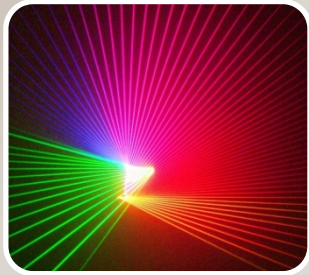


CRP 514: Introduction to GIS

Term Paper Presentation



How can (GPS) and (GIS) Improve Ambulance Performance Levels

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Sunday 9th January 2011



Outline



Introduction



Using a GPS system for effective management of ambulance



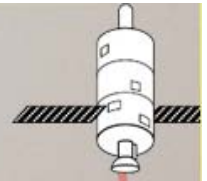
Ambulance Allocation (Case study - Funen Danish island).



Assessing ambulance response performance

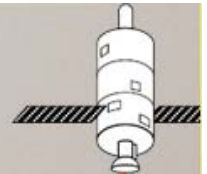


Conclusion





Introduction



Emergency medical services are very important

Patients need to be rapidly transported to the hospital

Ambulances should be allocated properly



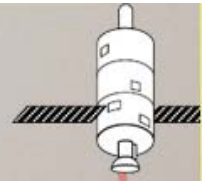
Introduction



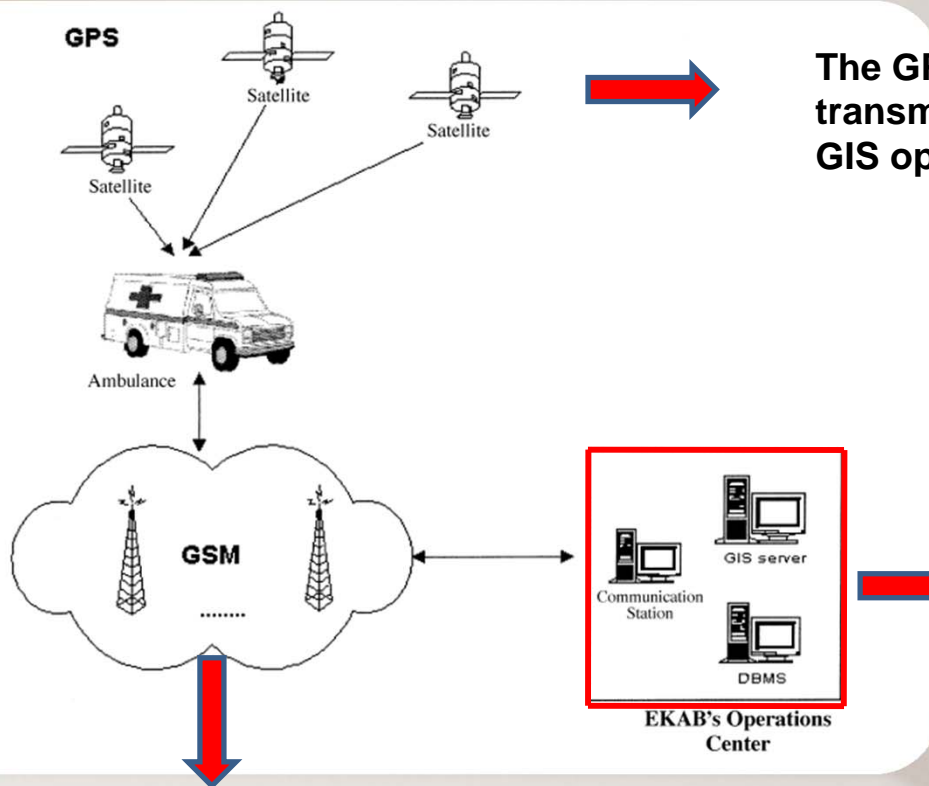
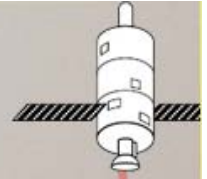
Efficient management of ambulance •

Reduce ambulances response time •

Improvement of ambulance performance •



Using a GPS system for effective management of ambulance



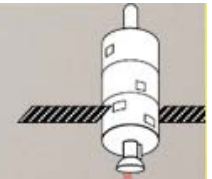
The GPS and GSM technologies will be used to transmit the exact positions of ambulances to the GIS operating in Operations Center..

Operations Center will exchange data with the ambulances through the GSM network..

GSM modem will transmit its position to the base station in the Operations Center



The primary functions for GPS subsystem



1. Depiction on a map of ambulance positions and hospital locations
2. Ambulance districting.
3. Finding the site of the incident.
4. Choosing the appropriate ambulance to handle an emergency incident.

