

Scenarios for SDSS Project

GEO1005 (2017-18 Q2)

Spatial Decision Support for Planning and
Crisis Management

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- Crisis Management / Emergency response Scenario
- Urban Planning Scenario
- Assignment

Title: Command and Control System - Fire

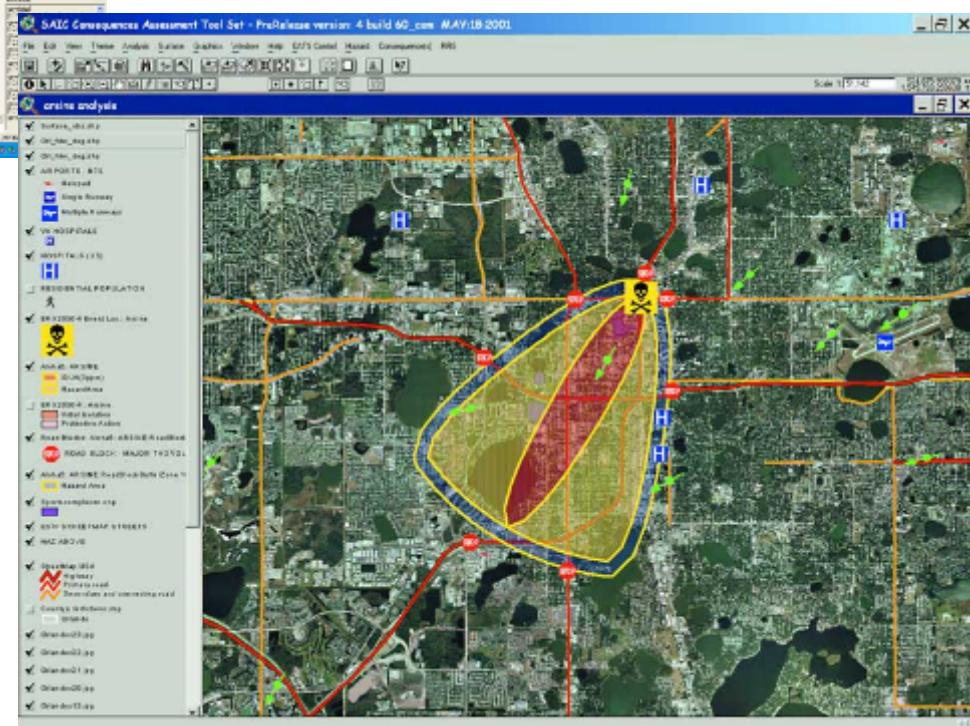
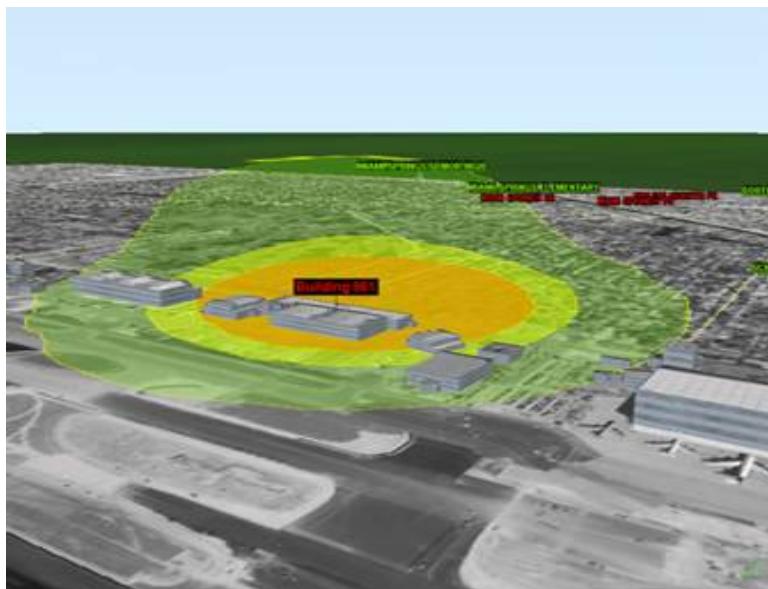
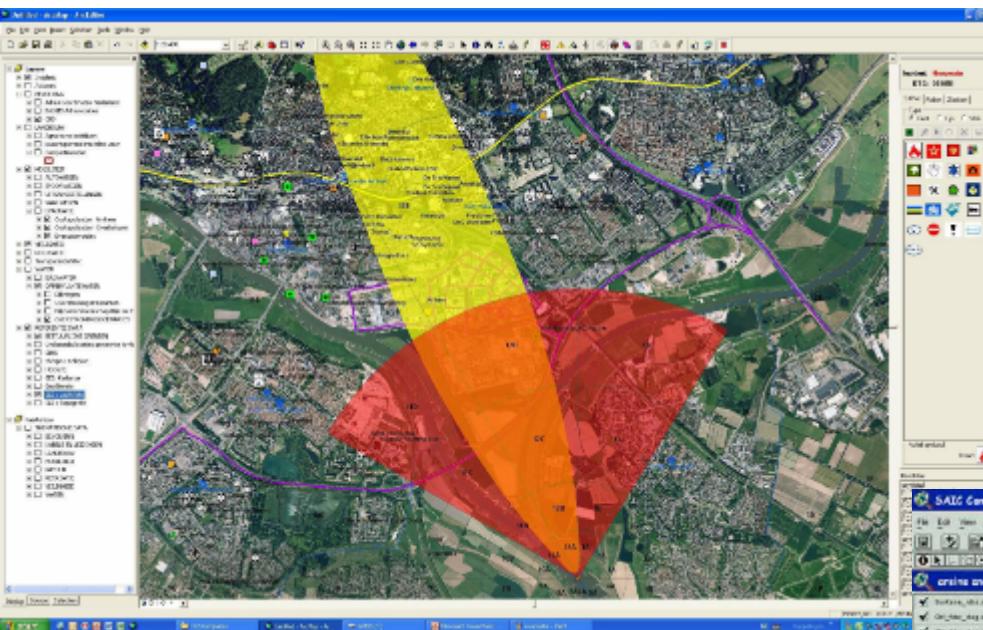
Fire has started in a big supermarket at 4:00 am in Rotterdam (Pinkstraat). The fire spreads quickly over the building and the cars parked at front of it. The emergency call was made by a group young people coming back from a party. The Officer of Duty decides to extinguish the fire only from outside. From the report: "the supermarket is close to houses and an institution for elderly people, many are awake and looking through the windows, lots of smoke, perhaps dangerous substances". OD request 7 fire brigade trucks, 2 ambulances and police support.

