An overview of transport modelling tools

Practical applications and future opportunities

George Lunt, AECOM

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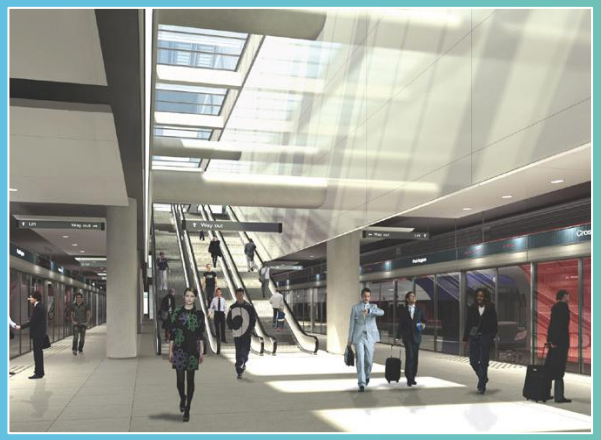
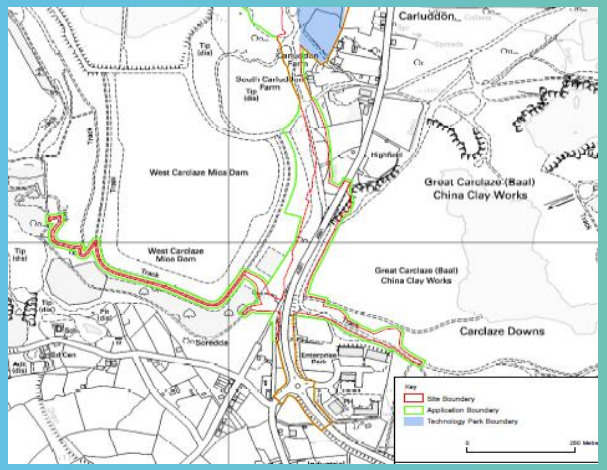


1. TRANSPORTATION
Crossrail, London



2. ENVIRONMENT
Carluddon A391 ES, Cornwall

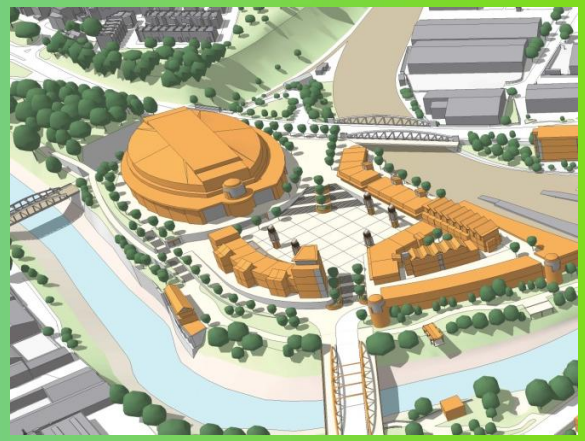
AECOM's professionals around the world are united by a common purpose –

To create, enhance and sustain the world's built, natural and social environments

A set of common values is at the heart of our culture

Integrity
Employees
Clients
Excellence
Innovation
Agility
Safety

3. DESIGN PLANINING
Olympic Legacy Masterplanning Framework, London



4. Programme, Cost Consultancy
Bristol Arena

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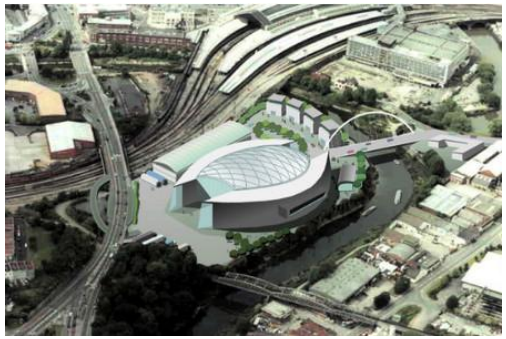
AECOM in Bristol

107 technical staff

Transportation
Buildings
Environment
Programme, Cost, Consultancy

University of Bristol, Queens Road Building Building Services, BREAM

Bristol Royal Infirmary Structural Engineering, Civil/Infrastructure Engineering, Geotechnical, Ecology, Transportation, Acoustic Engineering, CDM-Coordinator



Bristol Arena, Cost Consultants

Purpose and contents

- To give an overview of transport modelling tools and approaches, and how new technology is influencing their application
  - Why model?
  - Typical Models
  - The Future

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Why model transport?