Factors



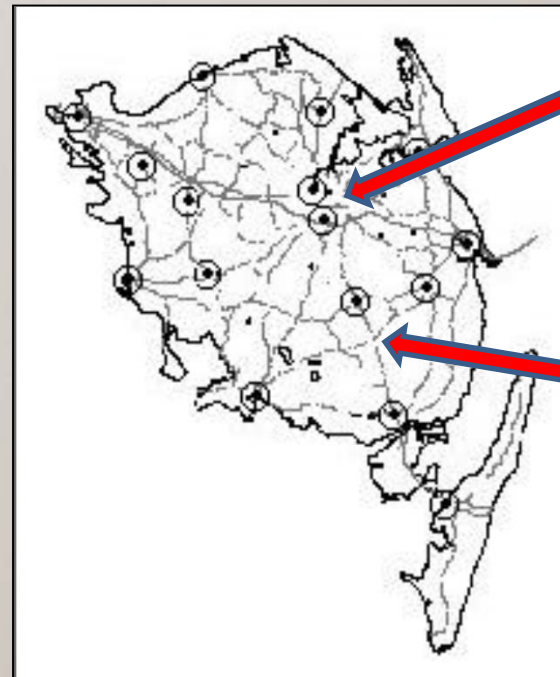
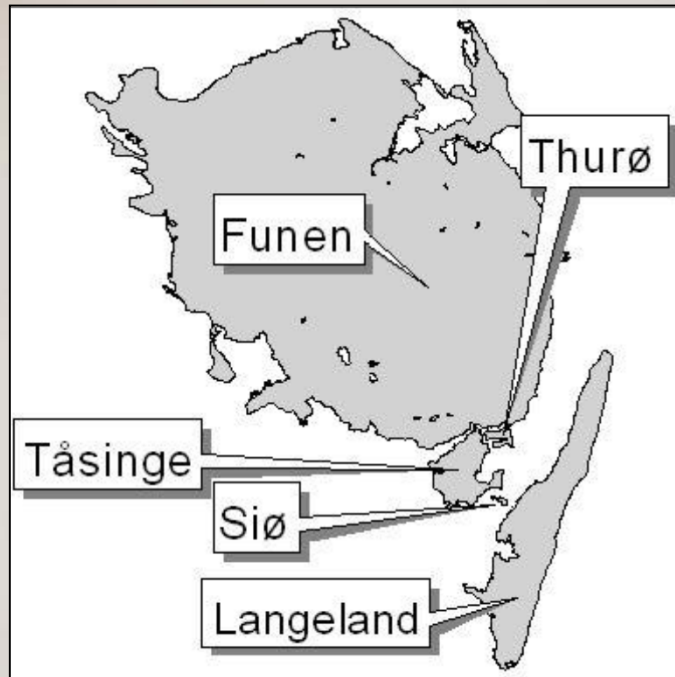
The ambulance position.
The traffic conditions.
The type and location of the incident

5. Routing an ambulance to the incident site and from there to the closest appropriate hospital.
6. Generation of statistics regarding incidents.



Ambulance Allocation: A case study (Funen Danish island):

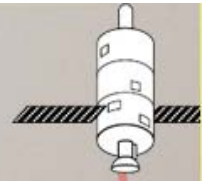
Finding placing ambulances on the Danish islands of Funen, Tasinge, Thuro, Sio and Langeland.



Falck garages

Road network with
speed limits above
70 km/h

Geographic data from Funen.



