Schemes

Final workshop of the DISTILLATE programme
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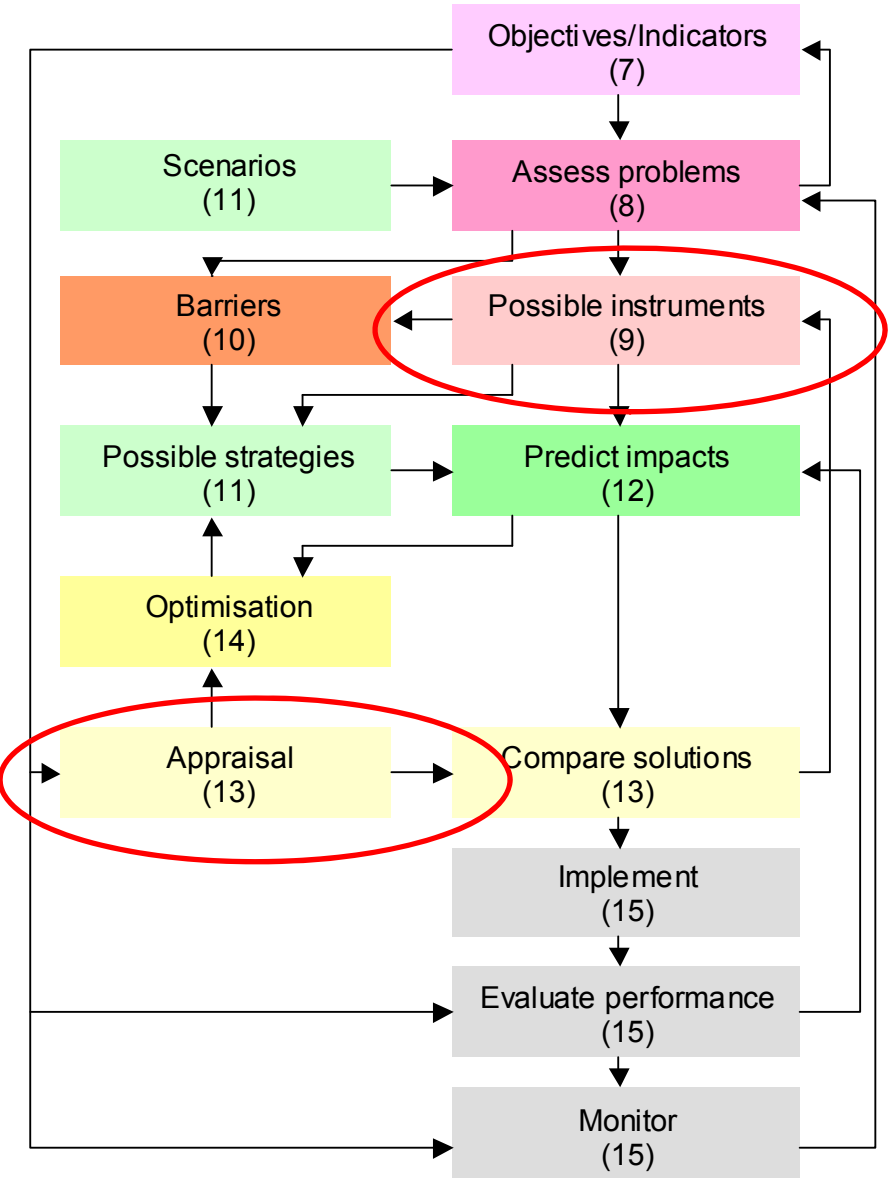
TRL

Generating Scheme Options
and
Exploring Distributional Impacts

Objectives



- To develop option generation methods
  - To enhance the range, innovation and quality of options
  - For strategies and schemes

Four Option Generation Products

	Strategies	Schemes
'Inside' the box	Packages of urban measures [KonSULT]	Streetspace main road redesign (Bloxwich)
'Outside' the box	Accessibility Planning options (Barnsley Dearne)	Community space design (Blackpool)

Facilitating Community Space Design

Using Participatory GIS to generate options

Out-of-the-Box Options

- Participants were encouraged to consider and justify their suggestions
- They were guided through this using flow chart
- This helped to identify alternative ‘out-of-the-box’ solutions

For example:

What would you change?
Improve the car park
How?
More disabled bays and better signage
Why do you want this change?
Improve safety of users
How else could you make the area feel safer?
Stop the kids hanging around
How would you do to achieve this?
Put in facilities for kids

- So a ‘solution’ to a ‘transport’ issue – might be better play facilities

Designing Streetspace Options

- Urban street design often causes major controversy – difficult to gain public support
- Conventionally engineers develop a preferred solution, which goes to consultation
- Little attention paid to options:
  - Which street design elements are included?
  - How many and when?
  - Where are they located?

