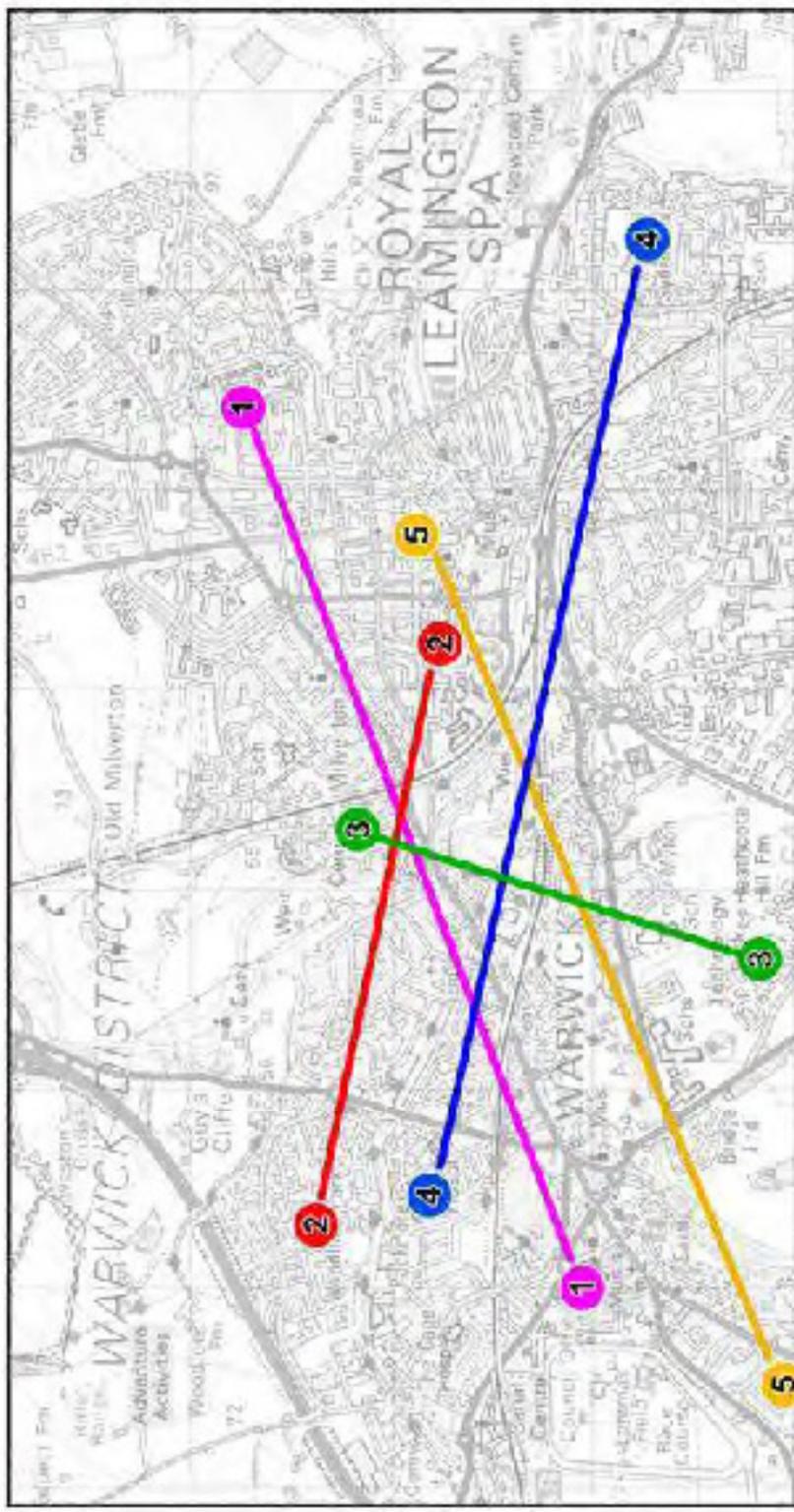


# Stakeholder Workshop 1

## Journey Time Comparisons



Journey	Origin	Destination	Bus Service	Journey Time (minutes) Start at 0800			Distance km (crow-flies)	
				Bus (inc walk)	Car	Walk Cycle		
1	Lillington	Shire Hall	G1	43	11	59	20	4.3
2	Woodloes Park	Riverside House	G1	21	14	48	14	3.1
3	Milverton	Warwick Technology Park	X17, 88	64	11	67	16	2.3
4	Sydenham	Warwick Hospital	65, G1	51	15	74	22	5
5	Shakespeare Av	Leamington Spa Town Centre	18A	36	12	63	20	4.7

# Stakeholder Workshop 1

## Walk and Cycle Networks



ATKINS

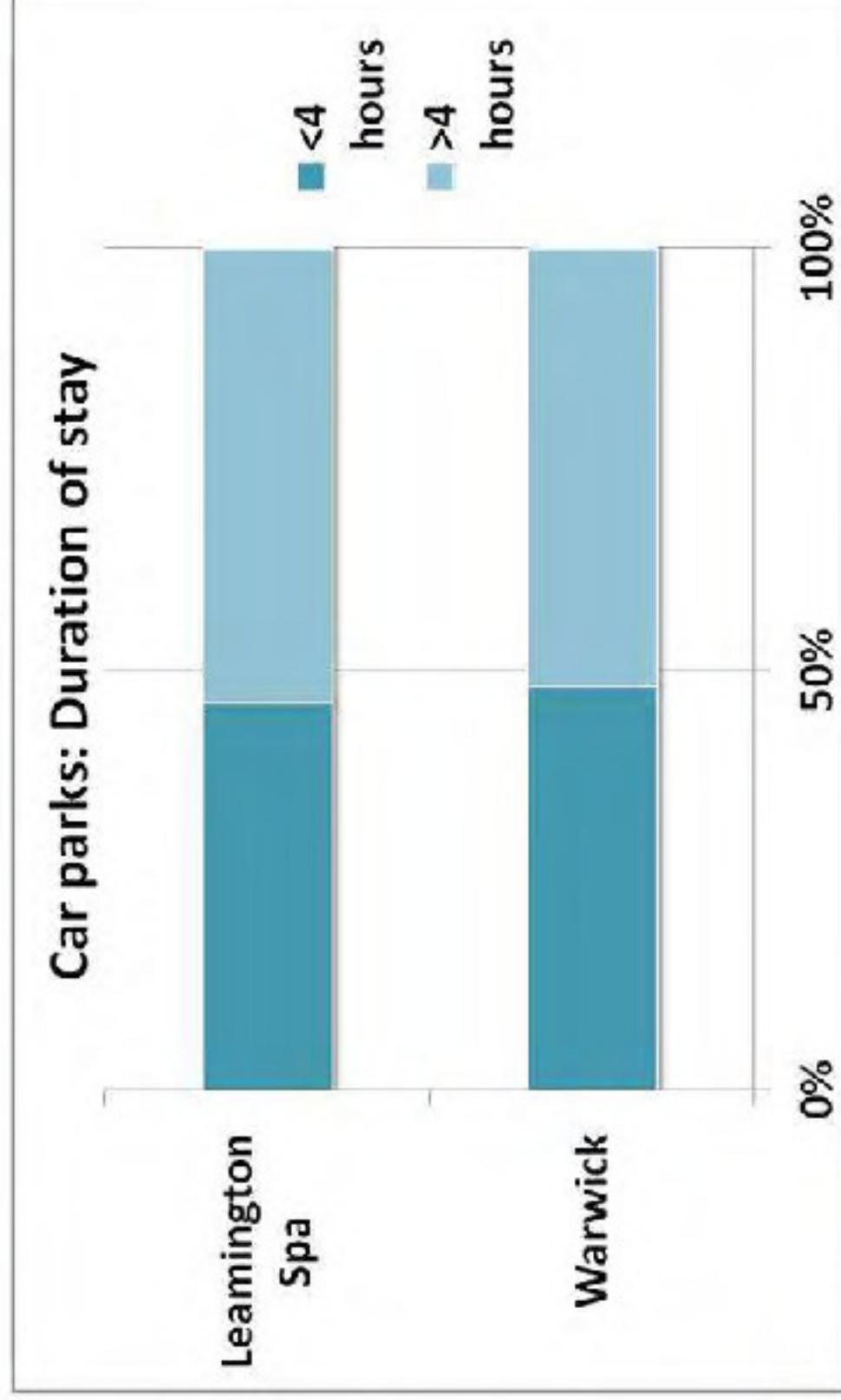
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## Stakeholder Workshop 1

# Key Issue 7 – Parking Supply can inhibit uptake of sustainable modes

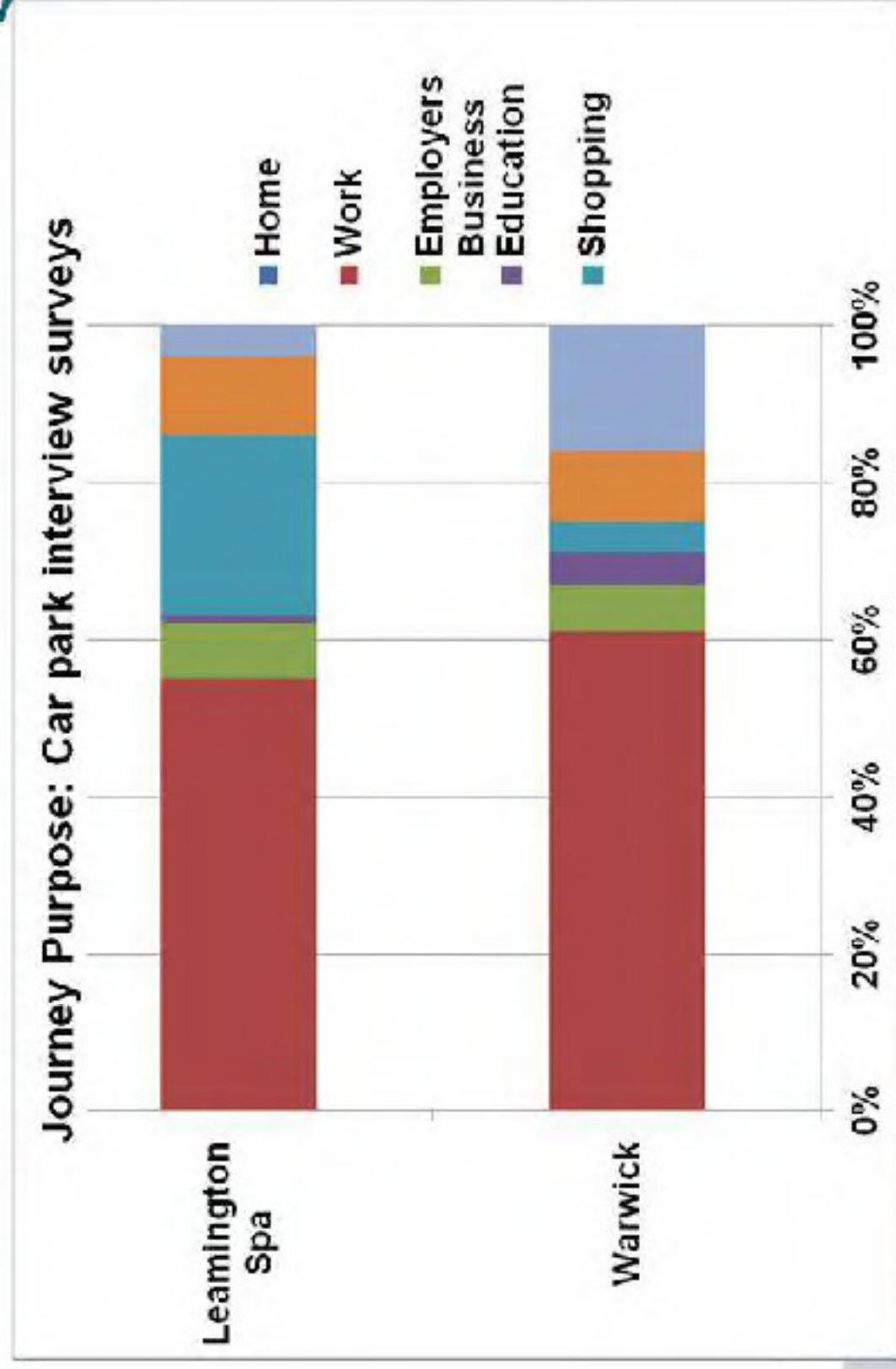
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## Stakeholder Workshop 1

# Key Issue 7 – Parking Supply can inhibit uptake of sustainable modes

ATKINS



## Stakeholder Workshop 1

# Key Issue 8 - Increasing sustainable travel will require behavioural change by large trip generators/attractors

ATKINS



- Free shuttle buses to Gaydon and Whitley
- 23% Car Share (2000 members)
- Dedicated car share car parks
- Engagement with Stagecoach

- 
- 10 commuter bus services
  - Free bus service from Leamington Rail Station
  - Pro-active on car share and cycling initiatives

## Stakeholder Workshop 1

# Key Issue 9 – The local network is sensitive to disruption

ATKINS



Emergency and Planned Road works



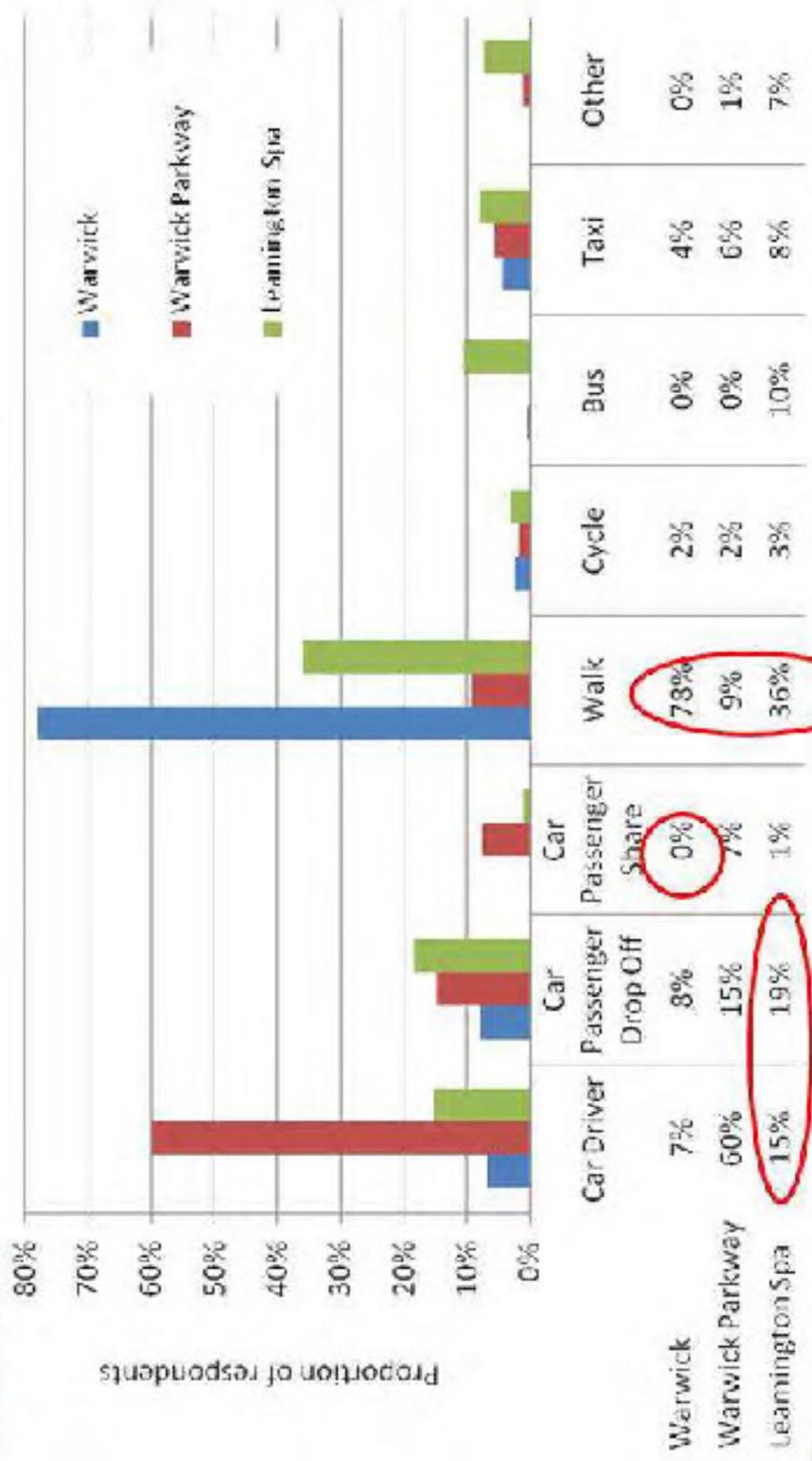
Accidents



Historic Road Networks (Narrow and Short Links)

## Stakeholder Workshop 1

# Key Issue 10 – There is opportunity to improve access to Railway Stations



## Stakeholder Workshop 1

# Summary of Issues

- 1a) Wider Socio-economic drivers of demand (Existing)
- 1b) Wider Socio-economic drivers of demand (Future)
- 2) High Car dependency for travel to work trips
- 3) High proportion of internal and short distance trips
- 4) Large proportion of through trips

## Stakeholder Workshop 1

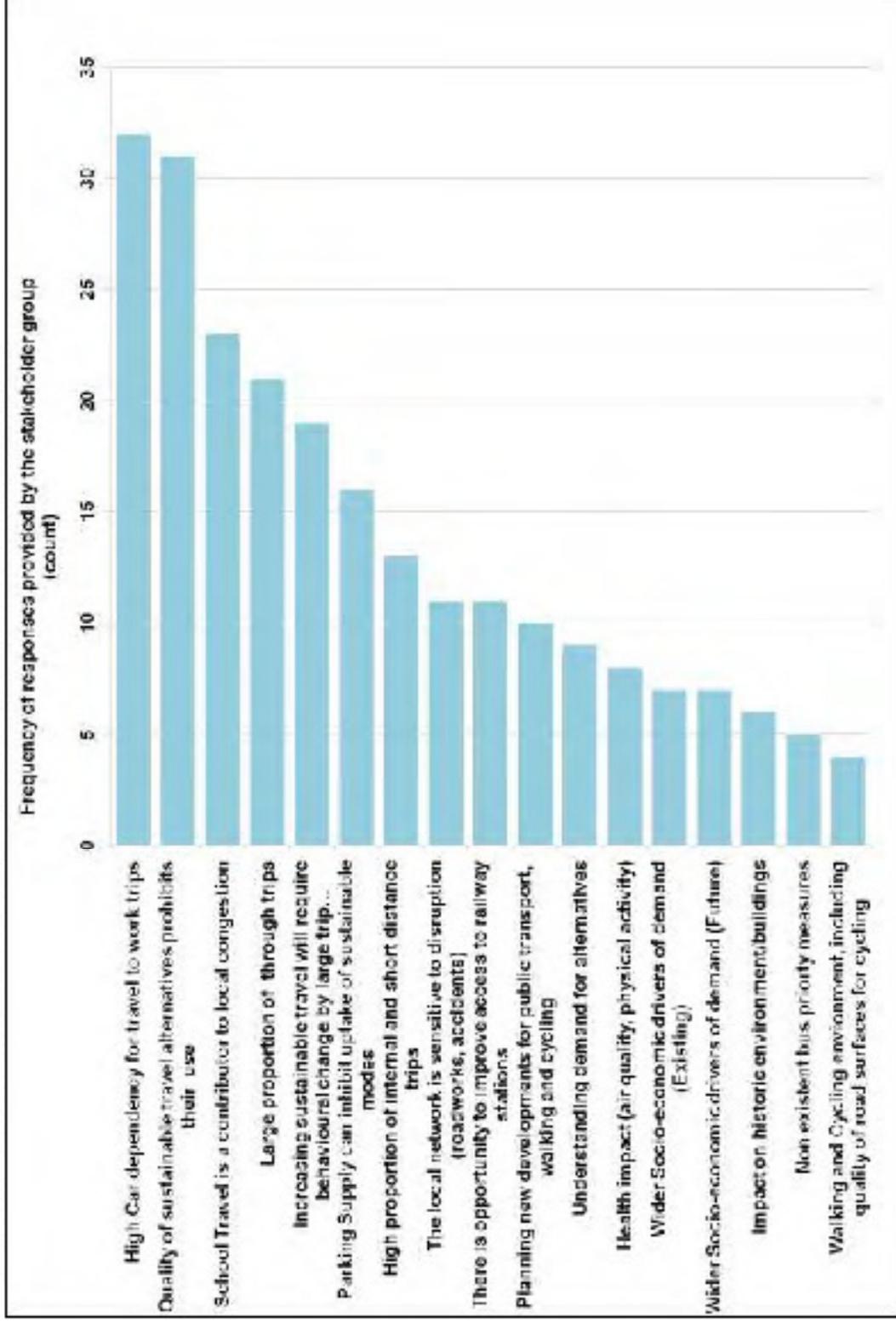
### Summary of Issues

- 5) School Travel is a contributor to local congestion
- 6) Quality of sustainable travel alternatives prohibits their use
- 7) Parking Supply can inhibit uptake of sustainable modes
- 8) Increasing sustainable travel will require behavioural change by large trip generators/attractors
- 9) The local network is sensitive to disruption (roadworks, accidents)
- 10) There is opportunity to improve access to railway stations

# Stakeholder Workshop 1

## Appendix D – Stakeholder Prioritisation

Figure A1 - Causes, Issues and Problems - Identified during Stakeholder Prioritisation Exercise



## **Appendix B. Stakeholder Workshop 2 Notes**

# Stakeholder Workshop 2

Project:	Warwick and Leamington Spa Transport Strategy
Subject:	Stakeholder Workshop Notes
Date:	15 July 2014

## Introduction

A series of stakeholder workshops and briefings are being undertaken to inform the development of the transport strategy on behalf of Warwickshire County Council (WCC). More specifically workshops are key to keeping stakeholders informed and actively engaged with the strategy as it develops. It also provides the opportunity to gather additional local intelligence information to inform the study evidence base and solutions. The timing of these workshops is outlined below:

- Workshop 1 - Issues and Problems (May 2014)
- Workshop 2 – Developing Solutions (July 2014)
- Stakeholder Presentation – Key Findings (September 2014)

A summary of the first workshop is provided below as context for the summary of the second workshop session.

## Workshop 1 Summary

The first stakeholder workshop was held on 13th May at Hill Close Gardens, Warwick. The purpose of the first stakeholder workshop was to identify local transport issues, problems and the causes of these, initiate thinking on the objectives of the transport strategy and to identify potential solutions from the perspectives of stakeholders. The key conclusions from the first workshop are outlined below. A detailed summary of the first workshop was provided to the attendees.

### Local Transport Issues

- Tackling the travel demand challenges associated with high local car dependency;
- Enhancing quality of modal alternatives to the car
- Reduction of throughtrips;
- Mitigating the effects of school travel on the network; and
- Encouraging sustainable behaviours amongst large organisations.

### Transport Strategy Focus

- Not compromise their local economies or be harmful to the cultural and built environments;
- Demonstrate collaborative responsibility for how issues are addressed (joined up thinking); and
- Exploit the role of active travel/sustainable transport options in addressing local public health and environmental issues (noise and vibration/air quality).

### Transport Strategy Considerations

- Stakeholder support for a form of travel demand management measure to be included in the final strategy proposed;
- Recognition that a step change in approach is required to adequately address Warwick and Leamington's existing and future transport challenges; and
- The strategy needs to represent a balanced approach ensuring that harder travel demand measures (sticks) are preceded with upfront investment in good quality transport alternatives.

# Stakeholder Workshop 2

## Stakeholder Workshop 2 - Introduction

The second workshop was held on 2<sup>nd</sup> July at Northgate House, Warwick. The second workshop was structured as follows:

- Provide a re-cap on key issues emerging from the 1<sup>st</sup> stakeholder workshop held in mid May
- Present 'additional' evidence collated following the 1<sup>st</sup> stakeholder workshop
- Interactive Session 1: engage stakeholders in the development of transport packages for specific areas
- Interactive Session 2: collect initial stakeholder views on the relevance and appetite for the application of 'demand management' measures in Warwick and Leamington Spa

The stakeholder discussion and views collected during the interactive sessions are summarised in the following sections.

### Interactive Session 1 – Develop an Area Based Transport Package

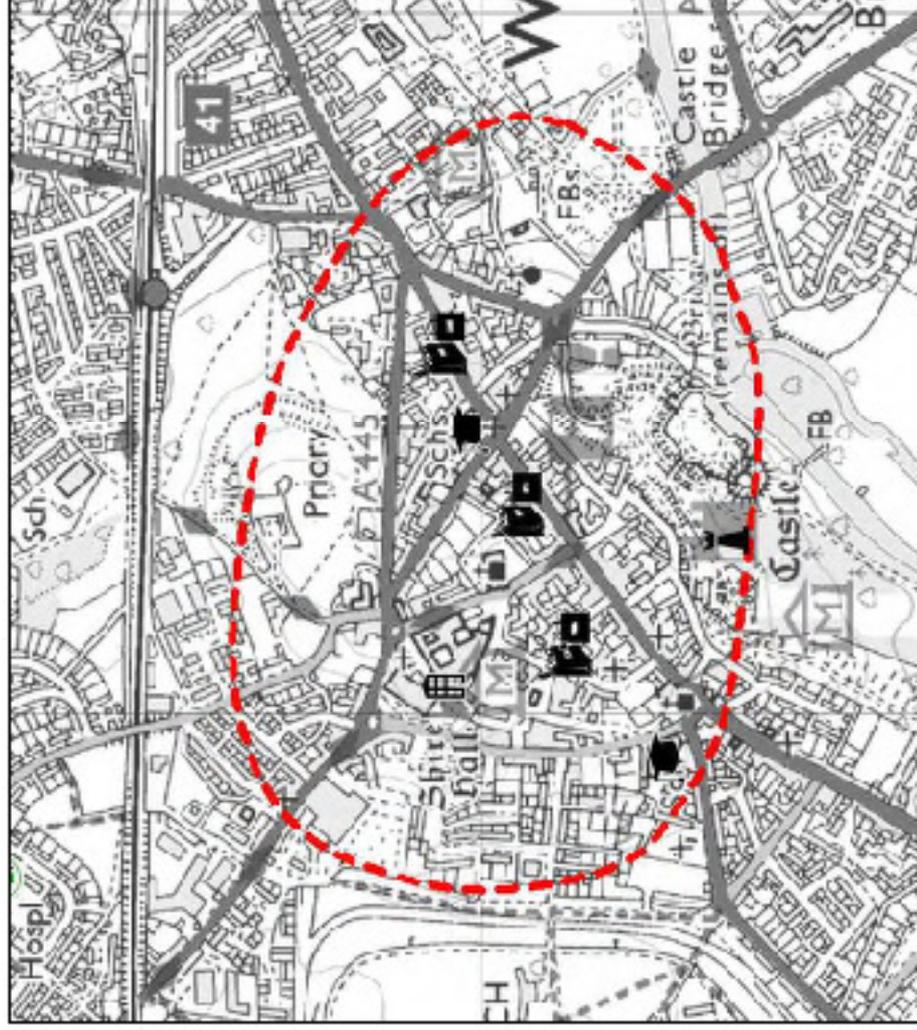
Stakeholders were invited to identify local transport issues and solutions for specific locations in Warwick and Leamington Spa which are relevant to them. These areas were:

- A. Warwick Town Centre
- B. Warwick Tech Park & Schools
- C. Leamington Spa Town Centre
- D. Warwick Hospital & Wedgenock
- E. Heathcote and Tachbrook

The stakeholder views and ideas on a transport package for each area have been captured and are presented below.

