

# DISTILLATE Product B4 – Option Generation

## Rapid Appraisal Participatory Geographic Information System (RAP-GIS) for ‘Out-of-the-Box’ Transport Option Generation with ‘Hard-to-Reach-Groups’

### Introduction

DISTILLATE is a four-year programme of research, funded by the Engineering and Physical Sciences Research Council (EPSRC) and carried out by four universities and the Transport Research Laboratory (TRL), in conjunction with local authority partners. The broad aim of DISTILLATE is to develop new products (processes and techniques) that will assist local authorities in developing and implementing sustainable transport strategies and schemes. The research programme consists of seven streams of work, one of which (Project B) deals with improved techniques for option generation, including public involvement.

There are four products being developed as part of Project B. The one reported on here deals with how to improve the development of scheme options involving local residents and generating potential transport solutions that may be considered ‘out-of-the-box’.

Blackpool Council kindly agreed to host the case study development of this activity. The area targeted for the development of the tool was a suburb of Blackpool city centre called Bispham village (see figure 1). This area comprised a local retail centre, well linked to the main inner-city road network, and serviced by public transport. The project team engaged with the local residents committee and local councillors to ensure the inclusion of their concerns in the tool development.



Figure 1. Panorama of Bispham village, Blackpool – location of the DISTILLATE fieldwork

### Research Questions – Problem Definition

The research problem this activity was intended to address included:

1. Methodologies to facilitate the development of scheme options for transport solutions that encouraged the identification of ‘out-of-the-box’ solutions

2. Develop methods and tools to engage with so called 'hard-to-reach' groups to identify the scheme options

## Methods

### Study approach and timing

The approach taken in the DISTILLATE tool development was to build on the findings of the successful EPSRC inclusive and urban design project, Inclusive and Sustainable Infrastructure for Tourism and Urban Regeneration (InSITU, see [www.insitu.org.uk](http://www.insitu.org.uk)), which had utilised a form of participatory GIS (GIS for Participation) to incorporate residents views in urban design schemes. In particular the on-street engagement techniques which had been piloted in York and Salford during the InSITU scoping study were taken as the basis for the tool development carried out in Blackpool for DISTILLATE.

The fieldwork for the study was carried out over three days during the summer of 2007, specifically on Saturday 23rd June, Tuesday 10th July and Wednesday 11th July.

### Engagement with hard-to-reach groups

Bickerstaff and Walker (2005) highlighted the high priority given by the Government to the need to foster 'civic engagement'. Especially since 2000, there has been a considerable expression of concern to respond appropriately to 'declining public participation in political processes' and 'growing public distrust of authority and expertise (c.f. House of Lords 2000; House of Commons 2001; IPPR 2004). Several recent government reports (Lyons, 2006; ODPM, 2006; UTU, 2005) have also emphasised the need for well-designed and inclusive public realms for the sustainable regeneration, reducing social exclusion and improving 'liveability'. There has also been an emphasis on the need for authorities to open up continuing dialogues with diverse communities and end-users to incorporate their views, preferences and valuable local insights into the process of urban design; the government's Urban Task Force (UTF) report suggests that "[t]oo often, design is imposed on communities rather than involving them" (UTF, 2005). Failure to engage widely has led to the exacerbation of a perceived disenfranchisement and a real disenchantment of many locals with the strategic course of regeneration and renewal schemes and projects. Further, the UTF has said that in many cases '[u]rban streets are over-engineered to maximise traffic flow, pedestrians and cyclists [both usually locals] are still treated as second- or third-class citizens' (op.cit.).

Defining these 'hard-to-reach' groups is obviously problematic, contentious and possibly divisive, however, local authorities in general have typically identified the following types of person for as requiring special effort for inclusion:

- People from black, minority or ethnic groups
- Asylum seekers
- People with disabilities
- Young people
- Older people
- People living in areas of deprivation or on a low income

Local authorities have experienced difficulties in engaging with these groups. Problems that have been identified that may be exacerbating the lack of engagement from these groups include language barriers, cultural differences, time, and ability to attend conventional consultation events.

