

Elgin Transport Model

**29 August 2006
Council Chambers
Elgin**

Project Team

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1. Study Background



Framework awarded to Halcrow Feb 06

- General call off contract to assist TMC with any Transportation related issues
- Construct a Transport Model – Elgin/Moray
- Undertake a STAG appraisal for Elgin

2. Transport Modelling



What are Transport Models?

- Transport Models are simplifications of a particular aspect of travel behaviour

Purpose of Transport Modelling

- To replicate travel behaviour now in order to predict what might happen in the future
- To understand future impacts of growth, land use change and development
- To assess implications of alternative transport packages and strategies
- To provide outputs for appraisal

Advantages of using a Transport Model

- Model runs much faster than real-time
- Does not disrupt real network
- Simply enables the optimum design to be found
- Provides easy to understand outputs (videos etc)

3. The Elgin Model



What software is used for the Elgin model ?

The model software selected is known as “Vissim”.

- State of the art ‘microsimulation’ model
- Can be integrated with public transport and land use models
- Accurately simulates the interaction between individual vehicles (lane changing, vehicle following and gap acceptance)
- Good at modelling roundabouts and many other traffic engineering features
- Wide range of output available for use in assessments

How was the Elgin model built?

- Major roads and junctions modelled
- Study area divided into a large number of homogenous origin and destination zones
- Three time periods modelled
 - AM weekday peak
 - PM weekday peak
 - Saturday peak



Traffic Inputs to the Model

- Road side interviews
- On site observations (queues etc)
- Traffic surveys of private cars and goods vehicles



Other Data

- Journey time surveys

4. Calibration and Validation

The background of the slide features a stylized image of the Earth as seen from space. A bright sun is positioned on the left side, with numerous thin, white lines radiating outwards across the entire frame, creating a starburst effect. A faint, multi-colored rainbow is visible in the lower-left quadrant of the image. The overall color palette is dominated by various shades of blue and teal.

Calibration is the process of *adjusting* the model to ensure that simulated traffic flows, routes and travel behaviour correspond with observed behaviour.



Validation is checking model output against an *independently* observed set of data to ensure that the calibrated model is robust.



- Best practice guidelines require 85% of all surveyed links to be within calibration targets.
 - Elgin model (am peak): **97%**
 - Elgin model (pm peak): **94%**
- Best practice guidelines require 85% of all journey time routes to be within validation targets.
 - Elgin model (am peak): **100%**
 - Elgin model (pm peak): **100%**
- Saturday model is currently under development

Model considerations...

- The model development is robust and suitable for detailed scheme design, assessment and optimisation.

However...

- Traffic flows and journey times can fluctuate daily by up to 20%
- The model will require maintenance (updating) as Elgin roads infrastructure/traffic patterns change



5. Base Model Output



- **Excellent representation of traffic movements throughout Elgin**
- **Realistic simulation of existing conditions at key junctions.**
- **Bus services modelled accurately**
- **Level crossing operation at The Wards**



6. Model Uses



How can we use the Elgin model to assist in future planning?

- **Future scenario testing:**
 - Traffic growth e.g. A96
 - Changes to infrastructure e.g. road closures
 - Transport strategies e.g. TM designs
- **Evaluation & Appraisal**
 - Quantify benefits or disbenefits e.g. Bypass
 - Optimise operation of new schemes
 - Assist with the STAG appraisal



- **Problem Identification**
- **Objective Setting**
- **Option Generation**
- **STAG Part 1**
- **STAG Part 2 \Leftrightarrow Transport Model input**
- **Conclusion**