Understand Current Conditions

Identify Improvements

Assess Improvement Options

Present Options to Key Decision Makers / Stakeholders

Improve Transport Provision

- Economy
- Environment
- Health and Wellbeing
- Society

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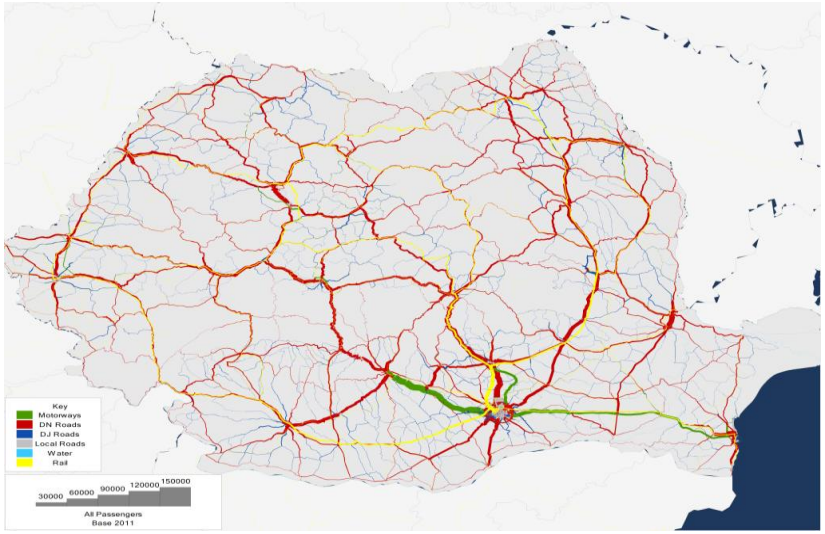
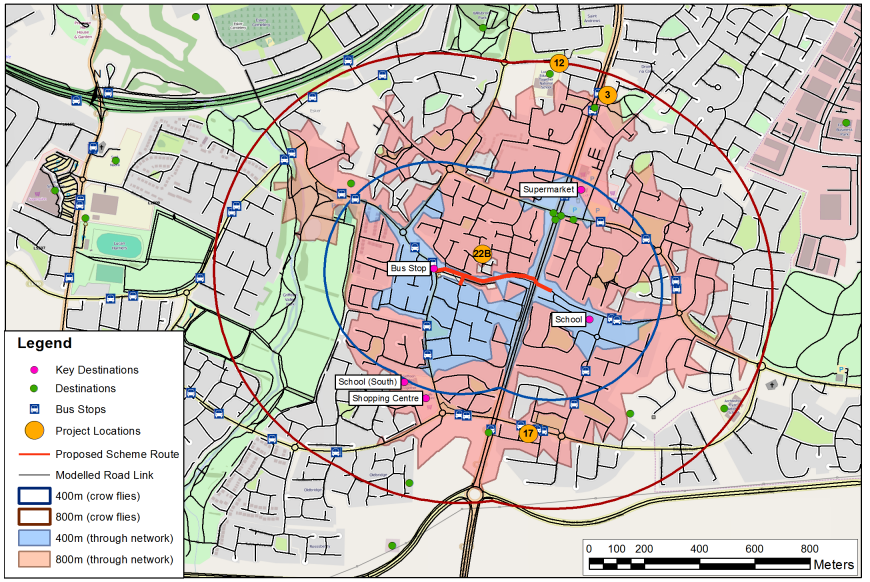
What kind of transport models are there?