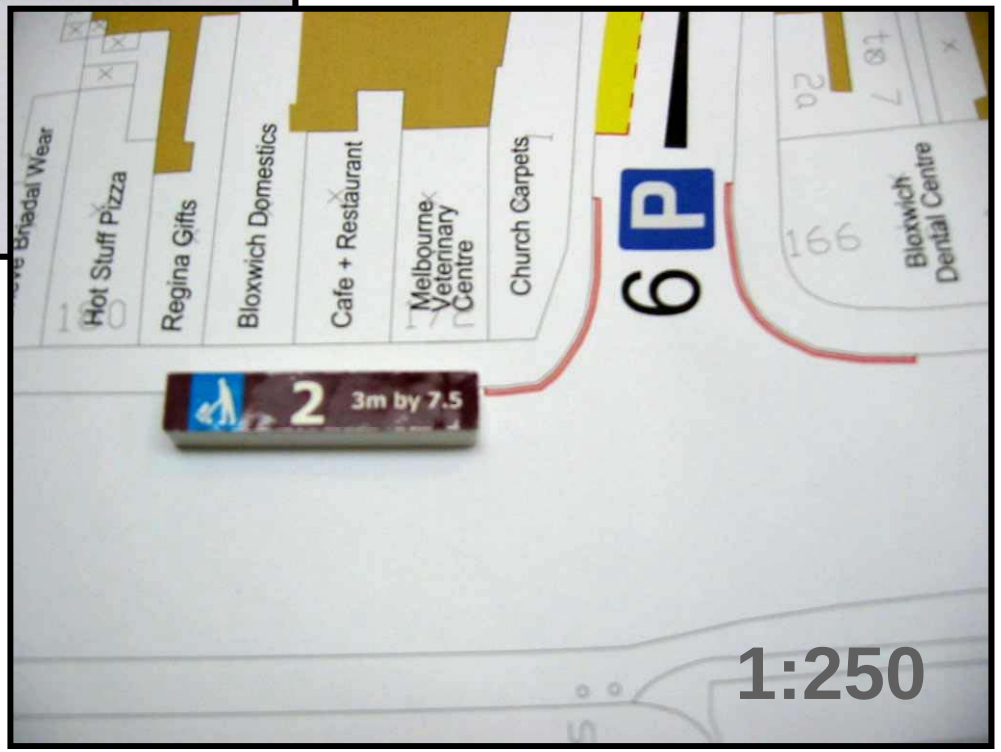
The Tools: ‘Blocks’ & ‘Bytes’

- For use in more complex streets, where have many competing street user groups
- Two complementary techniques:
  - Physical design exercise with local communities: scale plans, blocks, acetates
  - Conversion to electronic, GIS format, for use in larger public meetings and for developing engineering drawings

Tool 1 - Blocks

- By using blocks to scale, and detailed maps of the high street:
  - Users are made aware of many of the component options for allocating street space
  - They then generate their own options, by combining blocks in different ways and locations
  - Maps to scale allow users to work within the constraints that the engineers, face without having to have a detailed knowledge.