7. Summary



- **Transport Modelling**
- **The Elgin Model**
- **Future Uses**

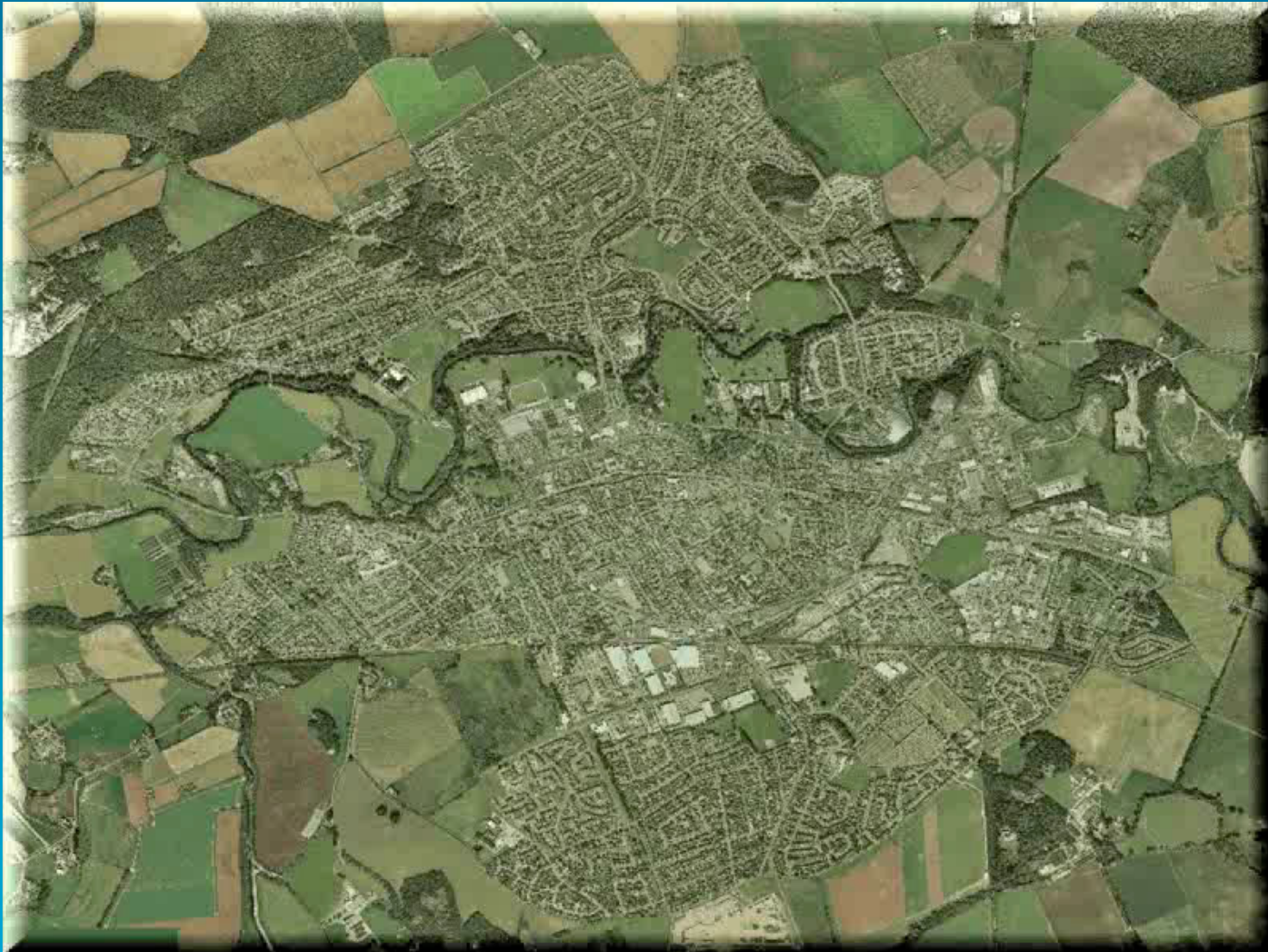