Level of emergency GRIP 2.



- **Stakeholders:**
 - Fire brigade, ambulance, police
- **Decision:**
 - Which firefighting stations have to be involved? Where the measurement teams have to be sent?
 - How many ambulances are needed and where?
 - Which roads need to be closed?
 - Which buildings have to be evacuated?
 - How the plume spreads
- **Information available:**
 - Map of the area (buildings, roads), weather condition (direction of wind, humidity), people in the area.
- **Knowledge required:**
 - Distance from the fire striations to the incident
 - Possibilities for access to the supermarket
 - Water sources
 - Affected area, threaten area
 - Vulnerable groups in de area
 - Possibilities for evacuation

Crisis Management Scenarios – Fire at a supermarket



Title: Command and Control System - Storm

A severe storm have passed through the country and has damaged many houses. In several areas help is needed. Some of the streets are blocked by broken trees and branches, there are damaged cars, traffic lights and roofs. Citizens need help is removing fallen objects and damaged properties.

Level of emergency GRIP2.

Crisis Management Scenarios – Storm

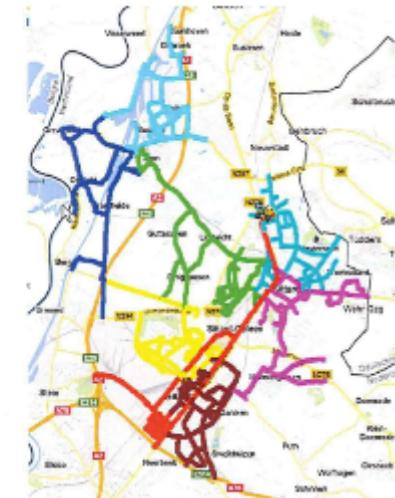
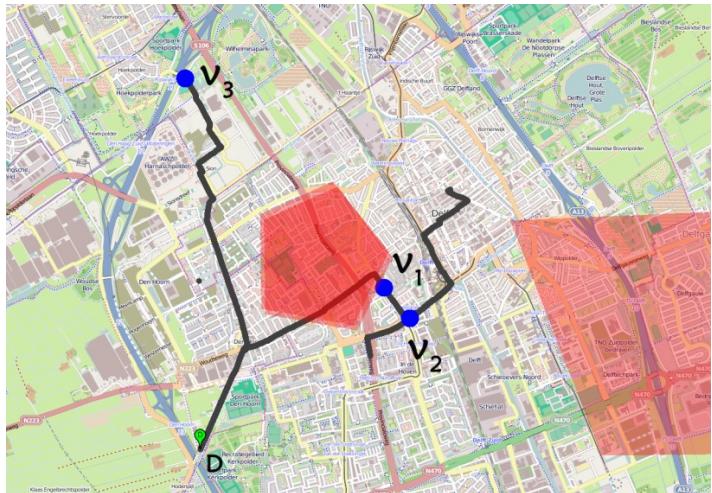


Crisis Management Scenarios – Storm

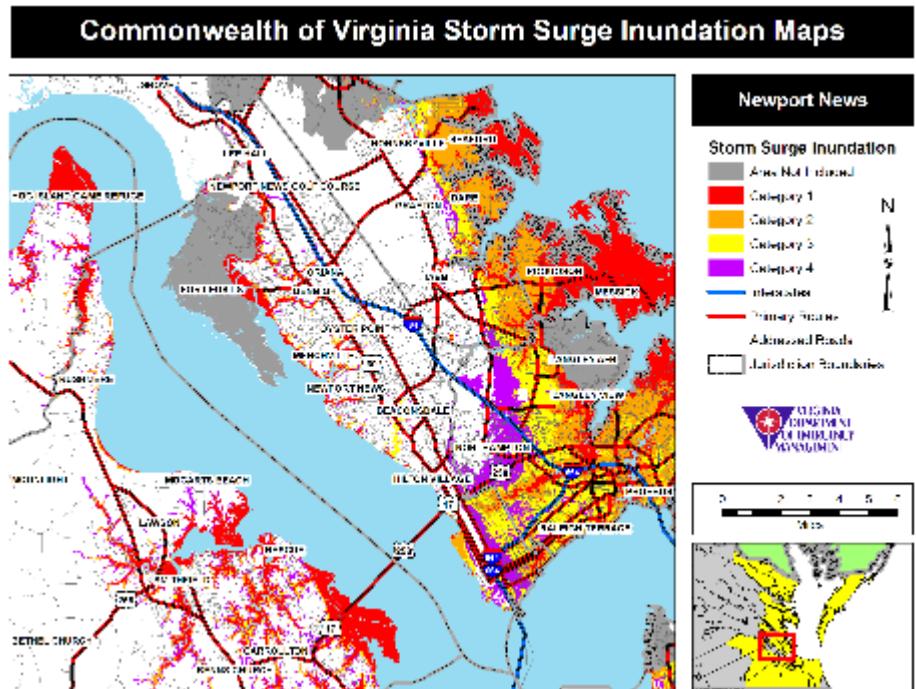
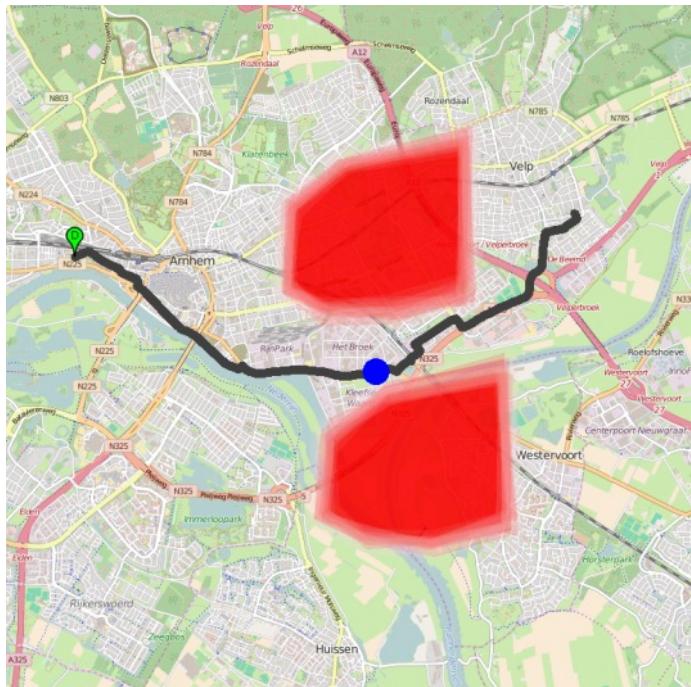
- **Stakeholders:**
 - Fire brigade, police, citizens
- **Decision:**
 - Which are the blocked roads?
 - What is the affected area that has to be considered?
 - Which areas need to be provided help first?
 - How many fire trucks are needed?
 - How to keep in contact with the citizens?
- **Information available:**
 - Map of the area (buildings, roads), weather condition (direction of wind, humidity).
- **Knowledge required:**
 - Locations of damages
 - Distance to the locations
 - Special equipment/vehicles
 - Common operational picture