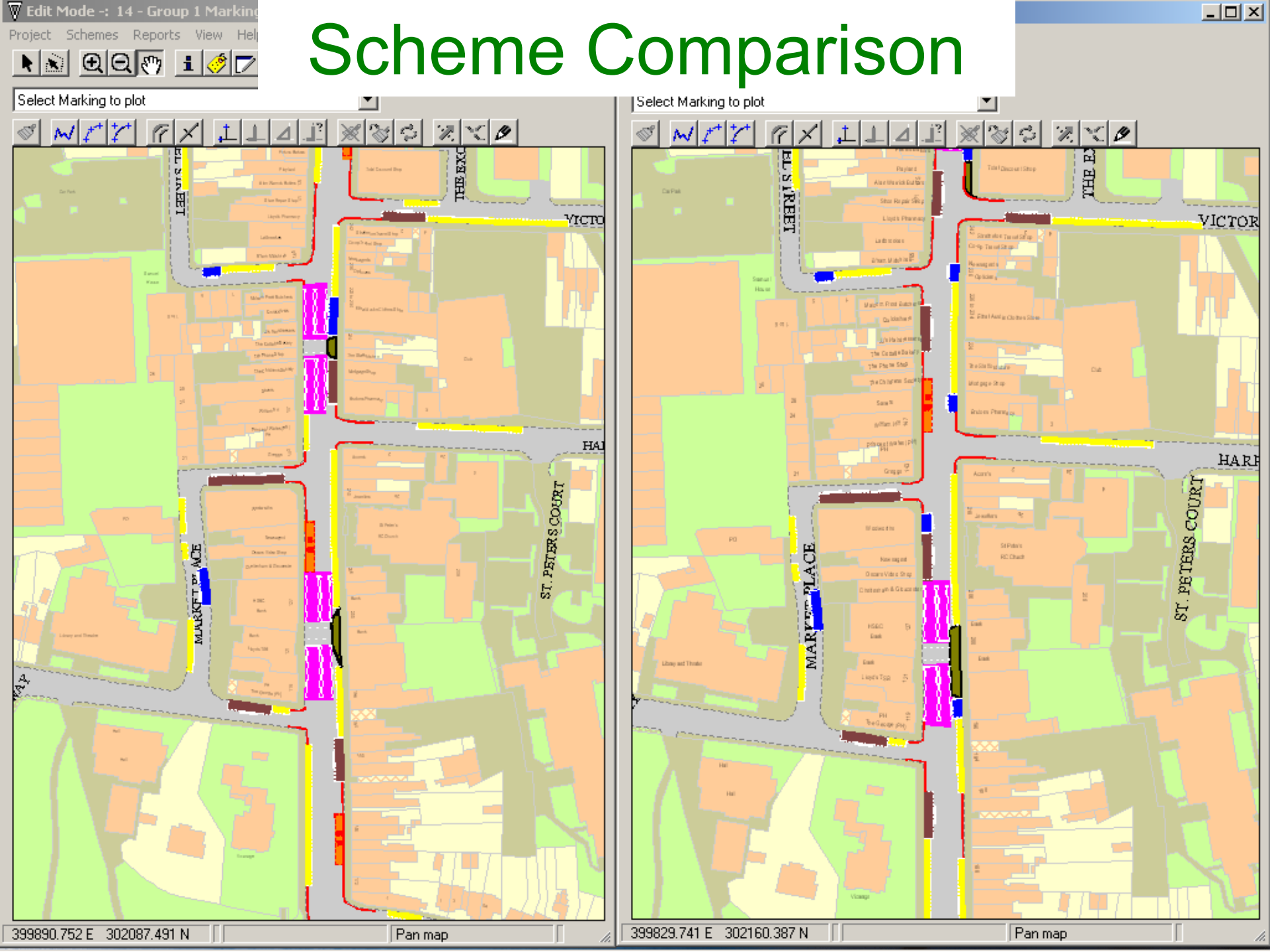
Example of Loading Bay Block



Tool 2 - Bytes

- Based on a development of LineMap, a GIS based tool developed by Buchanan Computing to plot road markings
- The software plots all road markings from UK Traffic Signs Regulations and General Directions (TSRGD) 2002
- Now converts to/from the block format, and can be edited on screen