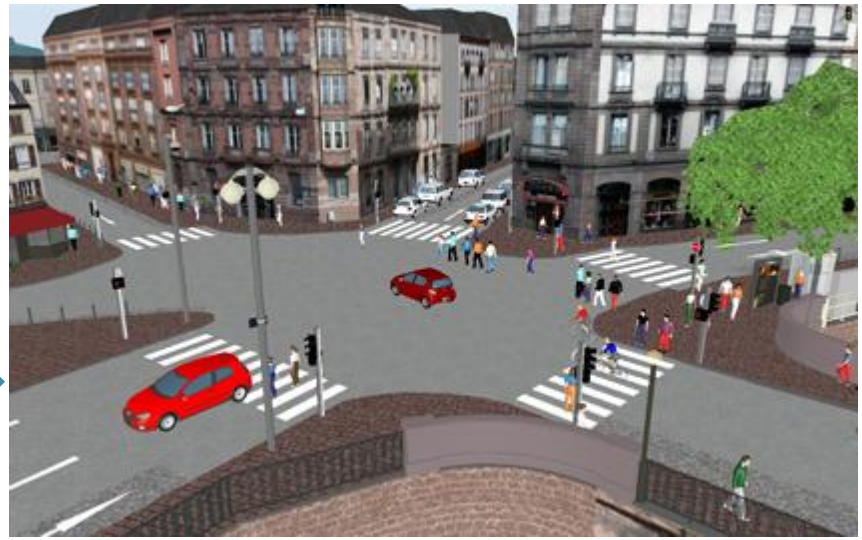


Wide Area

GIS

And others!

Local Area



Wide Area Modelling

How do you model the movement of people and goods from origins to destinations, and the resulting impact on the transport network?

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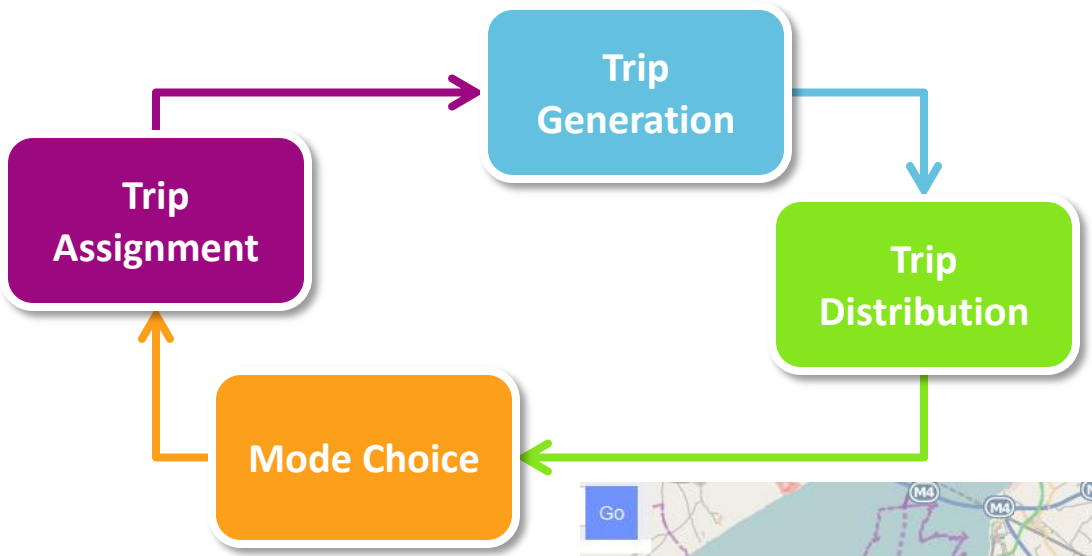
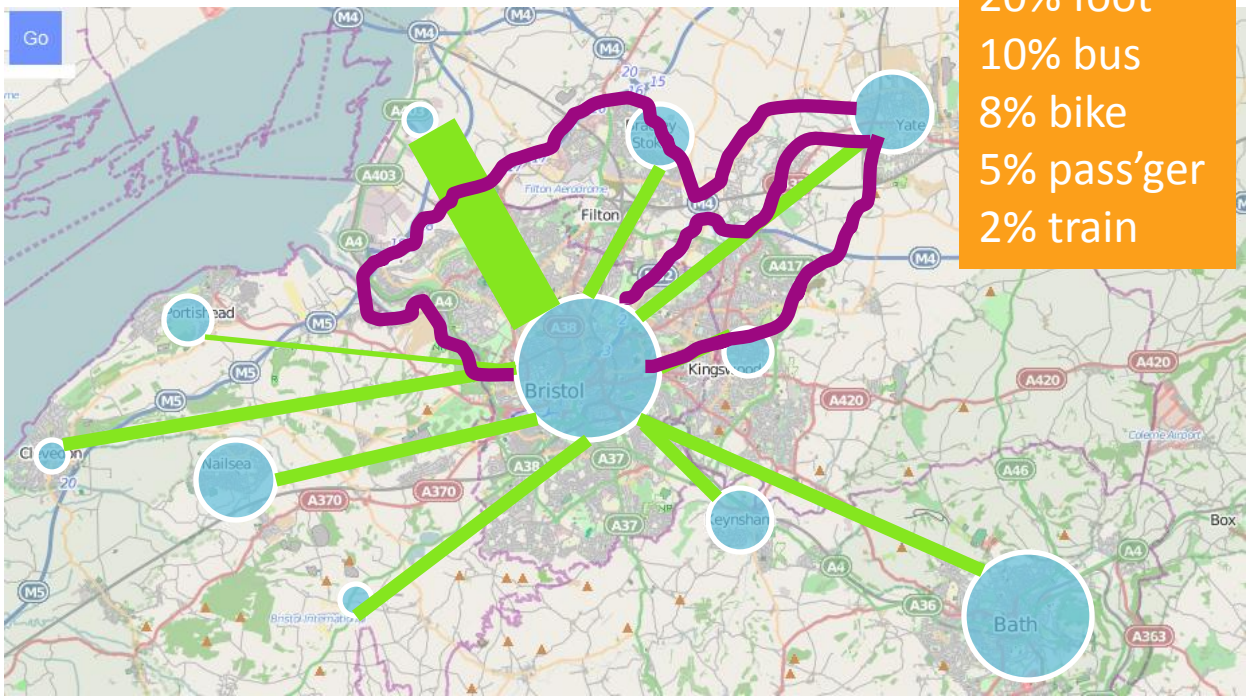
Wide area modelling