Crisis Management Scenarios – Storm

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<http://www.nmpo.nl/> (snow cleaning)

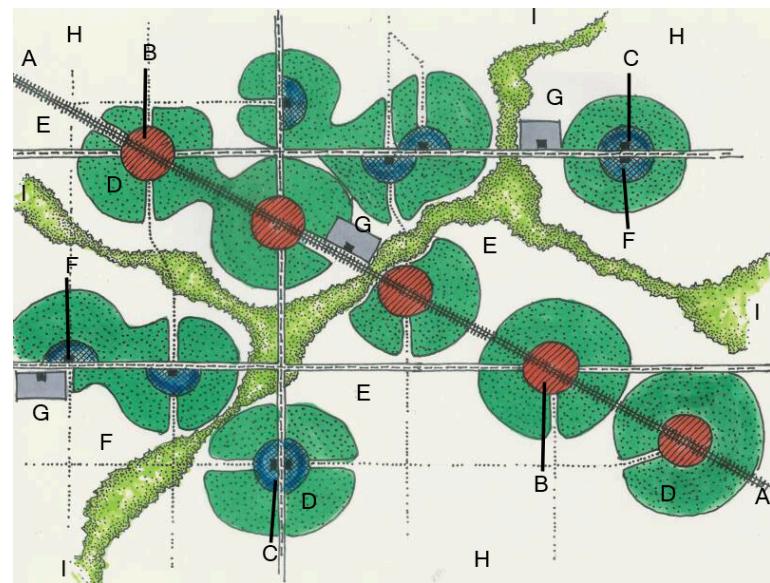


Title: Urban Intensification of Transport Nodes

EU policy sets new sustainable mobility targets for reducing or eliminating car use in cities in the next decade. Therefore everyone must have access to different public transport modes (rail, bus) within reasonable distance (800m and 400m respectively).

However, infrastructure has costs and it can't reach everywhere, therefore based on density one must provide bus services to feed rail stations with more people.

Planning the transit corridor involves producing alternative scenarios of land use and transport connections. It's important to compare and evaluate these alternatives, in term of residential density, land use mix, distance between centres, mode share and accessibility.



<http://waynedavisarchitect.com/wp-content/uploads/2014/04/eco-TODplanAnnotated1.jpg>

- **Stakeholders:**
 - Transport planner, urban planner, public transport operator, citizens group
- **Decision:**
 - We need to provide new public transport nodes or increase their frequency.
 - We need to increase density around public transport to increase public transport share.
 - We need to increase the attractiveness of locations served by public transport.
 - We need different types of modes for different purposes and people.
- **Information available:**
 - Road network, public transport network, population composition, buildings, land cover, land use.