Accident Analysis

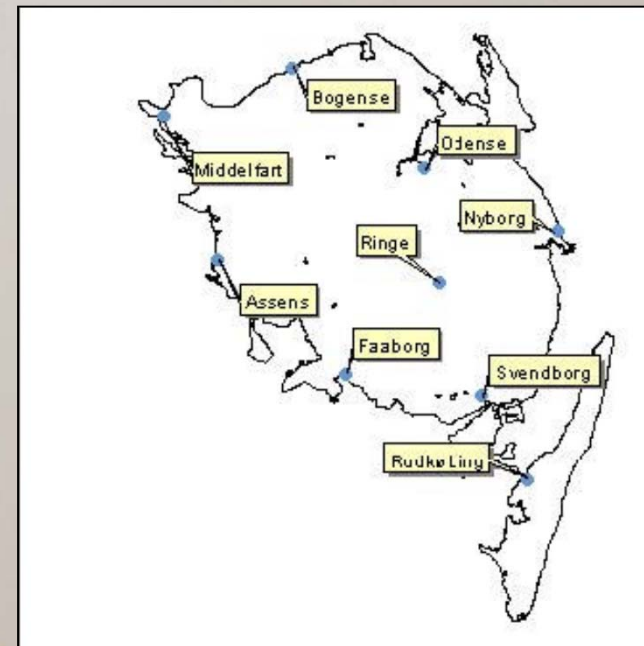
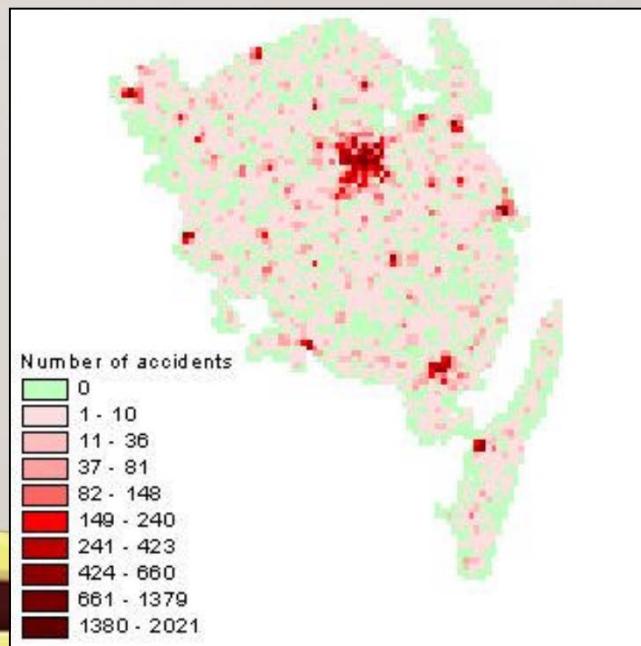
Accidents in general are deal with the following items:

Where do accidents happen?

When do accidents happen?

Geography:

Accidents mostly happen in towns, where people live and work



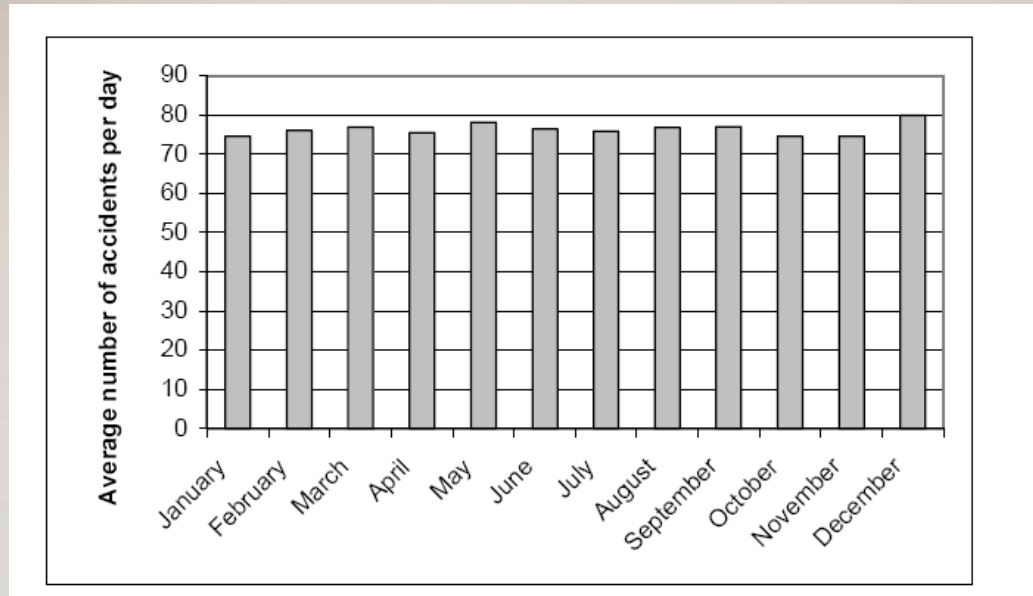
Accidents per km2 over the period

Positions of major towns on Funen.