A particular remit for the methodological tool development presented here was to investigate whether the use of a form of participatory GIS (PGIS) would encourage greater involvement from specific target groups, for this case of interest to Blackpool City Council: particularly the young, elderly (including those living in single occupancy households) and people with disabilities.

### Out-of-the-box transport schemes

While in our everyday experience, new ideas often appear to come from nowhere, ‘knowledge science’ has identified complex interactions between the quantity of knowledge and wisdom we possess, the level of our curiosity and enthusiasm, and our reluctance to engage. The challenge in developing tools for option generation in any applied field is to create an environment where these seemingly random processes can be stimulated and made rational, systematic, transparent and accountable.

Within the DISTILLATE framing of this issue, to qualify as an ‘out-of-the-box’ scheme, the proposals generated have to be ‘new’ in some generic sense and not simply a proposal that would be a ‘first’ implementation of a known scheme option in that particular location.

For scheme option generation with residents this required the development of a tool that promoted lateral thinking away from the obvious ‘transport’ focussed solutions. Instead the tool was intended to assist participants in identifying schemes that would address transport issues but possibly in a non-obvious way.

## Tool Development

### RAP-GIS

In order to facilitate the engagement with – and participation of – hard-to-reach groups, a rapid appraisal form of PGIS was developed. PGIS was thought to be particularly appropriate as a way of overcoming some of the problems identified by local authorities when engaging with hard-to-reach communities. The primary benefits of the RAP-GIS approach were that the technique is carried out in-situ at varying times and locations. This approach overcomes some of the barriers to engagement experienced by particular groups, for example, young people and those with childcare responsibilities as well as those who leave the house seldom or are dependant on carers for mobility.

The tool development included identifying a form of questions that promoted ‘out-of-the-box’ thinking for the participants, linked to rapid participatory mapping of their ideas.

#### *Structure query set: Stimulation of ‘Out-of-the-Box’ suggestions*

In order to encourage local residents to identify options for schemes beyond their initial, possibly obvious, suggestions an iterative structured querying approach was employed. This approach was a development of the structured queries trialled in the EPSRC funded scoping study, InSITU. Here structured queries were used to ensure the replicability of the interaction of the facilitators with the participants. During DISTILLATE this approach was further developed to promote the identification of ‘out-of-the-box’ thinking by participants during their RAP-GIS session. These queries were integrated into the mapping activity to further stimulate lateral thinking by engaging with the physical attributes and options presented by the specific location.

Firstly the feature to be changed was identified and if appropriate mapped as a ‘problem’ on the participatory maps. The participant was then asked to identify what change they would make and again indicate where they would implement this on the mapping (if appropriate). They were then asked to describe what this change would achieve and why this outcome was needed, or what benefits it would generate. These last three stages were iterative with people asked to think if an alternative change could achieve similar, superior or complementary improvements and again mapping where this would be implemented. The stages in this process can be seen in figure 2.