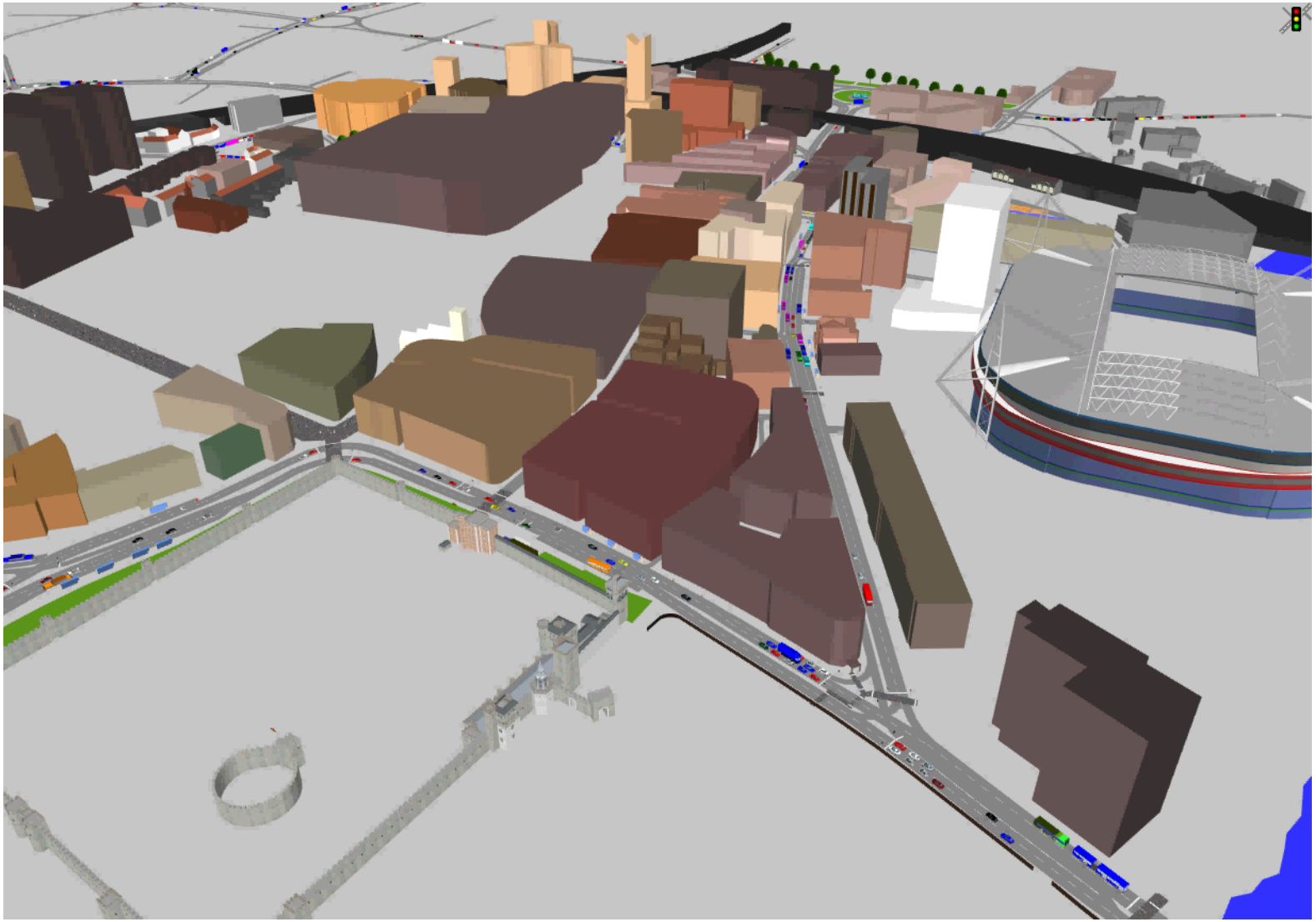
Bristol 2011 census

50% car
20% foot
10% bus
8% bike
5% pass'ger
2% train



Local area modelling: Junction Modelling

