

How to integrate mobility and safety data

Best practices and smart estimates

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Mobility data for road safety studies

Exposure is a primary factor concerning road accidents



Inhabitat.com



Finder.com.au

Used as **statistical measure** to compare events (accidents, injuries, deaths) in standardized parameters.

Mobility data for road safety studies

2 sets of data:

► exposure by mode

Exposure	Mode of travel	2006CC	2007CC	2008
Passenger kilometres	All transport			
Passenger kilometres	Non road-based transport			
Passenger kilometres	Road transport			
Number of trips	All transport			
Number of trips	Non road-based transport			
Number of trips	Road transport			

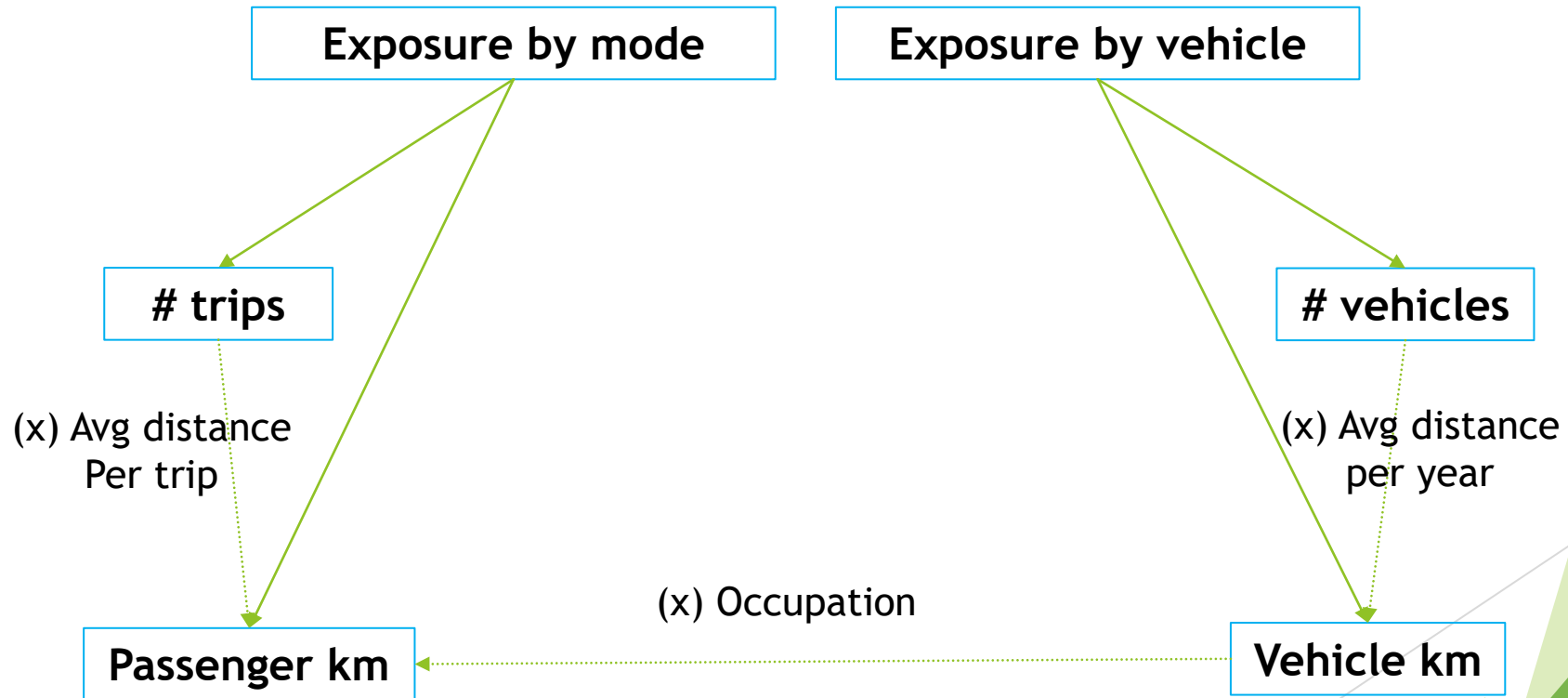
ITF

► exposure by vehicle

Exposure	Mode of travel	2006CC	2007CC	2008
Vehicles	Vehicle on 2-3 wheels			
Vehicles	Passenger car			
Vehicles	Light goods road vehicle			
Vehicle kilometres	Road transport			
Vehicle kilometres	Vehicle on 2-3 wheels			
Vehicle kilometres	Passenger car			
Vehicle kilometres	Goods road vehicle			
Vehicle kilometres	Light goods road vehicle			
Vehicle kilometres	Bus or coach			
Vehicle kilometres	Tram			
Vehicle kilometres	Other road transport			

Mobility data for road safety studies

(4) Exposure standards



“State of the Art”: Home-based OD surveys

Travel patterns in a given area (city)
for strategical planning

Who?