# Stakeholder Workshop 2

## A. Warwick Town Centre



Stakeholder comments most important transport issues and problem in this area

Traffic car trips; local aid strategy

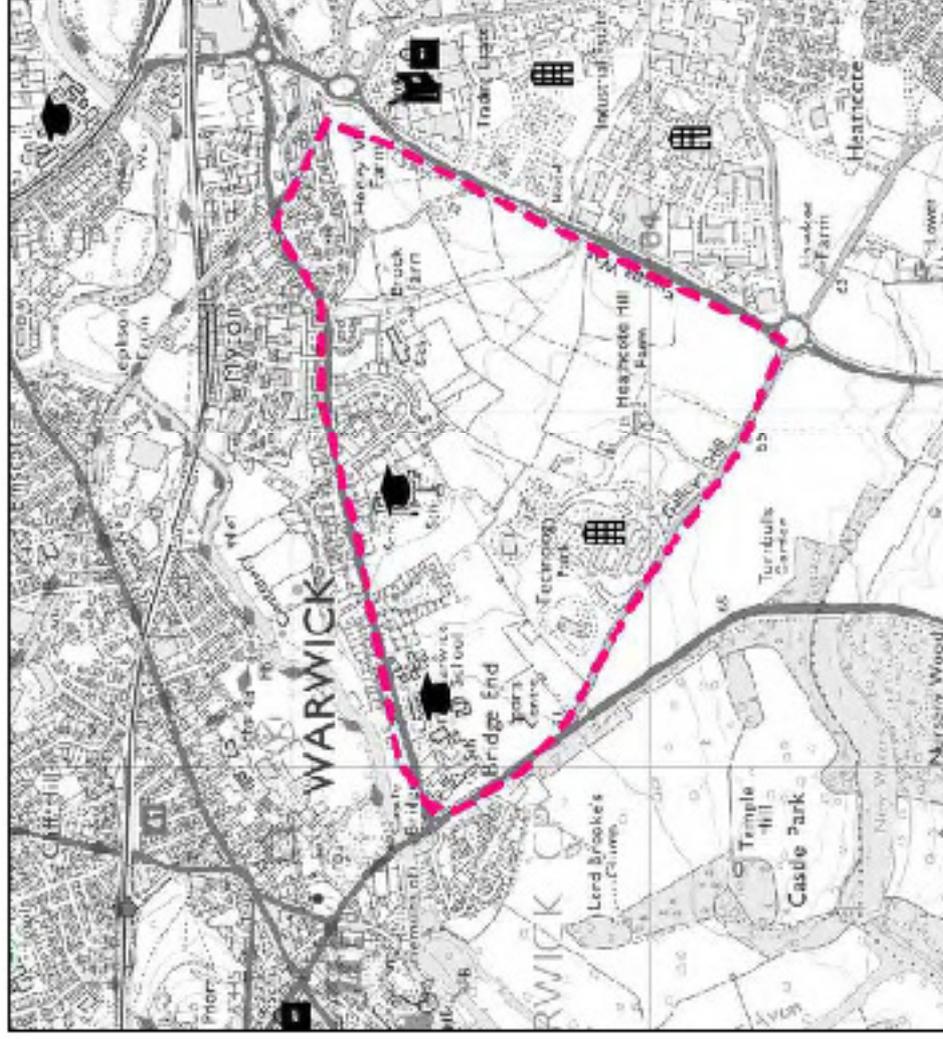
Improved environment for pedestrians and cyclists

Low bus usage, bus network doesn't meet needs, issues of access for buses within the town and routing.

Transport Measures	Stakeholder Comment
Walking and Cycling Infrastructure (cycle walking route links, crossing facilities, signage etc)	Include pavement to give priority to pedestrians. Priority for pedestrians over cars.
Bus Infrastructure Improvements (bus priority, street reconfiguration facilities, timetable (no motor etc))	Design of network management schemes must be suitable to public transport. Real time passenger information (RTP).
Bus Service Improvements (peak hour transport links, higher frequencies etc...)	Increase frequency of services. Perform bus routes and talk call.
Signage for Road Users	
Provision for Freight and Delivery	
Park and Ride and Park and Ride Facilities	
Travel Plan Initiatives (Workplace Schools/Residents/Localised)	Free bus passes to workers.
Collaboration between businesses to minimise car use/dependence	
Low carbon technologies e.g. electric vehicle	
Other	De-classify roads. Stop cars entering the town one day per year, give priority to pedestrians, cyclists and buses. Charge £10 per day for central town car parking.

# Stakeholder Workshop 2

## B. Warwick Tech Park & Schools

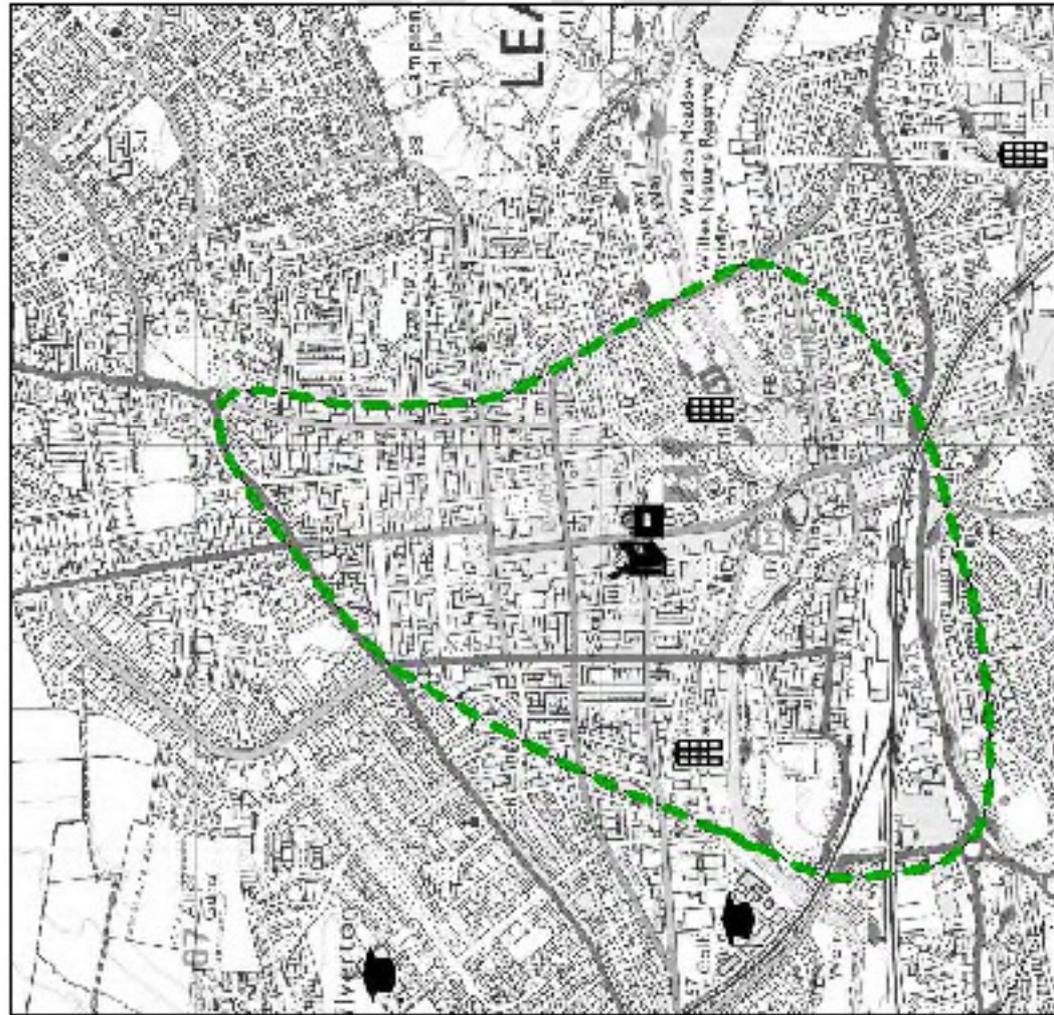


Stakeholder comment: 5 most important transport issues and problems in this area

- Lack of alternatives to using the car.
- Safety: using alternatives modes of travel to the car, vehicle security, child safety.
- Too convenient / cheap to use the car, e.g. parking charges. Alternatives to the car are costly and time consuming.
- Timing of journeys for schools and work causing peaks
- Strategic network does not provide viable alternative, results in traffic through the town.

Transport Measures	Stakeholder Comment
Walking and Cycling Infrastructure (Cyclewalk routes, cycle storage etc.)	Pedestrian crossings at roundabouts required. Lack of parking impedes cyclists and pedestrians. Walk and cycle routes between football park and the site and local schools could be beneficial. Lack of safe cycling facilities.
BUR Infrastructure improvements (priority, street lighting facilities, timetable information etc.)	Mode interchange point. Potentially the park and ride could be north and south of the point at Severn Trent. The bus would need to be regular and affordable. It may represent a safe alternative for schools; services would have to be able to get to the park and ride school club. Bus priority along Europa Way.
BUR services improvements (peak hour transport links, higher frequencies etc.)	The liquor stores are a barrier, requires more time to get to work to the site. The site should be better modal interchange and the football park. Better bus services to school.
Signage for Road Users	Warwick town centre is used as a through route when there are problems on the M40.
Provision for Freight and delivery	Enforcement of HGV restrictions in the town centre.
Park and Ride and Park and Shop Facilities	Walk and cycle routes from Park and Ride site to school.
Traffic Plan Initiative (Motorbikes/Scooters/Resident Personalised)	Co-ordinated traffic plan between companies at the football park. More incentives to car share, for school and employees.
Collaboration between business to minimise car use dependence	Car sharing scheme which could be joint between businesses in the area
Other	Financial incentives to reduce car trips and bus speeds to improve air quality

## Stakeholder Workshop 2 C.Leamington Spa Town Centre



- Stakeholder comments most important transport issues and problems in this area
- Reduce school trips by car.
- Sustainable access for people in the town centre without reliance on motorised activity.
- Address travel demand to southern employment/retail areas.
- Encourage more widespread use of bikes for short trips.
- Highlighted passenger transport strategy for new development.

Transport Measures	Stakeholder Comment
Walking and Cycling Infrastructure (cycle linking route links, crossing facilities, signage etc)	Improved routes to schools. Leamington Spa - Warwick cycle corridor. Inlay finishing. Employee facilities for cycling. Improve quality of routes: street lighting, signage. Town centre facilities for cyclists. Cycle corridors from south, west and north to/from the town centre.
Bus Infrastructure improvements (bus priority, site site change facilities, timetable information etc)	Bus priority on Europa Way, Tachbrook Road, Myton Rd and Emson Rd. Wholesale passenger information improvements. Inclusive real time information. Better weather proofed bus stops.
Bus service improvements (peak hour transport links, higher frequency etc...)	Availability of services, and Dystard type ticketing. More climate and attractive for users.
Signage for Road Users	
Provision for Freight and delivery	Tools for the delivery collection and management.
Park and Ride and Park and Stride Facilities	Park and Ride for access to the town centre from the north, possibly from the south (withough station). Combine with priority measures.
Travel Plan Initiative (to Kyles School/Reside outside locality)	Employee cycling facilities.
Collaboration between business to minimise car usage/pedestrian	
Low carbon technologies (e.g. electric vehicle)	
Other	

# Stakeholder Workshop 2

## D. Warwick Hospital & Wedgenock

**Stakeholder comment: 5 most important transport issues and problems in this area**

Hospital trips: staff and visitors, a high proportion by car. Car parking is nearby residential areas is a problem for residents. To access employment and hospital services must go through residential areas.

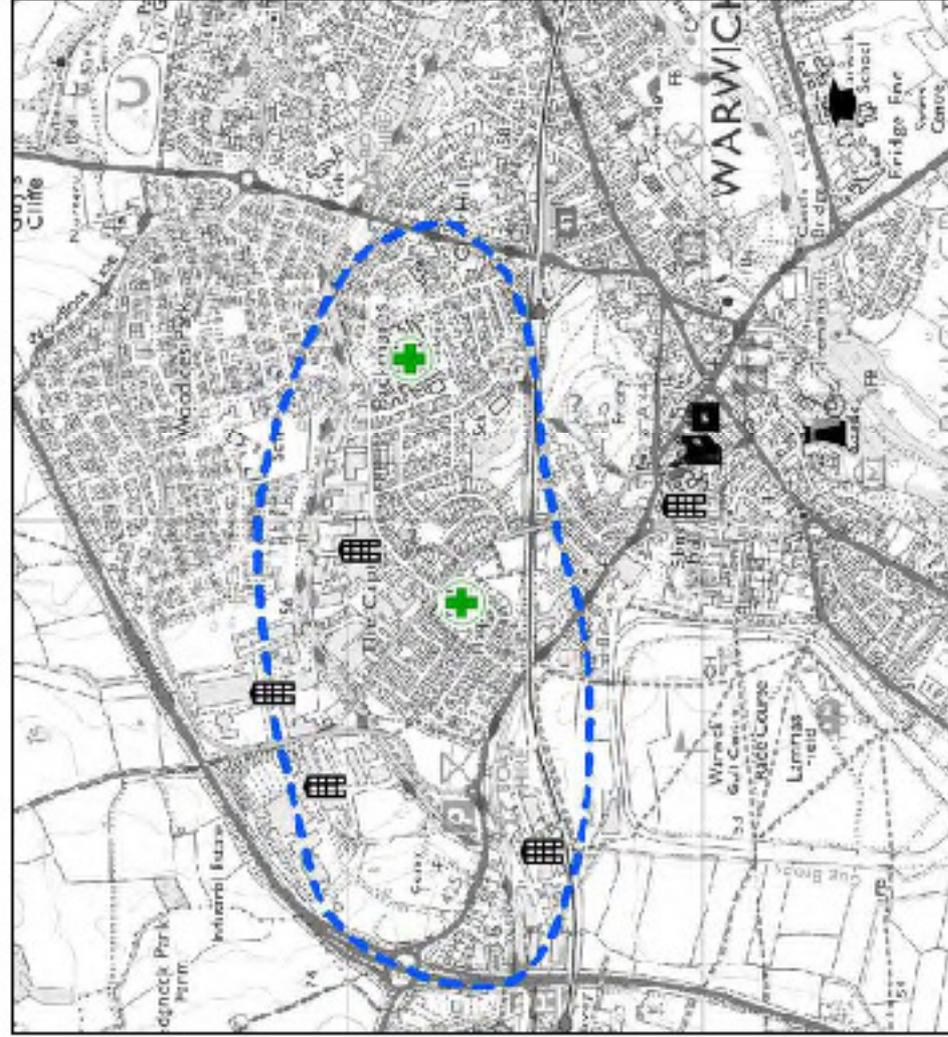
Travel behaviour and car dependency.

A need to encourage behavioural / cultural change to use PT/walk and cycle.

Carparking availability in town centre encourages car use.

Impact of this development in the south and increase in trips to the area, especially the hospital.

Transport Measures	Stakeholder Comment
Walking and Cycling Infrastructure (cycle/walking route links, crossing facilities, signage etc)	There is now a new cycle route through the area. Improve street lighting / safety to encourage hospital staff to walk/cycle through residential areas. Potential for walking buses for travel to school.
Bus Infrastructure improvements (bus priority, shelters, wheelchair facilities, timetable information etc)	
Bus service improvements (peak hour transport links, lighter services etc.)	Encourages to use public transport. Sign make it / hospital bus service.
Signage for Road Users	
Provision for Freight and delivery	
Park and Ride and Park and Shop Facilities	Park and Ride reduces from the south to the hospital and employment in the area.
Traffic Plan Initiative / Workforce/Resident/Personalised	Behavioural change for employees and residential.
Collaboration between business to minimise car use dependency.	
Low carbon technologies e.g. electric vehicles	
Other	Reducing the speed limit to 20mph to improve perceptions of safety and encourage walking and cycling. Car parking restrictions: residential zones, remove on-street in the town centre. Carpool taxi linking the two towns and key employment areas. A car and stock approach, e.g. park and ride complete with controlled parking zone in Woodles Park.



# Stakeholder Workshop 2

## E. Heathcote and Tachbrook

Stakeholder comment: 5 most important transport issues and problems in this area

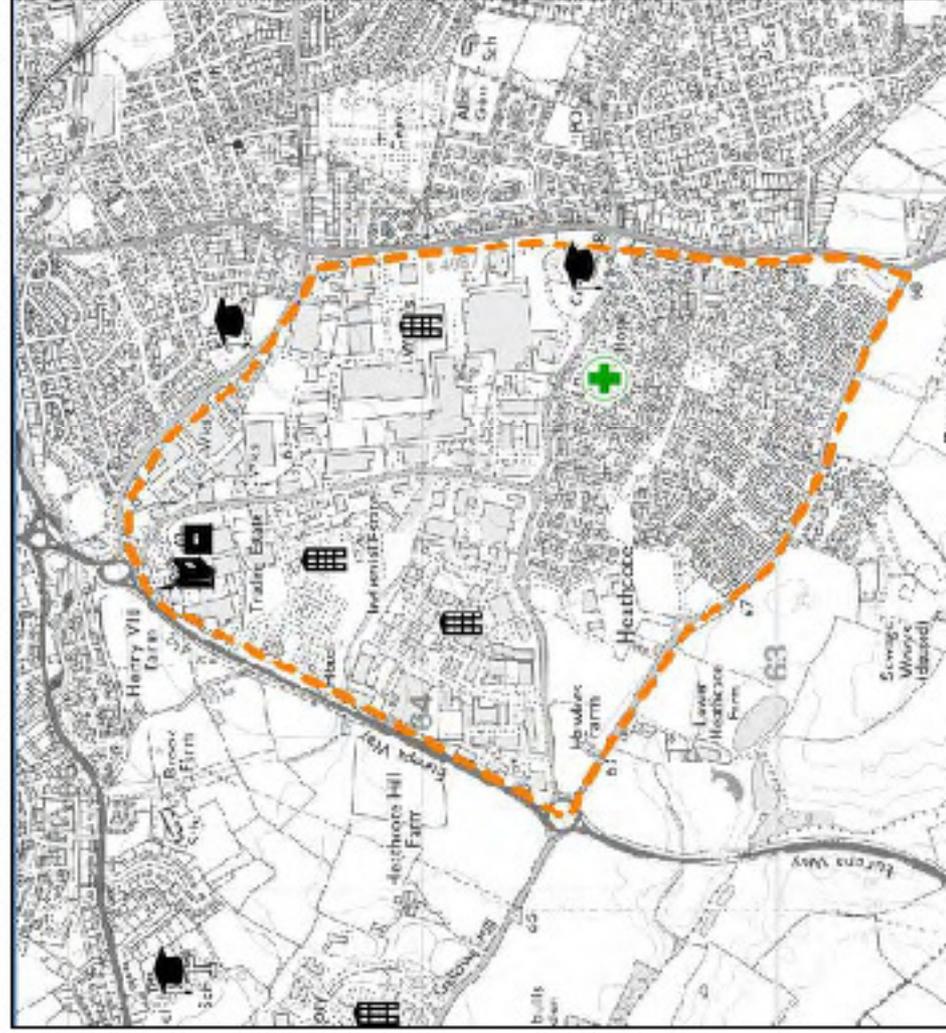
Congestion at peak times, mix of local and long distance trips, walking, cycling on Europa Way, more traffic in the village due to development.

Poor provision for safety of cyclists and pedestrians.

Bus services perceived to be very poor in the area.

Development proposals to the south of Leamington Spa.

Design of junctions in terms of safety, provision for pedestrians and cyclists and bus priority.



Transport Measures	Stakeholder Comment
Walking and Cycling Infrastructure Cycling route links, crossing facilities, signage etc)	Cycle routes for schools, joined up cycle network. Pedestrian and cycle crossings and routes required to improve connectivity to destinations. Walk and cycle access to schools from Warwick Gates. Buses have to include dedicated walk and cycle route on Europa Way.
Bus Infrastructure Improvements (bus priority, safe boarding facilities, timetable information etc)	Dedicated bus lane along Europa Way. Bus priority measures. Buses stop at bus stop and queue.
Bus Service Improvements (peak hour transport links, night services etc...)	Bus services for Warwick Gates. Direct bus services with priority to key attractions: hospital and colleges.
Signage for Road Users	
Provision for Freight and deliveries	
Park and Ride and Park and Ride Facilities	Link to area to the park and ride services. Southern P&R site should include Park and Ride, and provide for cyclists. The services will need employer buy in. Improve highway capacity to P&R sites.
Travel Plan initiatives (Workplace Schools/Residential/parents/voluntary)	School travel plans required for schools in the area and the colleges.
Collaboration between business (e.g. to minimize car use/dependence...)	Linking businesses to provide transport services.
Low carbon technologies (e.g. electric vehicles)	
Other	Transport infrastructure needs to make provision for sustainable modes as much as possible.

# Stakeholder Workshop 2

## Interactive Session 1 – Summary of Stakeholder Views

During the session each of the working groups identified key issues and potential local and further reaching solutions to these problems.

The key solutions identified by the group included:

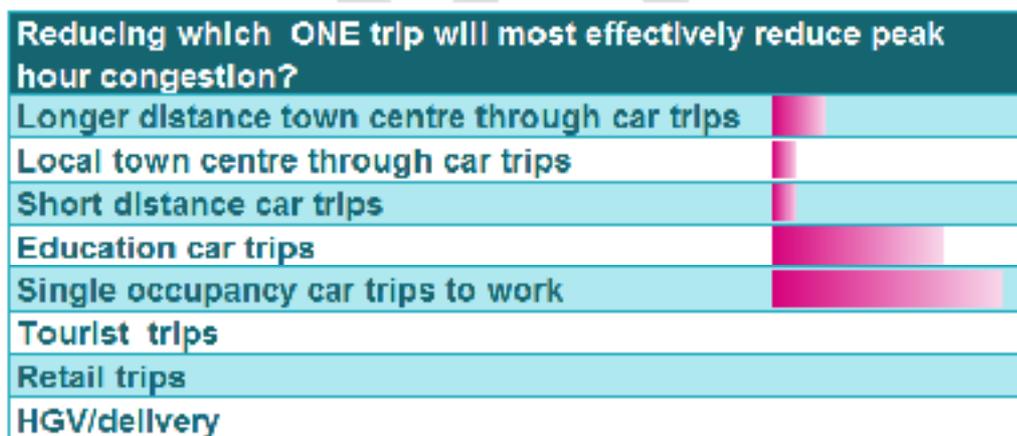
- Park and Ride services to key locations such as the hospital and employment sites
- Walk and cycle routes which are connected to schools and employment centres
- Improved bus services, infrastructure and information which make using the bus a more attractive option to the car
- Travel planning and behavioural change measures to encourage people to change their travel habits

The stakeholders provided their views on the confidence they have in these measures addressing the local transport issues and problems in Warwick and Leamington Spa. The group response was positive with a reasonably high level of confidence in the potential package being able to address the identified issues. The feedback from the groups showed that there was a wide recognition that the measures discussed in the first session were carrots, and that sticks would also be required to produce a package of transport measures which could result in a step change for travel habits in the towns.

The second session in the workshop focussed on demand management measures, which would be the stick required to complement the carrot measures identified.

## Interactive Session 2 - The role of demand management in Warwick and Leamington

The purpose of the second session was to gather stakeholder views on the relevance and appetite for the application of 'demand management measures'. Firstly, stakeholders were asked for their views on which trips, if reduced, would most effectively reduce peak hour congestion, and should therefore be the focus of demand management measures. The outcome of this discussion is shown below.



The group showed a strong view that reducing single occupancy car trips to work and education car trips would most effectively reduce peak hour, whilst a smaller proportion of the group felt that reducing longer distance town centre through trips by car would have a role to play in reducing peak hour congestion.

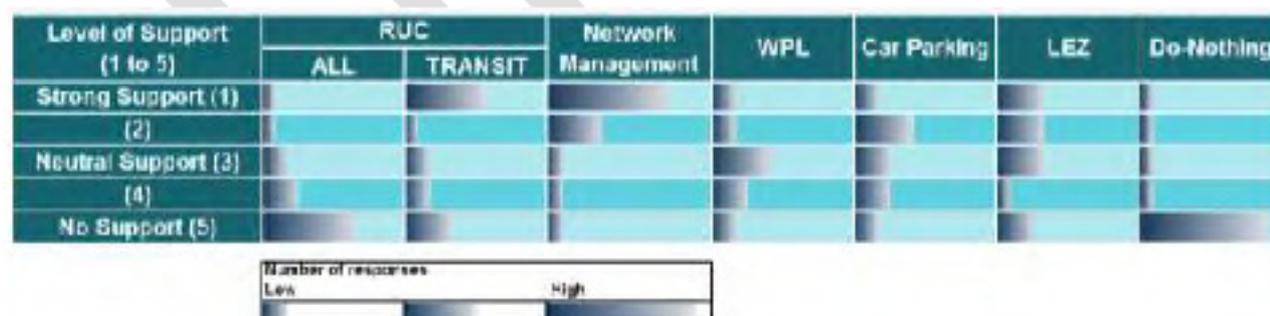
The group were then asked for their views on the impact of demand management measures on the specific trip types and the identified objectives. The groups were also asked to consider demand management measures in respect of deliverability, acceptability, cost, meeting objectives, benefit to the local economy and environment and timescales.

# Stakeholder Workshop 2

The information provided prompted wide ranging debate within each of the groups. A summary of the discussions is provided below.

Demand Management Measure		Stakeholder Comment
Road User Charging	ALL	<ul style="list-style-type: none"> <li>This would need to be combined with Park and Ride measures.</li> <li>RUC measures could encourage people to take long diversions to avoid the charge, resulting in a negative impact on the environment.</li> <li>There could be an improvement to the local environment and AQMAs in the urban areas.</li> </ul>
	TRANSIT	<ul style="list-style-type: none"> <li>May have an impact on HGVs and could mean that deliveries become grouped to avoid the charge, for example consolidated and planned deliveries which could reduce the number of HGVs in the town centre.</li> <li>This would need to be combined with Park and Ride measures.</li> <li>HGV deliveries in to town centre could be exempt, the charge only applied to HGVs travelling through the town centre using it as a short cut.</li> </ul>
Network Management		<ul style="list-style-type: none"> <li>Potential for network management measures in Warwick town centre is limited due to the built environment and could potentially damage local environment. Some measures could be applied at peak time however, e.g. signal changes.</li> <li>A popular suggestion was to pedestrianise the town centres and push car parks to edges to encourage more sustainable travel patterns. This could have an impact on town centre residents.</li> </ul>
Workplace Parking Levy		<ul style="list-style-type: none"> <li>These would only work if suitable alternative transport measures were available. If the revenue from this scheme goes towards bus services for example, this could be beneficial.</li> </ul>
Car Parking		<ul style="list-style-type: none"> <li>Reduce long-stay car parking provision to discourage commuting (particularly single occupancy vehicle commuting) by car</li> <li>Changes to car parking charges needs to be done carefully.</li> <li>Better use of on-street parking restrictions to allow spaces to be utilised by short stay users, for example shoppers. If long-stay car parking is restricted then this needs to be complemented by park and ride services.</li> </ul>
Low Emissions Zone		<ul style="list-style-type: none"> <li>It was felt that this was not a demand management measure, but would have a positive impact on air quality issues.</li> </ul>

The final exercise was to gather the group's views on their willingness to implement specific demand management measures by asking them to rate their support for each measure. The outcome of this exercise is summarised below.



The exercise identified that there was little support amongst the group for road user charging aimed at all car drivers; however there was stronger support for a transit charge aimed at through trips (with origins and destinations outside the area).

The group was unanimous in its view that doing nothing is not an option for the area, whilst it widely supports network management measures to reduce congestion and encourage the use of sustainable modes of transport.

# Stakeholder Workshop 2

## Stakeholder Workshop 2 - Key Conclusions

The purpose of the second stakeholder workshop was to gather stakeholder views on transport solutions to the identified local transport problems and issues in Warwick and Leamington Spa with the aim to develop a number of packages for testing.

The stakeholder group identified a range of more traditional transport measures, such as improved walking and cycling routes, bus services and infrastructure. The key message from the group was that they felt these measures alone would not be sufficient in effectively reducing congestion and addressing the transport issues in the area. The view of the group was that other measures, known as demand management measures, would also need to be explored.