Local area modelling: Microsimulation



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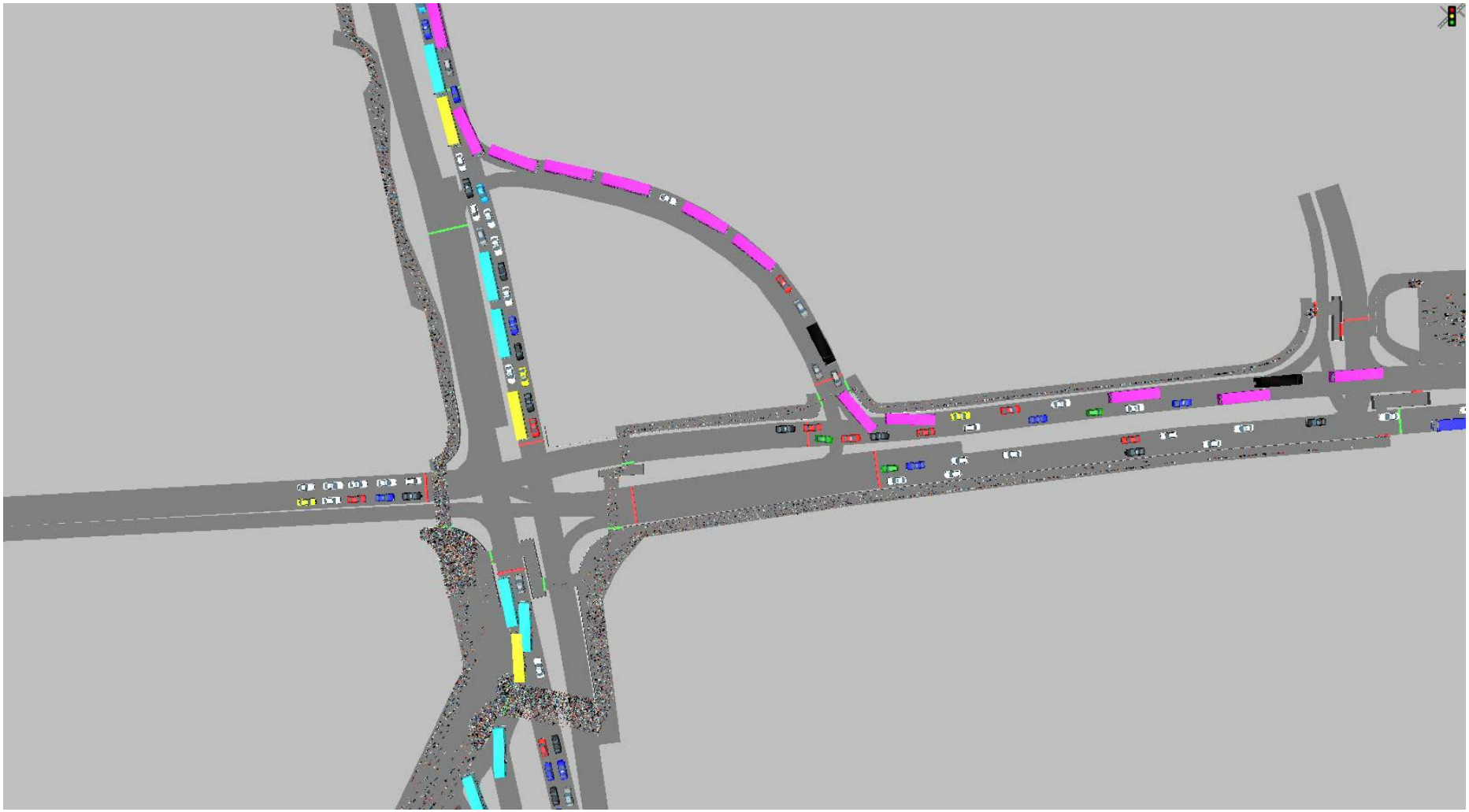
Local area modelling: Pedestrians



