



***O-D STUDIES, ROAD
DETERIORATION AND INTELLIGENT
O-D STUDIES***

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October 20, 2008

AGENDA

- What are O-D studies?
- What is an O-D Matrix?
- Road Deterioration
- Ideas for O-D studies
 - Satellite imaging
 - Global Positioning System
 - Mobile (cell) Phones Networks
- What's next?
- Questions or comments
- References

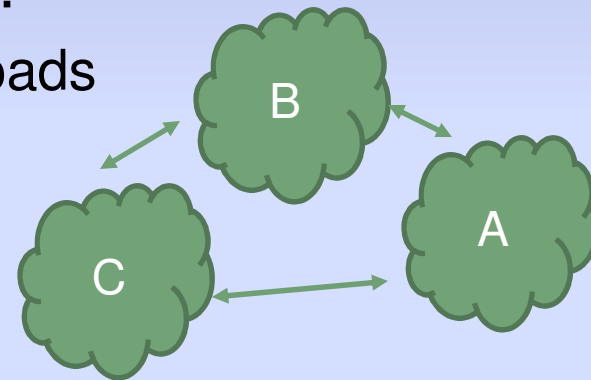
WHAT ARE O-D STUDIES?

- Origins and Destinations studies are done to determine the number of vehicles travelling, from and to, different zones within a network.
- Traditional means of acquiring O-D data include:
 - License plate studies
 - Post card studies
 - Roadside interviews



WHAT IS AN O-D MATRIX?

- Origins and Destinations Matrices are a mathematical representation of travelling vehicles throughout a network on a certain period.
- O-D matrices serve to determine:
 - Requirements for new/improved roads
 - Demand on the road network



O\D	A	B	C
A	54	40	47
B	36	24	28
C	21	31	25

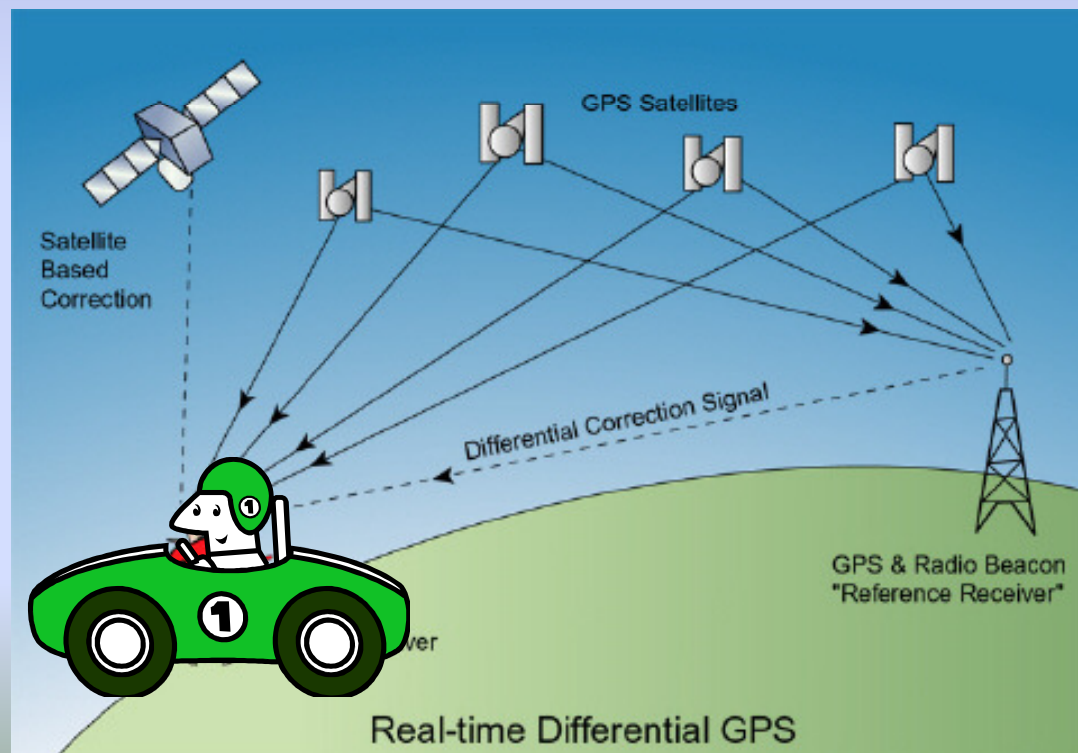
ROAD DETERIORATION

- Deterioration of the road system comes as a result of:
 - Natural factors
 - Rain, frost/thaw, extreme heat, etc.
 - Human activities
 - **Heavy vehicles** (Veh.) trips, reparation of aqueducts, etc.
- Focusing on the deterioration caused by heavy Veh.:
 - O-D matrices can help us determine the number of heavy Veh. using a specific link
 - Weight to damage relation
 - Exponential
 - An 18k SA does **over 3,000 times more damage** than an 2k SA



IDEAS FOR O-D STUDIES

- Satellite imaging
- Global Positioning System
- Mobile (cell) Phones Networks



SATELLITE IMAGING

- The problem with satellite imaging is re-indentifying vehicles.
- Only very unusual vehicles might be re-identified
 - Very rare and special vehicles

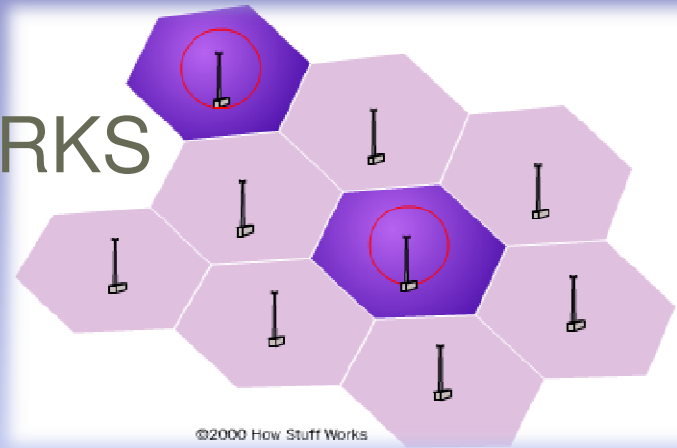


GLOBAL POSITIONING SYSTEM

- GPS Tracking has been used for **fleet** tracking
- A device of over \$200 is needed
 - How can we buy the devices?
 - How can we install this device to randomly selected Veh.?
- Travel information
 - If it can be obtained directly from the provider
 - Cost over **\$1** a day
 - What is the **refresh rate**?
 - If it is stored in the GPS device
 - How can we download travel history?
 - Can we maintain the **privacy** of the driver?



MOBILE PHONES NETWORKS



- Use **radio** technology
- Zone = cell
- Infrastructure and devices are available
- Phone companies **know** the location of their phones
- Need adjustments for:
 - Number of phones per Veh
 - Usage of different transportation modes
- Protocols to protect **privacy** have been established
- If a phone get “lost” daily travel information would too
- Can we use other device to obtain travel information?
 - A device installed in the Veh instead of the phone

WHAT'S NEXT?

- Literature review:
 - Find more articles on **mobile** (cell) **phone and GPS** technology
 - Find articles regarding **adjustments** needed for the use of phones in O-D studies
 - Find articles regarding the use of **other devices** using cell phone networks
 - What is the **public perception** of this kind of study?
 - How **public policy** affect intelligent O-D studies?
- To do:
 - Define specific **objectives**

QUESTIONS OR COMMENTS ☺



<http://htmlbasics.webzila.com/question.jpg>

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