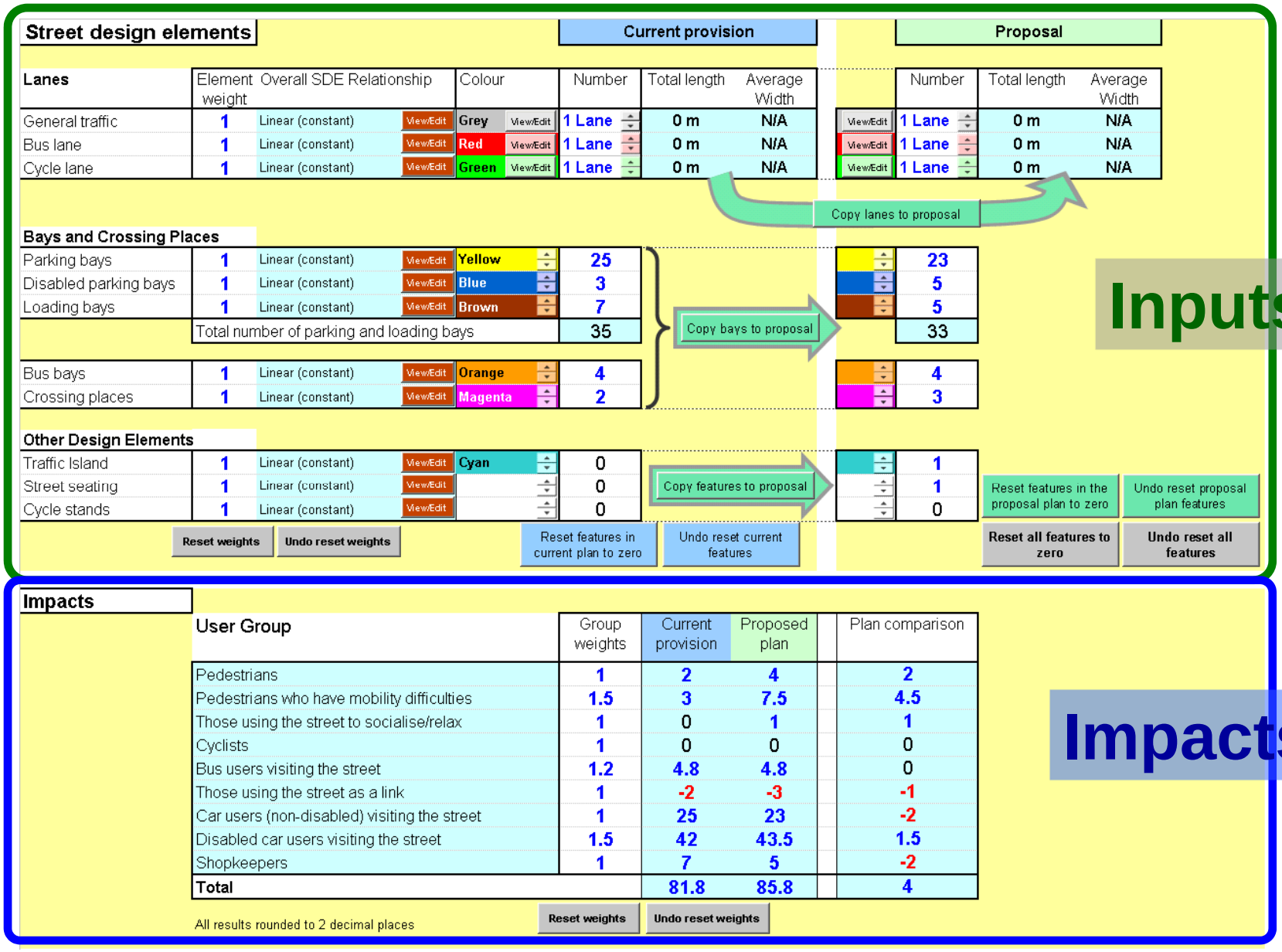
Scheme Comparison



Conclusions

- Using scale blocks and maps makes the design process as simple as possible to understand, and highlights opportunities and constraints
- LineMap provides a bridge between outline design and professional drawings – suitable for use in larger public meetings for scheme editing
- Enables councils to regain confidence of local people and plan with a wider understanding of the needs of an area.
- Allows members of the public to participate in street design and encourages innovative solutions
- High level of public support for resulting scheme
- Council very pleased with outcome – removes normal confrontational approach

Identifying Distributional Impacts

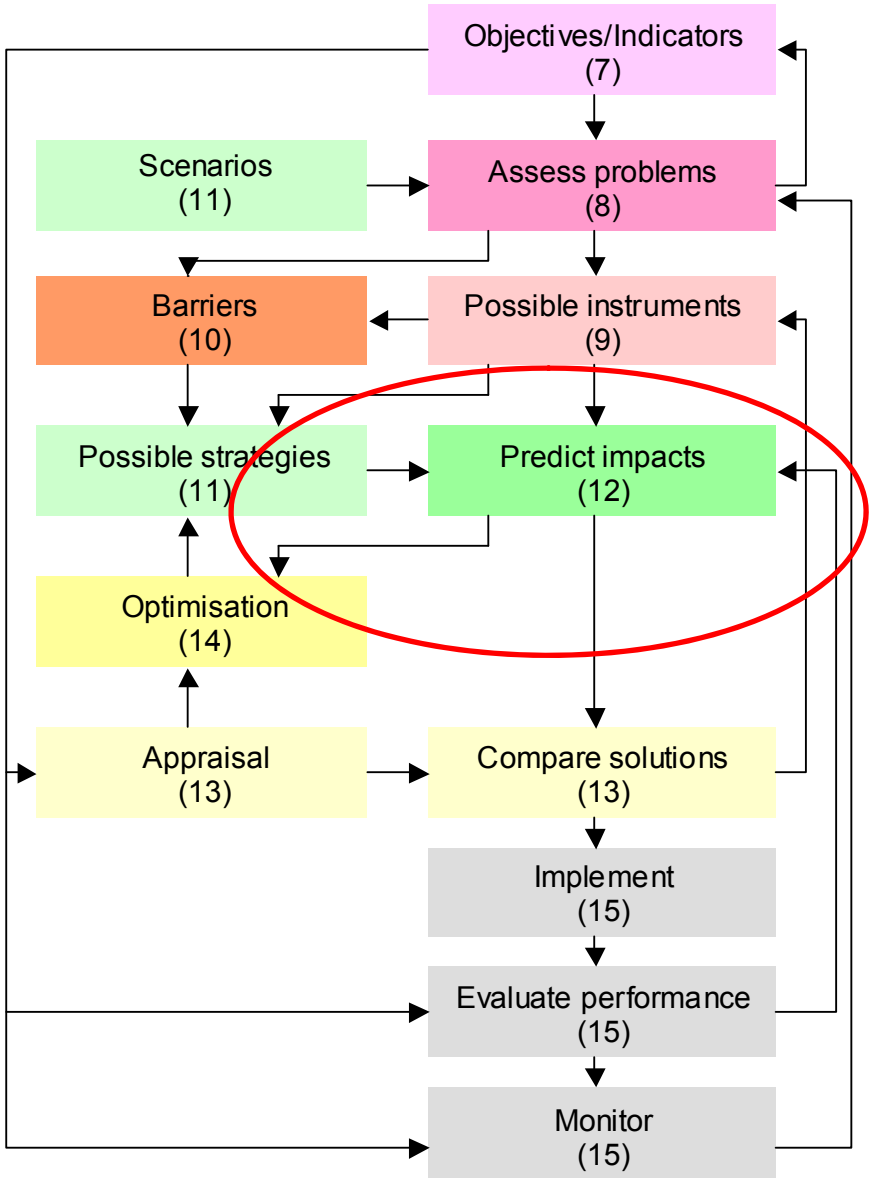


Impact calculations

- The impact calculations rely on a matrix that specifies whether a design element has a positive or negative impact for a particular user group
- Weightings can be applied to
  - User groups
  - Street design elements
  - Individual user group/element pairs
- Adjusting the weights allows the comparison to reflect the relative importance of particular user groups or street design elements
- Values in the matrix can be adjusted to show the particular importance of a design element to a particular group – for instance, disabled parking bays for disabled drivers