GIS / Accessibility: Permeability Assessment

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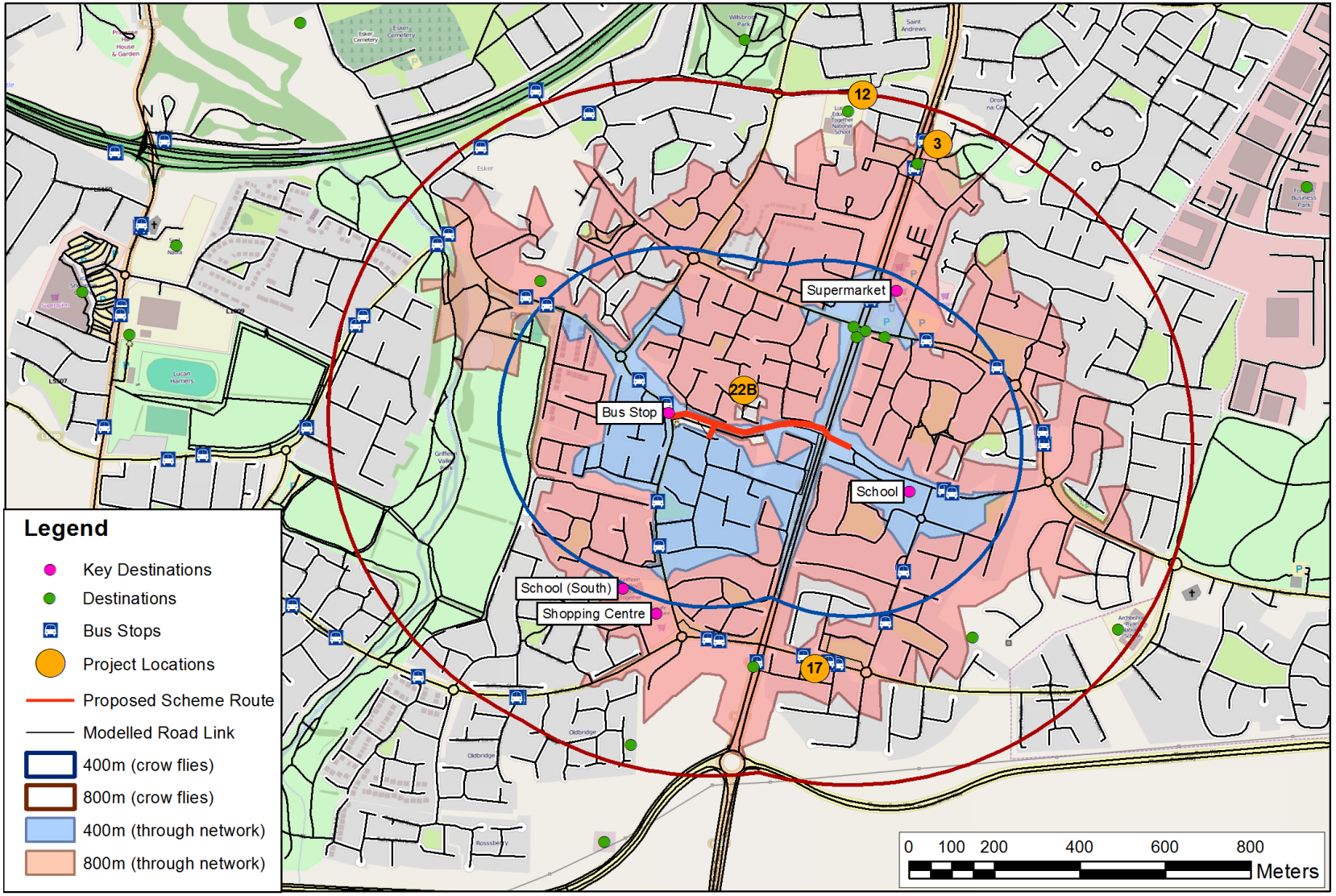
GIS / Accessibility: Permeability Assessment