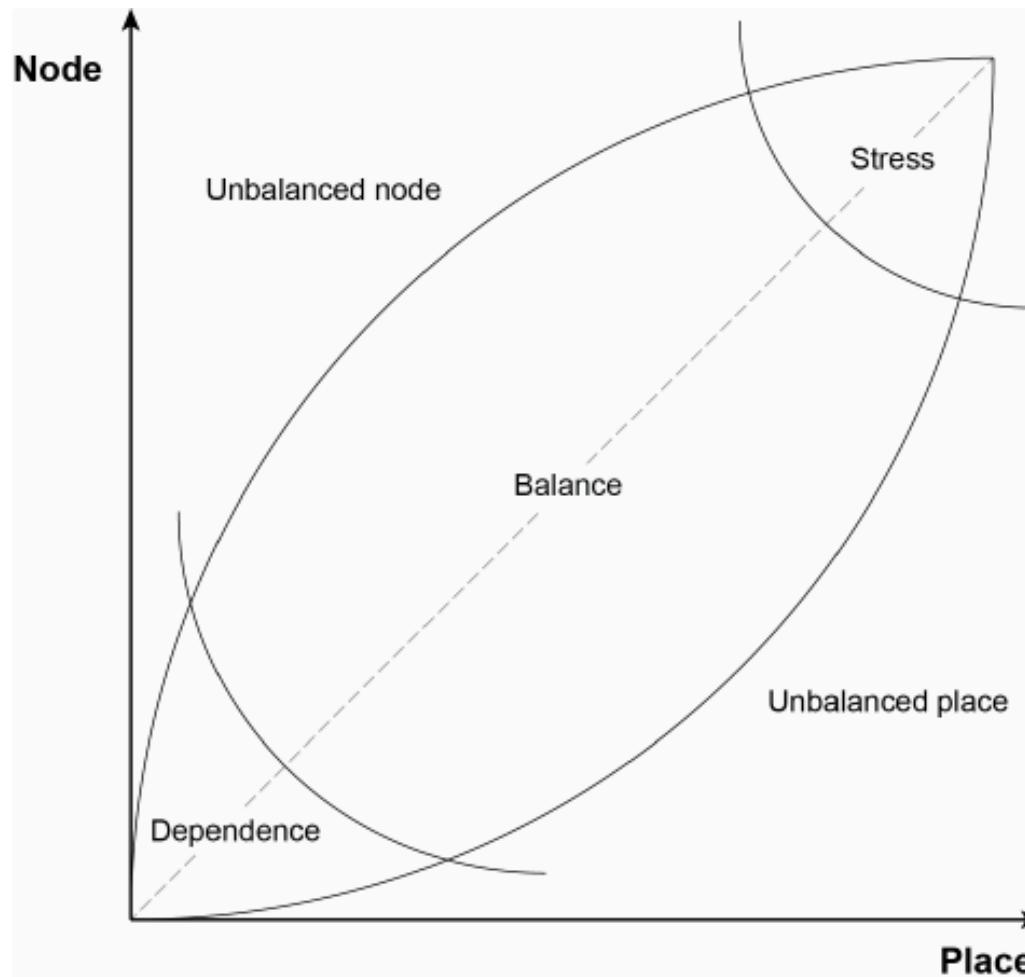
- **Knowledge required:**

- What is the distance to the nearest rail and bus stop?
- Where is the population that needs greater access to public transport?
- What is the public transport provision/accessibility of different locations?
- What is the land use mix in locations near rail nodes?
- Which locations near rail nodes have enough space to support increased housing density?
- What will be the increase in population using public transport based on current mode share?
- Which locations have density to support new rail nodes or services?