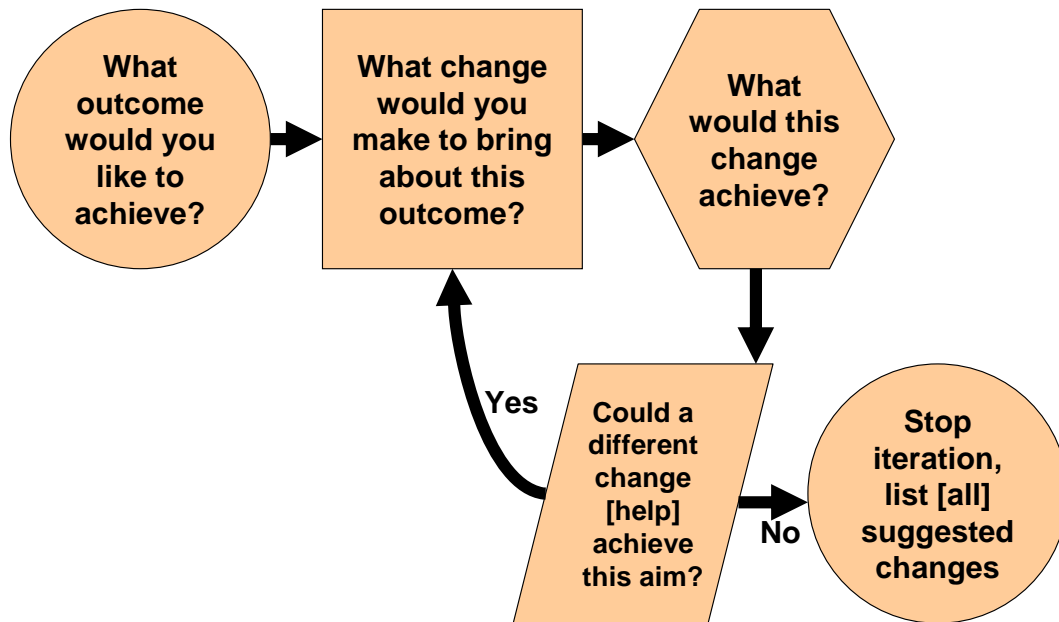


Figure 2. Iterative structured queries to encourage ‘out-of-the-box’ scheme solutions linked to RAP-GIS

A worked example may provide the best overview of how the structured queries were applied in practice.

*For example:*

*What outcome would you like to achieve?*

**Improve the car park**

Car park marked as problem on map

*What change would you make to bring this about?*

**More disabled bays and better signage**

Preferred location and type of disabled bays and signage marked on map

*Why do you want this change?*

**Improve safety of car park users and shoppers**

*Could a different change achieve this aim? Could a different change help with safety?*

**The kids hanging around make me feel unsafe – especially when they hang out in groups. So I would stop the kids hanging around.**

Location of where kids loiter marked on the map as a problem

*What change would you make?*

**Put in facilities for kids...**

This was followed by a discussion of what kinds of facilities for children were needed and where they could be located. The other options for improving safety were then discussed in a further iteration of the structured queries.

Other ‘out-of-the-box’ suggestions included improving the office space to ensure that the area, shops and car park remained well used and vibrant leading to overall regeneration which would mean greater access to local services for everyone. Another example was the problem of road safety – with the problem of excessive speeds on the current road sections – leading to a option of traditional traffic calming – but then moving onto increased pedestrianisation instead of traffic calming to slow traffic and the consequent increase in the space available for community use of the ‘village’ area (a hybrid version of this option can be seen in figure 13 below).

#### *In situ and multi-temporal survey location*

The RAP-GIS tool was specifically designed to be used in-situ at the location for which schemes were being discussed. The consultations were carried out in a Council branded caravan that was placed in the centre of the study area (see figure 3). The van was highly visible to all users of the space, and encouraged the curious (of all groups) to enquire “what’s going on?”



Figure 3. On-street in-situ consultations carried out in a Blackpool Council branded vehicle

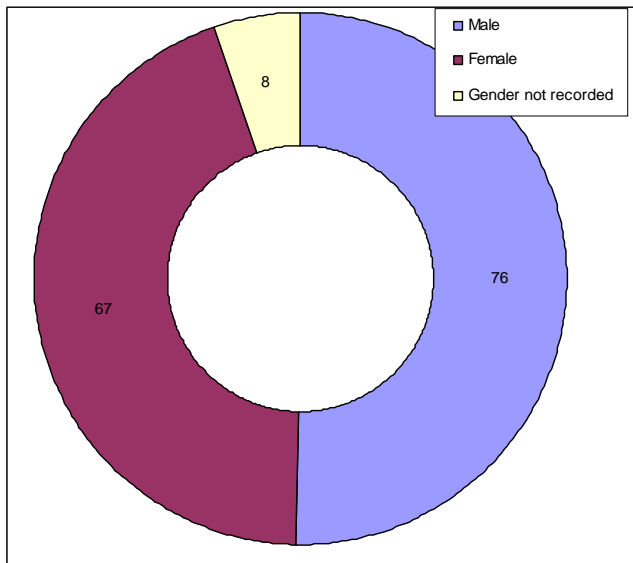
Once engaged, potential participants were informed that the research team was not from the Council – but that anything communicated to them would be passed to the Council for consideration. In addition participants were told that the consultation process could be completed in five minutes. This combination of usefulness of the exercise and rapidity encouraged a high uptake from participants (see figure 4).