GIS / Accessibility: Permeability Assessment

Permeability Assessment Tool — Overall Assessment

Created using PAT v1.1

Scheme Details			
Scheme ID and Name:	22B	**Post part 8 - Route Ballyowen Plan (Esker)**	
Scheme Description	*Improvements to existing route involving improved access points and a new walking and cycling path as well as toucan crossings (subject to detailed design)*		
Catchment Size			**SCORE: 7/10**
Population within 800m (through network)		8521	4
Performance against theoretical maximum		54%	3
Socio - Demographic Profile of population within 800m of the scheme (through network)	Value	Percentage	**SCORE: 7/15**
No. travel to work on foot (Average = 18%)	819	(13%)	3
No. Travel to work by bike (Average = 3%)	104	(2%)	2
No car households (Average = 14%)	198	(8%)	2
Current Useage			**SCORE: 1/5**
Walkers and cyclists (per hour)		0.0	1
Cyclists (per hour)		0.0	1

Calculated Walking and Cycling Distances (and times) to Key Destinations — **SCORE: 4/5**

	Prior Conditions			Anticipated Impact			Time Saving		
	Distance (m)	Cycle Time (mm:ss)	Walk Time (minutes)	Distance (m)	Cycle Time (minutes)	Walk Time (minutes)	Cycle time saving (minutes)	Walk time saving (minutes)	
Weighted Average Journey Time for top 5 destinations	1352.06	05:04	16:54	926.206	03:28	11:35	01:36	05:19	4

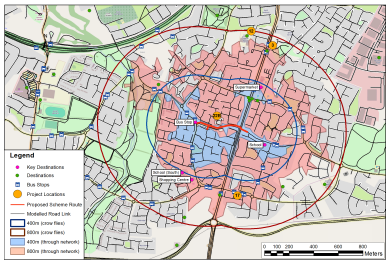
Modal Shift Potential - Quantitative Assessment Score — 43%

Qualitative Survey Results

	Existing	With Proposed Scheme	Improvement	
Directness	1	4	3	
Personal Security	2	3	1	
Legibility	1	4	3	
Quality of Environment	3	3	0	
Maintanence	2	4	2	
Road safety	2	4	2	
Overall Qualitative Score	21%	67%	46%	46%

Contribution to Objectives (aligned to national and local policy objectives)

	Text based upon interpretation of wider assessment
Encourage the use of walking and cycling for local trips; encouraging modal shift away from car use.	**This scheme would benefit a large catchment area with moderate levels of walking and cycling and few no car households. Journey time benefits are moderate, suggesting a moderate level of modal shift potential.**
Provide safe and secure walking and cycling routes which have a positive impact upon the public realm.	**Safety and security are anticipated to improve as a result of this scheme, with a moderate quality of environment maintained.**
Provide routes which more directly serve key local education, employment, health, retail and community destinations.	**This scheme would improve access to a school, shops and community facilities.**
Provide more direct connections to the wider walking, cycling and public transport networks.	**This option would improve local access to the bus network. The scheme is considered a secondary cycleway within the proposed Greater Dublin Area Cycle Network.**



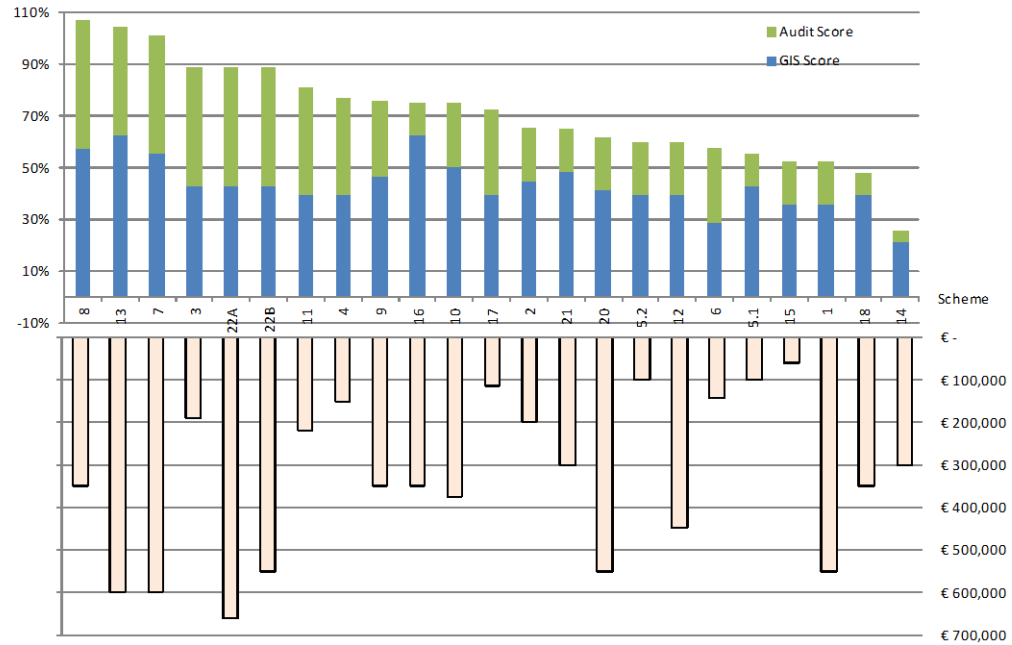
GIS / Accessibility: Permeability Assessment

