	↓ 34%	
<b>Total = 100%</b>	<b>↓ 90%</b>	<b>↓ 94%</b>	<b>↓ 83%</b>	

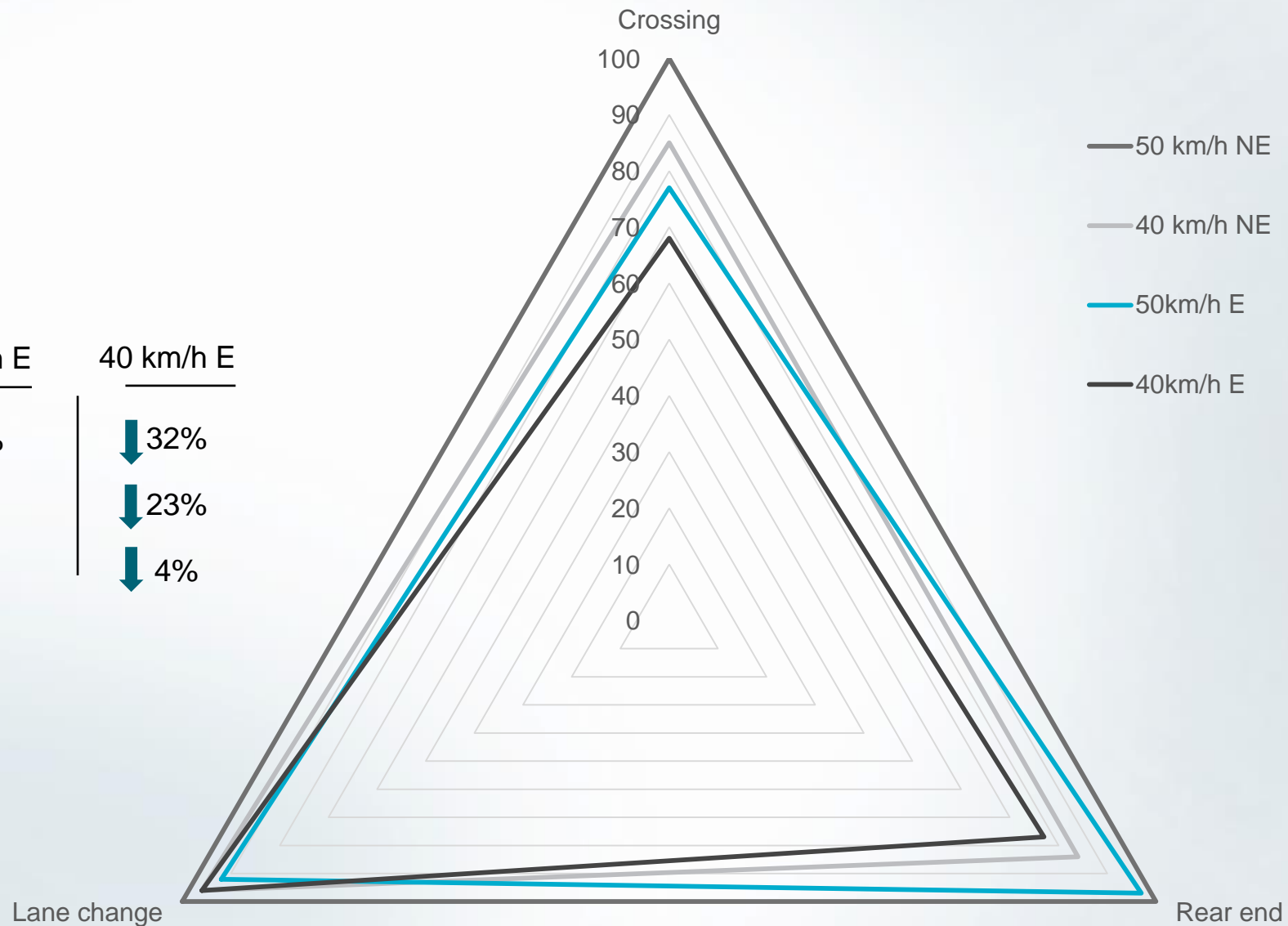
\*Share from the absolute conflict numbers from Case 1