The second part of the workshop focussed on demand management measures. The discussion on demand management measures highlighted the following key considerations:

- If demand management was applied, care should be taken to avoid a negative impact on the local economy, and that businesses might be less attracted to the area
- Demand management measures need to be complemented with improved alternatives to the car, there is a need for both the carrot and stick to achieve sustainable travel patterns

The next stage in developing the strategy is to identify packages of transport measures, informed by the findings of this second workshop, for testing. The purpose of the testing is to quantify the impacts of the package on the performance of the transport network with a view to developing the transport strategy for Warwick and Leamington Spa.

# Stakeholder Workshop 2

## Appendix A – Agenda

**Leamington Spa and Warwick Transport Strategy  
Solutions Workshop  
Wednesday 2<sup>nd</sup> July 2014 – 09:30-14:00  
Northgate House, Warwick**

Time	Agenda Item	Presenter (s)
09:30	Registration and Arrival	
10:00	Workshop Aims and Objectives/Workshop Rules	Adrian Hart/Adam Dent
10:10	Warm up: Recap and Evidence Update	Neil MacDonald
10:35	Q&A Session/Introduction to Breakout Sessions	Adam Dent
10:45	Breakout Session - Part A (Developing Area Based Transport Packages)	
11:45	Feedback on Part A	Facilitators
12:00	Introduction to Demand Management Concepts	Neil MacDonald
12:20	Breakout Session – Part B (The role of demand management in Warwick and Leamington)	
13:10	Group Feedback and Five Minute Wrap Up	Facilitators - Adrian Hart
13:30	Lunch and Networking	All
14:00	Close	

# Stakeholder Workshop 2

## Appendix B – Attendees

LIST OF CONFIRMED ATTENDEES FOR STAKEHOLDER WORKSHOP  
ON 2<sup>ND</sup> JULY 2014

	Richard Ashworth, Chairman of Leamington Society
	Sue Butcher, Warwick Chamber of Trade
	Steve Burd, Stagecoach Les Caborn, Councillor
	Jonathan Chilvers, WDC (Brunswick Ward) - arriving 12.30pm
	Philip Clarke, WDC (taking notes)
	Dennis Cripps, Resident (may be late)
	Nicki Curwood, Warwick Town Centre Manager
	Adam Dent, Advent Communications
	Mike Draper, Volvo
	Mike Digger, Poice
	Duncan Elliott, WDC (taking notes)
Apologies	Richard Hall, WDC
	Adrian Hart, WCC
	Edward Healey, Sustrans
	Grahame Helm, WDC (taking notes)
	Elizabeth Higgins, Councillor
	John Holland, Councillor
	Rodney King, Cycleways
	Jane Knight, WDC (Brunswick Ward)
	Bill Gifford, Councillor
	Balvinder Gill, WDC
Apologies	Nikki Gould, Warwick Schools Foundation
	Catherine Ludlow, Aston Martin
	Linsey Luke, Federation of Small Business
	James Mackay, Warwick Society Matt Lewin, Alliance Medical
	Philip Moore, Police
	Abbey Morris, South Warwickshire NHS Foundation Trust
	Rebecca Mushing, Wright Hassall Solicitors
Apologies	Peter Power, National Express
	Mark Reeve, Warwick Schools Foundation
	Katharina Schmutz, Cycleways
	Nick Small, Stagecoach
	Jenny St John, WCC Councillor
	Sidney Syson (Mrs), WDC Councillor
Apologies	David Tucker, Cov & Warwicks I FP
	Rob Walker, National Grid
	Nicola Wright, WCC Public Health (taking notes)
	Norman Vincett, WDC Councillor
	George Illingworth, WDC Councillor
	Matt Western, WCC Councillor
	Alan Wilkinson, WDC Councillor
	Dave Barter, WDC

# Stakeholder Workshop 2

## Appendix C – Stakeholder Group Presentation

LEAVE  
BRD

## Stakeholder Workshop 2

ATKINS

# ATKINS

## Warwick and Leamington Spa Transport Strategy

Stakeholder Workshop 2

Part A: Developing Solutions

Neil MacDonald

2<sup>nd</sup> July 2014

Plan Design Enable

able

## Stakeholder Workshop 2

# Workshop Overview

- To provide a re-cap on key issues emerging from the 1st stakeholder workshop held in mid May;
- To present 'additional' evidence collated following the 1st stakeholder workshop
- To actively engage stakeholders in the development of transport packages for further testing
- To collect initial stakeholder views on the relevance and appetite for the application of 'demand management' measures in Warwick and Leamington Spa

## Stakeholder Workshop 2

### Introduction – Part A

- Workshop 1 – Recap of Key Messages
- Emerging Strategy Objectives
- Evidence update
- Over to you!

# Stakeholder Workshop 2

## An integrated approach



A 3EP for the future used for bringing manufacturing home  
Kingsley Road, Leamington Spa

Warwickshire Local Transport Plan 2011 - 2026

Warwickshire Local Transport Plan 2011 - 2026



**LOCAL PLAN**  
helping shape the district



ATKINS

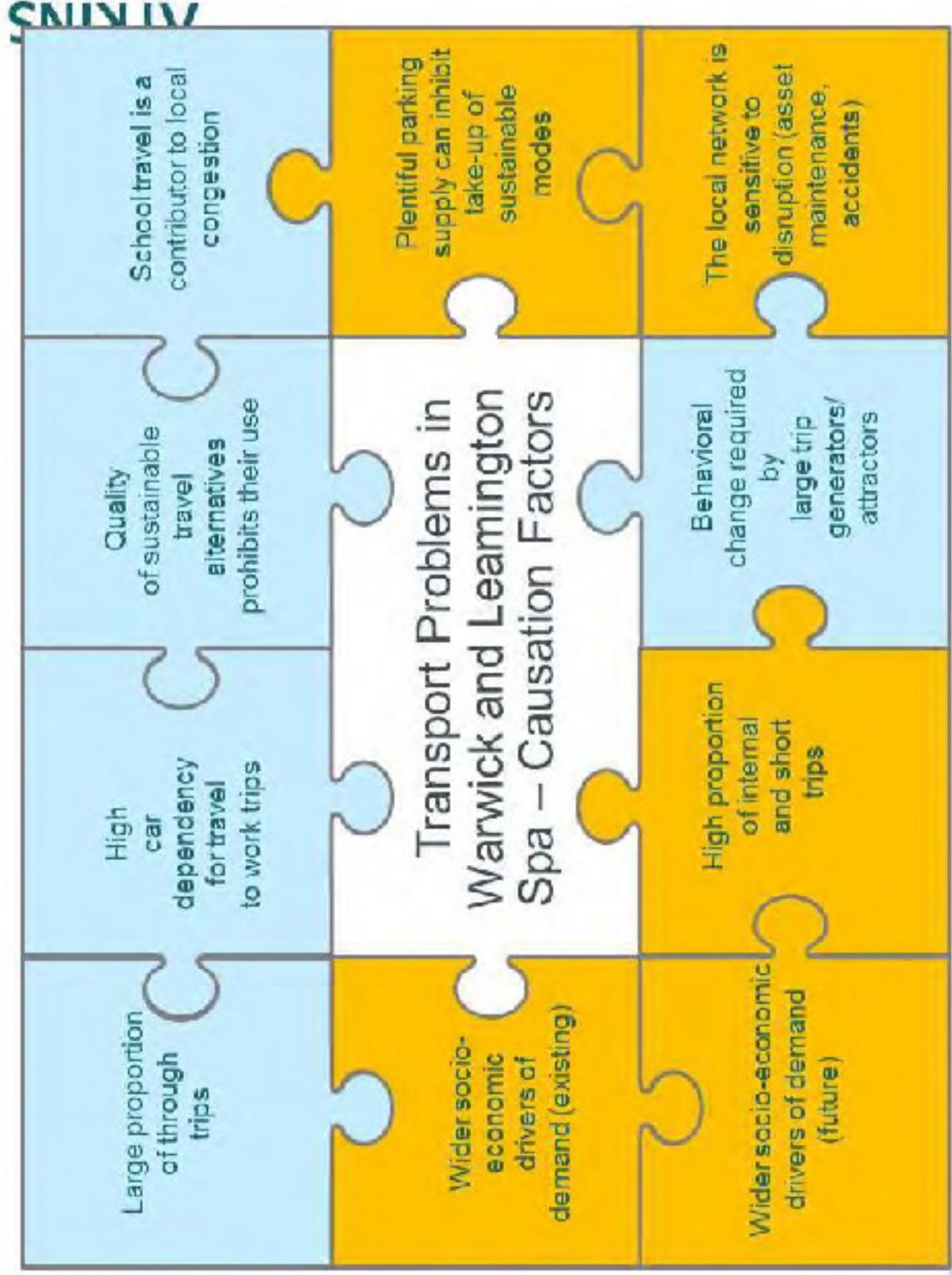
An 'Integrated' Approach to transport investment

Focused strategy objectives, outcomes and impacts

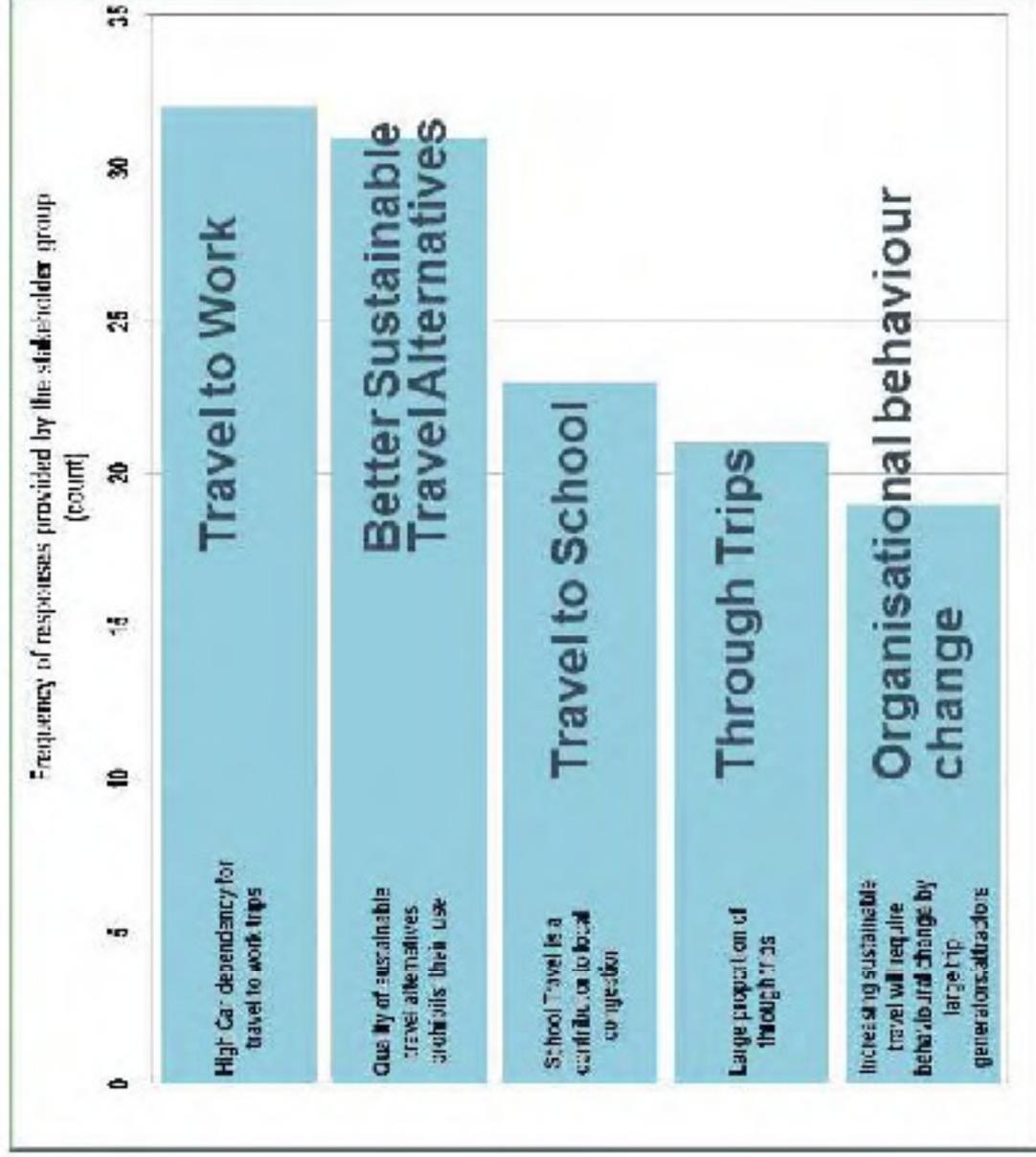
Understanding causes of these issues and problems

Understanding of network issues and problems

# Stakeholder Workshop 2



# Stakeholder Workshop 2



## Stakeholder Workshop 2

# What else do we need to do?

Support healthier communities and better wellbeing

Tackle transport issues outside of the peak

Protect the unique local natural and built environment

Delivered using a joined up approach

Address increased travel demand from housing development

Enhance the local perception of public transport

Deliver a step change



## Stakeholder Workshop 2

ATKINS

# Emerging Transport Strategy Objectives

ATKINS



Improved local economic performance and housing growth aspirations



Healthier and more active communities



Protect or enhance historic and built environment



Better local air quality



Safer and more secure transport systems



Measurable increase in the sustainable transport behaviours

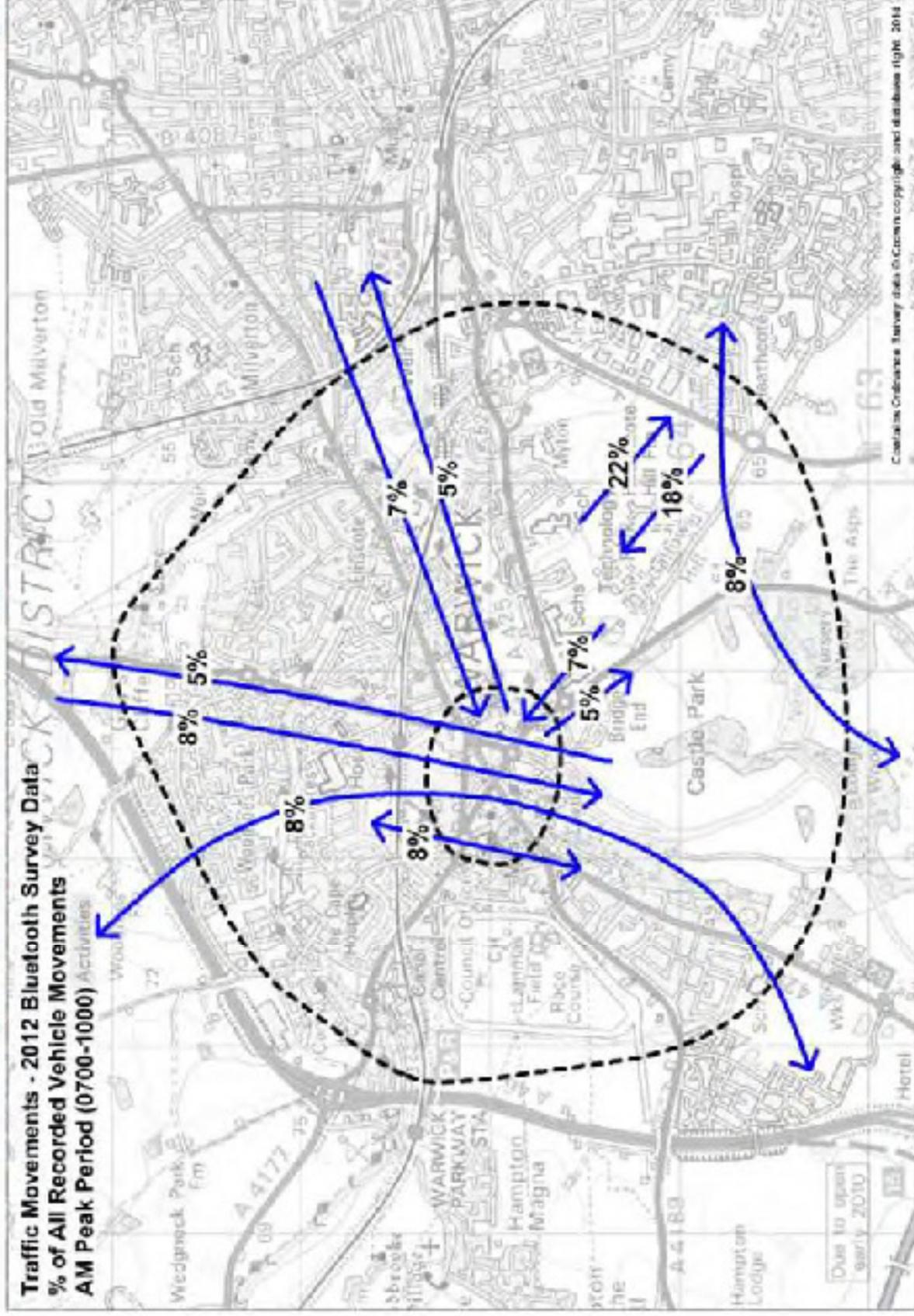
## Stakeholder Workshop 2

# Evidence Update

- O-D Analysis
- Travel to work patterns
- Car parking Information
- Modal Share Data

# Stakeholder Workshop 2

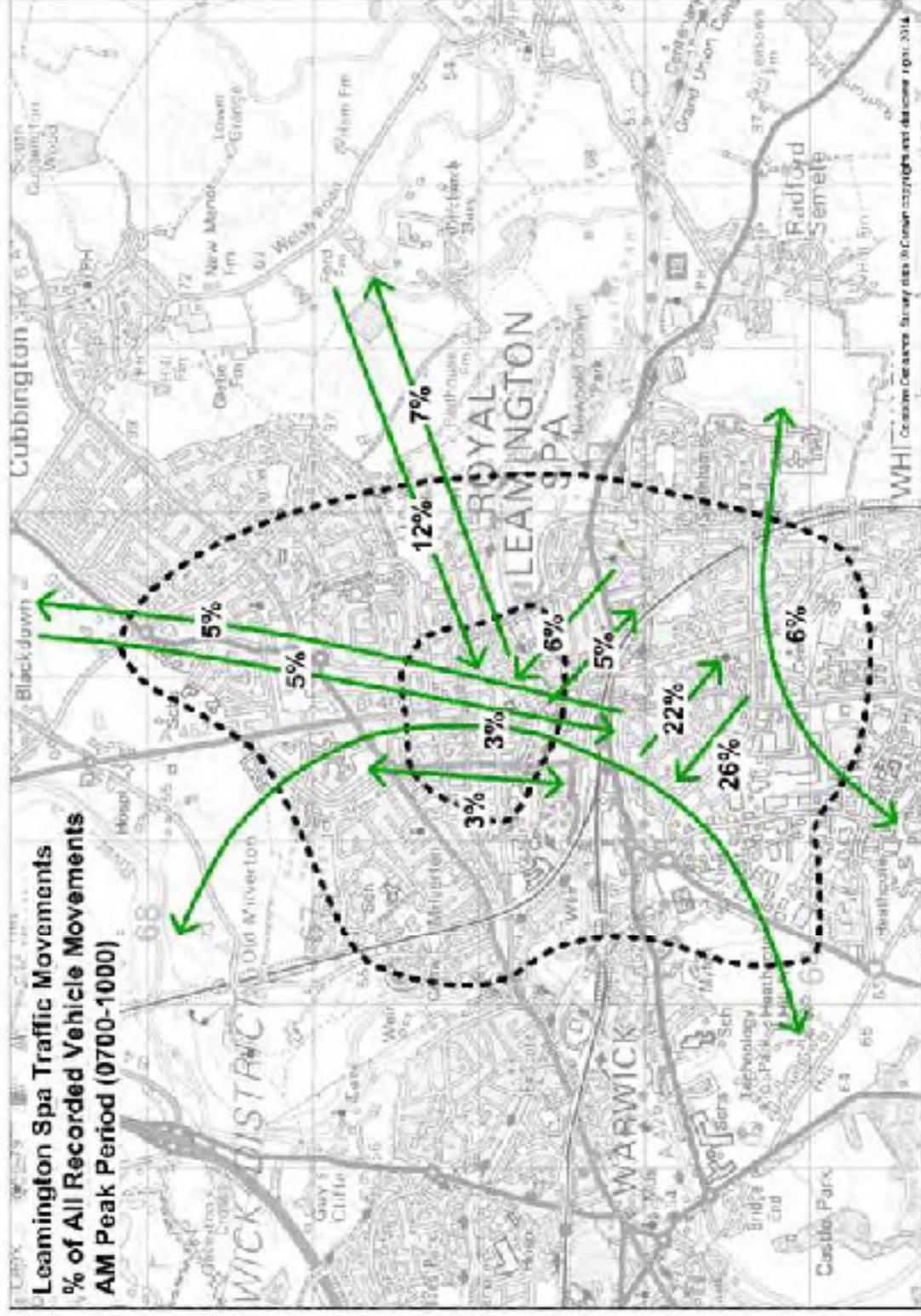
## O-D Analysis (Warwick)



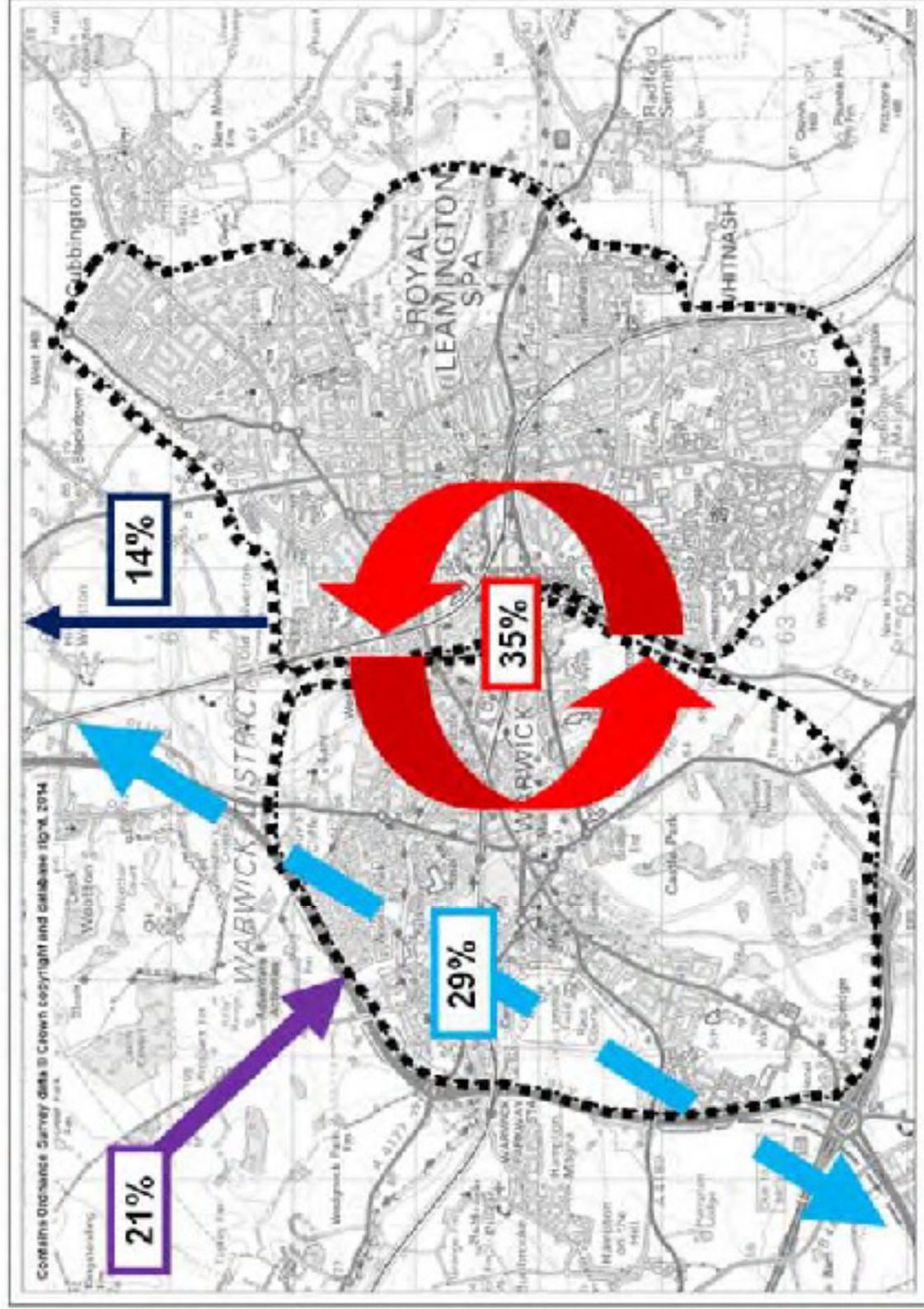
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# Stakeholder Workshop 2

## O-D Analysis (Leamington Spa)



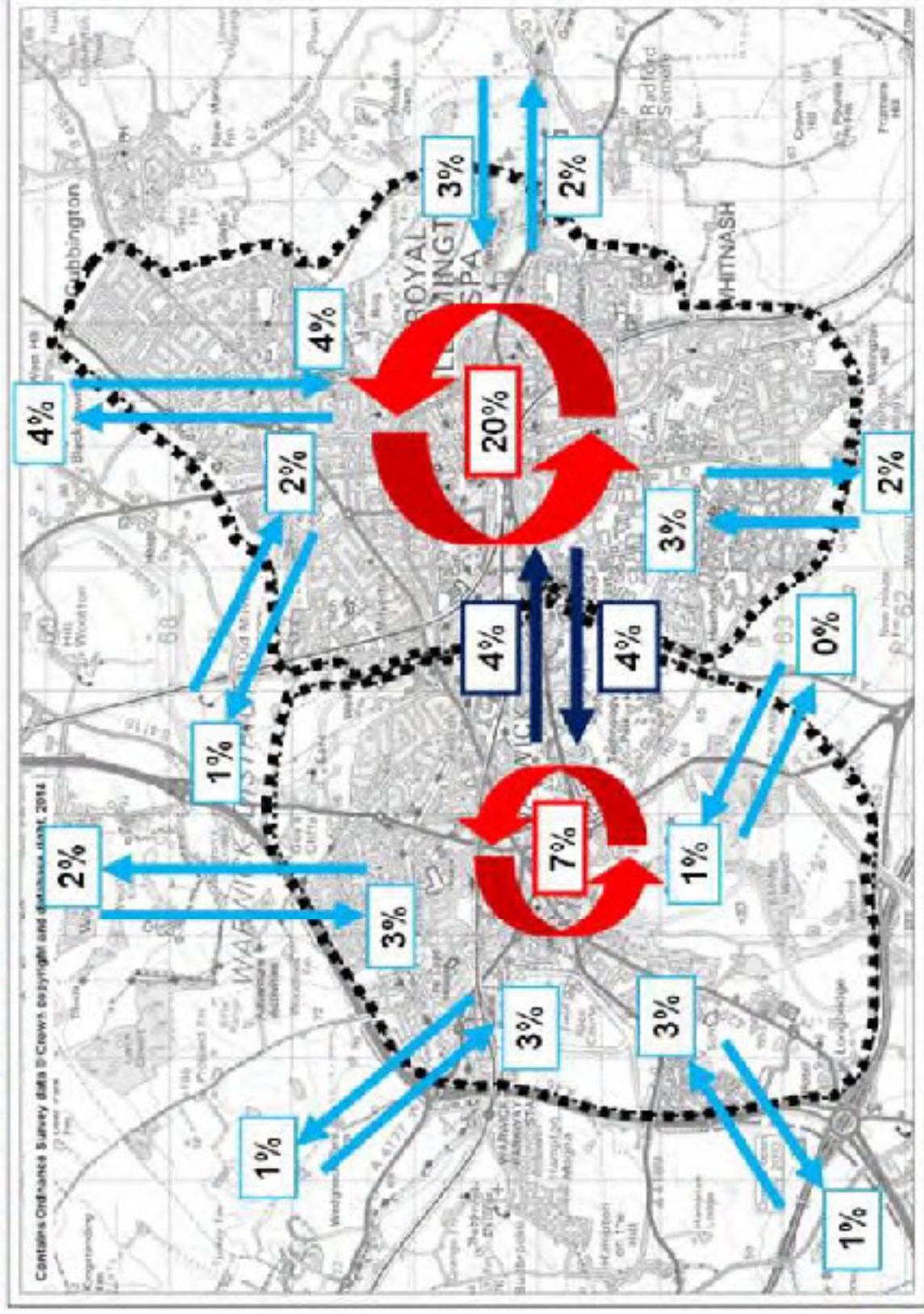
# O-D Analysis (Combined)