TOD Standard

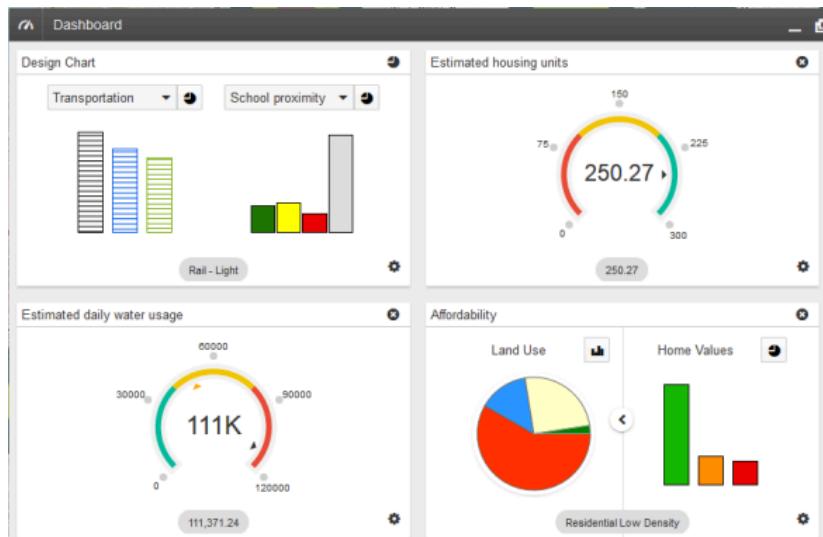
Source: <https://www.itdp.org/library/standards-and-guides/transit-oriented-development-are-you-on-the-map/what-is-tod/>



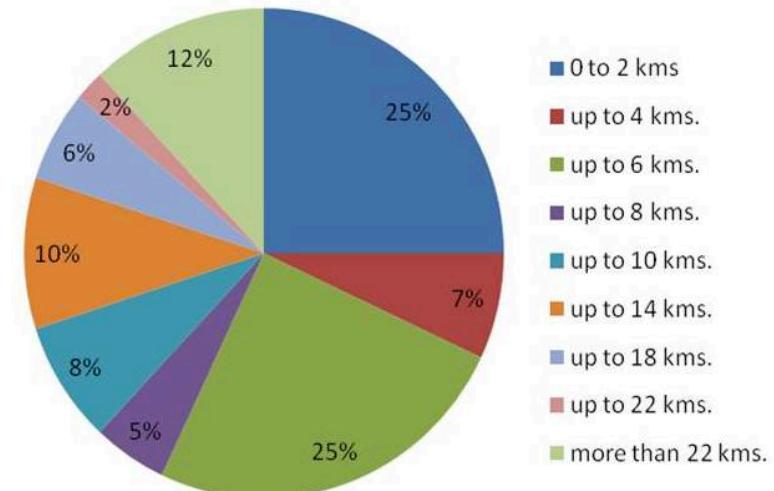
Node – Place Model

- Bertolini L (1999) Spatial Development Patterns and Public Transport: The Application of an Analytical Model in the Netherlands. *Planning Practice and Research* 14:199–210. doi: 10.1080/02697459915724
- Bertolini L (2008) Station areas as nodes and places in urban networks: An analytical tool and alternative development strategies. *Railway Development*. pp 35–57
- Chorus P, Bertolini L (2011) An application of the node-place model to explore the spatial development dynamics of station areas in Tokyo. *Journal of Transport and Land Use* 4:45–58. doi: 10.5198/jtlu.v4i1.145

Topic	Scenario A	Scenario B	Scenario C	Scenario D
Agricultural Land Consumed: 1998 - 2020	174 sq mi	143 sq mi	65 sq mi	43 sq mi
Topic	Scenario A	Scenario B	Scenario C	Scenario D
Infrastructure Cost 1998-2020 (approximate, millions, billions)	\$5.5 billions	\$3.5 billions	\$2.2 billions	\$1.2 billions
Topic	Scenario A	Scenario B	Scenario C	Scenario D
Single Family Homes vs. Condos, Apts. & Townhomes	10% Condos, 90% Single Family	30% Condos, 70% Single Family	40% Condos, 60% Single Family	60% Condos, 40% Single Family
Topic	Scenario A	Scenario B	Scenario C	Scenario D
Transportation Choices	Automobile	Automobile	Automobile	Automobile
Topic	Scenario A	Scenario B	Scenario C	Scenario D
Walkable Communities (walk to work, stores, school, transit)	1	2	3	4