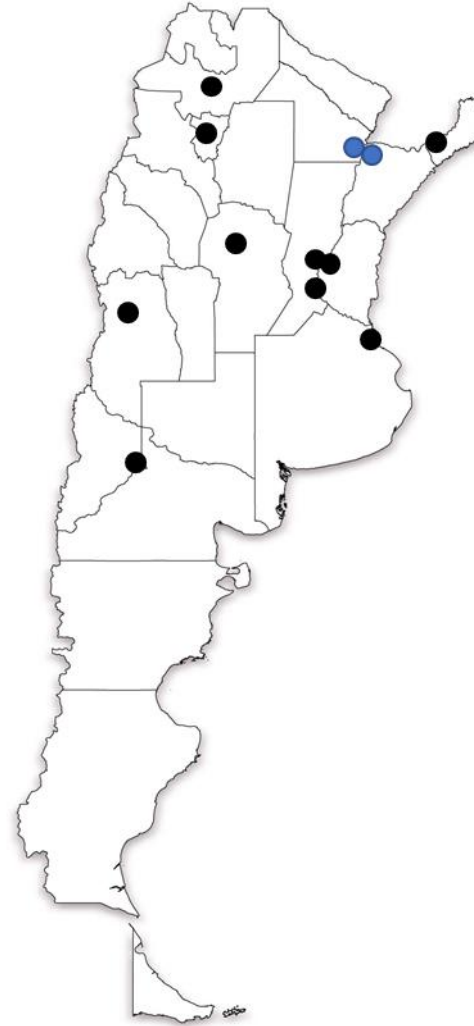
Where?

When?

Why?

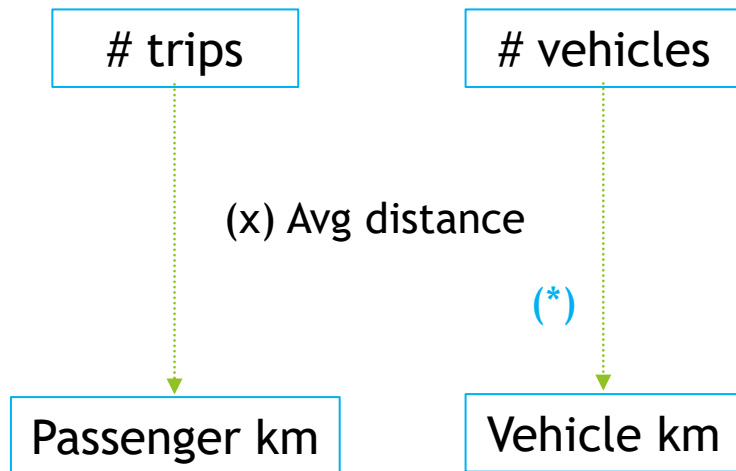
How?

How often?



“State of the Art”: Home-based OD surveys

¿How to obtain risk exposure measures through OD surveys?



Vehicles: # vehicles/household
(sample) * # households (census)

Trips: # generation rates (sample)
* # homes (census) * days/year (+
weekend adj.)

Avg. Distance: Origin & Destination
from sample + road network (*
trips/year)

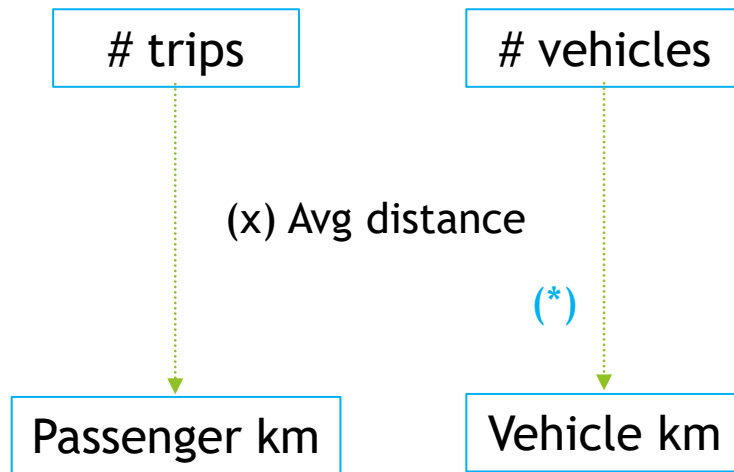
“State of the Art”: Home-based OD surveys

- ▶ Reliable & Precise
- ▶ Flexible (time series)
- ▶ Expensive (cost & time)
- ▶ Needs active involvement (non-passive)
- ▶ Used mainly for strategical analysis in large cities (12 in Argentina, pop > 300.000)
- ▶ What could be done in small towns/jurisdictions (under resourced, no tech)

“do-minimum” approach (better than “do-nothing”!)

focus on aggregate data

Smart estimates: a “second-best” approach



- ¿How to obtain each one of these...?

Smart estimates: a “second-best” approach

Number of vehicles

- Vehicle registrations (**overestimates** > 30%)
- Use survey data from other cities (correction factor to registrations)
- Insurance data (potential underestimates, ex. motorcycles)
- Econometric models / regressions (national data + per capita GDP)
- Local: * Traffic counts
 - * Camera records (LPR)



Buenosaires.gob.ar

Smart estimates: a “second-best” approach

Avg distance per year (Veh.km)

- Fuel use models;
- Economic and GDP models;
- Traffic counts;
- Original Equipment Manufacturers maintenance data;
- Phone surveys;
- Panel survey methods;
- Onboard vehicle telemetry;
- Cell phone apps/ telemetry;
- GPS data (limited to commercial vehicles);
- Odometer readings (registrations/renewals);
- Insurance-based data.



- * Vehicle sales data
- * Vehicle inspections

Smart estimates: a “second-best” approach

Number of trips per vehicle & Average distance per trip

Public (fixed-route)	Private
“easy”	“difficult”
<ul style="list-style-type: none">- Timetables (vehicle trips/year) * average occupation (field surveys)- Distance per trip from demand profiles	<ul style="list-style-type: none">- Occupation (field surveys) * vehicle trips/year- Vehicle trips/year = Vehicle distance/year / Avg. distance/trip (surveys, mathematical models (1/3 L), trip distribution functions)

Final thought

“Information is not
knowledge”

A. Einstein

“Knowledge is power”

F. Bacon



Boxtheorygold.com

Thank you!!