Time :

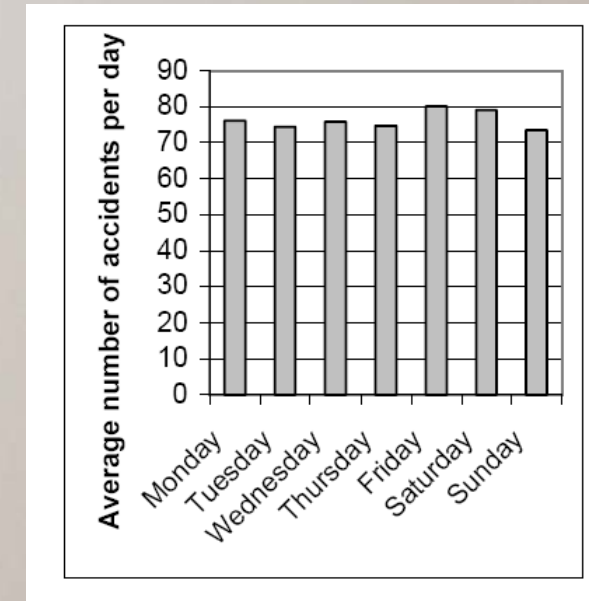
Average number of accidents per day
in a standard month



There is no considerable difference in the number of accidents over the year.

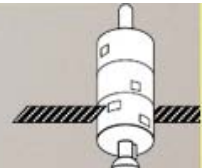
December has the largest

Average number of accidents per day



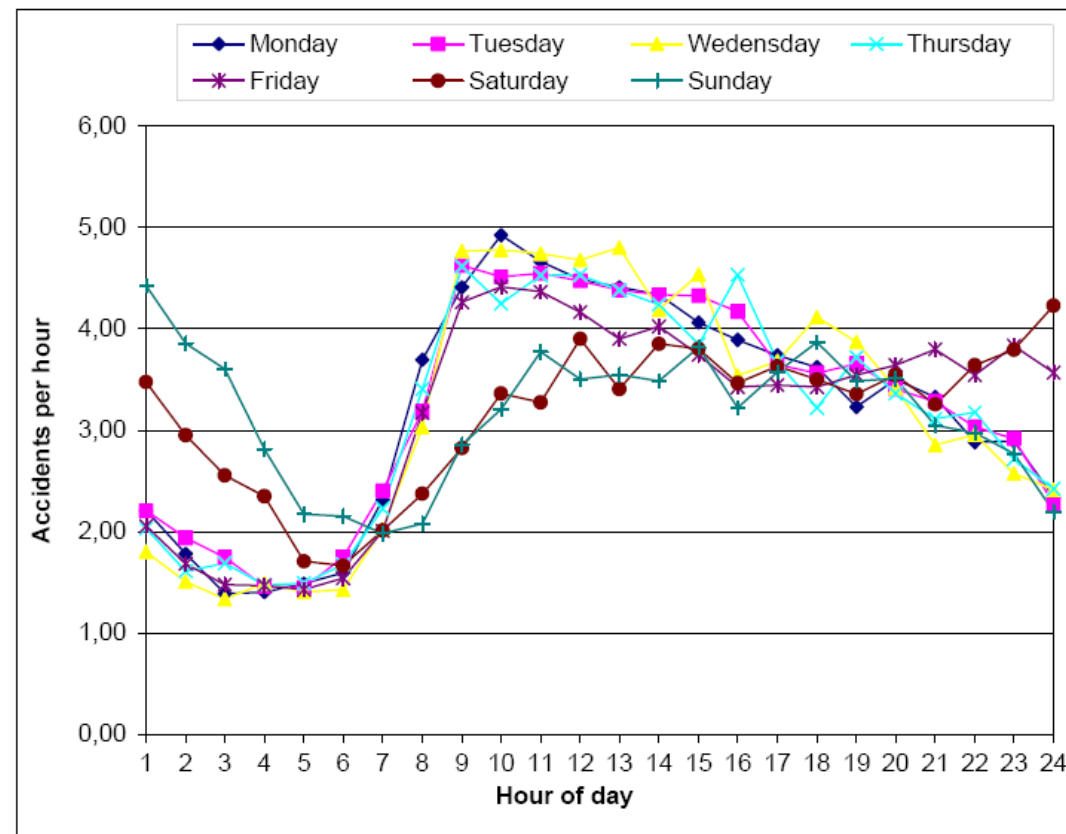
There is a considerable deviation when looking at days.

Friday has the most average of accidents and **Sunday** has the lowest number of accidents



Time :