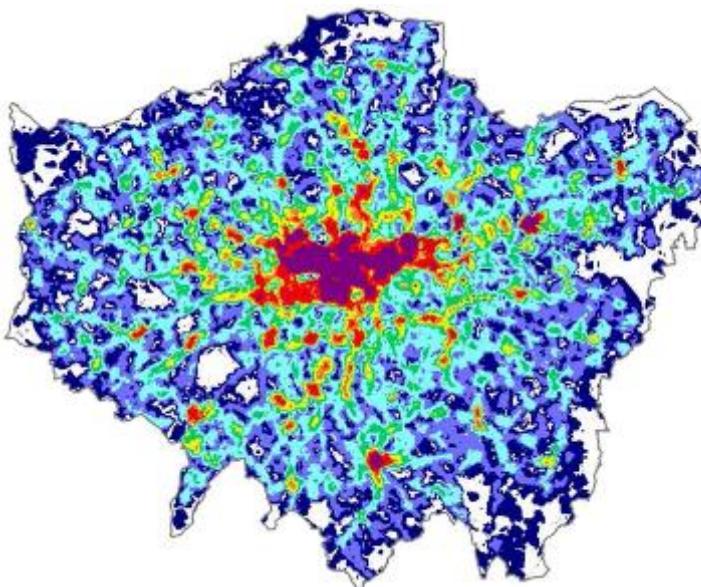


Distance Travelled by BRTS Passengers with tickets

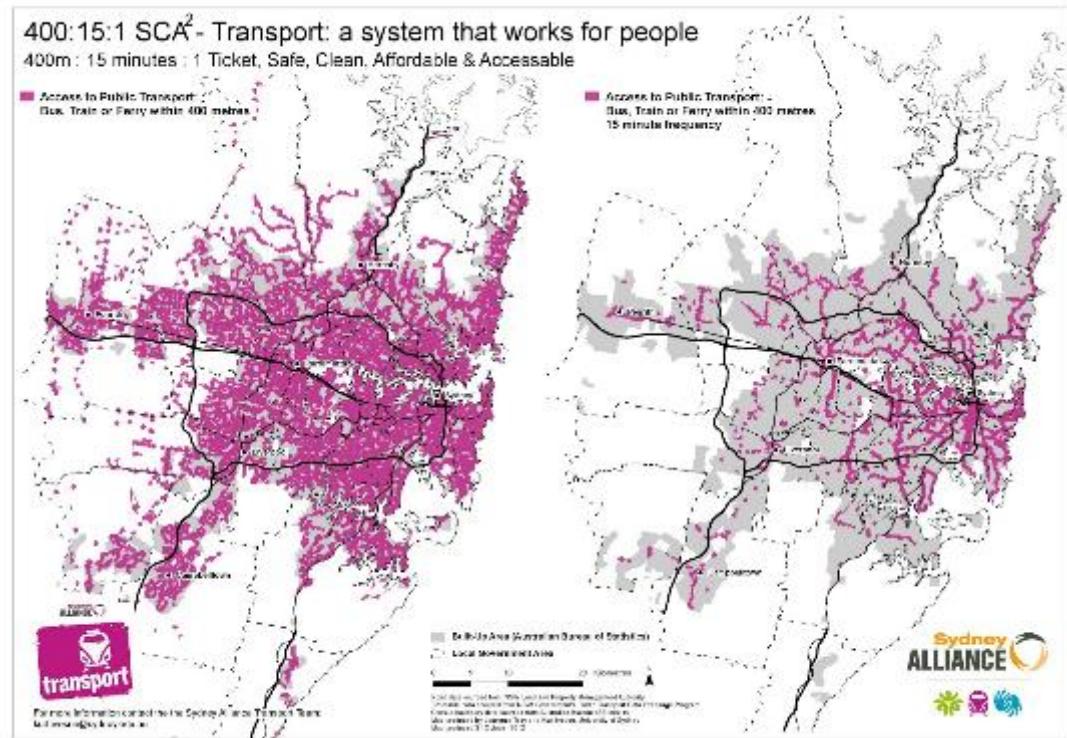




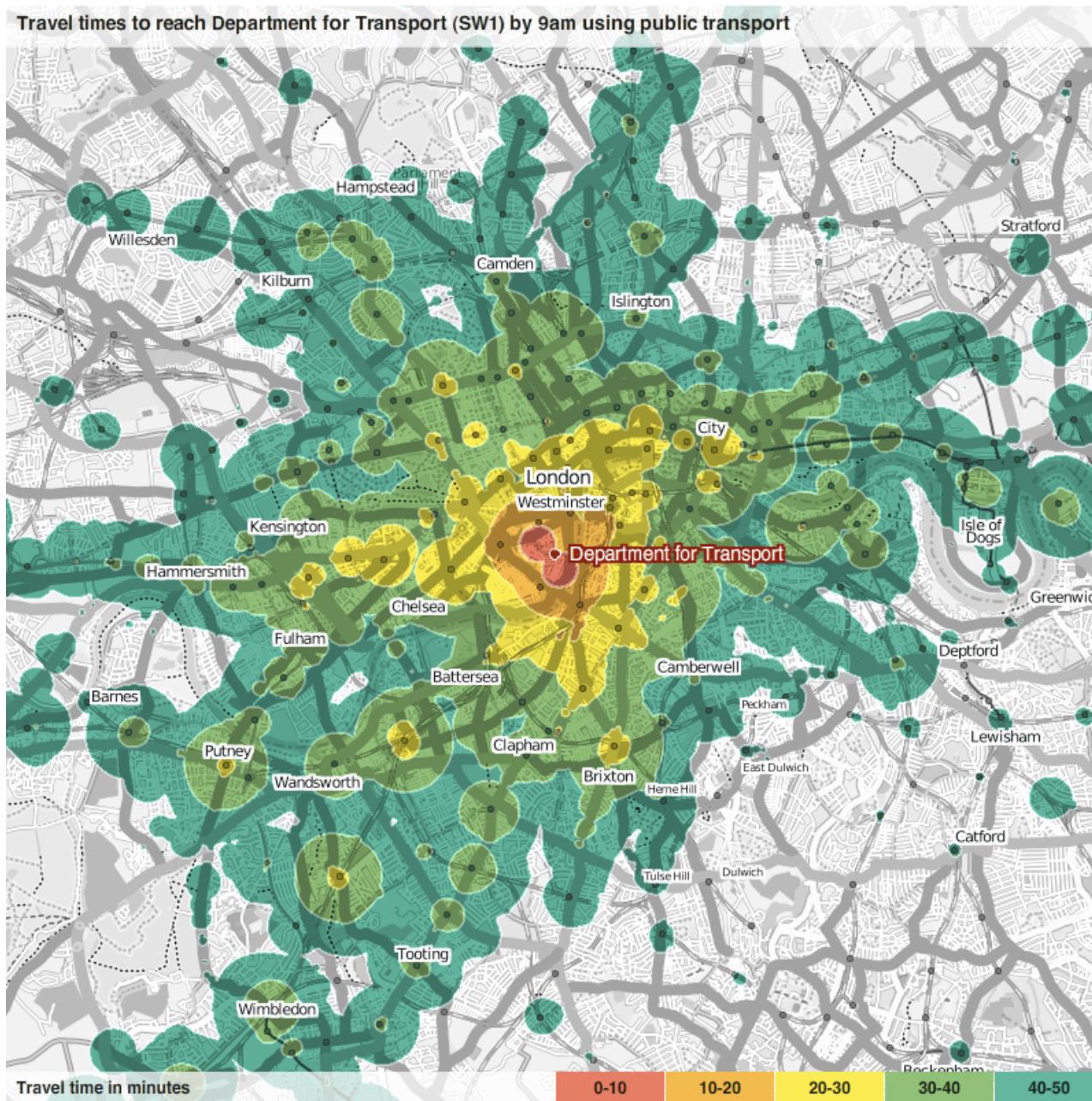
	401	480	481
Total population	825	497	690
Total area in ha	85.67	17.95	68.82
Built up area 38.63	37.03	17.64	
Residential areas - (400m next bus stop)	23.44	17.64	25.58
Population living within 400 m walking distance	62%	100%	66%



Source: PTAL – London
(Public Transport Accessibility Layer)



Source: <http://contemporarycity.org/2014/04/sydney/>



1. Register individually on GitHub
2. Enroll into groups of 3 (at least one should be confident with Python)
3. Look at previous years' projects
4. Select one scenario to work on
5. Create GitHub repository for the group