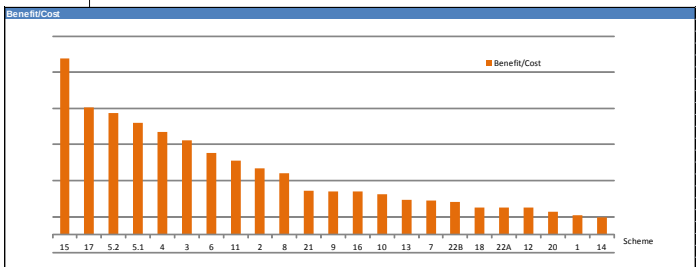
Permeability Assessment Tool . AECOM Summary Created using PAT version 1.1

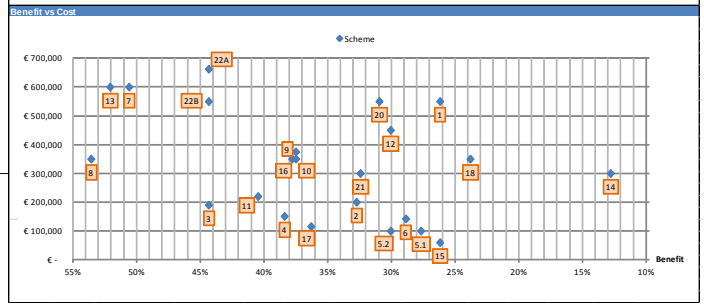
Schemes

1 Shared route from Marlfield to Aylesbury	8 Shared route from Bawnogue to Grand Canal	16 School Complex, Rathfarnham
2 Firhouse Rd West to SWP, Old Bawn, Tallaght	9 Broadfield Manor	17 Foxborough estate, Lucan
3 Ballyowen Park to Outer Ring Road	10 Willsbrook Park to Lucan	18 Links to Kingswood Local Centre
4 Shared route at Belgard Heights, Tallaght	11 Firhouse Road via Woodstown	20 Links to Kilnamanagh Local Centre
5.1 Ballyboden Way to Whitechurch	12 Mount Bellew	21 Sarah Curran Avenue to Ballyboden Road
5.2 St Enda's / Grange Rd to Whitechurch	13 West Tallaght Link	22A Original part 8 - Route Ballyowen Plan (Esker)
6 Knocklyon	14 Saggart to Avoca via Rathcoole Park	22B Post part 8 - Route Ballyowen Plan (Esker)
7 River Camac to Green Route	15 Paddocks to Hillcrest Adamstown	

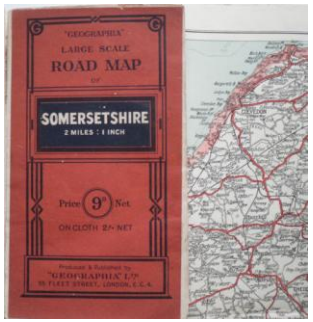
Scheme Benefits & Costs







Future modelling opportunities



Summary

Transport Modelling is very important in order to:

- Understand current conditions
- Identify improvements
- Assess improvement options
- Present options to key decision makers / stakeholders
- Improve transport provision

Three Key Modelling tools have been presented, although many others exist:

- Wide area modelling
- Local area modelling
- GIS / accessibility

Modelling tools have not caught up with changing technology. Many opportunities to influence and change current approaches and techniques

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