Average number of accidents per hour over a mean day



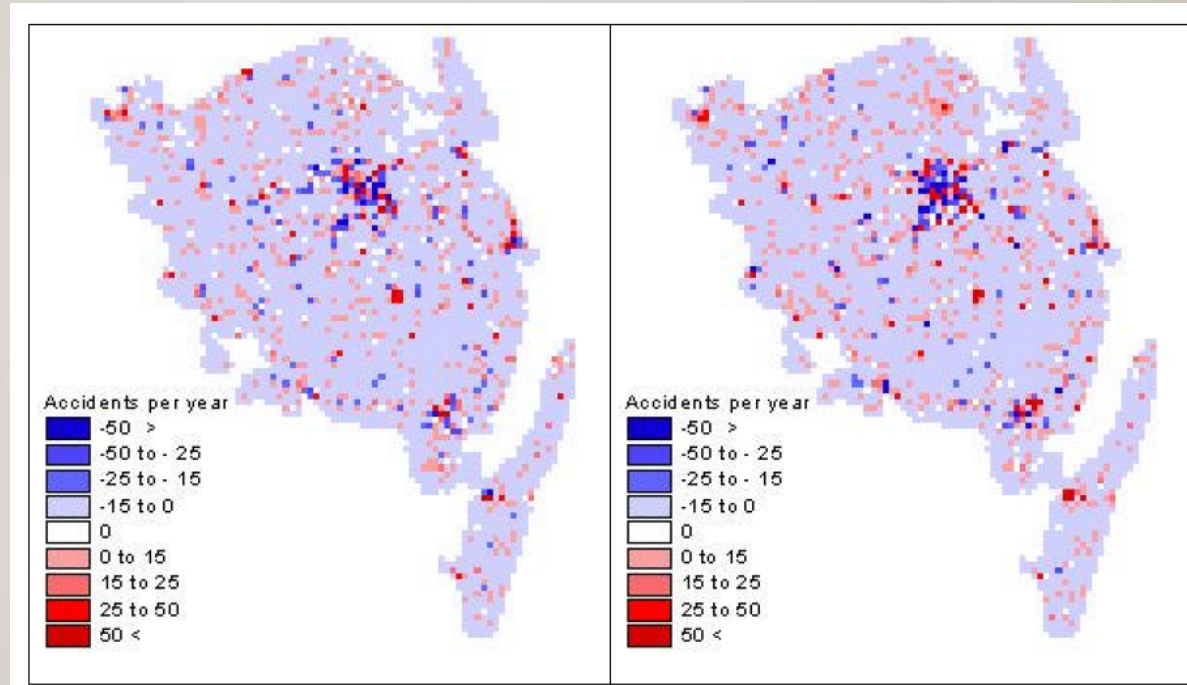
If we took the number of accidents over the week on an hourly basis, rather than on a daily basis, the variation will be more different

The **lowest** number of accidents happen when people are at sleep.
The **highest** number of accidents happen between **9 am and 2 pm** in the weekdays when people are at work.

Visual Inspection of Accidents :

Accidents per km2: “summer weekends” minus “winter weekends”.

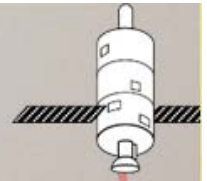
Accidents per km2: “summer weekends” minus “fall at work”.



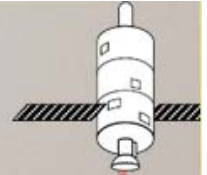
Each cell in the grid is **one** by **one** km.

There is a lot of **light blue**, hence there seem to be slightly less accidents in areas where very few people live or work.

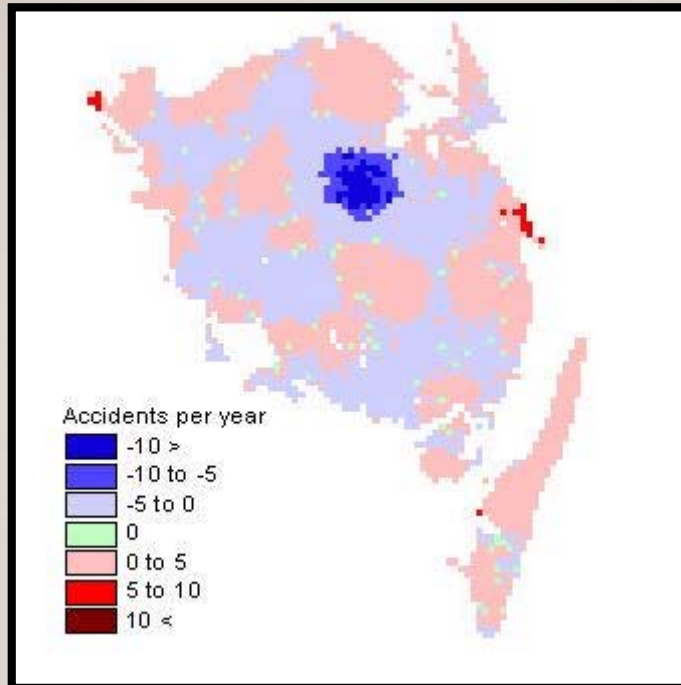
The (three to four cells) in the middle are Ring (Festival >>> Many people)