# Travel Patterns

## Stakeholder Workshop 2

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## Stakeholder Workshop 2

# Travel Patterns - Demand

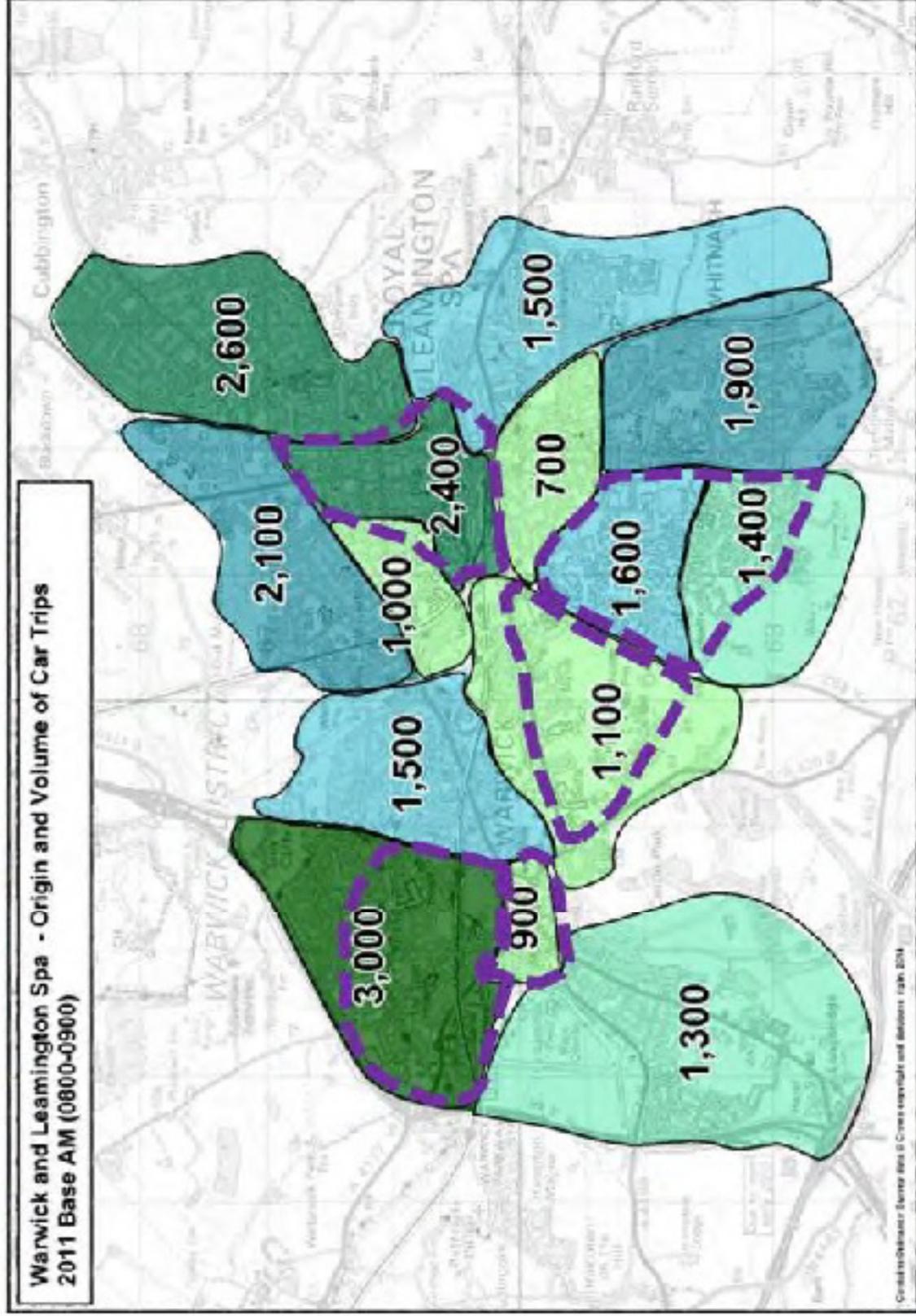
Origin	Destination					
	Warwick	Leamington Spa	North	East	South	West
Warwick	3300	2000	1000	100	700	900
Leamington Spa	2000	9300	2000	800	1100	300
North, including Kenilworth and Coventry	1700	1900	1400	200	1500	500
East, including Radford Semele and Southam	400	1300	300	300	500	100
South, including Bishop Tachbrook, M40	1400	1500	1500	400	600	2800
West, including Hampton Magna and A46	1400	800	800	1000	2800	500



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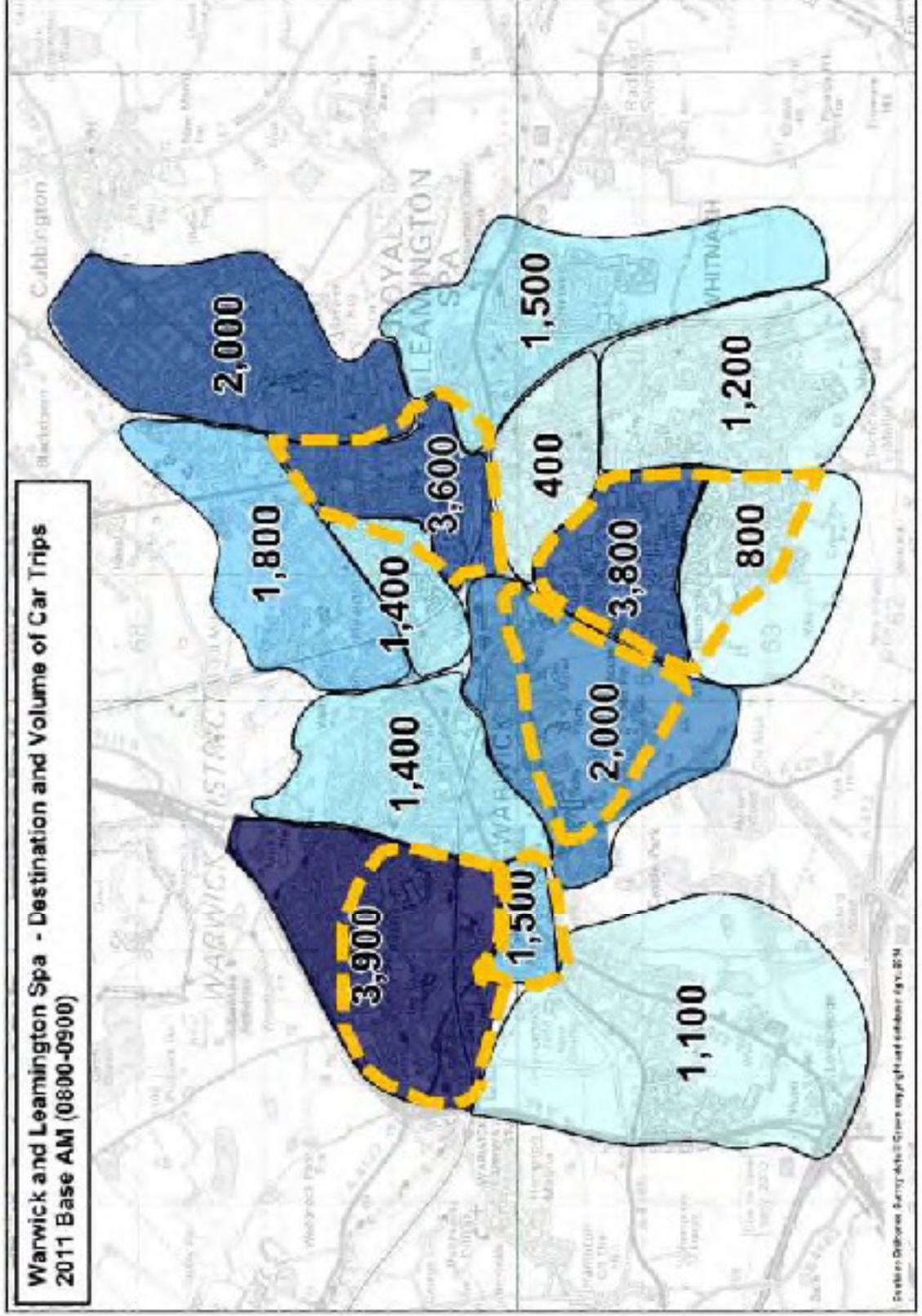
## Travel Patterns - Generators

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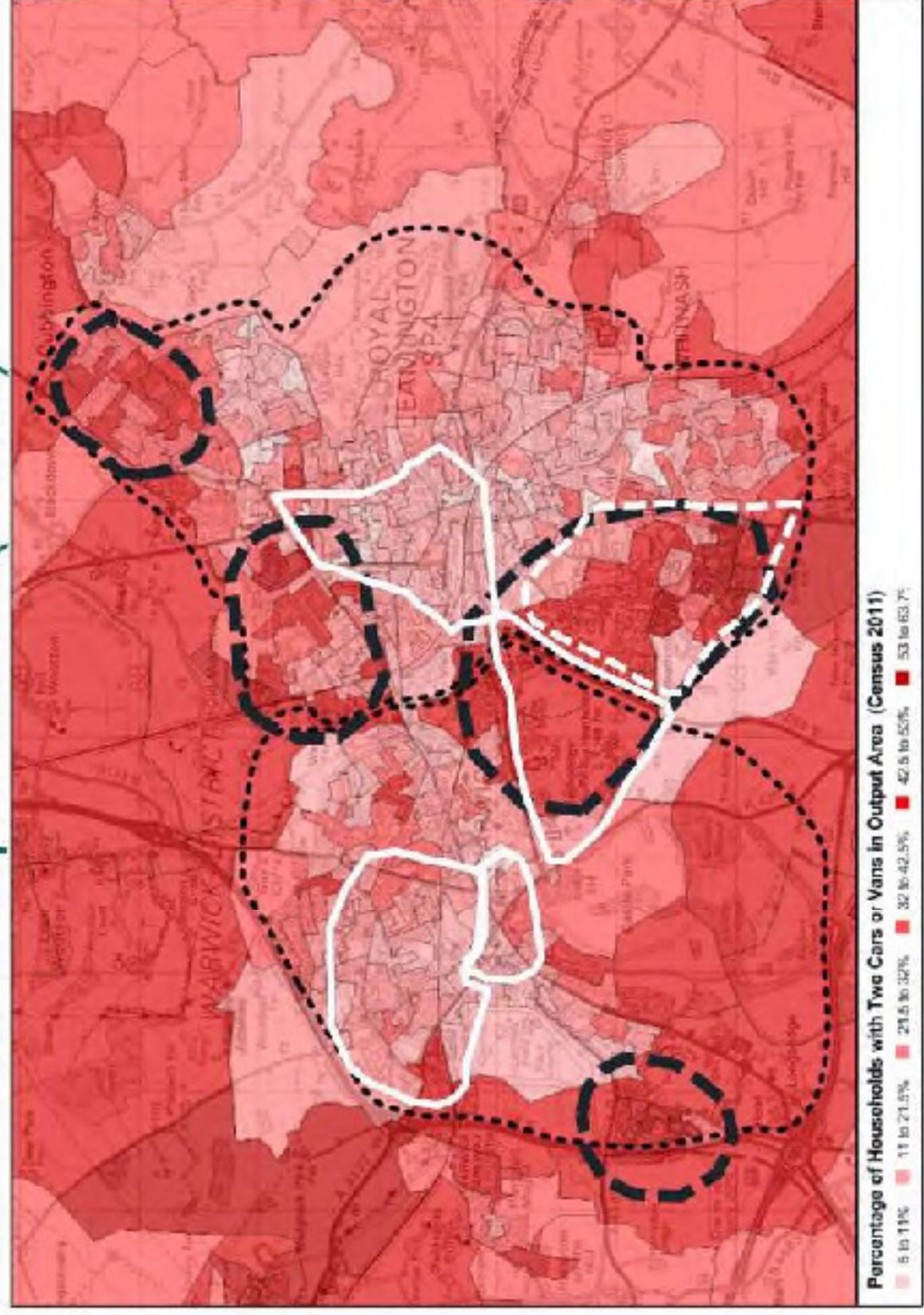
## Travel Patterns - Attractors



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## Car Ownership Levels (2011)

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## Travel to Work – Modal Choice

How do you usually travel to work?

	Warwick Hospital (2,500)	WDC (450)	WCC (1,600)
Car (alone)	78%	88%	62%
Bus	3%	6%	1%
Motorbike	0%	2%	1%
Walk	7%	14%	14%
Train	3%	4%	1%
Bicycle	3%	6%	6%
Car (with others)	7%	7%	9%
Taxi	0%	0%	0%
Driving with passengers	N/A	N/A	4%



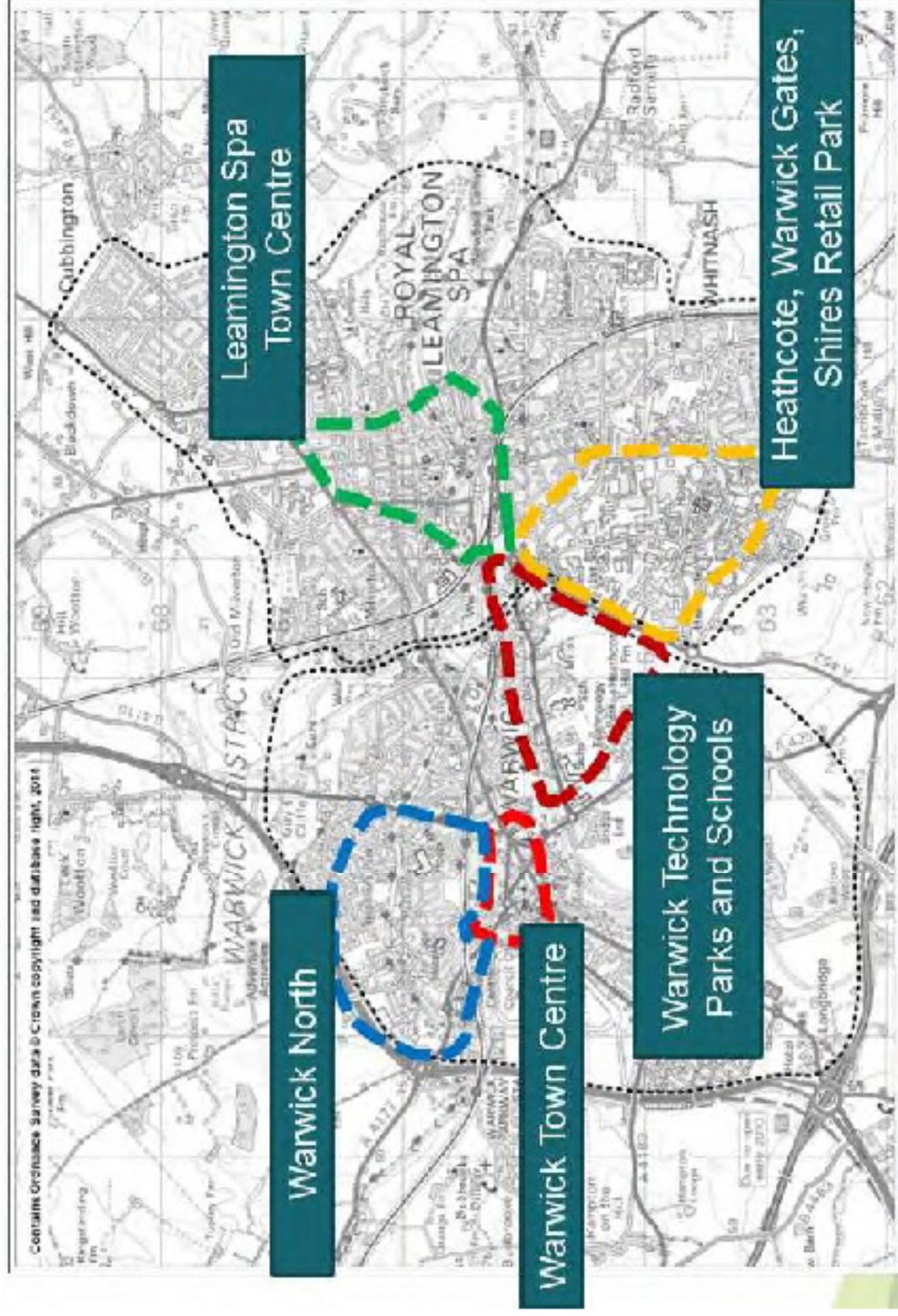
## Stakeholder Workshop 2

Location	Off-Street Car Parking Spaces	Additional On Street Parking
Tachbrook industrial Estate	<b>3,250</b>	n/a
Warwick Technology Park	2,142	94
Tachbrook Business Area	<b>1,800</b>	220
Wedgnoek Industrial Estate / OPUS40	1,343	n/a
Heathcote Industrial Estate	<b>980</b>	259
Shire Retail Park, Tachbrook Park Drive	650	n/a
Warwick Hospital	610	n/a
Gallagher Business Park, Gallagher Way	325	n/a
Warwickshire County Council (including Cape Road)	760	n/a
Warwick District Council, Riverside House	203	n/a

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So where might interventions be best applied?

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# Stakeholder Workshop 2

## Area Based O-D Analysis

Walking      Cycling      PT/CShare

Potential Intervention Area	Internal	Warwick wider area	Leamington Spa wider area	Outer Area	Total
Warwick Town Centre	14 (1%)	455 (30%)	175 (12%)	854 (57%)	1,498
Leamington Town Centre	625 (18%)	462 (13%)	1,102 (31%)	1,376 (38%)	3,565
Warwick North	714 (18%)	566 (14%)	467 (12%)	2,168 (56%)	3,915
Warwick Technology Park and Schools	55 (3%)	342 (18%)	833 (43%)	720 (36%)	1,950
Heathcote, Warwick Gates Shires Retail Park	792 (17%)	669 (15%)	1,671 (36%)	1,449 (31%)	4,581

## Stakeholder Workshop 2

### Round up

- We have a clear understanding of the transport related issues and problems affecting Warwick and Leamington
- We understand their causes and where they are most relevant
- We have a defined set of issues and impacts we are trying to achieve
- We now need to develop the solutions to address these issues and problems

## Stakeholder Workshop 2

Now over to You! (1 hour)

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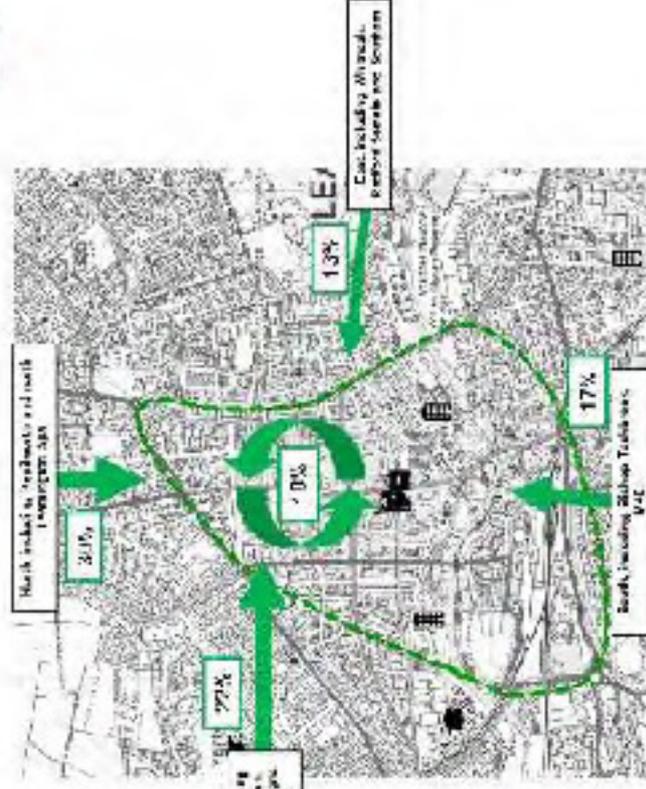
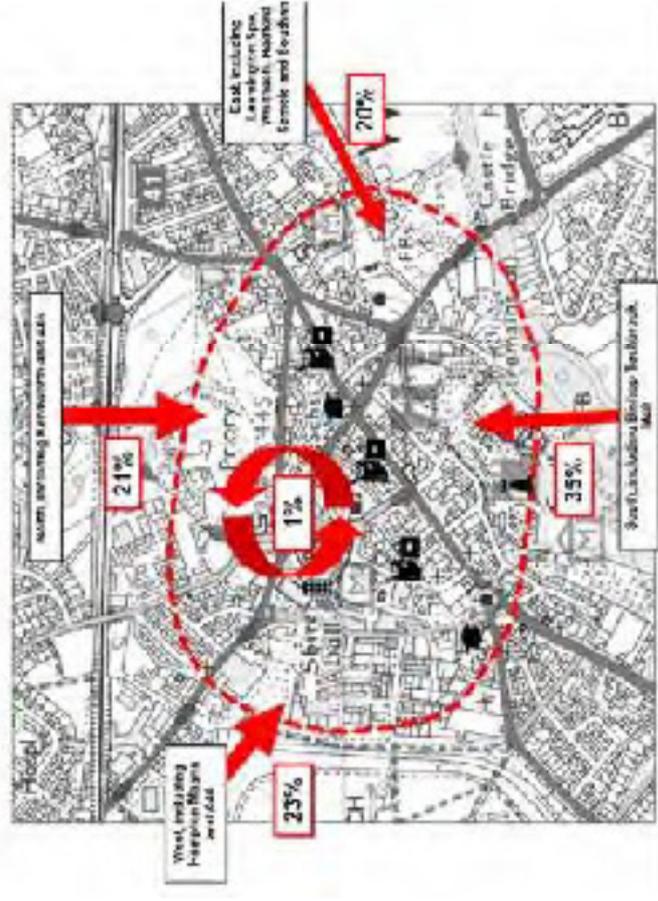
### Part A - Developing Area Interventions



# Stakeholder Workshop 2

## Key Intervention Areas - 1

NS



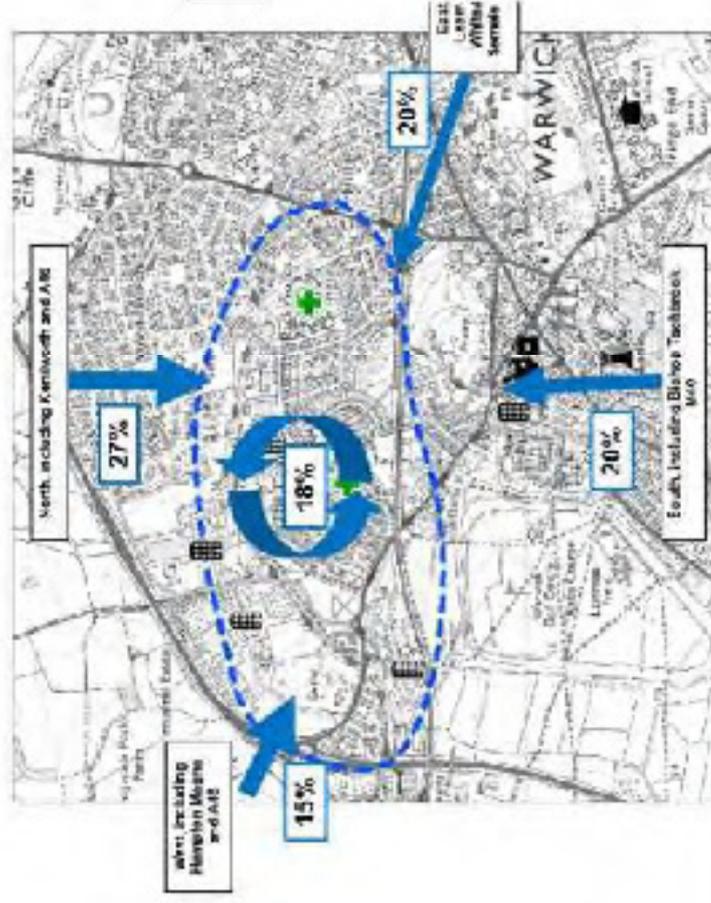
Warwick Town Centre

Leamington Spa Town Centre

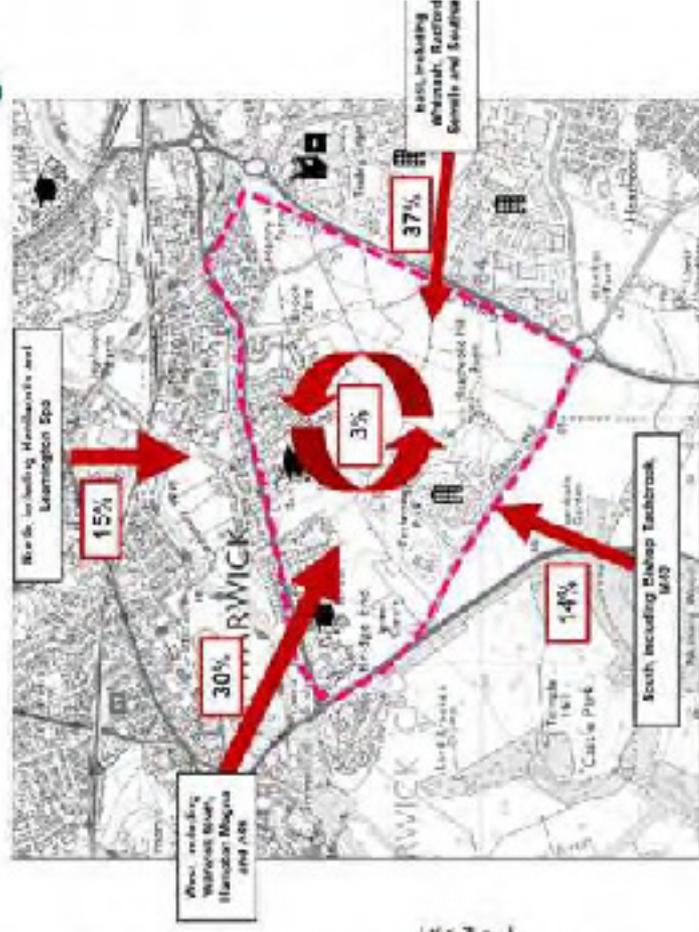
# Stakeholder Workshop 2

## Key Intervention Areas - 2

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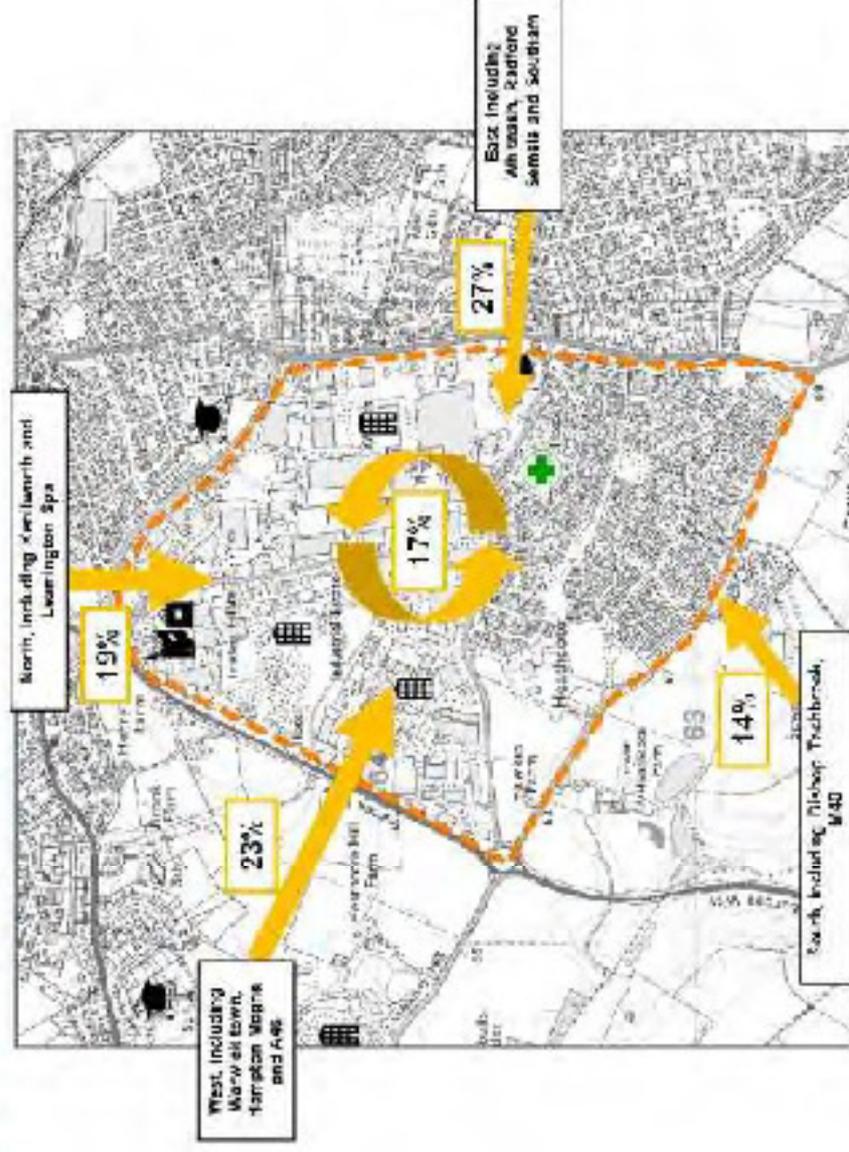
Warwick Hospital  
and Wedgnock  
(Warwick North)