Enhanced analytical decision support tools

Objectives



- **To enhance existing predictive models to represent a wider range of policy instruments**
- **To improve the ability of users to apply models**

Suggested Themes

1. Demand restraint measures
2. Public transport improvements
3. Land use measures
4. Soft measures (attitudinal)
5. Slow modes and small scheme impacts
6. Data issues
7. Model use

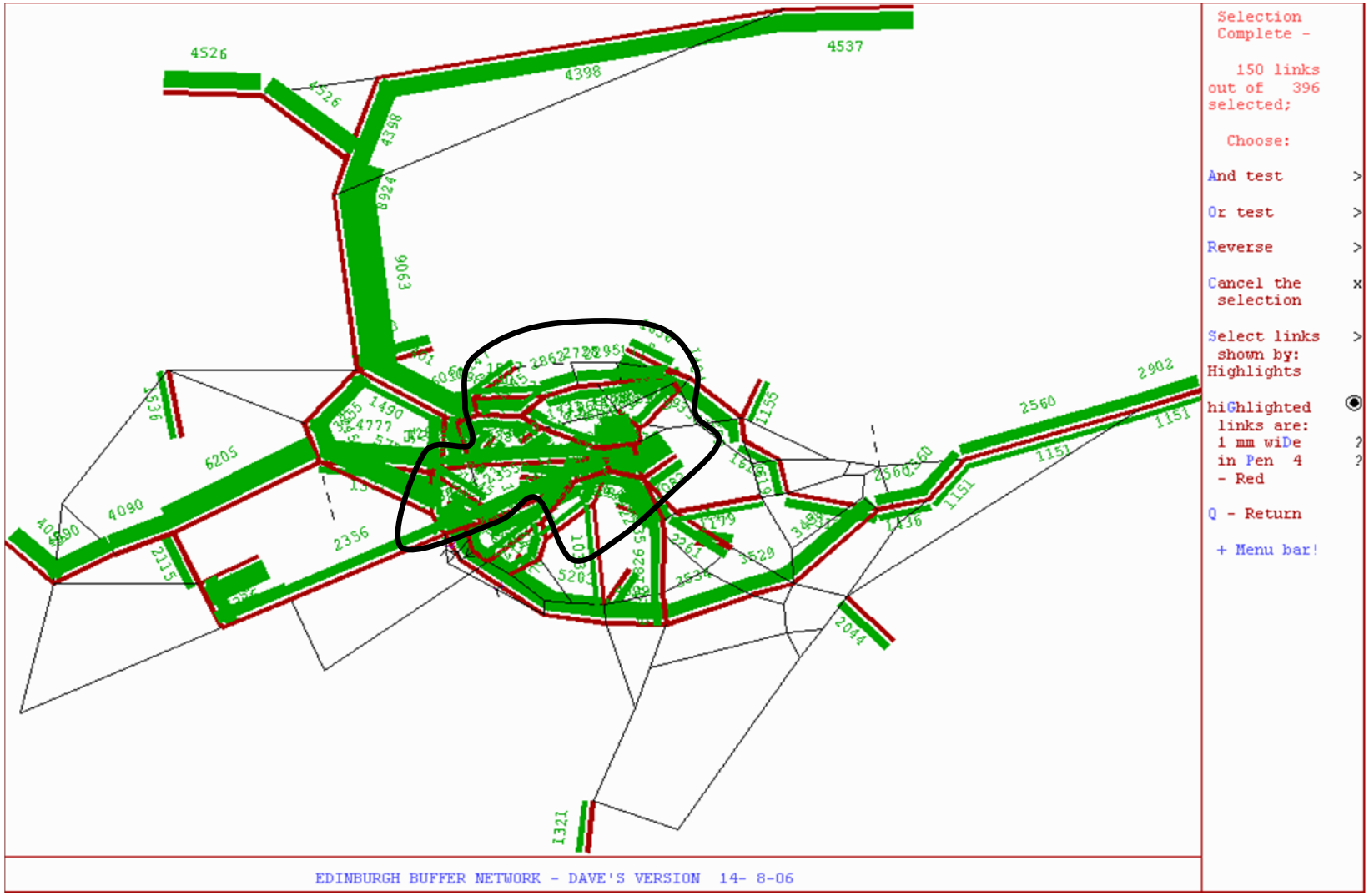
Demand restraint modelling

- Cordon location –short cut approach
- Area based charging
- Parking choice model

A short cut approach to cordon location

- Aim to develop a method between judgement and Genetic Algorithm based approach
- Use fact that Top 15 marginal cost tolls gave high proportion of first best benefits
- Charge a high cost trip somewhere – not necessarily on the high cost links
- Use Select Link Analysis to design where best to place cordon and catch the high cost flows