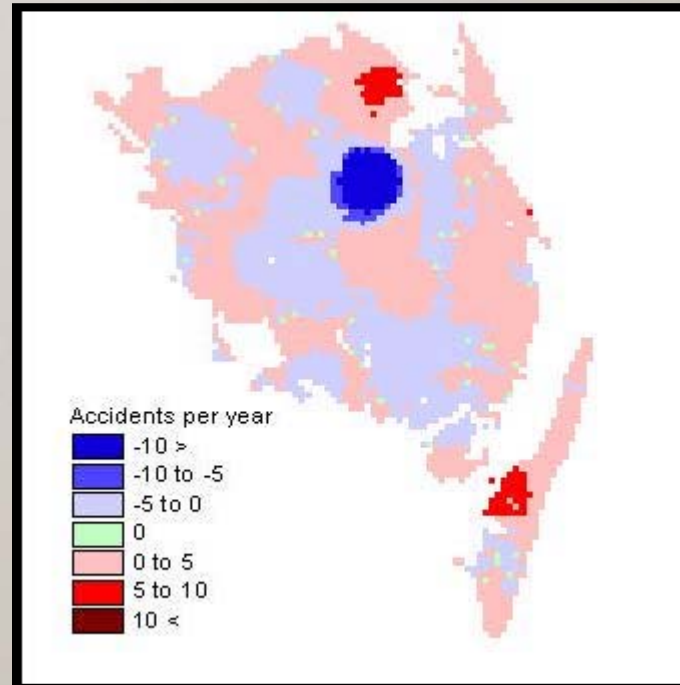
Visual Inspection of Accidents :



Accidents per km² (mean within **five km** radius):
“summer weekends” minus “winter weekends”.



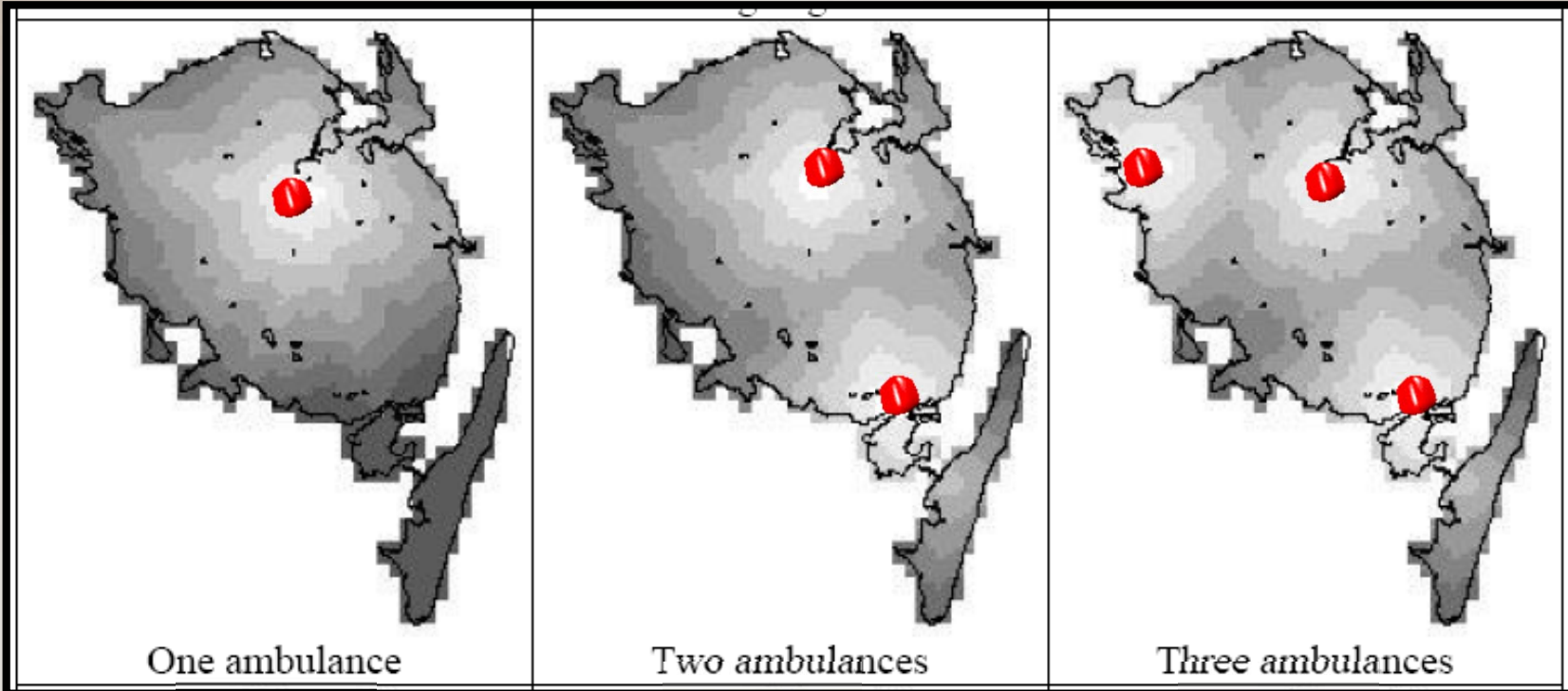
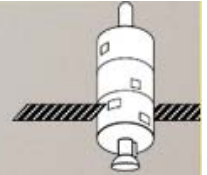
Accidents per km² (mean within **five km** radius):
“summer weekends” minus “fall at work”.