# SSAM evaluation

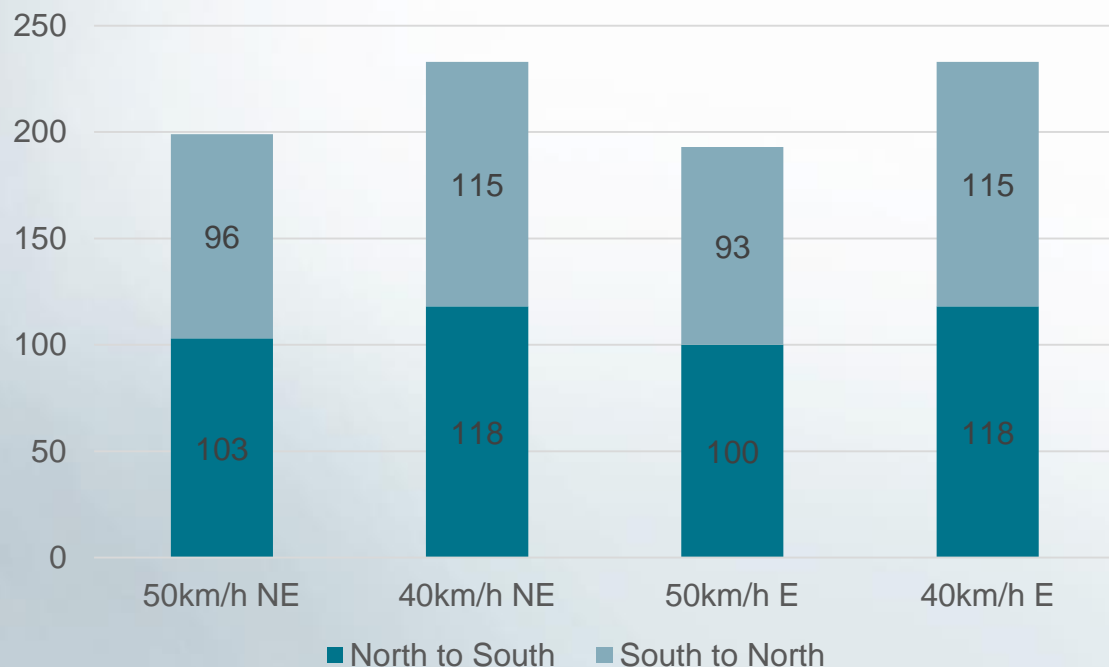
	50 km/h NE	40 km/h NE	50 km/h E	40 km/h E
Crossing = 7%		↓ 15%	↓ 23%	↓ 32%
Rear end = 58%		↓ 14%	↓ 3%	↓ 23%
Lane change = 35%		↓ 4%	↓ 8%	↓ 4%