Warwick  
Technology Park  
and Schools

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# Key Intervention Areas - 3



# Heathcote and Tachbrook

## Stakeholder Workshop 2

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## Warwick and Leamington Spa Transport Strategy

Stakeholder Workshop 2

Part B: Demand Management  
Solutions

Neil MacDonald

2<sup>nd</sup> July 2014

Plan Design Enable

able

## Stakeholder Workshop 2

# Identified Key Interventions – Demand Management

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**Travel/transport Demand Management relates to:**

“the application of strategies and policies to reduce travel demand (specifically that of single-occupancy private vehicles), or to redistribute this demand in space or in time” (Nelson, 2000)

# Why Demand Management?



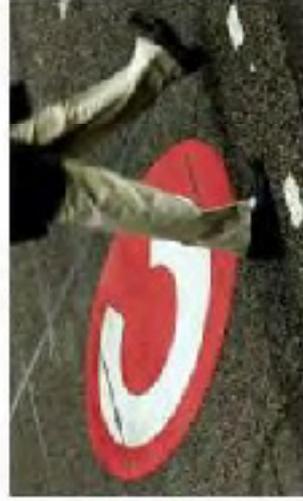
- Traditional transport planning approach isn't necessarily having the desired strength of effect at present
- Increasing network capacity is becoming increasingly more challenging as demand to travel is and will continue to increase
- Demand management can help make conventional measures more effective (everyone needs a push)
- Funding constraints
- A need to manage the environmental and social impacts of transport

## Stakeholder Workshop 2

# Illustrative Demand Management Measures



Intensive Network  
Management Approaches



Transit Charges  
(All Users/Through  
trips)



## Stakeholder Workshop 2

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# Illustrative Demand Management Measures

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Public Car Parking Availability



Car parking spaces

Workplace Car Parking Levies



↑ Costs of car parking

Restrictions (time, distance, zones)

Low Emission Zones



## Stakeholder Workshop 2

### Transit Charges (All Users)

<b>What is it?</b>	<ul style="list-style-type: none"> <li>• A mechanism through which motorists pay to use a defined area of road space (bridge, road, area)</li> <li>• Takes different forms (Area licences; cordon/zone charging; distance based/ time based)</li> </ul>
<b>Why do it?</b>	<ul style="list-style-type: none"> <li>• Manage congestion</li> <li>• Fund new transport investment</li> <li>• Fund asset maintenance</li> </ul>
<b>Trip Impact</b>	<ul style="list-style-type: none"> <li>• All car trips/LGVs/HGVs</li> <li>• All journey purposes</li> <li>• Immediate effect on congestion</li> <li>• Neutral to beneficial impact on business</li> <li>• Reduced emissions/improved air quality</li> <li>• Increased use of active/sustainable travel modes</li> <li>• Revenue source for new transport infrastructure</li> </ul>
<b>Pros</b>	<ul style="list-style-type: none"> <li>• Politically very contentious (not applied outside London)</li> <li>• Intensive technology requirements</li> <li>• Revenue stream declines after initial impact – ongoing operation costs</li> <li>• Carefully managed exemptions required</li> </ul>
<b>Where?</b>	Widespread application internationally; London; Singapore; Stockholm;

## Stakeholder Workshop 2

### Transit Charges (Strategic Through Trips Only)

**What is it?**

- As per all users but focuses on longer distance through trips only

**Why do it?**

- Manage congestion sourced by longer distance through trips
- Fund new transport investment
- Fund asset maintenance

**Trip Impact**

- Longer through trips only
- All journey purposes for long trips only

- Targets through trips only
- Neutral to beneficial impact on business
- Reduced emissions/improved air quality
- Increased use of active/sustainable travel modes
- Revenue source for new trans infrastructure

**Pros**

- Politically very contentious (not applied outside London)
- Intensive technology requirements
- Revenue stream declines after initial impact – ongoing operation costs
- Will not address shorter local trips

**Cons**

- Impact on active travel/public transport trips unlikely to be so prominent

**Where?**

- Pending further investigation

## Stakeholder Workshop 2

### Intensive Network Management

<b>What is it?</b>	<ul style="list-style-type: none"> <li>• Re-allocation of road space (buses/HOV's); Route signing strategies/prohibited movements; priority measures for buses and active modes; speed restrictions; public realm schemes</li> </ul>
<b>Why do it?</b>	<ul style="list-style-type: none"> <li>• To make alternative modes more attractive and reliable</li> <li>• Make single car trips less desirable</li> </ul>
<b>Trip Impact</b>	<ul style="list-style-type: none"> <li>• All trip types</li> <li>• Safer roads</li> <li>• Congestion relief</li> <li>• Deliverable</li> <li>• Economic value of public realm (triple benefits – economy; health and modal shift)</li> </ul>
<b>Pros</b>	<ul style="list-style-type: none"> <li>• Most effective schemes</li> <li>• Can move congestion to other areas</li> <li>• Requires resolution on road space conflicts</li> <li>• Re-routing effects</li> </ul>
<b>Cons</b>	
<b>Where?</b>	Widespread UK application

## Stakeholder Workshop 2

## Workplace Parking Levy - PNR

**What is it?**

- The WPL is a charge made on the maximum number of liable workplace parking places provided by an employer

**Why do it?**

- Manage congestion
- Fund new transport investment
- Fund asset maintenance

**Trip Impact**

- Work based Commuter Trips Only

**Pros**

- Targets a major contributor to peak hour congestion (long and short distance trips)
- Technically more easy to deliver than RUC approach
- Can be used to fund new transport investment

**Cons**

- Will the employer cover the bill?
- Smaller businesses exempt
- Fleet management and retail spaces
- Does not tackle through trips or educational trips
- Unproven impacts in the UK

**Where?** Nottingham; Perth; Melbourne; Sydney; North America

## Stakeholder Workshop 2

### Public Parking Availability

**What is it?**

- Regulation of public on/off street parking through management of parking charges; restrictions and availability

- Car parking availability is one determinant of car use/dependency... which causes congestion
- Cost of maintaining car parks
- On-site operational / capacity issues
- Inconsiderate parking

**Why do it?**

**Trip**

**Impact**

- All users of public parking - including retail, work, education and leisure
- Can encourage faster turnover of spaces and increase economic activity
- Within the control of planning authority to deliver
- Can encourage car-sharing/more sustainable car behaviours (reduction in shorter trips)
- Can be targeted to specific times of the day

**Pros**

- Public parking represents a relatively small proportion of overall capacity
- Won't affect through trips or school trips
- Adverse affect on leisure/retail trips and associated economic impact
- Dependency on revenues for operate car parks

**Cons**

**Where?**

Nationally

## Stakeholder Workshop 2

### Low Emission Zones

<b>What is it?</b>	<ul style="list-style-type: none"> <li>• A Low-Emission Zone (LEZ) is a geographically defined area which seeks to restrict or deter access by specific polluting vehicles or only allow low/zero emission vehicles</li> </ul>
<b>Why do it?</b>	<ul style="list-style-type: none"> <li>• Restrict specific vehicle movements</li> <li>• Improve the natural and built environment</li> <li>• Raise revenues for investment</li> </ul>
<b>Trip Impact</b>	<ul style="list-style-type: none"> <li>• High polluting vehicles across multiple journey purposes</li> <li>• Air quality impacts in restricted areas with associated health benefits</li> <li>• Reduced vibration and noise/public realm improvements within zone</li> <li>• Increase in active modes as heavier traffic removed</li> </ul>
<b>Pros</b>	<ul style="list-style-type: none"> <li>• Already considered and rejected in Warwick</li> <li>• Vehicle emissions already improving</li> <li>• Won't directly reduce trips for newer cleaner vehicles</li> <li>• Enforcement challenges</li> <li>• Unknown re-routing and impact effects</li> </ul>
<b>Where?</b>	London; Germany, Sweden, Netherlands, Italy, Tokyo

## Stakeholder Workshop 2

# Identified Key Interventions – Demand Management – Impact on Trips

	Road User Charges		Network Management	Workplace Parking Levies	Car Parking	Low Emission Zones
	All	Transit				
Longer distance town centre through car trips	●	●	●			●
Local town centre through car trips	●		●	●	●	●
Short distance car trips	●		●	●	●	●
Education car trips	●	●	●			●
Single occupancy car trips to work	●	●	●	●	●	●
Tourist trips	●		●		●	●
Retail trips	●		●		●	●
HGV/delivery	●	●	●			●

## Stakeholder Workshop 2

# Identified Key Interventions – Demand Management – Deliverability Evaluation

	Road User Charges		Network Management	Workplace Parking Levies	Car Parking	Low Emission Zones
	All	Transit				
Deliverability	Red	Red	Yellow	Yellow	Yellow	Yellow
Acceptability	Red	Yellow	Green	Yellow	Yellow	Green
Cost	Red	Red	Yellow	Yellow	Green	Green
Meeting the objectives	Green	Green	Green	Yellow	Yellow	Yellow
Benefit to Local Economy	Red	Yellow	Green	Yellow	Yellow	Yellow
Benefit to Local Environment	Green	Green	Green	Yellow	Yellow	Green
Timing	Red	Red	Green	Yellow	Green	Yellow

## Stakeholder Workshop 2

# Identified Key Interventions – Demand Management – Impact on Objectives

	Road User Charges		Network Management	Workplace Parking Levies	Car Parking	Low Emission Zones
	All	Transit				
Improved performance of local economy	●●	●●	●●●	●●	●●	●●
Protection of Warwick and Leamington Spa historic and built environment	●●●	●●	●●●	●●	●●	●●●
Healthier and active communities	●●●	●●	●●	●●	●●	●●●
Better air quality	●●●	●●	●●	●●	●●	●●●
Safety and security	●●●	●●	●●●	●●	●●	●●
Supporting sustainable housing growth	●●●	●●	●●	●●	●●	●●
Measurable shift towards sustainable travel choices	●●●	●●	●●	●●	●●	●●

## Stakeholder Workshop 2

Back over to You! (50 minutes)

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Part B - Is there a role for demand management in Warwick and Leamington?



## Stakeholder Workshop 2

LEAFBRO

## **Appendix C. Park and Ride Report, 2014**

# Technical note

Project:	Park & Ride for Warwick and Warwick	To:	Alan Law / Margaret Smith
Subject:	Mode Choice Model Update	From:	Michael Addyman / Andy Clark / Matt Gamble
Date:	18 <sup>th</sup> August 2014	cc:	Neil MacDonald / Adrian Taylor / James Lindsay

## 1. Introduction

Atkins has been commissioned by Warwickshire County Council to produce a transport strategy for the Warwick and Leamington Spa area by conducting a study which:

- Examines existing and forecast transport issues;
- Identifies transport issues and objectives for the area;
- Identifies transport schemes, in addition to those previously identified, to address the specific issues;
- Assesses the identified schemes; and
- Consolidates the schemes in to a coherent transport strategy for Warwick and Leamington Spa.

The scope of the Atkins commission is specifically to identify and test transport packages (including demand management) that encourage sustainable travel and help reduce town centre congestion in Warwick and Leamington Spa. This includes taking account of the likely transport impact of Warwick District Council's proposals for potential housing and employment growth sites in the Local Development Framework up to 2028.

Park and ride (P&R) has been considered by Warwickshire County Council proposals previously and needs to be considered as part of the process of development a transport strategy package. Hence the commission includes the updating of the 2011 Leamington Spa and Warwick P&R spreadsheet based mode choice model originally developed by JMP for Warwickshire County Council (WCC).

The P&R model is a binary logit mode model which forecasts patronage by comparing the generalised costs of travel by car against P&R and applying the proportion of mode transfers to the travel demand lying in scope. The definition of an in scope trip is provided later in the technical note.

The JMP mode choice model was first built with a base year of 2007 using data, demand and travel cost data extracted from a Q-View traffic assignment model of Leamington Spa and Warwick. The P&R spreadsheet model was subsequently updated by Arup to a base year of 2011. WCC has requested the P&R model now be updated to make use of newly available data from an S-Paramics model with a base year of 2011 and future year development scenario of 2028.

Having undertaken the update to the model, Atkins met with local operator Stagecoach to discuss the emerging findings and understand the concerns / aspirations regarding P&R from an operator's perspective.

The remainder of this technical note sets out the methodology for undertaking the update and the results shown. It also includes a summary of the discussion between Atkins and Stagecoach. The technical note culminates in a set of recommendations to inform the transport strategy for WCC.

# Technical note

## 2. Available Data

### 2.1. Existing P&R Mode Choice Model

WCC provided Atkins with the existing 2011 P&R model. Two separate files were provided – one for each of the proposed P&R locations:

- North site: Northern Park\_RideModel\_2011.xls
- South site: Greys Mallory Park\_RideModel\_2011.xls

### 2.2. S-Paramics Model Data

The following S-Paramics trip demand matrices files were provided by WCC for a 2011 base year and a 2028 future year scenario:

- 2011 demands: Aggregated Paramics zones and demand matrices\_Base 2011.xlsx
- 2028 demands: Aggregated Paramics zones and demand matrices\_WLWA LDF 2028.xlsx

Journey time and distance skim matrices were provided by WCC for both the 2011 base and 2028 future year scenarios. The following files have been used to update the model:

- 2011 distance skim: 2011 WLWA BASE SCENARIO AM Light Veh JD Matrices.xlsx
- 2028 distance skim: 2028 WLWA LDF SCENARIO AM Light Veh JD Matrices.xlsx
- 2011 and 2028 journey time skim: Average Journey Time Matrices (in seconds) WLWA 2011 Base & 2028 LDF.xlsx

## 3. P&R Model Update

### 3.1. P&R Services

The location of the proposed P&R sites remains unchanged from that assumed in the 2011 P&R model. A northern site would be located at the junction of the B4115 and A452 Leamington Road, providing a southbound service which would serve demand to Leamington Spa. A newly proposed northbound service (not included in the existing model) would serve demand to Kenilworth. A site in the south (Grey's Mallory) would be located at the junction of the A452 Europa Way and A425 Banbury Road, serving demand to both Leamington Spa and Warwick. Atkins is aware that there is a potential alternative site for the south P&R at the junction of the A452 Europa Way and Harbury Lane (referred to as the Heathcote site), approximately 1km to the north of the Grey's Mallory site.

### 3.2. P&R Models

The 2011 north and south site P&R spreadsheet model structure has been used as a starting point for the updated models. An additional model was required for the newly proposed northbound route serving Kenilworth from the north site. The following six P&R models have been developed:

- 2011 North Site – Northbound service to Kenilworth;
- 2011 North Site – Southbound service to Leamington Spa;
- 2011 South Site – Serving Leamington Spa and Warwick;
- 2028 North Site – Northbound service to Kenilworth;
- 2028 North Site – Southbound service to Leamington Spa; and
- 2028 South Site – Serving Leamington Spa and Warwick.

### 3.3. Zoning Systems and P&R Catchment Definition

The previously derived 2011 P&R model developed by Arup was structured around the Q-View model zoning system. The current update of the model requires the structure of the P&R models to be reconfigured to

# Technical note

reflect the S-Paramics Model zoning system. Hence origin and destination zones for trips in scope at each P&R site have been re-specified to align with the S-Paramics model.

An additional change that has been required in the modelling process relates to the mode shift % cap. The original Q-View Model, as used in the JMP 2011 version of the model, covered a wider area than the S-Paramics model used for the updated modelling. The S-Paramics model journey time skims only capture a small proportion of the total in-car time for longer distance trips. As such, the relative difference between the car and P&R generalised costs will be greater than if the full distance had been captured. This gives the model a bias in favour of car over P&R. The updated model was initially predicting very little mode shift to P&R with the JMP cap left unchanged at 25%<sup>1</sup>. Atkins' view was that because the majority of trips with the potential to use the P&R are expected to come from outside the S-Paramics model extents, the cap should be relaxed and hence a value of 50% has been used. Relaxing the cap from 25% to 50% means that these longer distance trips are not denied the opportunity to switch mode.

The P&R services are assumed to stop at all intermediate stops en-route. Figures 1 to 3 indicate the intermediate destination zones which have been deemed to be within scope. The intermediate zones were selected by drawing a 400 metre radius around existing bus stops on the route and selecting zones where the majority of dwellings fall within the resulting boundary.

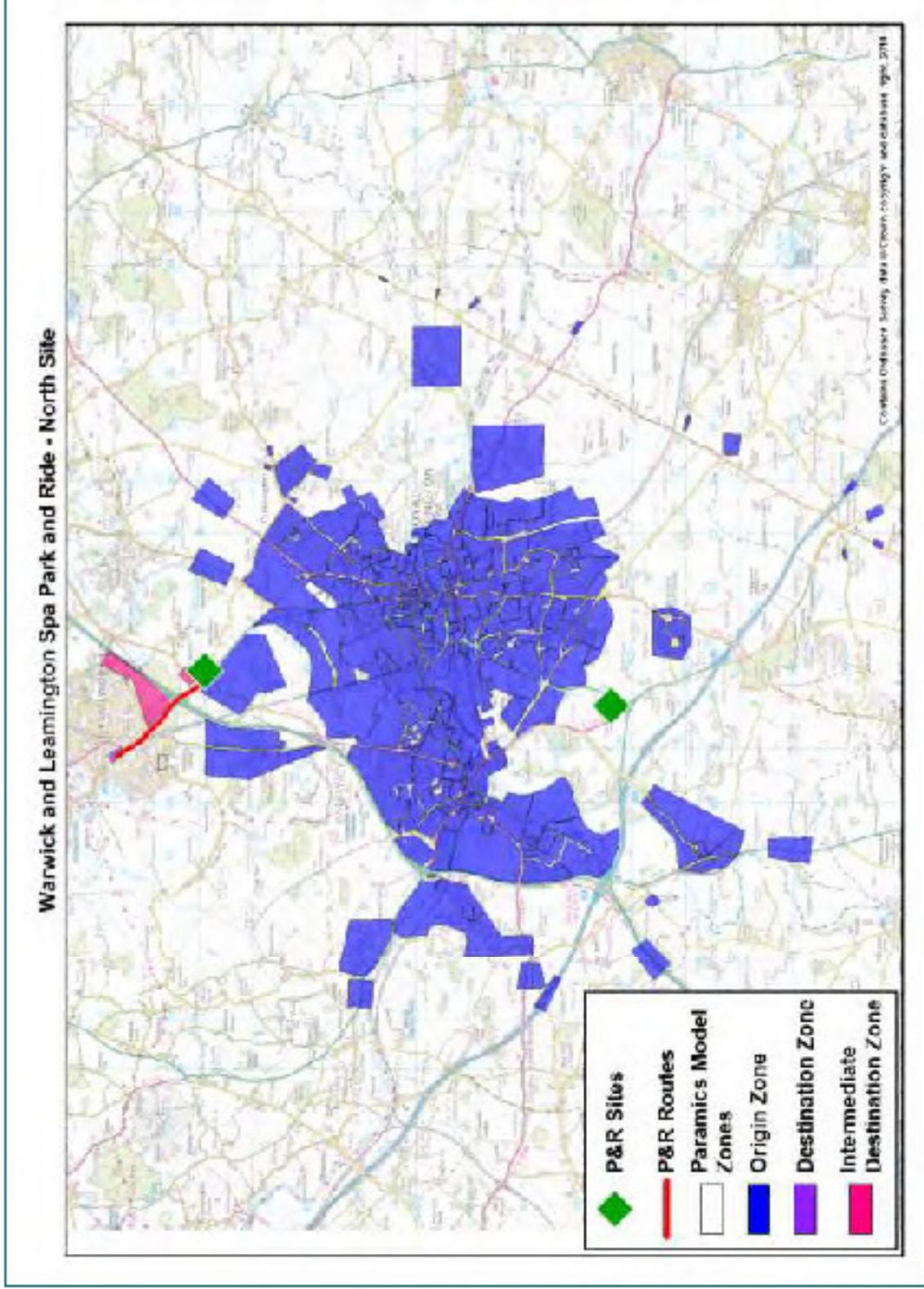
This process resulted in a list of origin, intermediate destinations, and destination zones for each of the P&R sites and associated routes. The identified origin and destination S-Paramics zones for each P&R site and associated routes are presented in Figures 1 to 3.

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<sup>1</sup> A cap of 25% means that once the difference in generalised journey cost between the two modes exceeds 25%, all trips are assumed to be made on the least costly mode.

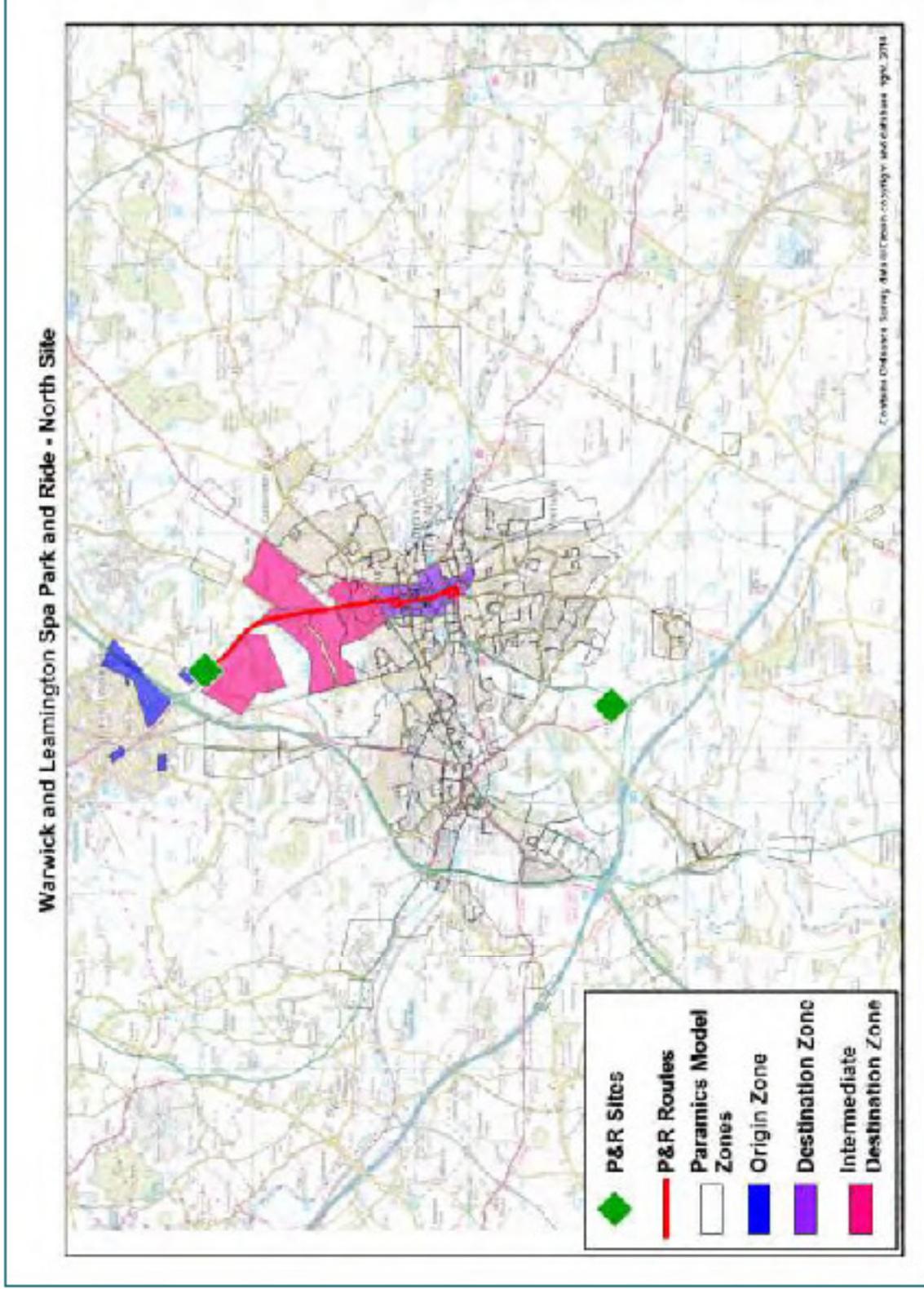
# Technical note

Figure 1. Geographical Location of Trips in Scope – North Site serving Kenilworth



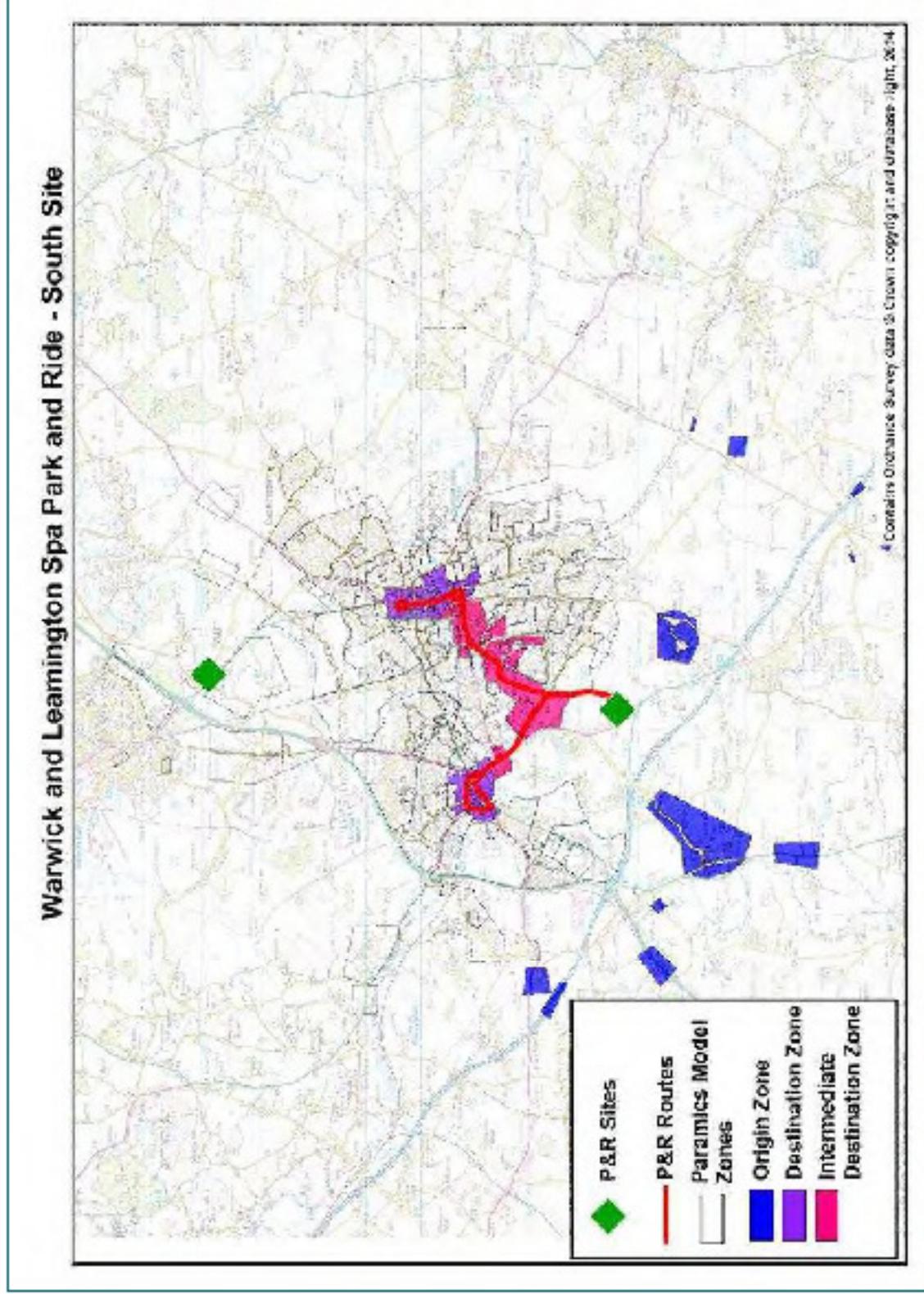
# Technical note

Figure 2. Geographical Location of Trips in Scope – North Site serving Leamington Spa