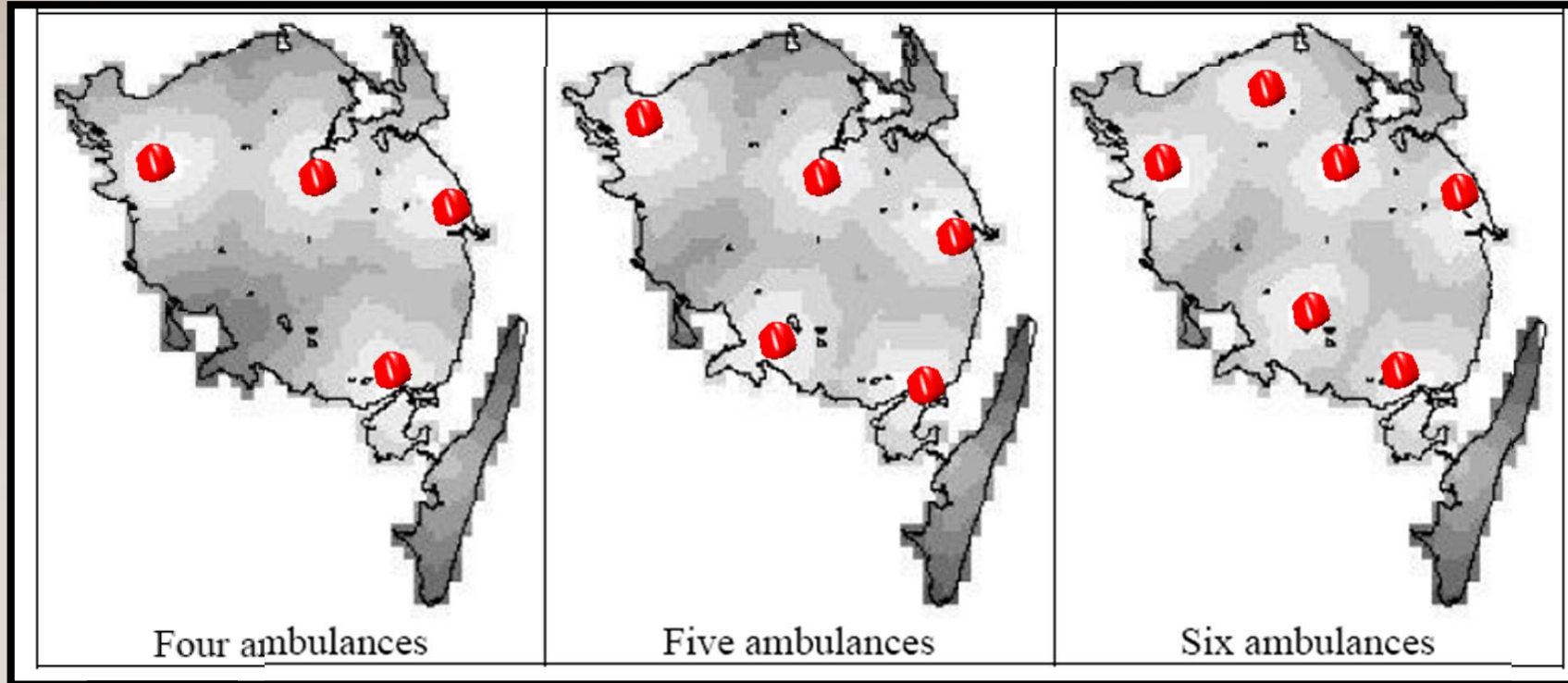
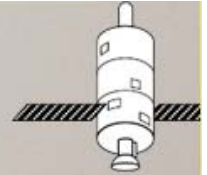
The new plots are easier to interpret.
There is increase in some of the coastal areas.