\*Change from the absolute conflict numbers per type from Case 1

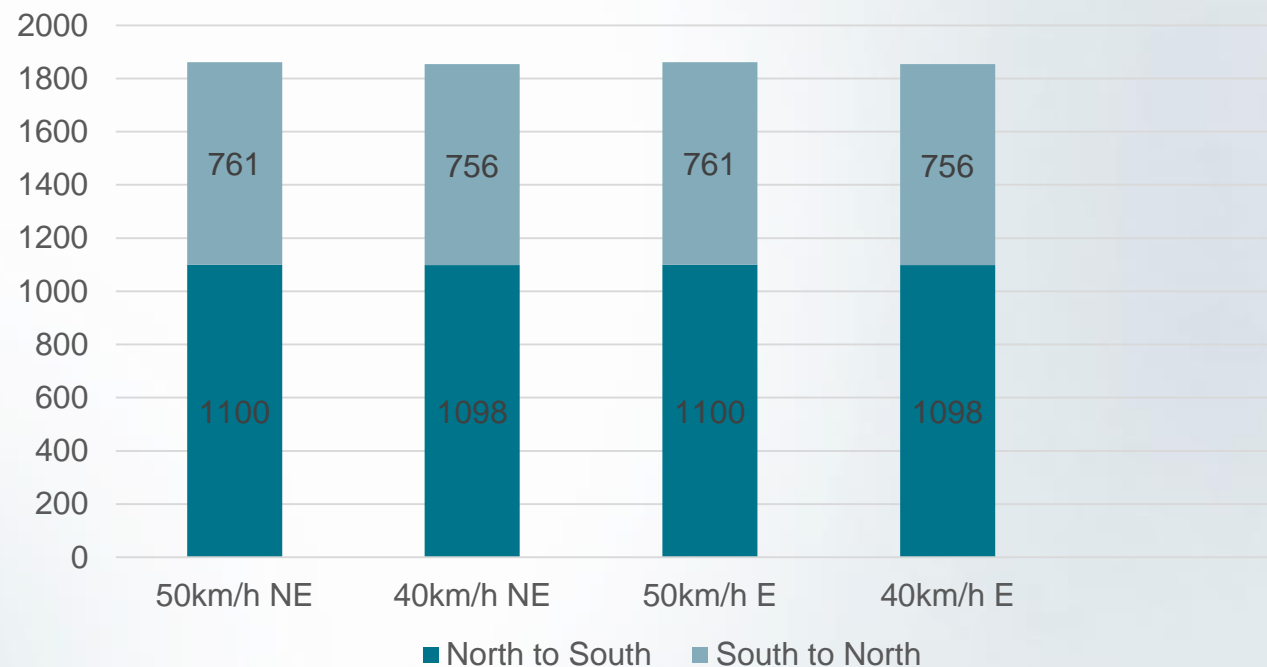


# Vehicle Travel Time evaluation

## Vehicle Travel times (seconds)



## Number of vehicles

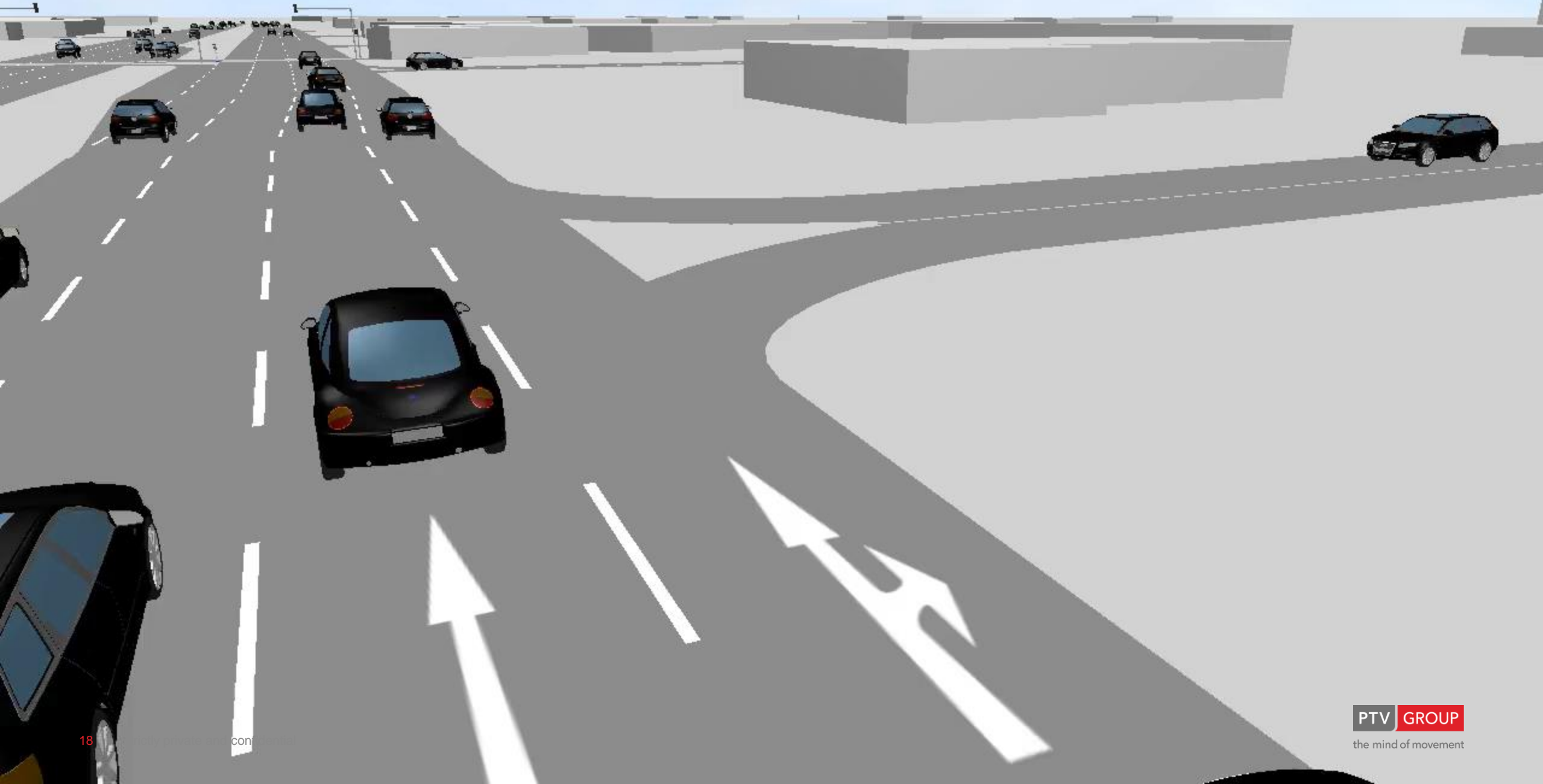


But that's just the tip of the iceberg...





# Unsignalized intersection conflicts





# Lane change and rear end conflicts



Obstructed left-turn lane



Start collecting subjective data



Change of perspective: Understand more about the subjective parameters that leads to people speed in regular roads

# Model Improvements

- Weather conditions
- Light conditions
- Unexpected stops to shops
- PuT Stops
- Cargo trucks un-/loading
- Driving behaviors





# Conclusions

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- One conflict can mean one person's life
- Lower speeds decrease conflicts in this example
- Lower speeds do not necessarily affect travel times/create congestion
- Technology has been relentless on making innovative tools, let's catch up with innovative solutions powered by these tools



A background network diagram consisting of numerous small grey dots connected by thin, light grey lines, forming a complex web of interconnected nodes and edges. The overall aesthetic is clean, modern, and technical.

# Want to join the conversation?

#MindofMovement



the mind of movement