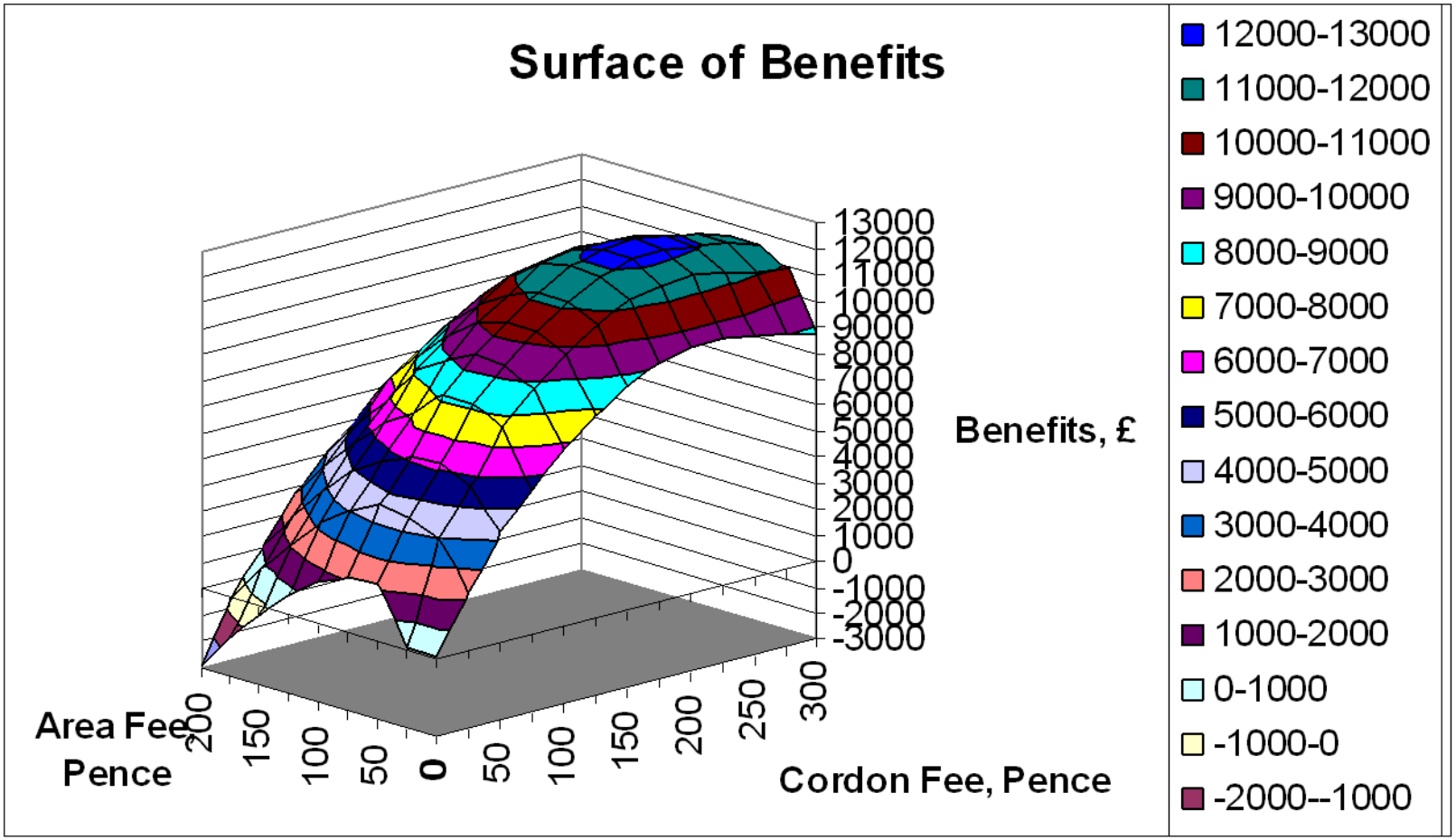
Display SLA using bandwidths



Area based charging

- Adapt models to charge for trips within an area rather than per crossing of a cordon
- Allow exemptions or discounts for residents
- Implemented in SATURN
- Tested on a Cambridge network

Area based charging benefit surface



Parking model

- Develop a simple parking location choice model with the demand spread over multiple time periods
- Integrate within assignment stage of the transport modelling process
- Illustrate the method with practically available data for a realistic network of Leeds
- Develop a modelling framework that can be used to test parking demand management policies

Improved Public transport modelling

1. DRACULA – Bus reliability

2. STM Partial modelling of trip chaining (extended park and ride)

DRACULA – Bus reliability

- Incorporates interactions between bus operation, passenger arrivals, boarding times and private traffic.
- Simulation helps understand impacts on reliability and tested alternatives to increase reliability
- York case study