# Technical note

Figure 3. Geographical Location of Trips in Scope – South Site with Routes to both Leamington Spa and Warwick



# Technical note

## 3.4. Demand, Journey Times and Distances

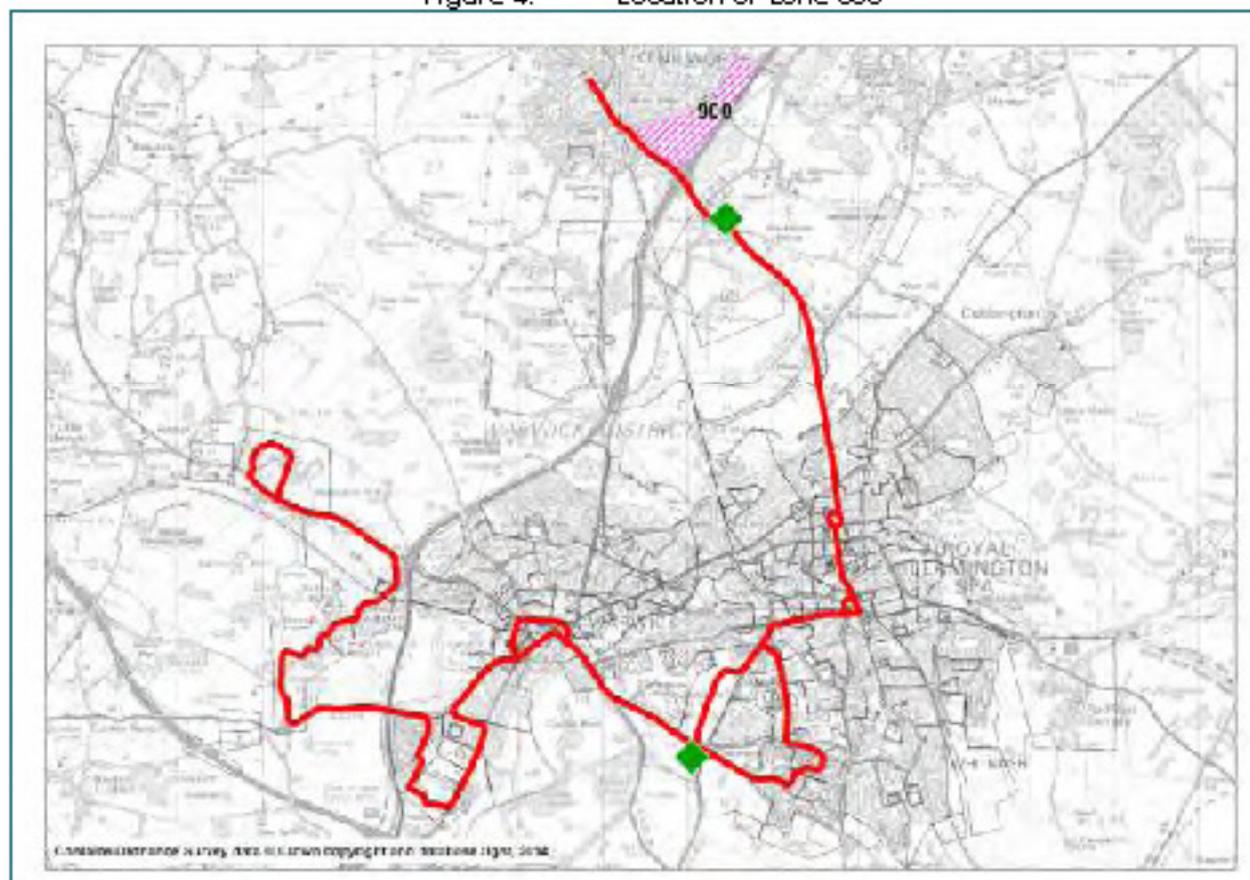
The resulting list of OD pairs in scope for each P&R site have been used to extract AM peak hour (0800-0900) demand, journey times and distances from the S-Paramics model for 2011 and 2028. The 0800-0900 S-Paramics vehicle demands are factored up to the peak period 0700-0900 values using a factor of 1.672. This factor has not been updated from the original JMP model provided.

Overall travel demand in scope have been extracted from the S-Paramics (input) demand matrices factored from vehicle trips to pers on trips by applying car occupancy factors; journey times and distances are taken from the S-Paramics model costskims generated as an output from the traffic assignment process. Tables 1 and 2 present the vehicle trips in scope for each site and destination. The inter-peak vehicle trips in scope have been scaled from the AM peak hour vehicle trips.

It is noted trips in scope at the south site northbound to intermediate destinations are lower in 2028 than 2011. The same is also true for southbound services from the north site. It is assumed that this is due to constraints applied when deriving the future year demand matrices for the S-Paramics model. An 'in scope' trip is either a trip from an origin zone to an intermediate zone or an origin zone to a destination zone. Note the underlying assumption is that the P&R bus services will follow existing bus routes through the network, hence trips with an origin at the intermediate zone will have access to existing services. It is assumed that those trips from intermediate zones that can take a bus already do so. For this reason and to help ensure prudency no additional P&R demand is included in the trips in scope from intermediate zones to a destination zone.

The large increase in northbound trips in scope from the north P&R site is mostly associated with S-Paramics development Zone 900. There are no trips to this zone in the 2011 demands compared to 476 in scope in 2028. The model predicts that 57 of these 476 in scope trips switch to P&R. The location of Zone 900 is shown in Figure 4. The zone covers a parcel of land south of Kenilworth bordered by the A46, Leamington Road and the residential areas adjacent to Birches Lane.

Figure 4. Location of Zone 900



# Technical note

Table 1. North Site Northbound Vehicle Trips in Scope

	2011		2028	
	To Intermediate	To Kenilworth	To Intermediate	To Kenilworth
AM Peak (0700-0900)	32	702	514	762
Inter-Peak (0900-1500)	51	1,131	827	1,227

Table 2. North Site Southbound Vehicle Trips in Scope

	2011		2028	
	To Intermediate	To Leamington Spa	To Intermediate	To Leamington Spa
AM Peak (0700-0900)	271	409	264	440
Inter-Peak (0900-1500)	435	657	425	709

Table 3. South Site Vehicle Trips in Scope

	2011			2028		
	To Intermediate	To Leamington Spa	To Warwick	To Intermediate	To Leamington Spa	To Warwick
AM Peak (0700-0900)	1,093	720	1,134	936	505	885
Inter-Peak (0900-1500)	1,759	1,158	1,826	1,506	813	1,424

Local trips from intermediate origins to Leamington Spa, Warwick and Kenilworth have not been included in the trips in scope in both the 2011 and 2028 models, as set out in Tables 1, 2 and 3. It is however accepted that a proportion of any increased demand in 2028 may use the existing bus services, or the new P&R service.

Table 4 presents the change in trips in scope from the intermediate origins between 2011 and 2028. The south site captures 103 additional trips in scope from growth to 2028. Therefore, based on the assumption that the level of mode shift is similar to that for the south site as a whole (approximately 20% - see figures later in report), then the additional trips are insignificant. A very small number of additional trips are captured in scope at the north site using the northbound route, and a drop in demand using the southbound route results in fewer trips in scope in 2028.

Table 4. Change in Trips in Scope from Intermediate Origins

	2011	2028	Difference
South Site	132	236	103
North Site NB	0	6	6
North Site SB	39	37	-2

## 3.5. Model Parameters

The P&R model uses a number of parameters to calculate the generalised cost for each mode of transport. The key model parameters are listed in Table 4. The values presented are 2011 values and for this initial update of the model have been retained from the previous 2011 P&R model.

In the 2028 models, the P&R fare and parking charges have been increased in line with inflation estimates. Values of time and vehicle operating costs used by the model have also been adjusted to 2028 values with factors from the most recent WebTAG release.

It has been assumed that the P&R journey times will remain at 2011 values in 2028 through the provision of bus priority schemes.

# Technical note

Table 5. Model Parameters

Parameter	North Site	South Site
P&R Fare (return trip – assumed to be a flat fare)	£2.21	£2.21
Car Occupancy	1.16 peak 1.68 inter-peak	1.16 peak 1.68 inter-peak
P&R Headway (minutes)	Leamington Spa 10 Kenilworth 10	Leamington Spa 10 Warwick 10
P&R Journey Time (minutes)	Leamington Spa 10 Kenilworth 10	Leamington Spa 10 Warwick 8
Assumed proportion Parking Free / Paid <sup>2</sup>	Leamington Spa 41% / 59% Kenilworth 69% / 31%	Leamington Spa 41% / 59% Warwick 69% / 31%
Parking Charge (peak)	Leamington Spa £5.19 Kenilworth £3.50	Leamington Spa £5.19 Warwick £4.97
Parking Charge (off-peak)	Leamington Spa £3.31 Kenilworth £2.00	Leamington Spa £3.31 Warwick £2.26
Private Non-Residential (PNR)	Not explicitly captured in the model. Assumed to be part of the "Free" parking proportion specified above	
Parking Enforcement	The model assumes 100% enforcement of parking	
Mode Specific Constant	-2.5 minutes, derived from values assigned to bus quality (one minute), information (one minute), CCTV (one minute) and waiting room provision (two minutes). The model assumes all of these facilities are provided and subtracts the total minutes (five) from 2.5	
Mode Switch Parameter	0.04 minutes <sup>-1</sup>	

## 4. Model Results

Tables 5, 6 and 7 present the vehicle trips in scope and the number of those trips the model predicts will switch to P&R for each site and associated destination. All trips reported are one-way (P&R to destination) only. The presented patronage values are the number of vehicle trips switching to P&R factored up by the occupancy values in the model of 1.16 in the peak and 1.68 in the inter-peak.

### 4.1. North Site

At the north site there are a higher number of trips in scope for destinations in Kenilworth than in Leamington Spa (see Figures 1 and 2). However, a higher proportion of the trips to Leamington Spa are predicted to shift to P&R. 105 (26%) of the 409 trips to Leamington Spa are predicted to switch to P&R, whereas only 67 (9%) of the 702 trips to Kenilworth switch. The percentage switch in the inter-peak period is lower at 21% for trips to Leamington and 2% for trips to Kenilworth.

The southbound route also sees a high percentage of trips that terminate at an intermediate destination switch to P&R.

The total number of vehicle trips in scope increases in 2028 for both Leamington Spa and Kenilworth. In both the AM and inter-peak periods, the percentage of trips switching to P&R is comparable with the 2011 model.

A total of 81 passengers are predicted to use the P&R route northbound to Kenilworth during the AM peak period. The southbound route is predicted to have higher patronage at 200 passengers during the same period.

<sup>2</sup> The proportion of free to paid parking for Kenilworth has been assumed to be the same as that for Warwick for the purpose of this model update.

# Technical note

## 4.2. South Site

Trips in scope at the south site are higher for trips to Warwick at 1,134 compared to a 720 to Leamington Spa in the AM peak period. However, the model predicts Leamington to be the more attractive of the two routes, with 23% of trips predicted to switch to P&R, compared to only 11% to Warwick trips (this is likely to be a function of the larger proportion of free parking in Warwick and lower parking charges). The P&R route becomes less attractive in the inter-peak with the percentage switch in the inter-peak period decreasing to 16% for trips to Leamington Spa, and 0% to both Warwick and the intermediate stops. This is likely to be due to a combination of lower parking charges off-peak and reduced levels of highway congestion, lowering the car generalised journey cost.

The total number of vehicle trips in scope decreases in 2028 for both Leamington and Kenilworth. In both the AM and inter-peak periods, the percentage of trips switching to P&R is comparable with the 2011 model.

A total of 586 passengers are predicted to use the P&R service from the southern site. 147 of those passengers travel to Warwick, 193 to Leamington, and 246 to intermediate stops en-route.

# Technical note

Table 6. North Site Northbound Route Results

	2011			2028		
	To Intermediate	To Kenilworth	Totals	To Intermediate	To Kenilworth	Totals
AM Peak(0700-0900)						
Vehicle trips in scope	32	702	734	514	762	1276
Vehicle trips switch to P&R	3	67	69	61	84	145
% Mode Change	9%	9%	9%	12%	11%	11%
P&R Patronage (pers ons)	3	77	81	71	97	168
Inter-Peak(0900-1500)						
Vehicle trips in scope	51	1131	1182	827	1227	2054
Vehicle trips switch to P&R	0	18	18	20	28	47
% Mode Change	1%	2%	2%	2%	2%	2%
P&R Patronage (pers ons)	1	30	31	33	46	79

Table 7. North Site Southbound Route Results

	2011			2028		
	To Intermediate	To Leamington Spa	Totals	To Intermediate	To Leamington Spa	Totals
AM Peak(0700-0900)						
Vehicle trips in scope	271	409	679	264	440	705
Vehicle trips switch to P&R	67	105	172	67	115	182
% Mode Change	25%	26%	25%	25%	26%	26%
P&R Patronage (pers ons)	78	122	200	78	133	211
Inter-Peak(0900-1500)						
Vehicle trips in scope	435	657	1093	425	709	1134
Vehicle trips switch to P&R	42	140	182	40	148	188
% Mode Change	10%	21%	17%	9%	21%	17%
P&R Patronage (pers ons)	70	235	305	67	248	315

# Technical note

Table 8. South Site Results

	2011				2028			
	To Intermediate	To Leamington Spa	To Warwick	Totals	To Intermediate	To Leamington Spa	To Warwick	Totals
<b>AM Peak(0700-0900)</b>								
Vehicle trips in scope	1093	720	1134	2947	936	505	885	2326
Vehicle trips switch to P&R	212	166	127	506	216	136	143	495
% Mode Change	19%	23%	11%	17%	23%	27%	16%	21%
P&R Patronage (persons)	246	193	147	586	251	158	166	575
<b>Inter-Peak(0900-1500)</b>								
Vehicle trips in scope	1759	1158	1826	4743	1506	813	1424	3473
Vehicle trips switch to P&R	3	182	2	187	21	166	43	229
% Mode Change	0%	16%	0%	4%	1%	20%	3%	6%
P&R Patronage (persons)	5	306	3	315	35	278	72	385

## 4.3. Comparison of Updated Model with 2011 JMP Model

To compare the updated Atkins model against the JMP model, a like for like scenario has been run, applying the quoted JMP 2011 base scenario specifications to the Atkins updated 2011 base model. This allows a direct comparison with the only differences between the two models being the input demand matrices and journey time and distance skims.

Trips to intermediate destinations have not been included in the comparison as it is not clear from the JMP report that trips to intermediate destinations were captured in the model. Also, the north site northbound route to Kenilworth is not reported in the following sub-sections as the route was not included in the JMP model.

As earlier noted, a change has been made to the mode shift % cap, reflecting the use of the S-Paramics model in place of the Q-View model.

### 4.3.1. North Site

In the peak period, the JMP model predicted 117 vehicle trips to Leamington Spa from the north site would switch to P&R, which is comparable to the Atkins model prediction of 108 vehicle trips. In the inter-peak period the JMP model predicts no trips switch mode to P&R whereas the Atkins model predicts 148 trips would switch excluding intermediate stop demand. In testing the inter-peak demand, Atkins notes that the model at the north site is quite sensitive to the mode shift % cap. If the Atkins model were to revert to a cap of 25%, as used by JMP, the model would show inter-peak demand of zero, but Atkins relaxed the cap to reduce the bias in favour of car.

# Technical note

Table 9. South Site Comparison

	JMP	Atkins
P&R Fare (return trip – assumed to be a flat fare)	£1.50	£1.50
Car Occupancy	1.16 peak 1.68 inter-peak	1.16 peak 1.68 inter-peak
P&R Headway (minutes)	Leamington Spa 10	Leamington Spa 10
P&R Journey Time (minutes)	Leamington Spa *	Leamington Spa 10
Assumed Proportion Parking Free / Paid	Leamington Spa 41% / 59%	Leamington Spa 41% / 59%
Parking Charge (peak)	Leamington Spa £3.60	Leamington Spa £3.60
Parking Charge (inter-peak)	Leamington Spa £2.00	Leamington Spa £2.00
Vehicle Trips in Scope (peak)	Leamington Spa *	Leamington Spa 409
Vehicle Trips that Switch to P&R (peak)	Leamington Spa 117	Leamington Spa 108
Vehicle Trips in Scope (inter-peak)	Leamington Spa *	Leamington Spa 657
Vehicle Trips that Switch to P&R (inter-peak)	Leamington Spa 0	Leamington Spa 148

\*P&R Journey time and trips in scope are not quoted in the JMP report.

## 4.4. South Site

The JMP model predicts that 169 vehicle trips from the south site to Leamington Spa during the peak period would switch mode to P&R, which is comparable to the Atkins model prediction of 172 trips. Trips to Warwick switching to P&R are predicted to be higher by the Atkins model at 124 vehicle trips compared to 72 predicted by the JMP model. During the inter-peak period the Atkins model predicts a lower number of trips switching to P&R than the JMP model for the destinations of both Leamington Spa and Warwick.

# Technical note

Table 10. South Site Comparison

	JMP	Atkins
P&R Fare (return trip – assumed to be a flat fare)	£1.50	£1.50
Car Occupancy	1.16 peak 1.68 inter-peak	1.16 peak 1.68 inter-peak
P&R Headway (minutes)	Leamington Spa 10 Warwick 10	Leamington Spa 10 Warwick 10
P&R Journey Time (minutes)	Leamington Spa * Warwick *	Leamington Spa 10 Warwick 8
Assumed Proportion Parking Free / Paid	Leamington Spa 41% / 59% Warwick	Leamington Spa 41% / 59% Warwick
Parking Charge (peak)	Leamington Spa £3.60 Warwick £3.00	Leamington Spa £3.60 Warwick £3.00
Parking Charge (inter-peak)	Leamington Spa £2.00 Warwick £1.90	Leamington Spa £2.00 Warwick £1.90
Vehicle Trips in Scope (peak)	Leamington Spa * Warwick *	Leamington Spa 720 Warwick 1134
Vehicle Trips that Switch to P&R (peak)	Leamington Spa 169 Warwick 72	Leamington Spa 172 Warwick 124
Vehicle Trips in Scope (inter-peak)	Leamington Spa * Warwick *	Leamington Spa 1158 Warwick 1826
Vehicle Trips that Switch to P&R (inter-peak)	Leamington Spa 278 Warwick 51	Leamington Spa 221 Warwick 11

\*P&R Journey time and trips in scope are not quoted in the JMP report.

The like for like test demonstrates that the Atkins model predicts comparable levels of mode shift to the JMP model during the peak period at both the north and south sites. On the whole, the Atkins model predicts a more favourable switch of trips to P&R. From the south site, the Atkins model predicts a slightly higher mode shift to P&R than the JMP model during the peak period, but slightly lower mode shift during the inter-peak period.

The JMP model predicted no mode switch to P&R from the north site during the inter-peak period, whereas the Atkins model predicts that 148 vehicle trips would switch. Atkins has expressed concerns regarding the accuracy and method employed to derive the inter-peak patronage. In addition, given that the model is sensitive to the mode shift % cap, Atkins recommends that any future consideration of inter-peak (and peak) demand looks at this threshold in more detail.

Trips to intermediate destinations that are captured by the Atkins model are not reported in the aforementioned comparison results, neither are the trips associated with the new north site northbound route to Kenilworth.

## 5. Model Sensitivity Testing

To understand how sensitive the model is to the parameters used to calculate generalised cost, the following tests have been undertaken. Sensitivity test results can be seen in Appendix A.

# Technical note

## 5.1. P&R Fare

The P&R fare in the original models is set at £2.21 for all routes. Sensitivity tests of £0.00, £1.10, and £3.31 have been run to test the sensitivity of the model to the P&R fare. The fares lower than the standard £2.21 can be taken as a proxy for the proportion of passengers that use concessions.

As expected, the result of increasing the P&R fare is a reduction in the number of trips switching to P&R. The impact is much more pronounced in the inter-peak period. Changing from £2.21 to £3.31 reduces vehicle trips from 140 to 13 in the inter-peak and hence the impact is considerable.

## 5.2. P&R Frequency

The P&R frequency in the original models is set to every 10 minutes for all routes. To test the sensitivity of this parameter, frequencies of 5, 20 and 30 minutes have been tested.

As the headway and resulting wait time increases, the number of trips switching to P&R diminishes, as one would expect. The impact is more pronounced in the inter-peak period. The uptake of P&R reduces to zero in the AM peak with a headway of 30 minutes.

## 5.3. Parking Charge

The parking charges in the original models are set to £5.19 in Leamington, £4.97 in Warwick and £3.50 in Kenilworth. Sensitivity tests have been run with the parking charges at 0%, 50% and 150% of the original values.

As the parking charge increases, P&R becomes an increasingly attractive option with more trips making the switch. The effect is more pronounced in the inter-peak period.

## 5.4. Free / Paid Parking

The split of free to paid parking in the original models is set to 41% / 59% in Leamington and 69% / 31% for Warwick and Kenilworth. Sensitivity test of 100% / 0%, 50% / 50%, and 0% / 100% have been run. Decreasing the percentage of paid parking results in a decline in the number of trips switching to P&R. This sensitivity serves to demonstrate that if the free workplace parking at some of the larger employers in Warwick and Leamington Spa was no longer provided, then there may be considerably more demand for P&R in the towns.

# 6. Modelling Conclusions

During an early critique of the model, it was identified that the inter-peak demand used to derive overall demand is a factored down AM peak hour matrix. It is unlikely however that the distribution of peak hour arrivals will be comparable to inter-peak patterns, hence there are reservations as to the accuracy of such a method of assessing demand. Atkins would recommend consideration is given to construction of inter-peak demand matrices most realistically from Traffic Master OD matrices (despite the inherent small sample size).

Given the reservations regarding the inter-peak matrix, these conclusions focus on the AM peak period model results only. The 2011 mode choice model has been updated using data from the 2011 and 2028 S-Paramics model. A new zoning system has been developed, identifying S-Paramics zones for origins, intermediate destinations, and destinations served by the proposed P&R services.

Patronage figures have been extracted from the model based on the number of trips predicted to change mode from car to P&R. The southbound route from the north site to Leamington is predicted to be more successful than the Kenilworth route at attracting trips to switch mode. 2011 patronage to Leamington Spa is predicted at 200 passengers, compared with only 81 passengers to Kenilworth.

The south site captures more than double the number of trips than the north site. Routes from the south site to both Warwick and Leamington Spa attract comparable patronage levels at 147 and 193 passengers in 2011 respectively. A large number of passengers (246) are also predicted to use the south sites services to travel to intermediate destinations.

## Technical note

Sensitivity tests were undertaken to explore the uncertainty of parameters used in the model. Sensitivity tests have shown that the model is sensitive to each of the parameters tested, most significantly in the inter-peak period. Given the reservations expressed earlier in this note regarding the use of a factored down AM peak matrix for the inter-peak, it is recommended that further work is done to derive a more accurate inter-peak matrix. The S-Params demand files do not include any inter-peak information so Traffic Master OD data could be used as an alternative to derive inter-peak demand matrices.

Further work could also be done to provide more accurate figures for each of the parameters used by the model to calculate the generalised cost of each mode. Atkins has identified that the following updates would be desirable in the future to refine the modelling process further:

- Confirm indicative egress times from P&R to ultimate town centre destination (currently two minutes for Warwick and three minutes for Leamington Spa);
- Confirm expected P&R fare levels (currently set at £2.21 return for both Warwick and Leamington Spa). This would include identifying any expected differential in peak and off-peak P&R fares;
- As above, identify inter-peak demand from the Traffic Master OD database;
- Gain inter-peak travel time skims from either a rescaled Params model assignment or from the Traffic Master Journey time database;
- Seek any local evidence of car occupancy;
- Update the on-street and public parking cost regimes in the respective town centres, including Kenilworth which has been added to the model as part of this update; and
- Update proportions of users having free and pay parking for each town, if data becomes available (or sub-area of town if available) by time period, currently set at 59% paying in Leamington Spa and 31% paying in Warwick. A robust figure is also required for Kenilworth (currently assumed to have a similar distribution to Warwick);
- Seek to provide further evidence validating that the Mode Specific Constant used in the model is appropriate, at -2.5 minutes, and to understand whether JMP's stated adjustments such as bus quality accounting for one minute, are robust; and
- Consider testing the sensitivity of the model to a change in the mode shift % cap. The JMP value of 25% has been relaxed to 50% in the updated model to take account of the use of S-Params in place of Q-View.

## 7. Meeting with Stagecoach

Atkins met with Stagecoach on Tuesday 8<sup>th</sup> July to discuss the emerging results from the P&R model update. This section briefly outlines the key points arising from the discussion. Attendees were as follows:

- Representing Atkins: Matt Gamble, Andy Clark; and
- Representing Stagecoach: Steve Burd, Nick Small and Chris Simes.

At the outset of the meeting, Nick Small of Stagecoach confirmed that Stagecoach's general aspiration would be for P&R to be incorporated as part of an integrated network, rather than dedicated P&R services being provided. This would provide a relatively low-risk investment for WCC.

Stagecoach expressed concern that until recently, there has been little liaison between WCC and bus operators regarding the role bus can play in the towns' development, but appreciate that significant effort is now being made. Stagecoach welcomed the discussion regarding potential future P&R to serve the towns.

### 7.1. North Site

Stagecoach were very positive regarding a north site, situated at the junction of the B4115 and A452 Leamington Road. Key points of discussion regarding the north site were as follows:

- As currently envisaged, the site could be served by frequent commercial services between Warwick, Leamington, University of Warwick and Coventry which run on the A452. Subject to satisfactory access being achieved, Stagecoach confirmed that this means there should be little or no cost to WCC for the operation of the bus service;

## Technical note

- Stagecoach currently runs a number of services towards the University of Warwick from Leamington Spa in the AM peak. Some of the return workings are 'dead workings', not carrying passengers. Hence the potential to offer significant peak capacity from a new site into Leamington Spa and / or Warwick is greater than that shown in the timetable;
- Stagecoach believe there may be a additional opportunities linked to the University of Warwick, in that with constrained parking at the campus and Travel Plan obligations, plus a number of large events (for example, graduation ceremonies), there may be significant demand potential for northbound P&R services;
- In addition to serving University of Warwick in the northbound direction, Atkins discussed with Stagecoach potential demand for Coventry. Stagecoach were of the opinion that there may be some demand but this is unlikely to be significant; and
- Stagecoach were not of the opinion that the A452 corridor from the site into Leamington Spa is notably congested at the current time, but supported Atkins' modelling approach of maintaining the existing journey time for the 2028 model run, which assumes that a level of bus priority is provided in the future.