The use of on-street RAP-GIS mapping allowed people who could not (or would not) consider attending a public meeting to make a contribution whilst undertaking their everyday activities. In addition, the consultation was carried out at a range of times from early morning (during the

commute to work and school run), through the day and into the early evening when younger people utilised the space. This flexibility of when people could participate also encouraged people who might not normally be willing, or able, to spend any significant length of time answering surveys or attending meetings to making sure their views were included. Moreover, as the research team were there all day, people could chose when to spend their ‘five minutes’ with us and some made a return visit at a more opportune moment.

These benefits of the RAP-GIS tool ensured that the range and number of participants (particularly from the hard-to-reach groups Blackpool council were interested in targeting) was high compared to that which may have been achieved using conventional consultation techniques (see figure 4).

In total 151 people participated during the Distillate engagement exercise. The research team was particularly directed by Blackpool Council to engage with young people and those with mobility issues. Of the people who participated, 31 were under the age of twenty years (approximately 21% of participants). These corresponded to a group who would typically not attend conventional consultation exercises and meetings held by the council. The RAP-GIS approach appeared to overcome barriers to participation due to the benefits of being in-situ and also through the novelty of the mapping approach. In terms of people with mobility issues approximately seven people (5%) who clearly had mobility issues (as manifested through the use of walking aids or wheelchairs) participated. These included older people (in the 65+ age range) alongside younger people with disabilities. In addition to the direct participation from this group a number of other people made reference to family members who had mobility issues and the problems they experienced in the local area. They also generated potential solutions including the better zoning of parking, safer crossings, slower traffic, better public transport and wider bays for disabled drivers next to the main parade of shops.



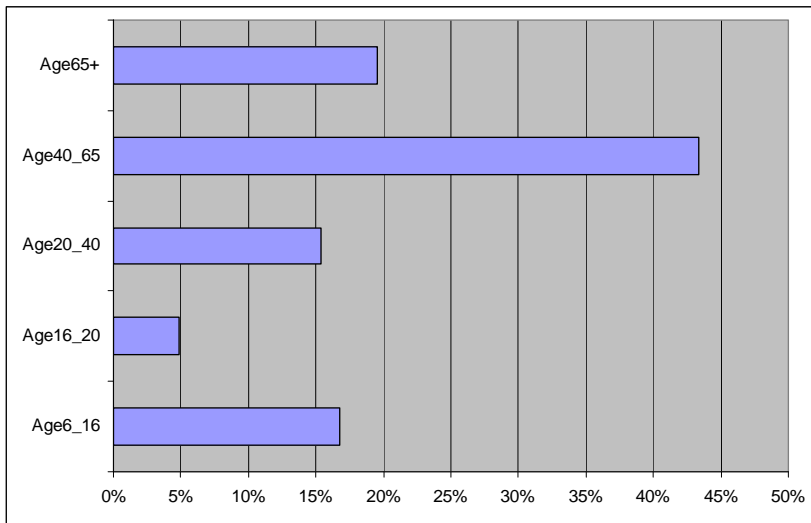


Figure 4. Top graph shows the number of participants, split by gender. The bottom graph indicates the age profile of participants

### *Individual mapping*

During the consultation, participants were asked to indicate information about problem issues, scheme solutions and where they could be implemented. This was done on individual maps for each participant: individual maps were used to encourage ‘new’ thinking rather than building a collective or consensus viewpoint reached through group discussion or ‘Planning for Real’ type collective mapping as has been the case with past implementations of PGIS. In some limited circumstances small numbers of participants collaborated on the development of a single map. For example, families tended to work together as did small gangs of school children. These were treated as single maps, but the age and gender of all participants recorded separately as individuals to indicate the level of participation. If there were disagreements within these small groups, individual maps of specific viewpoints were completed.