8. Questions and Answers

The End



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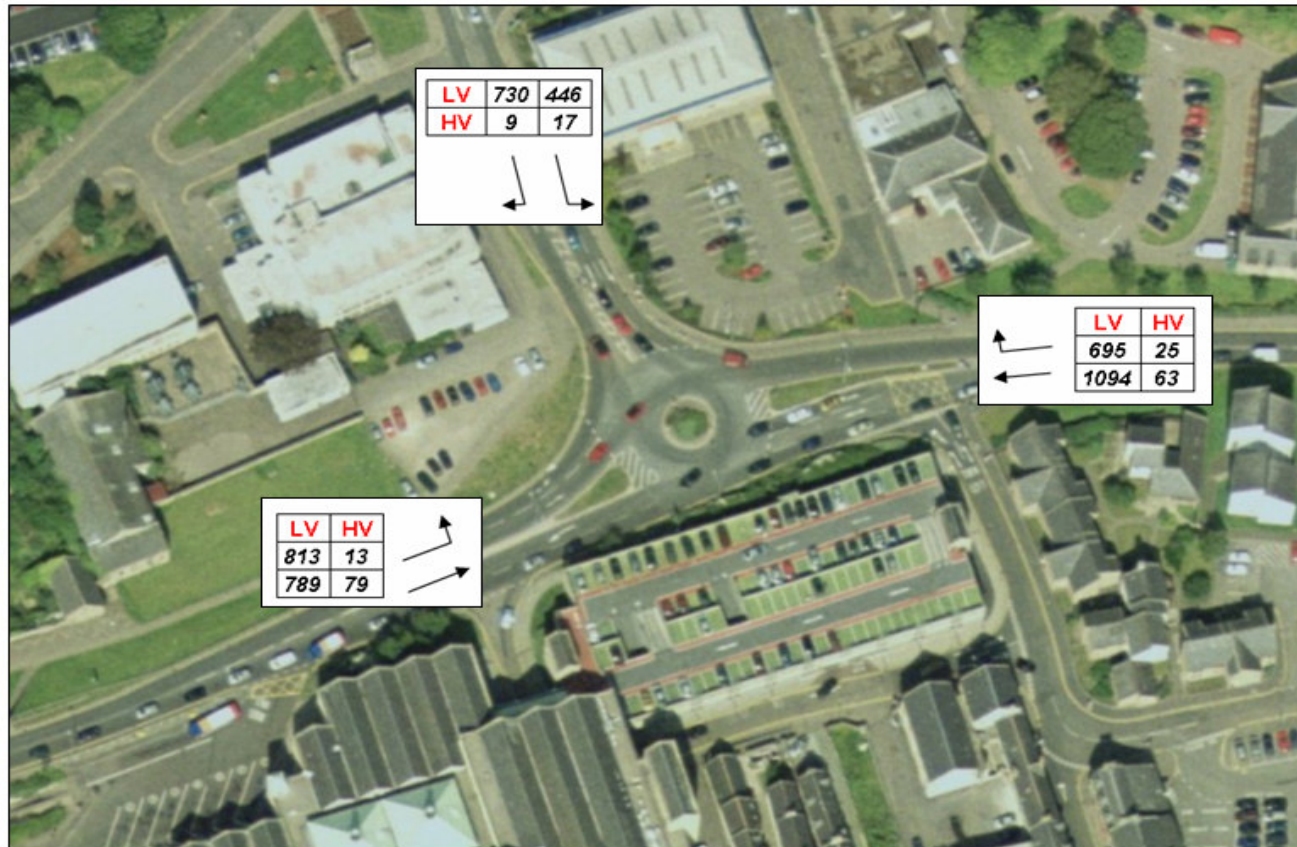