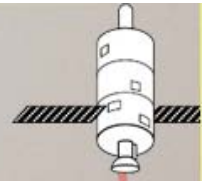
Best Results for allocation of ambulances on Funen



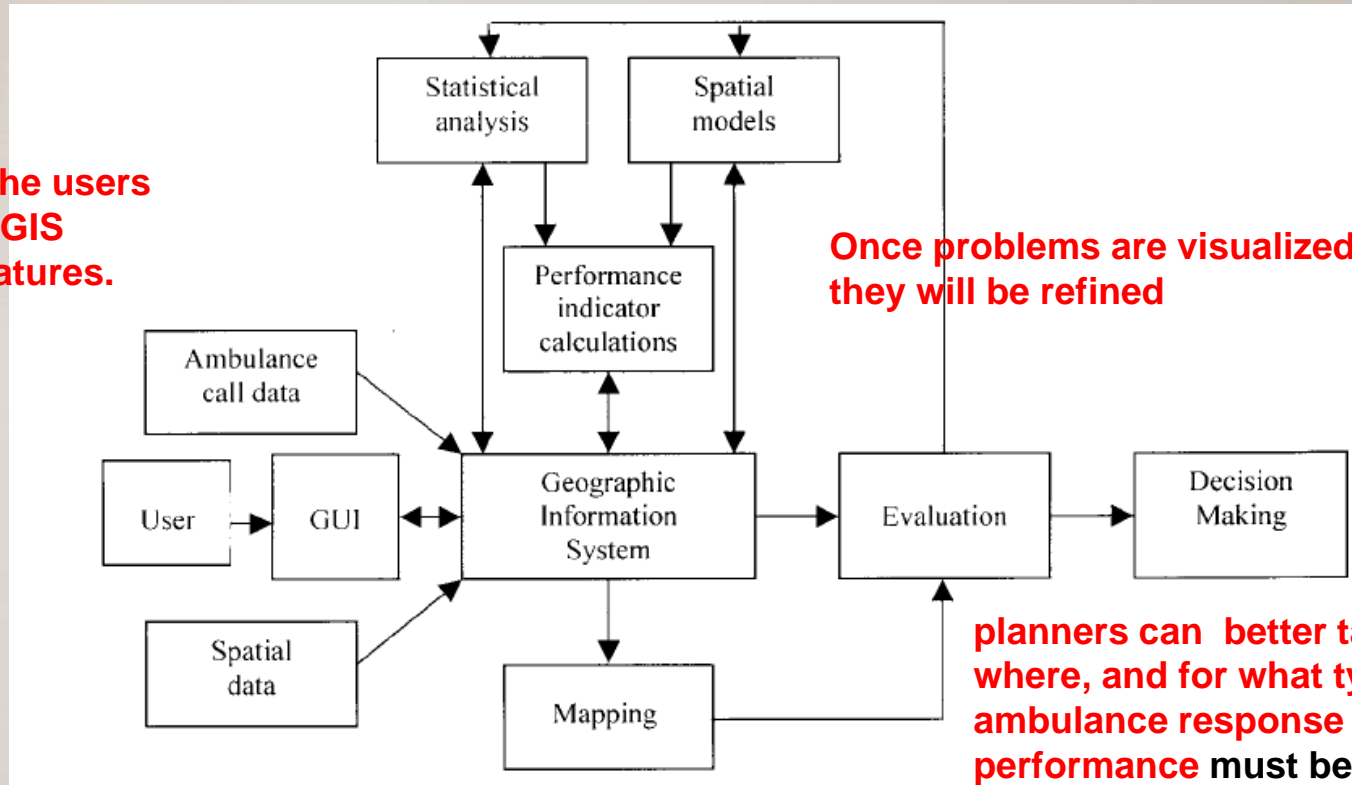
Best Results for allocation of ambulances on Funen



Assessing ambulance response performance

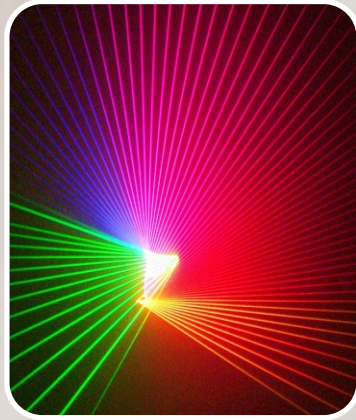


The GUI helps the users to interact with GIS environment features.



Mapping enable planners and to preprocess data, identify and visualise problems easily.





Thank you