The A3 sized base maps provided to participants were composites of Google Earth imagery. The specific zone under consideration for scheme development had a lens applied to bleach out the underlying imagery making it clear the locations of primary consideration. This also facilitated clearer mapping (by being able to clearly see any additions even on full-colour imagery). A mixture of colour versus black and white base maps were employed to assess participants’ preferences. Whilst the younger participants showed a slight tendency to select the colour base maps, overall they appeared to be no strong preference amongst participants for either type of map. This result indicates that, in future, the costs of materials could be reduced through the use of black and white maps without impinging of the levels of participation (unless, of course, there was a particular drive to attract younger participants).

The visual nature of participatory mapping removes the barriers of literacy and to an extent language (although potentially introducing a new barrier for visually impaired groups). One of the benefits of PGIS is that the maps become the focus of participation; this is particularly the case with the RAP-GIS tool developed under DISTILLATE. This tool removes the barriers present in public meetings where often the most vocal or confident people can dominate discussions (unless carefully facilitated (Cinderby and Potts, 2007)).

The RAP-GIS tool allows the generation of target group specific information. In the Blackpool case study, information on age (split into five groups as shown in figure 3) and gender were

recorded. In alternative scenarios, specific groups might be selected based on their particular concerns, unique knowledge or understanding, or target groups selected by the local authority. For example, if scheme options for people with mobility problems were particularly relevant, then demographic details of this target group could be recorded alongside the information they provide in the consultation.

### *Ethical considerations of RAP-GIS*

Best practice guidelines have been suggested for the use of participatory GIS (Rambaldi, Chambers, Fox and McCall (2006)):

- Who participates? Whose voice counts?
- Who identifies the problem?
- Who controls the process?
- Whose reality?
- Who own the outputs?
- Whose analysis and use? Ultimately...
- What has changed?
- Who has benefited?
- Who is empowered and disempowered?

The RAP-GIS technique fulfils only a subset of these ideals. The technique has been successful in increasing participation from groups who would typically not engage in conventional consultation exercises. However, there is less control over participation than would be the case at a conventional focus group-type participatory exercise where particular stakeholders or representatives of specific groups could be invited. With RAP-GIS, participation is dependent on who is in the vicinity of the on-street activities. Sufficient pre-publicity may overcome this drawback especially if targeted at specific audiences. The voices of different groups can be clearly differentiated using the technique as the demographics of the participants are recorded in the database. This ensures that the specific views of different groups can be highlighted in the generation of schemes. However, the 'group' identified have so far been selected by outside agencies (Blackpool Council) rather than being self selected by the communities involved. For example, within the under 16 age group, individuals may associate themselves with specific cultural groups, and not see themselves as a homogenous subset of society.

The problems discussed are identified by the participants, although the general theme and the geographic extent of the consultation are controlled by the facilitators and controlled physically by the extent of the paper maps used to capture local participants views. In Blackpool, a smaller scale Ordnance Survey map was available to capture additional information beyond the extent of the individual air photos to overcome this limitation.

The outputs from the process are analysed, owned and controlled by the facilitators of the RAP-GIS process, in this case the DISTILLATE researchers. This does not fulfil the criteria of best practice suggested above; however, this limitation in the process was communicated to participants during the consultation so that at least they were informed and gave their consent for this to occur. This limitation is similar to many on-street survey techniques where information is captured quickly; individuals may not feel they have significant time to consider and discuss the full implications of their participation.



Overall the RAP-GIS process fulfils some of the criteria under the guidelines for best practice but it is more extractive and less participatory than the ideal presented by Rambaldi et al. However, the technique is designed to generate scheme options that will hopefully benefit communities (or groups within them whose schemes options and preferences can be examined through the GIS database). The tool does empower communities through assisting them to generate scheme ideas for their local neighbourhood, a process they may typically have been excluded from in the past.