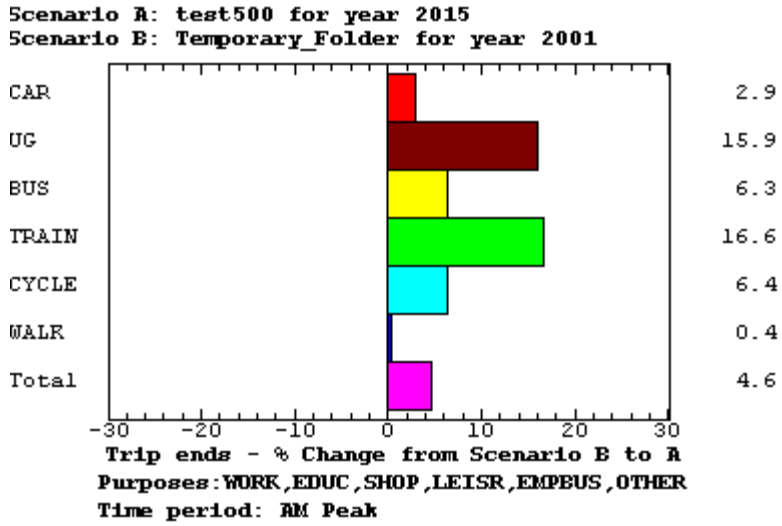
Bus reliability - results

- Headway variation and number of passengers boarding interrelated:
- Unreliability increases with congestion and passenger demand
- Passenger demand has more serious impact on headway variability than on total journey time
- Extension of bus-lane itself does not improve reliability, but combined with signal gating strategy will bring benefit
- Reduced boarding time (advanced ticketing system) brings in most significant improvements

STM – Park and Ride

- Treats trip chaining in terms of park and ride at Glasgow underground stations (Subway system). The entire Subway system can be modelled.
- Uses model of capacity constraint including ‘overflow’ model to transfer excess demand at car parks.
- Used to investigate interaction between direct travel to Glasgow centre and by Subway park and ride in context of strategic model.

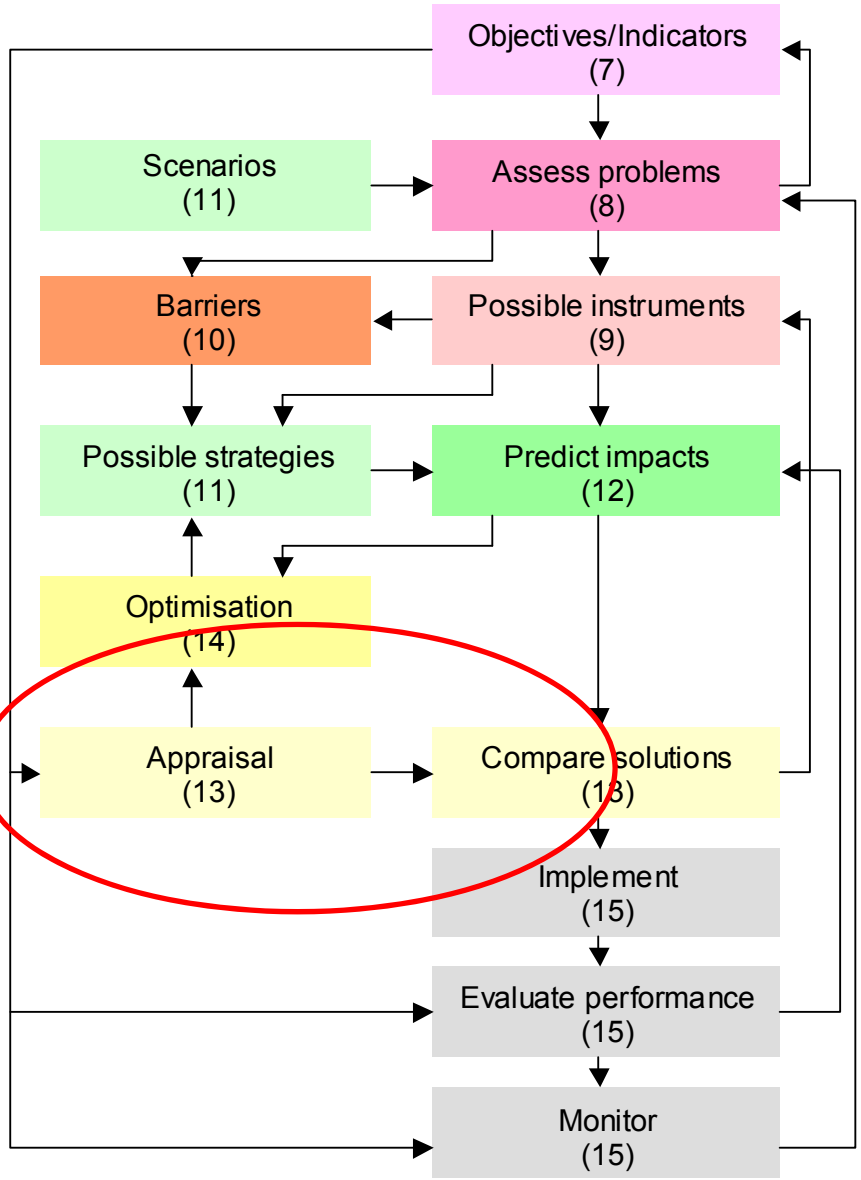
Run I (50% increase in jobs) – impact on Subway system



% mode share increases for all the catchment zones – Subway increases by about 16%

Small and local scheme assessment

Objectives



Overall objective:

- To develop appraisal methods which reflect the requirements of sustainability

Small and local scheme assessment:

- Methods for appraising small schemes

Looking at the inconsistencies between targets and appraisal:

- Appraisal methods and sustainability

Small and local scheme assessment

Motivation came from local authority requirements:

- Proper assessment of small (non major) schemes
  - prioritisation
  - analysis
  - assessment of behavioural and attitudinal measures
    - publicity campaigns
    - intensive marketing
    - targeted travel advice
- Assessment against targets/indicators (not formal appraisal)
- Transparent process
  - A number of methods had been developed for individual authorities but worked as a black box
- Authorities wanted a decision support tool NOT a decision making tool

Methodology

The tool is an (Excel based) assessment matrix with the following stages:

1. Select indicators to be included in assessment
2. Weight the indicators on a scale of importance to the LA (1-5)
3. Assess the impact of each proposed scheme against the indicators (scale -3 to + 3)
4. Score = ∑importance*impact score for all indicators for each scheme
5. Estimate cost of scheme
6. Compare score and cost across all potential schemes

Screenshot – assessing the impact

Stage 3: ADD THE IMPACT SCORE

In this stage you will need to estimate the potential impact of the project that you are assessing on the indicators that have been selected.

In this section you will need to make an assessment of how you think the project will impact against each selected indicator.
Each indicator should be given an impact score of between -3 and + 3. A negative score means that the indicator has got worse

Highly Significant Negative Impact			Neutral			Highly Significant Positive Impact
-3	-2	-1	0	1	2	3

Examples:
e.g. the project will reduce the number of cyclists killed by 50 so it is a highly significant +ve impact and a score of 3
e.g. the project will increase local pollution by 20% so will be given a score of -3

Step 1: You can assign an impact score using the impact score drop down box
Step 2: When you are happy with the weights click on the stage 4 button
Step 3: the notes/ evidence section has been added to back up impact scores given

Stage

Scheme Description: Pedestrian Crossings

Indicator Type	Indicator	Category	Impact Score
LTP_Mandatory	% of a) households; b) households without access to a car; within 15 and 30 minutes of a GP by Public Transport	Accessibility	1
LTP_Mandatory	Congestion (vehicle delay).	Economic	0
LTP_Mandatory	Cycling Trips (Annualised index)	Accessibility	0
LTP_Mandatory	Bus punctuality Indicator	Accessibility	0
LTP_Mandatory	Total killed and seriously injured casualties	Safety	2
LTP_Mandatory	Child killed and seriously injured casualties	Safety	1
LTP_Mandatory	Principal Road Condition	Maintenance	1
LTP_Mandatory	Footway Condition	Maintenance	0
LOCAL	Percentage of residents surveyed who said they feel 'fairly safe' or 'very safe' during the day whilst outside in x (authority name)	Safety	2

Screenshot – final screen

STAGE 4: RESULTS

Scheme Description	Pedestrian Crossing	**Assessors Initials**	ck
DATE OF ASSESSMENT	12/11/2007	**Expected cost of scheme**	£20,000
		You need to add in your estimate of the cost	
Number of Indicators included	12	**You then need to either save this page as .txt file or copy and paste into the scheme comparison file. Then you can re do stage 3 and 4 for the next scheme**	
SCORE	31		

Type	Indicator	Category	Combined score (impact x importance)	Importance Score	Impact Score
LTP_Mandatory	% of a) households; b) households without access to a car; within 15 and 30 minutes of a GP by Public Transport	Accessibility	3	3	1
LTP_Mandatory	Congestion (vehicle delay).	Economic	0	2	0
LTP_Mandatory	Cycling Trips (Annualised index)	Accessibility	0	2	0
LTP_Mandatory	Bus punctuality Indicator	Accessibility	0	4	0
LTP_Mandatory	Total killed and seriously injured casualties	Safety	10	5	2
LTP_Mandatory	Child killed and seriously injured casualties	Safety	5	5	1
LTP_Mandatory	Principal Road Condition	Maintenance	2	2	1
LTP_Mandatory	Footway Condition	Maintenance	0	3	0
Local	Percentage of residents surveyed who said they feel 'fairly safe' or 'very safe' during the day whilst outside in x (authority name)	Safety	6	3	2
Local	Number of Home Zones	Other	0	4	0
Local	Percentage of all households within 13 minutes walk of an hourly or better bus service	Accessibility	2	2	1
Local	Number of days of air pollution	Environmental	3	3	1

Looking at the inconsistencies between targets and appraisal

Motivation came from local authority concerns:

- Formal appraisal as a barrier to the delivery of sustainable transport schemes
- Role of appraisal in decision making
- Particular concerns:
  - Importance of travel time savings (and treatment of fuel duty)
  - Value for Money (VfM) and achievement of objectives

Exploration of the issues

- Partly looking at the political and practical issues around appraisal
- What should the relationship be between appraisal, VfM, and the choice of schemes to deliver policy?
  - the potential inconsistences between appraisal/VfM and “policy fit” (or achievement of targets)

Addressing the problem

- Review of possible approaches:
  - Aligning the indicators used, their relative weights and the target values with the criteria used in appraisal
  - Setting targets to be consistent with the outcome of an appraisal of a complete strategy to achieve sustainability objectives

- The aim will be to increase the consistency and transparency with which decision making is carried out and raise awareness of this important issue

No easy answers!