### 7.2. South Site

Atkins shared the results of the modelling for the south site, which show strong demand into Leamington Spa but weaker demand into Warwick.

Key points of the discussion were as follows:

- Stagecoach advocates a similar approach to that at the north site, whereby a P&R site would be integrated into the local bus network. At the current time, however, there are very few services that pass the Grey's Mallory site, but Stagecoach believe that a viable P&R service could be provided by combining with a new bus route to serve new residential developments in the area;
- Stagecoach's specific aspiration for the route into Leamington Spa from a south site at Grey's Mallory is for a 'virtual busway' to be created through the proposed new development parallel to and to the west of Europa Way, which incorporates bus gates at key points to prevent it from becoming attractive to through traffic and gives buses a key journey time advantage over the parallel highway route;
- Stagecoach believes that bus priority will be required from the outset to ensure that the bus journey time compares favourably with the highway journey time and hence there is a good level of mode shift;
- Stagecoach were concerned at the lack of obvious space for bus priority on the corridor into Warwick; and
- As well as serving the town centres, Stagecoach see opportunities to serve Warwick Hospital and Myton School and Trinity College Catholic School towards Leamington Spa.

Whilst the focus of the modelling has been on the site at Grey's Mallory, Atkins explained that various WCC documentation refers to two different sites to the south, the other site being located at the junction of Europa Way and Harbury Lane. Stagecoach expressed a view in favour of Greys Mallory but were open to opportunities at the Gallagher site between the The Asps and Gallows Hill.

## 8. P&R Cost Assessment

### 8.1. Capital Costs

Capital costs for the north and south sites have not been updated as part of this commission. Detailed cost estimates were compiled by JMP who previously undertook the P&R modelling. These costs included the capital costs associated with the new parking areas but also the ongoing operating costs for the car parks, such as security and cleaning. The capital costs outlined by JMP ranged from £1.24m to £1.67m for the

# Technical note

north site (based on 200 spaces), depending on the option chosen. The equivalent figures for the south site were £2.59m to £3.01m, based on an 800 space car park.

## 8.2. Bus Operating Costs

Bus operating costs have not been produced to accompany this latest model update. This is because the meeting with Stagecoach confirmed that there is significant scope for WCC to consider P&R services being provided as part of the wider bus network and not as standalone, dedicated services. This means that potentially Park and Ride bus services would be provided at zero cost to WCC. With respect to the southern site this needs to be considered as part of a package utilising the various development opportunities to define a frequent bus service which in all likelihood will require 'pump priming' at least in the early stages. Nonetheless, Atkins has undertaken a high level review of the bus operating costs previously prepared by JMP and note that no provision has been made for:

- Engineering staff costs;
- Spare vehicles;
- Depot overheads;
- Dead mileage; and
- Profit margin.

Parameters such as driver costs and Bus Service Operators Grant need to be updated. For a service secured by competitive tender, BSOG needs to be removed from the calculation.

## 9. Overall Conclusions

Atkins has undertaken an update to the modelling for P&R for two sites to serve Leamington Spa, Warwick and Kenilworth. The headline findings are highlighted in bold text, with supporting evidence provided below each headline finding.

**Modelling of both the north and south sites indicates a reasonable level of demand for P&R, clearly demonstrating that P&R warrants more detailed consideration as part of the wider transport strategy.**

The modelling has identified that the south site captures more than double the number of trips in scope than the north site. Routes from the south site to both Warwick and Leamington Spa attract comparable patronage levels at 147 and 193 passengers in 2011 respectively. A large number of passengers (246) are also predicted to use the south site services to travel to intermediate destinations.

**A comparison with the 2011 modelling undertaken by JMP confirms that the Atkins model predicts a comparable level of mode shift during the peak period at both the north and south sites.**

From the south site, the Atkins model predicts a higher level of shift in the peak than the JMP model, but a lower level during the inter-peak. The most notable difference between the two sets of modelling is that the JMP model assumes no shift during the inter-peak for the north site, southbound. This confirms the need outlined below for a better consideration of the approach to the inter-peak modelling. If using a mode shift % cap of 25%, the Atkins model matches that of JMP at the north site, with no inter-peak demand shown, but when relaxing the cap to 50% (as recommended by Atkins), then significant inter-peak demand is shown.

**The sensitivity tests confirmed that the model is sensitive to various parameters in the model, including the availability of free parking and the charge for parking in the towns.**

This demonstrates that the removal of free parking at large workplaces in Warwick and Leamington Spa and Warwick may serve to have a significant impact on the viability of P&R services.

**Atkins recommends that a number of improvements are made to the model, including the need to consider the inter-peak in more detail.**

The S-Params demand files do not include any inter-peak information so Traffic Master OD data could be used as an alternative to derive inter-peak demand matrices and hence provide a more robust assessment

## Technical note

of the inter-peak period. In addition to this major recommendation, Atkins has made some more minor recommendations to help WCC to refine the modelling process further, including consideration of factors such as a different bus fare dependent on time of day, rather than a flat fare. We also recommend that the modal constant and mode switching parameter are reviewed in the light of experience with P&R services elsewhere.

There was clear interest from Stagecoach in the results and the opportunity for P&R to form part of the transport strategy in the future. Atkins recommends further liaison with Stagecoach.

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Atkins recommends that in considering how to provide P&R services, WCC engages with Stagecoach to develop a cost-effective but attractive model of serving P&R sites. In doing so, it will of course wish to take full account of the opportunities and constraints for P&R product development (notably with respect to charges).

In addition to serving Leamington Spa and Warwick, Atkins updated the model to include the town of Kenilworth. The modelling confirms there may be a reasonable level of demand to this town and hence it warrants being included in any further modelling / consideration of P&R.

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In addition, discussions with Stagecoach confirmed Atkins' view that a number of currently unmodelled sources of demand, such as University of Warwick and Coventry, should be taken into consideration in the development of any business case for the northern site. There are also other sites within the towns that could be a useful source of demand, such as Warwick Technology Park, IBM, Volvo, Warwick Hospital, Warwick School and Warwick Castle. There is also potential demand for the south site to be used as an interchange for commercial buses travelling to the Jaguar Land Rover site at Gaydon. Jaguar Land Rover operates a similar facility to serve Gaydon from Birmingham Airport.

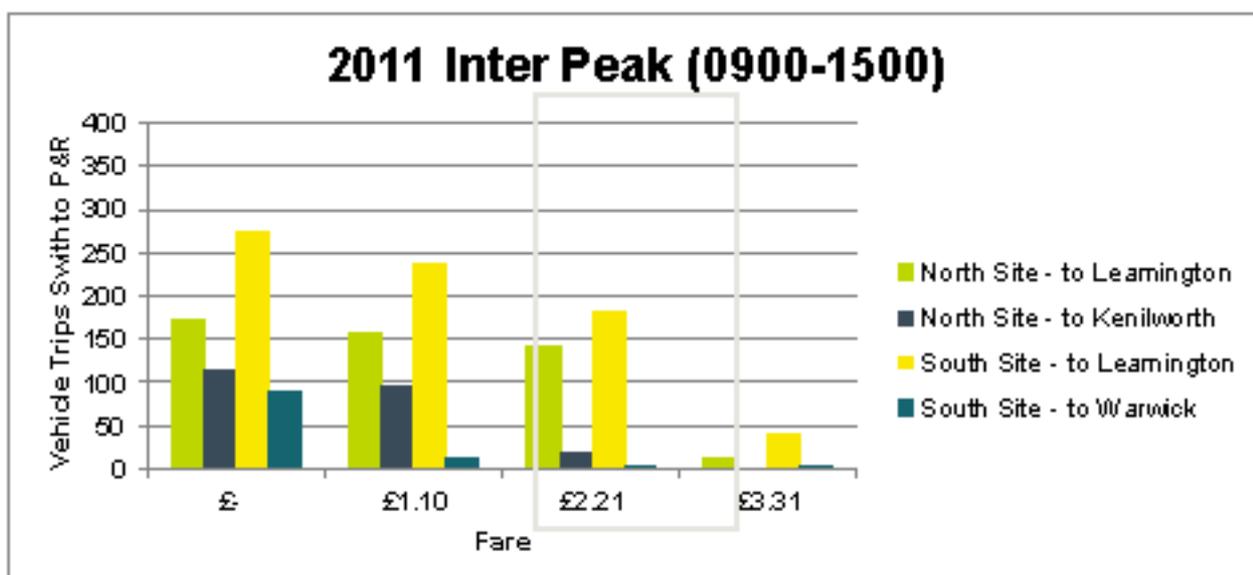
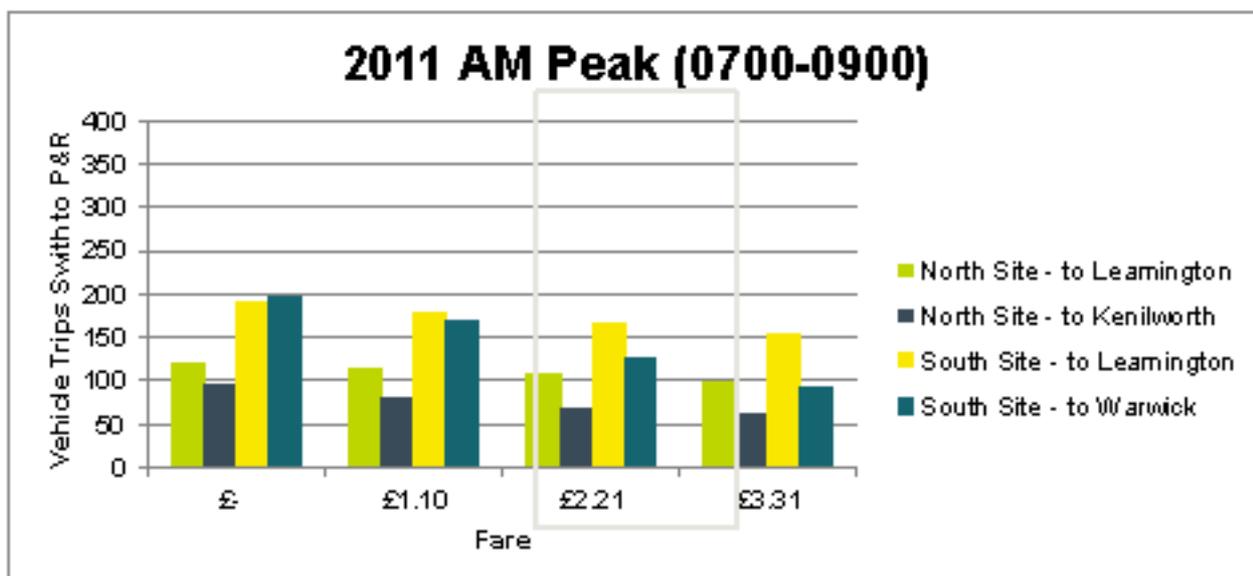
The numbers presented in the report confirm that P&R could form a useful component of any future strategy for the Warwick and Leamington Spa area and hence the potential P&R sites warrant more detailed consideration.

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The updated model now provides a platform for WCC to test various different P&R scenarios, adjusting the parameters to allow for an assessment of the sensitivity to frequency and bus fare, amongst others. To reiterate, a more comprehensive consideration of the inter-peak demand should also be sought by WCC. In addition to testing additional scenarios, Atkins recommends that WCC considers the revenue implications of different P&R scenarios, including the impact on parking revenues in the town centres. Although Stagecoach has indicated that a high level of commercial operation may be possible, it would be prudent for WCC to give further consideration to the possible nature and subsequent operating costs of the bus operation in the future. Finally, there are a number of opportunities to increase the demand for P&R by encouraging local employers / visitor attractions (such as Warwick Castle) to promote the use of the P&R sites, which would help to build the case for these sites further.

# Technical note

## Appendix A – P&R Fare Sensitivity Test Results

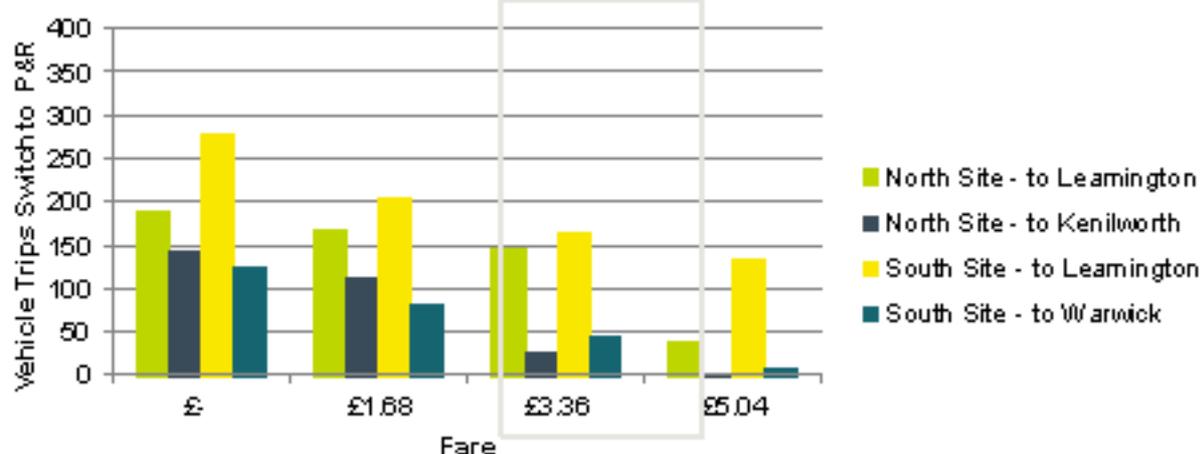


# Technical note

## 2028 AM Peak (0700-0900)

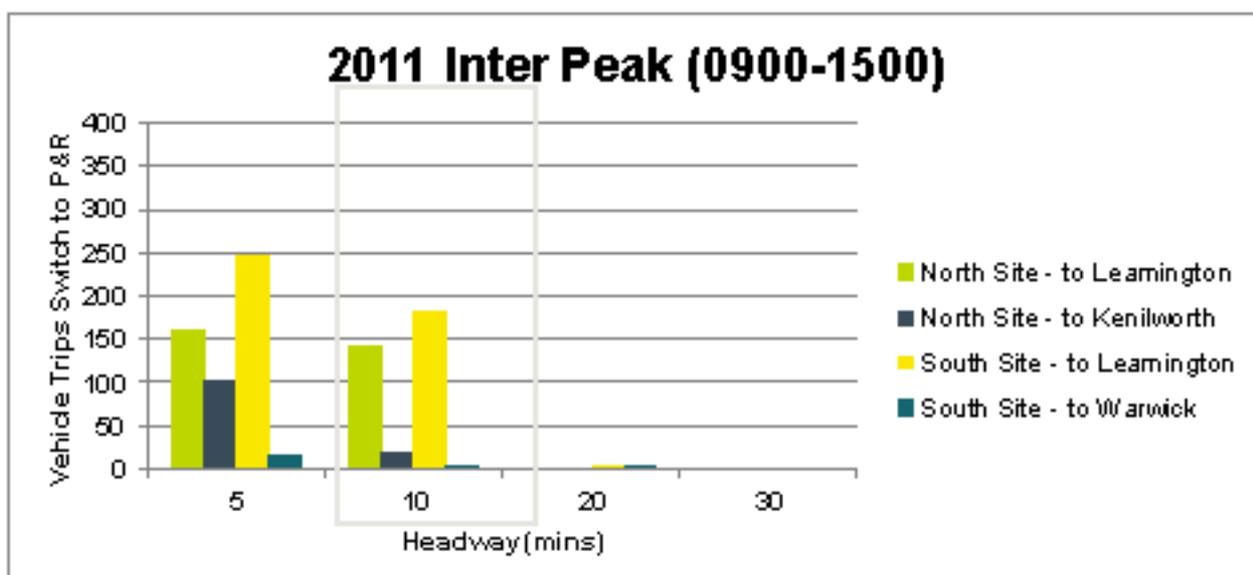
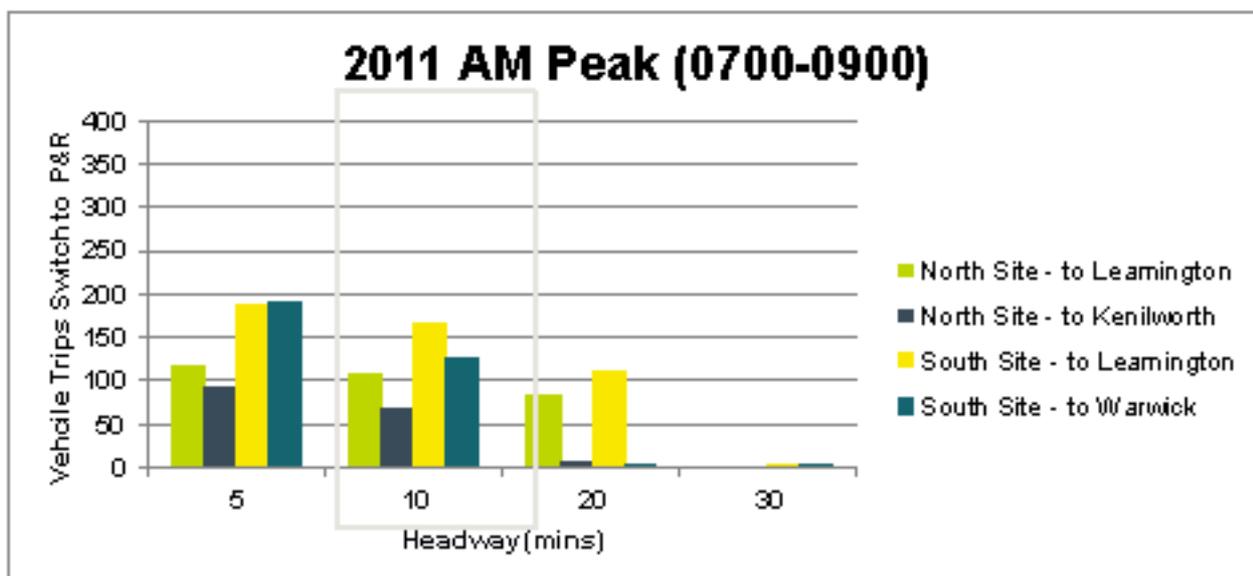


## 2028 Inter Peak (0900-1500)



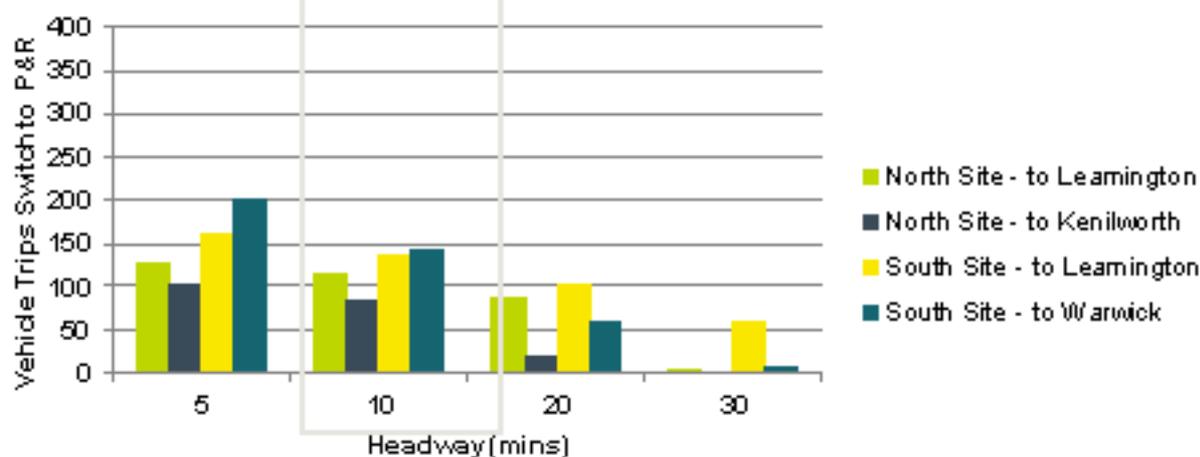
# Technical note

## Appendix B – P&R Frequency Sensitivity Test Results

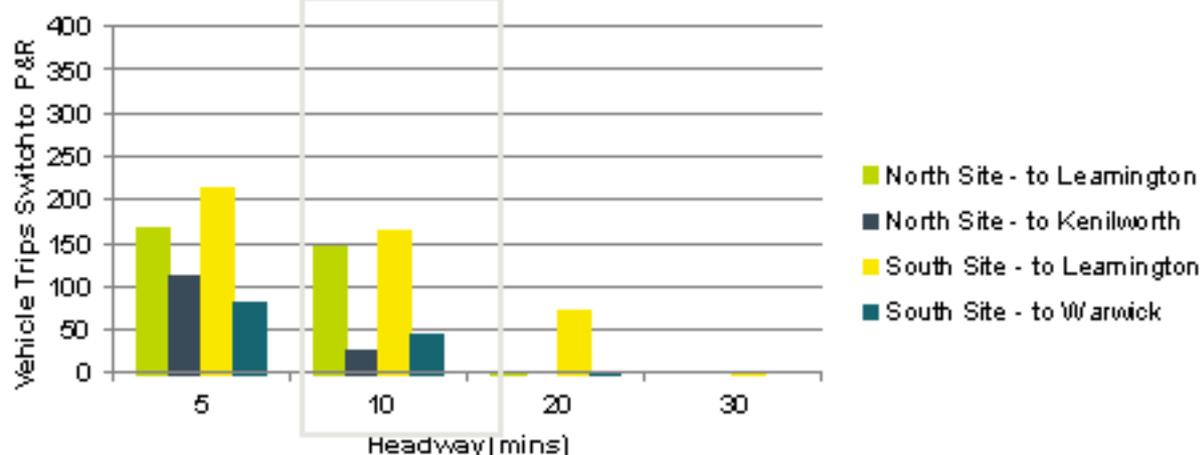


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## 2028 AM Peak (0700-0900)

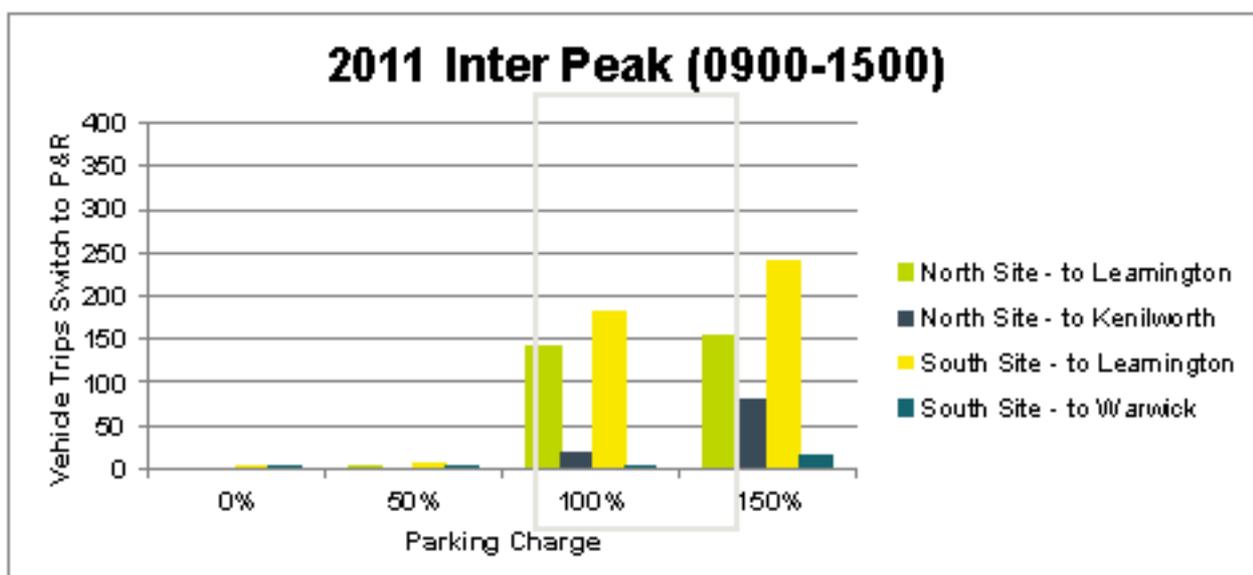
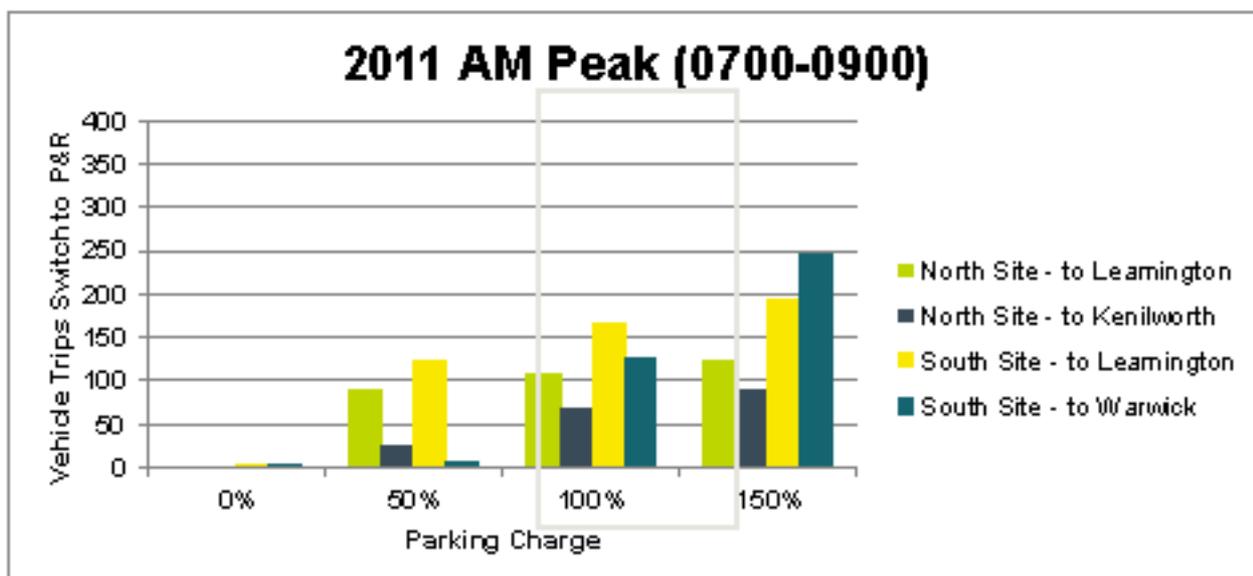