The options generated at the RAP stage, that is the on-street option generation phase, can then be re-presented to local forums or consulted upon to ensure more general popular – or more specific – legitimacy.

## RAP-GIS database structure

The outputs from the RAP-GIS consultation process are a number of paper maps containing a wide range of information and corresponding to data on problems, possible scheme options and demographic information. In order to enter this information into the digital database the mapped information has to be coded into a variety of thematic and spatial classes.

In the DISTILLATE example, the specific geographic extent of the case study area was split into discrete zones based on the location of comments received from the participants; these zones were given a unique code number. In a spreadsheet and linked database the specific comments received from each participant were recorded. Each participants map was allocated a unique code and the age and gender of their authors recorded to generate information and allow querying of the final database by demographic. On a separate worksheet, the comments received for specific zones linked to the map were coded for each participant depending on whether they had indicated a problem for that area or a solution. On final worksheets, the specific problems, solutions and scheme options for that area were recorded as text entries. These worksheets were imported into a database for linking to the GIS maps. PCI Geomatica was used for the GIS analysis in this case study, however, any GIS could be used to store and visualise the type of information generated by the RAP-GIS process.

## RAP-GIS Outputs

The structure of the RAP-GIS database allowed a wide variety of maps to be produced to communicate visually the results of the consultation. The visual nature of these consultation outputs appeared to help when communicating the outcomes to other stakeholders (such as other citizens, local authority officers and local community leaders). This benefit is likely to be due to the advantage that images can be assessed more quickly than written information, especially when accompanied by an oral presentation of the detail behind the images.

The RAP-GIS process could be used to generate options for the future in isolation, however, in the case study reported on here a variety of supporting information was also captured including the location of problem areas in the community. This supporting information was produced through the process of problem identification and generation of options for solutions as depicted in figure 2 above.

Figure 5 indicates the intensity of problems from all participants. Using the RAP-GIS database these results could also be visualised and broken down by age and/or gender (see figure 6). If other

target groups were important and their demographic information was collected during the consultation process then the specific information generated by these informants could also be visualised.

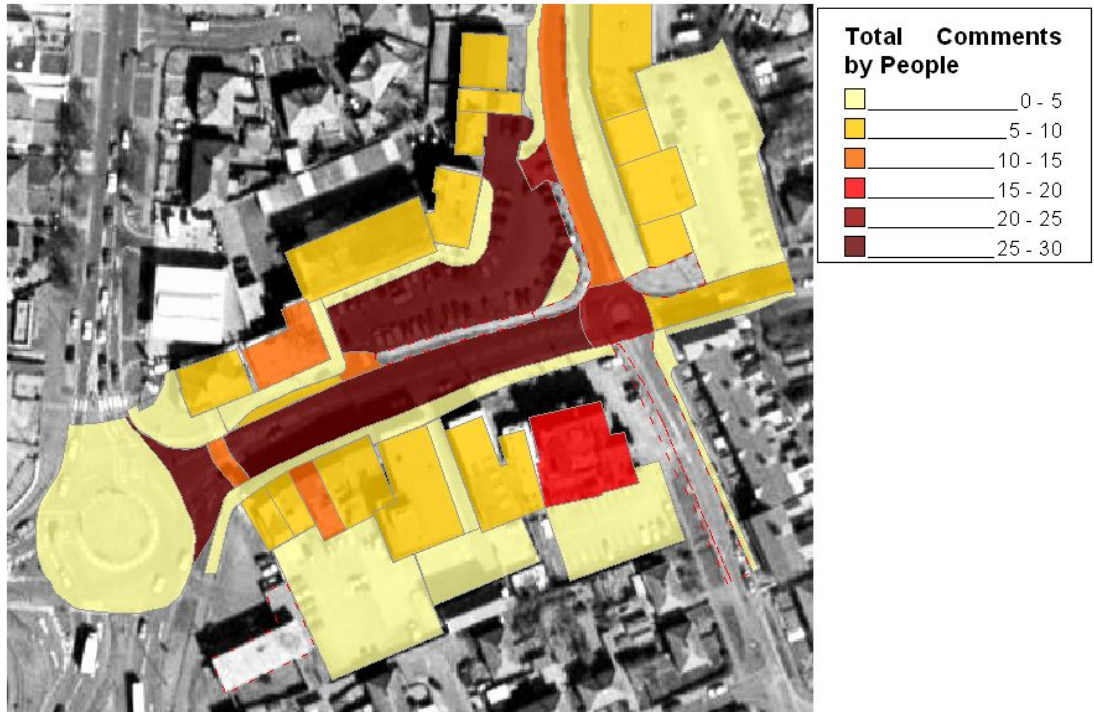


Figure 5. Intensity of problem areas



Figure 6. Comments received from participants in the youngest age range

A similar map highlighting the location of possible solutions generated by local participants can be seen below in figure 7. Some of the locations of solutions differ from the problem areas they are designed to address. For example, the highlighted area in the top centre of the map was identified as a potential site for increased youth facilities such as a skate park. This option was a solution addressing the needs of the young people in the community who currently 'play' in and around the car park causing problems in that physical location. These linkages between the spatial location of problems and solution options can be tracked in the RAP-GIS database.

In addition to the geographically located data collected through the RAP-GIS process, additional scheme suggestions, problems and ideas may also be generated. For example, in the Bispham case study suggestions to do with business rents for the shops and the availability of children's facilities were captured as separate comments within the Access database. These comments can be included in any reporting generated for local authority officers or the wider public.

These outputs provide a rapid visual assessment the locations of the information collected in the consultation together with their relative importance to participants (based on the number of comments). This was useful in communicating this data to experts, including policy makers and local authority officers.

From the RAP-GIS database outputs that identify the particular problems can also be produced to contextualise the issues participants would like to see addressed as well as the range of viewpoints. An example of problems associated with the car parking area in Bispham can be seen below (figure 8.). In addition to the text comments coded for different types of problems or differing viewpoints, supporting material such as photographs, videos or sound files can be included and visualised in the GIS database. This further contextualising of locally-specific information is particularly useful to report to local authority officers who may be thinking more strategically and other non-local stakeholders who may be less familiar with the scheme area.