## 2028 Inter Peak (0900-1500)



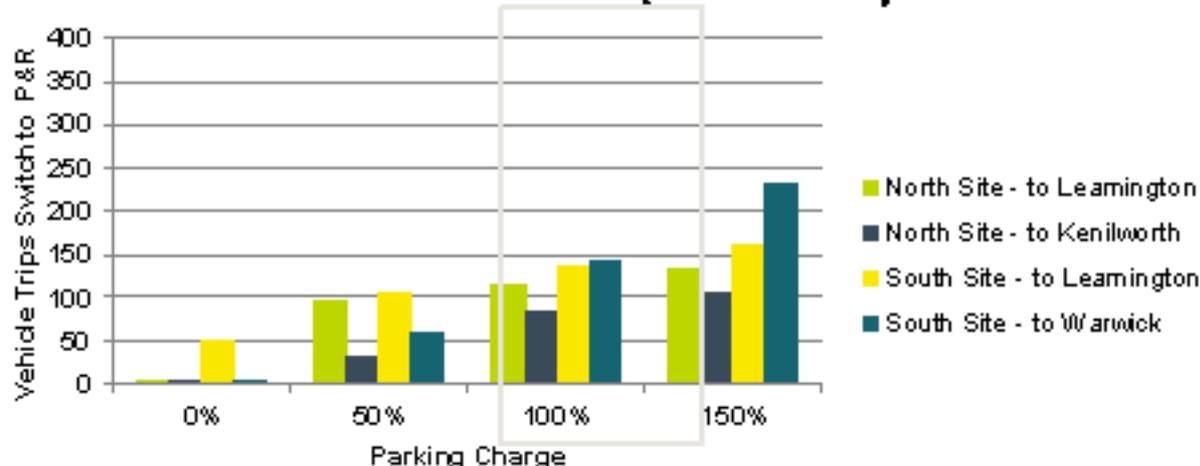
# Technical note

## Appendix C – Parking Charge Sensitivity Test Results

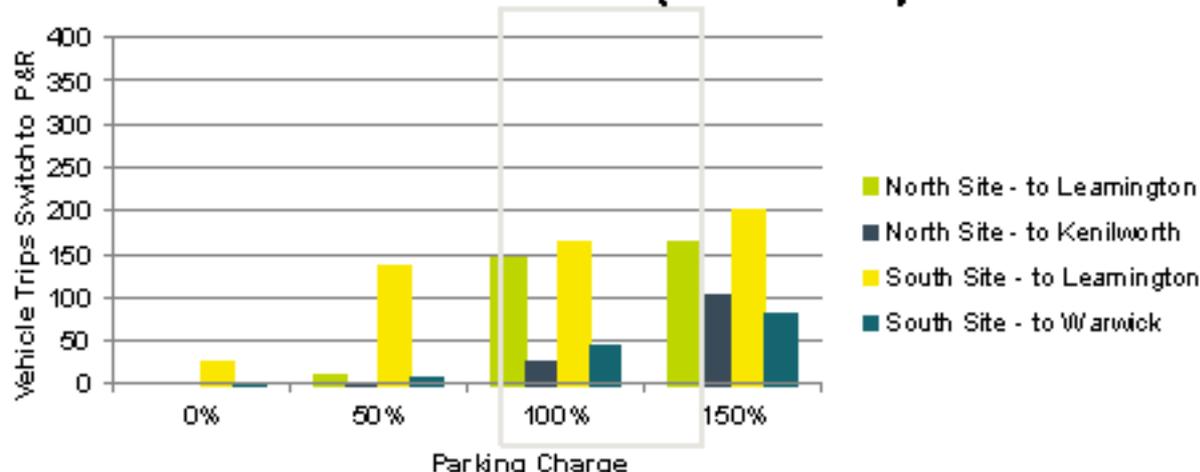


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## 2028 AM Peak (0700-0900)

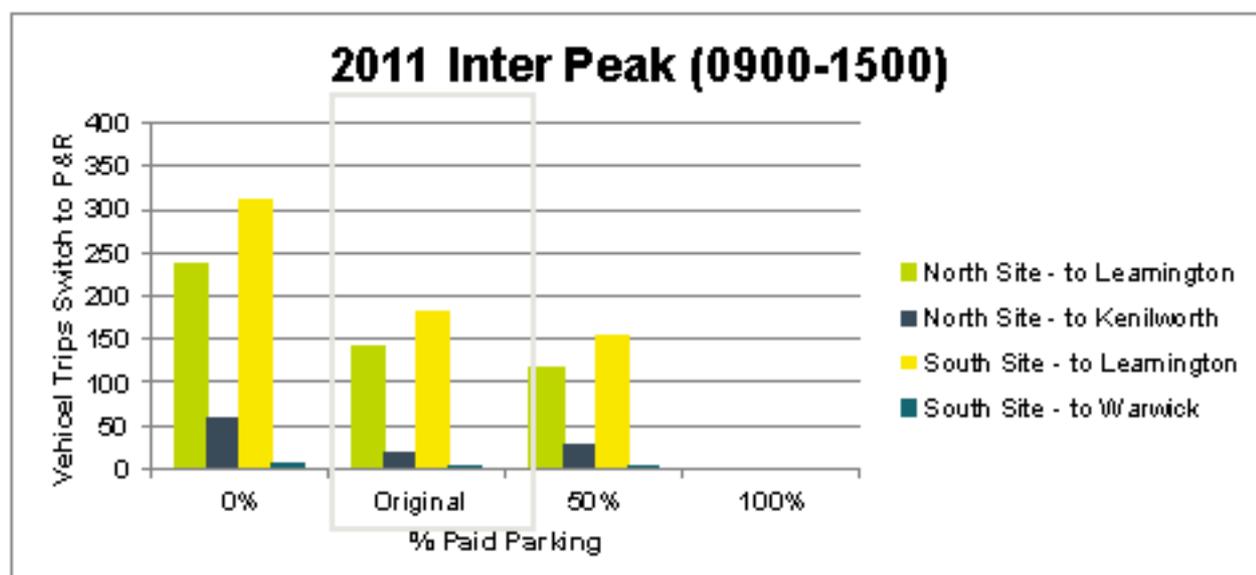
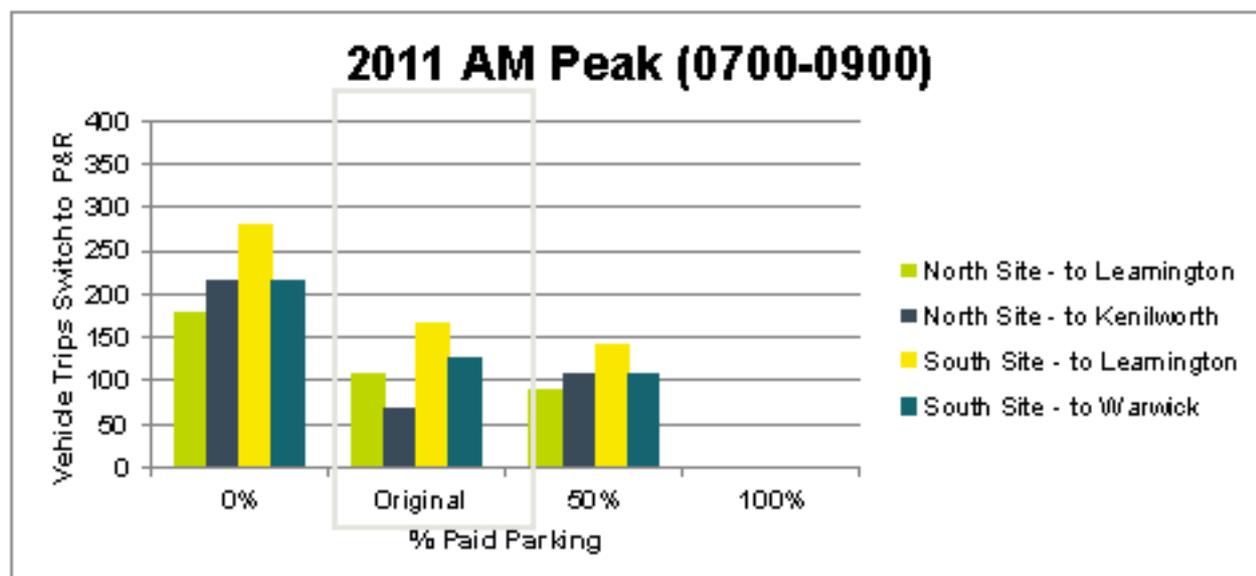


## 2028 Inter Peak (0900-1500)



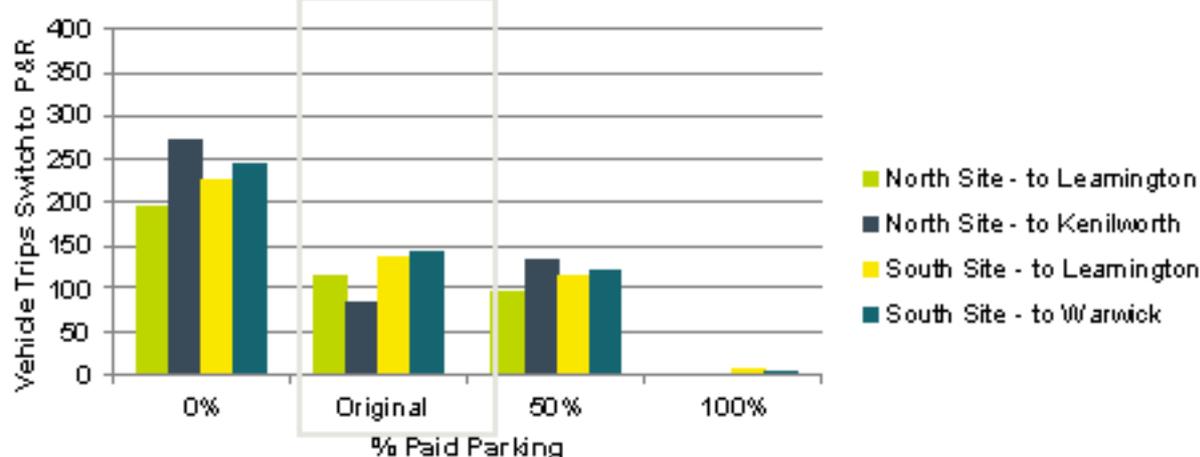
# Technical note

## Appendix D – Paid/Free Parking Sensitivity Test Results

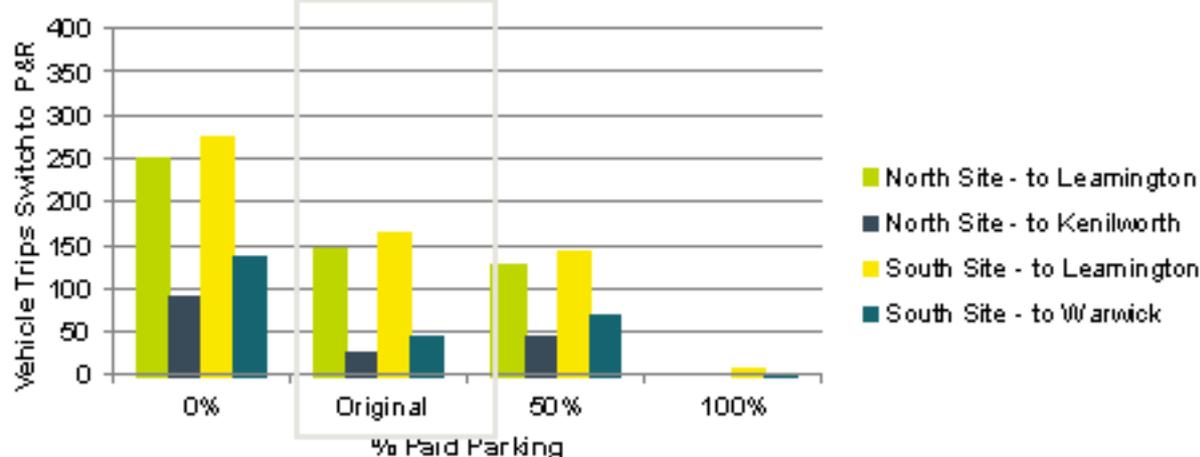


# Technical note

## 2028 AM Peak (0700-0900)



## 2028 Inter Peak (0900-1500)



## **Appendix D. Option Assessment – Option Strengths and Weaknesses**

Table 1. Option A: Bicyclable Transport Package

Task/Outcome	SUE Outcome	Headline Benefits	Other Uncertainties
Performance	Key Issues	<ul style="list-style-type: none"> <li>• Contributions to reduced dependency on car to afford local commuting, education and retail trips</li> <li>• Contributions to a reduction in town centre through trips</li> <li>• Enhanced quality of the suburban transport alternative necessary to local mobility</li> <li>• Encourage local trip generation to contribute towards additional walking and cycling through an alternative route</li> <li>• An alternative to address local town centre</li> <li>• Improved journey time reliability benefits to residential private transport and public transport users</li> </ul>	<ul style="list-style-type: none"> <li>• This approach will not directly tackle travel demand issues associated with widespread proliferation of road parking in the town/suburban parks and industrial estates</li> </ul>
	Strategy Objectives	<ul style="list-style-type: none"> <li>• Strong relevance to all local transport objectives for Network and Learning</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
Likely Social Impact	Economy	<ul style="list-style-type: none"> <li>• Expected to bring peak hour demand reduction of 3,000 to 4,000 (per day) across the town network</li> <li>• Expected contribution to average journey times per vehicle on the network, coming from reduced delays</li> <li>• Potential to increase local town centre as a result of provision of walking and cycling modes as alternatives to the delivered B-CPTs of up to 20% to 30% demand reduction (recent study by the DfT)</li> </ul>	<ul style="list-style-type: none"> <li>• Scale of impact will be dependent upon scale of investment</li> <li>• Re-allocations of road space will not result in additional journey time benefits for car users – will be if they will bring wider economic benefits through creating a more attractive place for business</li> <li>• Impact likely to be stronger if combined with some form of demand management measures e.g. parking of delivery/ storage vehicles parking only</li> </ul>
	Environment	<ul style="list-style-type: none"> <li>• Re-allocation of road space away from the car offers opportunity to improve the local built and physical environment through managing the adverse effects of car use</li> <li>• The modal shift impact will offer associated local benefits to air quality and noise – particularly in town centres and on busier routes</li> </ul>	<ul style="list-style-type: none"> <li>• Definition of impacts will be based upon total package delivery – likely to be some adverse impacts on local environment if re-allocations due to re-allocation of road space to walking, pedestrian and public transport modes</li> </ul>
	Social	<ul style="list-style-type: none"> <li>• Increase in physical activity provision to active modes improved in the town</li> <li>• Encouraging young people to travel more actively will help address potential future obesity challenges</li> <li>• Removal of parking and improvements of alternatives will help promote local perceptions of travel safety</li> <li>• Improvements to the alternative will help enhance journey quality to commuters</li> </ul>	<ul style="list-style-type: none"> <li>• Depending on level of package delivered, there is a risk of adverse impacts of vehicle re-allocations during impacts</li> </ul>
	Technical Feasibility	<ul style="list-style-type: none"> <li>• Depending on package components proposed, the package should be feasible to deliver over the course of the plan period</li> </ul>	<ul style="list-style-type: none"> <li>• Full time network gaps and peak periods to deliver package are not immediately</li> <li>• In the short-term, such measures that implementation of the package will require significant cooperation from the private sector to adopt additional alternative delivery</li> </ul>
Likelihood	Stakeholder Support	<ul style="list-style-type: none"> <li>• Will mostly be supported by local organisations, although there may be some concerns around effects of road space re-allocations on car users</li> <li>• Local bus operators keen to support additional transport package development</li> </ul>	<ul style="list-style-type: none"> <li>• Stakeholders may not perceive the package as a radical enough</li> <li>• Stakeholders may need to appreciate the wider economic benefits of sustainable transport schemes</li> </ul>
	Public Acceptability	<ul style="list-style-type: none"> <li>• Will mostly be supported by local population, although there may be some concerns around effects of road space re-allocations on car users</li> </ul>	<ul style="list-style-type: none"> <li>• Overall public may not perceive the package as radical enough</li> <li>• Overall public will need to understand the benefits of planning for sustainable transport modes if they are to bring additional capacity to the car</li> </ul>
	Cost	<ul style="list-style-type: none"> <li>• Solutions can be tested and implemented depending on budget availability</li> <li>• Funding could be accessed through a range of sources e.g. LCF, LTP and private contributions (Section 109/30)</li> </ul>	<ul style="list-style-type: none"> <li>• Significant cost to the family unit to deliver the package as a whole</li> <li>• Will require sustained commitment of human resources and investment to deliver</li> <li>• Uncertainty on funding sources will affect what can be delivered</li> </ul>
	Timing	<ul style="list-style-type: none"> <li>• The package can be commenced in the short term and be implemented progressively</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>

Table 2. Option B: Park and Ride

Test Criteria	Sub Criteria	Headline Benefits	Main Unintended
Reliability	Key Issue 6	<ul style="list-style-type: none"> <li>• Contribution towards reduced dependency on car for longer distance commuting, education and retail trips</li> <li>• Contribution towards a reduction in town centre (through trips)</li> <li>• Contribution towards a reduction in transport infrastructure necessary to local and regional sites</li> <li>• Potential to reduce single occupancy car trips to work from outside the study area</li> <li>• Potential to reduce number of school based car trips by providing Park and Ride locally</li> <li>• Park and Ride can be incorporated into a broader strategy on educational and parking policy</li> </ul>	<ul style="list-style-type: none"> <li>• This option does not directly address current supply of car parking in the area</li> </ul>
Likely Base of Impact	Strategy / Objective	<ul style="list-style-type: none"> <li>• Strong relevance to transport strategy objectives</li> </ul>	<ul style="list-style-type: none"> <li>• This option does not have a negative impact on the strategy objectives.</li> </ul>
Likely Base of Impact	Economic	<ul style="list-style-type: none"> <li>• Potential for a number of around 5000 trips to the park and ride during the morning peak period</li> <li>• Small reduction (2%) improvement in peak hour journey times</li> <li>• Supporting the economy by improving access to town centres and employment areas</li> <li>• Reducing traffic on key corridors in the town and reducing car trips into the town centres</li> <li>• Improves journey times, (the package removes approximately 500 car trips from the corridor) and the town centre highway network</li> <li>• Local potential employment areas in the urban area</li> <li>• Provides viable car parking capacity in the right place and enables growth in the town centres without need for additional town centre car parking.</li> <li>• A healthy town and more amenities will see a positive daily education and employment base</li> </ul>	<ul style="list-style-type: none"> <li>• Large term success and reduction of benefits of Park and Ride requires an integrated approach with 'other' measures for example 'Hydrocar Parking Levy', increase on parking charges</li> <li>• Requires coordination with a wider policy on parking</li> </ul>
Environment	Environment	<ul style="list-style-type: none"> <li>• Reducing car trips into the town centres would improve the town centre environment</li> <li>• Reducing car trips to employment areas, retail centres and school would improve environmental issues locally</li> </ul>	<ul style="list-style-type: none"> <li>• Some dis-benefit in the areas around the sites, however this can be mitigated by design</li> </ul>
Social	Social	<ul style="list-style-type: none"> <li>• Providing the potential to access and visit by Park and Ride</li> <li>• Park and Ride facilities can be used for community events</li> <li>• Providing traffic on key corridors will improve the environment for local walking and cycling journeys</li> </ul>	<ul style="list-style-type: none"> <li>• Nil</li> </ul>
Technical Feasibility	Technical Feasibility	<ul style="list-style-type: none"> <li>• Further work required to secure sites</li> <li>• Park and Ride site can utilise existing bus services</li> </ul>	<ul style="list-style-type: none"> <li>• Bus priority measures are required to support successful P&amp;R</li> </ul>
Stakeholder Support	Stakeholder Support	<ul style="list-style-type: none"> <li>• Stakeholder support in the perspective of Park and Ride</li> <li>• Interest from local bus operators supported by appropriate supporting infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Stakeholders may not view this as addressing all the problems in the area</li> </ul>
Public Acceptability	Public Acceptability	<ul style="list-style-type: none"> <li>• Subject to financial viability would be publicly acceptable</li> </ul>	<ul style="list-style-type: none"> <li>• The public may be concerned about costs and increased accessibility given experience elsewhere locally</li> </ul>
Cost	Cost	<ul style="list-style-type: none"> <li>• Interest from local bus operators to service with existing bus services (this is not the case currently is equal)</li> <li>• Scope for walking passengers to form adjacent planned development of local improve commercial viability of bus services</li> </ul>	<ul style="list-style-type: none"> <li>• Local authorities would need to fund the delivery and on-going maintenance of the site, possibly in conjunction with developers of planned development in the area</li> <li>• This is an ongoing revenue commitment, however this could be covered by revenue generated from increased town centre parking policy</li> </ul>
Timing	Timing	<ul style="list-style-type: none"> <li>• Deliverable in the short term subject to funding and securing appropriate sites</li> </ul>	<ul style="list-style-type: none"> <li>• Delivery is dependent upon securing appropriate funding and securing sites.</li> </ul>

Table 3. Option C: Increase in Long Stay Parking Charge

Test Criteria	Sub Criteria	Headline Benefits	Main Drawbacks
Relevance	Key Issue	<ul style="list-style-type: none"> <li>As part of a value strategy, increased car parking charges would secure long term benefits of Active Travel and Park and Ride.</li> <li>Potential provide additional revenue to the local authority which could be used to fund the operation of the Park and Ride site, particularly because there is a strong willingness to pay (as shown in the low demand reduction as a result of the charge).</li> <li>1000 excess are committed to the car parking issue.</li> </ul>	<ul style="list-style-type: none"> <li>This option does not directly address current supply of car parking in Glasgow.</li> </ul>
Likely, Scale of Impact	Strategy / Objective	<ul style="list-style-type: none"> <li>Limit demand on transport strategy objectives.</li> </ul>	<ul style="list-style-type: none"> <li>This option does not have a negative impact on the strategy objectives.</li> </ul>
Likely, Scale of Impact	Economic	<ul style="list-style-type: none"> <li>7000 additional long stay parking will help attract local business to the centre.</li> <li>Impact on local economy by providing additional jobs capacity.</li> <li>100% increase in long stay car parking charges at VNC car park will result in a small reduction in car trips.</li> <li>People are still willing to pay for the convenience of car parking even if the charges are doubled.</li> <li>Even with an increase in car parking charges compared to revenue by rail services and more of a long stay car parking charges remain very competitive in the long term.</li> <li>Some benefit to local environment, particularly around the car parks.</li> </ul>	<ul style="list-style-type: none"> <li>Large term success and reduction of benefits of Park and Ride (especially integrated approach with 'flex' measures for example 'Hydrogen Parking Levy', increase in parking charges)</li> <li>Requires coordination with a value policy on parking</li> </ul>
Likely, Scale of Impact	Environment	<ul style="list-style-type: none"> <li>No direct social benefits.</li> </ul>	<ul style="list-style-type: none"> <li>Some benefits in the areas around the sites, however, this can be mitigated by design.</li> <li>Nil.</li> </ul>
Likely, Scale of Impact	Technical Feasibility	<ul style="list-style-type: none"> <li>Can be delivered within the constraints of local authorities.</li> </ul>	<ul style="list-style-type: none"> <li>Business measures are required to support successful P&amp;R.</li> </ul>
Likely, Scale of Impact	Stakeholder Support	<ul style="list-style-type: none"> <li>Some additional support to an approach to address car parking.</li> </ul>	<ul style="list-style-type: none"> <li>Delivered as part of wider issues addressing all the problems in the area.</li> </ul>
Likely, Scale of Impact	Public Acceptability	<ul style="list-style-type: none"> <li>Public and local authorities to support measures in car parking charges.</li> </ul>	<ul style="list-style-type: none"> <li>The public may be concerned about costs and financial sustainability given experience elsewhere.</li> </ul>
Likely, Scale of Impact	Cost	<ul style="list-style-type: none"> <li>Low implementation cost.</li> <li>Potential provide additional revenue to the local authority which could be used to fund the operation of the Park and Ride site.</li> </ul>	<ul style="list-style-type: none"> <li>Local authorities would need to fund the delivery and ongoing maintenance of the site, possibly in conjunction with benefits of planned development in the area.</li> <li>There is an ongoing revenue commitment, however, this could be covered by revenue generated from increased long term car parking.</li> </ul>
Likely, Scale of Impact	Timing	<ul style="list-style-type: none"> <li>Can be delivered in the short term.</li> </ul>	<ul style="list-style-type: none"> <li>Delivery is dependent upon securing appropriate funding and securing sites.</li> </ul>

Table 4. Option D: Workplace Parking Levy

Test Criteria	Sub-Criteria	Headline Benefits	Main Drawback
Reliability	Key Issue C	<ul style="list-style-type: none"> <li>Directly breaks a causal chain that could significantly reduce the reliability of the journey to work and places a variability of charge on private non-commercial parking</li> <li>Chances potential revenue stream to fund large scale sustainable transport interventions</li> <li>Will indirectly address all of the causes identified earlier, causes of local congestion in Warwick and Leamington</li> <li>It accompanies a strong package of supporting measures, VLM, would contribute towards a reduction in single occupancy (i.e. including hybrid) travel to and from work</li> <li>Strong positive contribution to all local transport objectives in Warwick and Leamington</li> </ul>	<ul style="list-style-type: none"> <li>Downside of directly funded local (generally) car trips</li> <li>Limited local on local (direct) local (generally) movement unless more support is applied to Warwick and Leamington Roadworks</li> <li>Limited mobility impact - not supported as it is charge is intended to encourage (through) local work, and the ability to work</li> <li>No direct impact on non-work local services, school trips, quality of suburban transport alternative</li> </ul>
Likely Baseline Impact	Strategic Objectives	<ul style="list-style-type: none"> <li>Strong positive contribution to all local transport objectives in Warwick and Leamington</li> <li>The charge itself at £1.50 per day would have a relatively small effect on overall demand for the car, but it would have a high willingness to pay for parking. This revenue for the car could be used for local sustainable transport interventions (Package A)</li> <li>Would act as a check to lock in the benefits of sustainable transport interventions - increased the all-year-round of the all-year-round transport mode</li> <li>Could result in local bus services reducing or ceasing parking for non-productive means</li> <li>A higher level would be required to be paid per day (could result in a network demand reduction of up to 3000 trips if the charge was passed by the business to commuters)</li> </ul>	<ul style="list-style-type: none"> <li>Due to limited expenditure impact the scheme unlikely to make a significant contribution to achieving local transport policy aims</li> </ul>
	Economic	<ul style="list-style-type: none"> <li>Accompanied by an upfront sustainable transport package fits</li> </ul>	<ul style="list-style-type: none"> <li>Other net reduction in demand for the local network as suppressed demand from locally generated (generally) by any more capital (generated)</li> <li>When impact of such a change on local bus services would need to be subjected to further study</li> <li>No direct effect on average vehicle speeds, journey times or journey time reliability</li> </ul>
	Environment	<ul style="list-style-type: none"> <li>Reduced car dependency and greater likelihood to shift to sustainable travel which provides benefits to improved health and social interaction</li> <li>Already successfully implemented in Nottingham with 100% compliance</li> </ul>	<ul style="list-style-type: none"> <li>Technology and equipment required to support a formal charge e.g. cameras on bridges would have an adverse impact on the current operations of the full environment</li> <li>Direct operational environment e.g. air quality and noise likely to be minimal</li> </ul>
	Social	<ul style="list-style-type: none"> <li>Some ability to bring a range of support (if given current parking issues in certain areas)</li> </ul>	<ul style="list-style-type: none"> <li>Reassigned impact as needed would be a net benefit from a formal charge and net traffic changes would be limited</li> </ul>
	Technical Feasibility	<ul style="list-style-type: none"> <li>The public might support the given current parking issues in certain areas</li> </ul>	<ul style="list-style-type: none"> <li>Feasibility challenging to deliver</li> <li>Not delivered elsewhere outside of London</li> </ul>
	Stakeholder Support	<ul style="list-style-type: none"> <li>Legislation currently in place for local authorities to implement - Nottingham scheme was introduced within 2 years</li> </ul>	<ul style="list-style-type: none"> <li>Likely to be successful support, although expectations of scheme impact need to be managed</li> <li>Politically (only approach) and unlikely to meet demands of growth strategy for the town</li> <li>Public supportability of the intervention as a package of measures, without a large proposal</li> </ul>
Deliverability	Public Supportability	<ul style="list-style-type: none"> <li>Generation revenue which could cover costs, however further feasibility required</li> </ul>	<ul style="list-style-type: none"> <li>Likely to be successful support, although expectations of scheme impact need to be managed</li> <li>Public supportability of the intervention as a package of measures, without a large proposal</li> </ul>
	Cost	<ul style="list-style-type: none"> <li>Legislation currently in place for local authorities to implement - Nottingham scheme was introduced within 2 years</li> </ul>	<ul style="list-style-type: none"> <li>Likely to attract significant set up and ongoing investment in infrastructure costs</li> <li>If the scheme is successful the net ongoing running costs are likely to be significant with no residual income for investment in complementary measures</li> </ul>
	Timing	<ul style="list-style-type: none"> <li>Legislation currently in place for local authorities to implement - Nottingham scheme was introduced within 2 years</li> </ul>	<ul style="list-style-type: none"> <li>Only likely to be achievable in the long term due to political sensitivity and if being relatively early in a overall development</li> </ul>



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