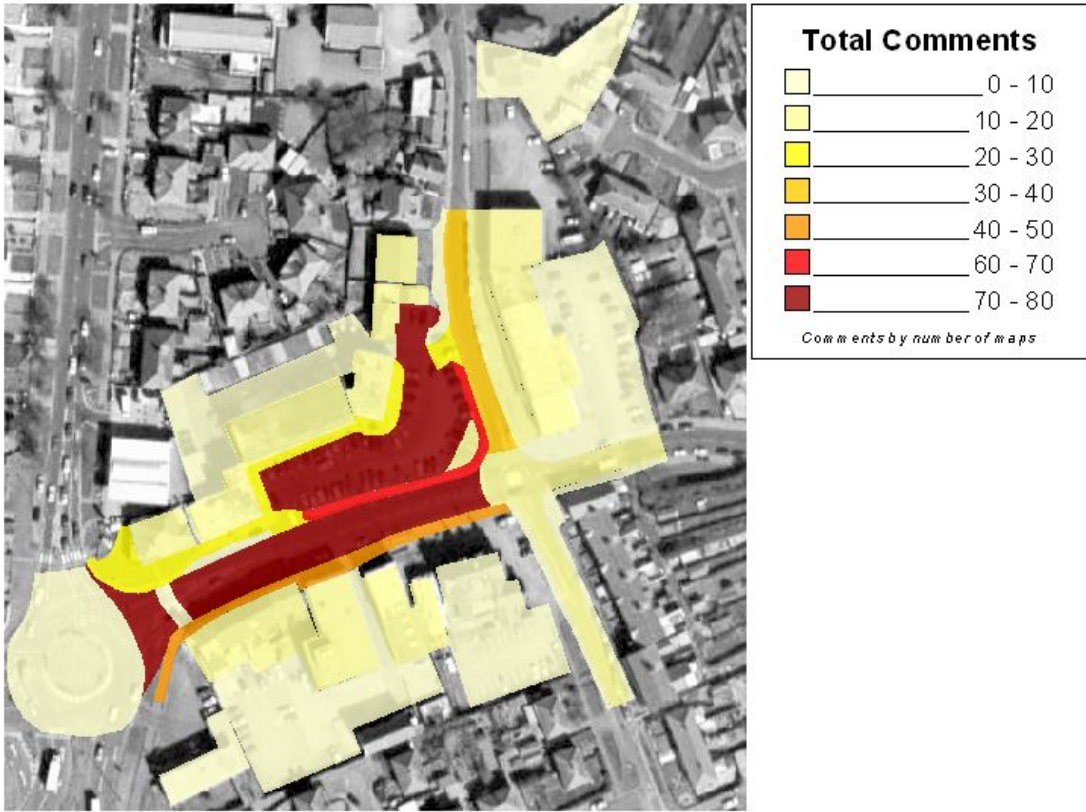


Figure 7. Spatial representation of the intensity of possible solutions generated by RAP-GIS



Figure 8. Range of comments associated with the problem zones identified by participants  
 A similar visualisation for the options generated specifically for the car park can be seen below in figure 9.



Figure 9. Range of options for solutions generated for the car park

From the collection of specific scheme suggestions generated through the RAP-GIS, tool it was possible to classify options into groups that were; complementary, neutral or mutually exclusive.

For example, improving the layout of the car park was mutually exclusive from grassing over the tarmac. However, improving the signage for the area or additional seating could be complementary to either scheme suggestion.

This differentiation and amalgamation of individual suggestions allowed composite schemes to be generated and visualised to improve their communication to a wider stakeholder group. These visualisations have been done in a vector graphics package (Corel Draw) outside the GIS although alternatively CAD may be usefully employed to carry out this process.

In the Bispham case study, two such composite schemes were identified though the RAP-GIS process. One could be considered business-as-usual (figure 10) and scheme suggestions included within it would not qualify as out-of-the-box in the definition outlined earlier. However, the second overview scheme (figure 11) which promotes increased used of the space for public transport users, cyclists and pedestrians contains ideas that for the participants would meet the criteria as novel and therefore out-of-the-box.

Initial visualisations were produced based on the scheme suggestions generated through the RAP-GIS process. These were presented to Blackpool Council transport officers in December 2008. At the meeting the visualisations proved useful in communicating the local participant's viewpoints. In addition the visualisations generated feedback on options that were not technically possible or that did not represent current best practice. For example, zebra crossings were considered old-fashioned and expensive and not the best solution to the scheme ideas generated by the RAP-GIS process. Based on this feedback, revised visualisations were produced to present back to the local residents of Bispham village for consultation. These can be seen below in figures 12 and 13.



Figure 10. Original visualisation of business as usual overview scheme suggestions



Figure 11. Original visualisation of an overview scheme to encourage greater pedestrian, cyclist and public transport access of facilities in Bispham. The change in paved surface colour was stated as a request to differentiate the space for community uses.



Figure 12. Revised visualisation of business as usual overview scheme suggestions. Changes made based on council suggestions include the use of raised pedestrian crossings rather than 'zebras'. Also the exit has been remodelled to better promote its use as an exit only to complement the clearer signage.



Figure 13. Revised visualisation of an overview scheme to encourage greater pedestrian, cyclist and public transport access of facilities in Bispham. Changes made based on council recommendations include revising the carriageway surface to more clearly match the improved paving and direct routing of the bus service giving priority over other vehicles.

## Conclusion

The RAP-GIS tool developed by DISTILLATE B4 'Option Generation' activity represents a new approach to engaging with hard to reach groups. It has proved successful in generating 'out-of-the-box' transport scheme suggestions and communicating these effectively to local authority transport officers. This novel approach holds promise as useful new tool for public engagement and scheme generation in range of settings including transport planning and urban design.

## References and Further Reading

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