Junction Turning Count

Alexandra Road / North Street

730am to 930am

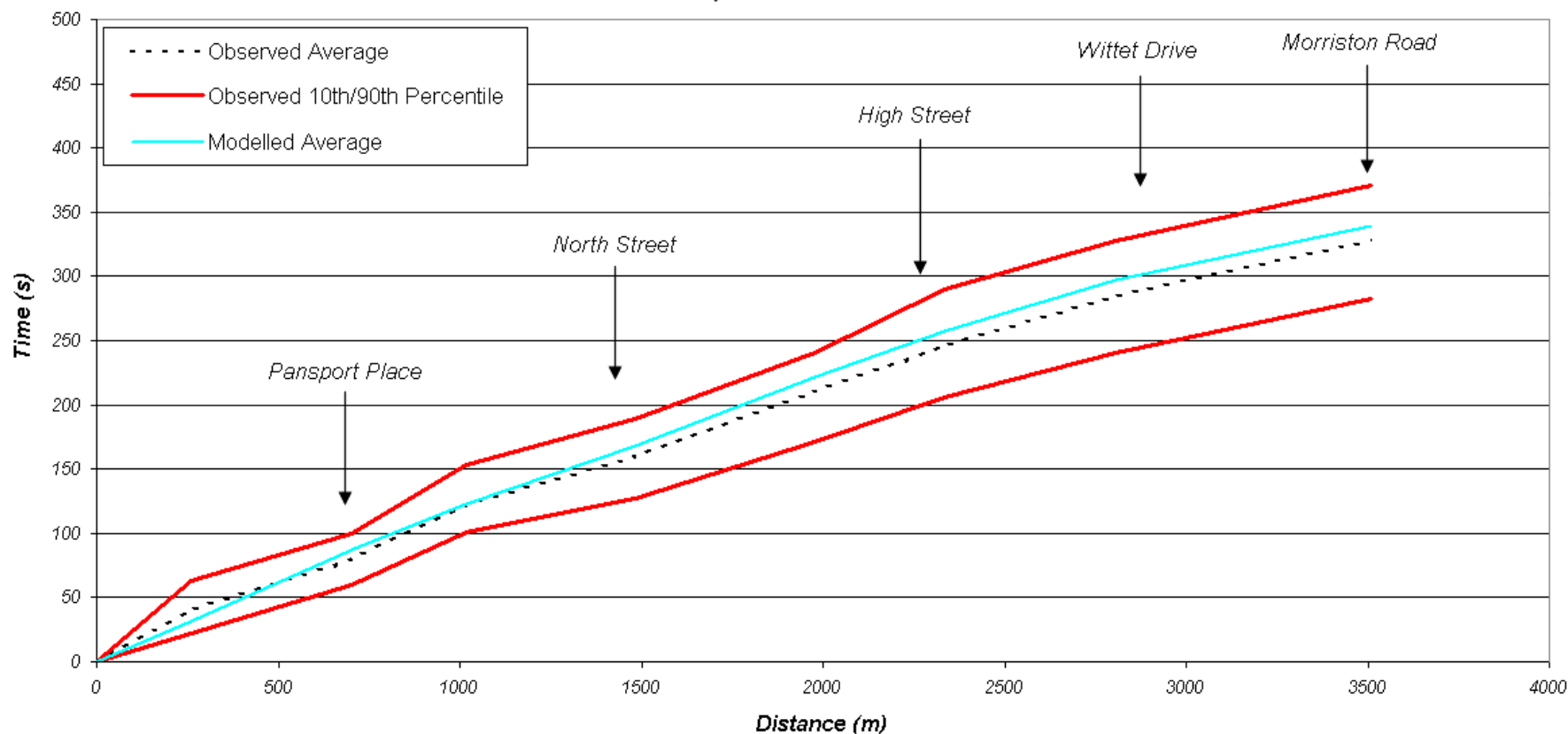






AM Peak Comparison of Observed and Modelled Journey Times

A96 from Chanonry Roundabout to Morriston Road





AM Peak Screenline / Cordon Calibration Data

Elgin VISSIM Model
10/06/2006

INBOUND SCREENLINES			
Total Volumes			
Outer Cordon	VALIDATED		
Inner Cordon	VALIDATED		
Eastern Screenline	VALIDATED		
Western Screenline	VALIDATED		
River Screenline	VALIDATED		
Railway Screenline	VALIDATED		
All Counts			
<5	<10	<15	
100%	100%	100%	

OUTBOUND SCREENLINES			
Total Volumes			
Outer Cordon	VALIDATED		
Inner Cordon	VALIDATED		
Eastern Screenline	VALIDATED		
Western Screenline	VALIDATED		
River Screenline	VALIDATED		
Railway Screenline	VALIDATED		
All Counts			
<5	<10	<15	
100%	100%	100%	

Screenline
Outer Cordon

Screenline
Inner Cordon

Screenline	Site	Inbound			
		observed	modelled	difference	GEH
Outer Cordon	A941 to/from Lossiemouth	783	785	-2	0.07
	Calcots Road	50	47	3	0.43
	A96 Barmuckity	1621	1687	-66	1.62
	Linkwood Road	186	188	-2	0.15
	A941 New Elgin	574	567	7	0.29
	B9010 Pluscarden Road	200	228	-28	1.91
	A96 west of Elgin	1337	1371	-34	0.92
	B9012 Duffus Road	165	161	4	0.31
Totals		4916	5034	-118	1.67

Screenline
Eastern Screenline

Screenline
Western Screenline

Screenline
River Screenline

Screenline
Railway Screenline

Screenline	Site	Inbound				Outbound			
		observed	modelled	difference	GEH	observed	modelled	difference	GEH
Eastern Screenline	A36 South College Street	1316	1321	-5	0.14	1065	1057	8	0.25
	Maison Dieu Road	743	742	7	0.26	652	564	88	3.57
	Linkwood Road	576	560	16	0.67	308	330	-22	1.23
	Thornhill Road	232	278	-46	0.63	265	249	17	1.06
	Totals	3333	3338	-55	0.35	2742	2536	144	2.73
Western Screenline	B3012 Duffus Road	165	161	4	0.31	110	153	-43	3.75
	Morrison Road	333	327	6	0.33	343	330	13	0.71
	A36 West Road	1382	1333	-51	0.30	1158	1125	33	0.38
	B3010 Pluscarden Road	200	228	-28	1.91	130	135	-5	0.43
	Totals	2080	2109	-29	0.53	1741	1743	-2	0.05
River Screenline	Morrison Road	343	330	13	0.71	333	327	6	0.33
	A341 North Street	1051	1086	-35	1.07	1025	1110	-85	2.60
	Pansport Road	808	732	76	2.74	510	439	71	0.43
	Totals	2202	2148	54	1.16	1868	1936	-68	1.56
Railway Screenline	B3010 Pluscarden Road	200	228	-28	1.91	130	135	-5	0.43
	The Wards	418	455	-37	1.77	418	473	-55	2.61
	A341 Railway Bridge	1613	1614	-1	0.02	377	1084	-107	3.33
	Ashgrove Road	124	135	-11	0.37	220	227	-7	0.47
	Raillet Lane	262	255	7	0.37	308	285	23	1.34
	Totals	2617	2688	-71	1.39	2053	2204	-151	3.27

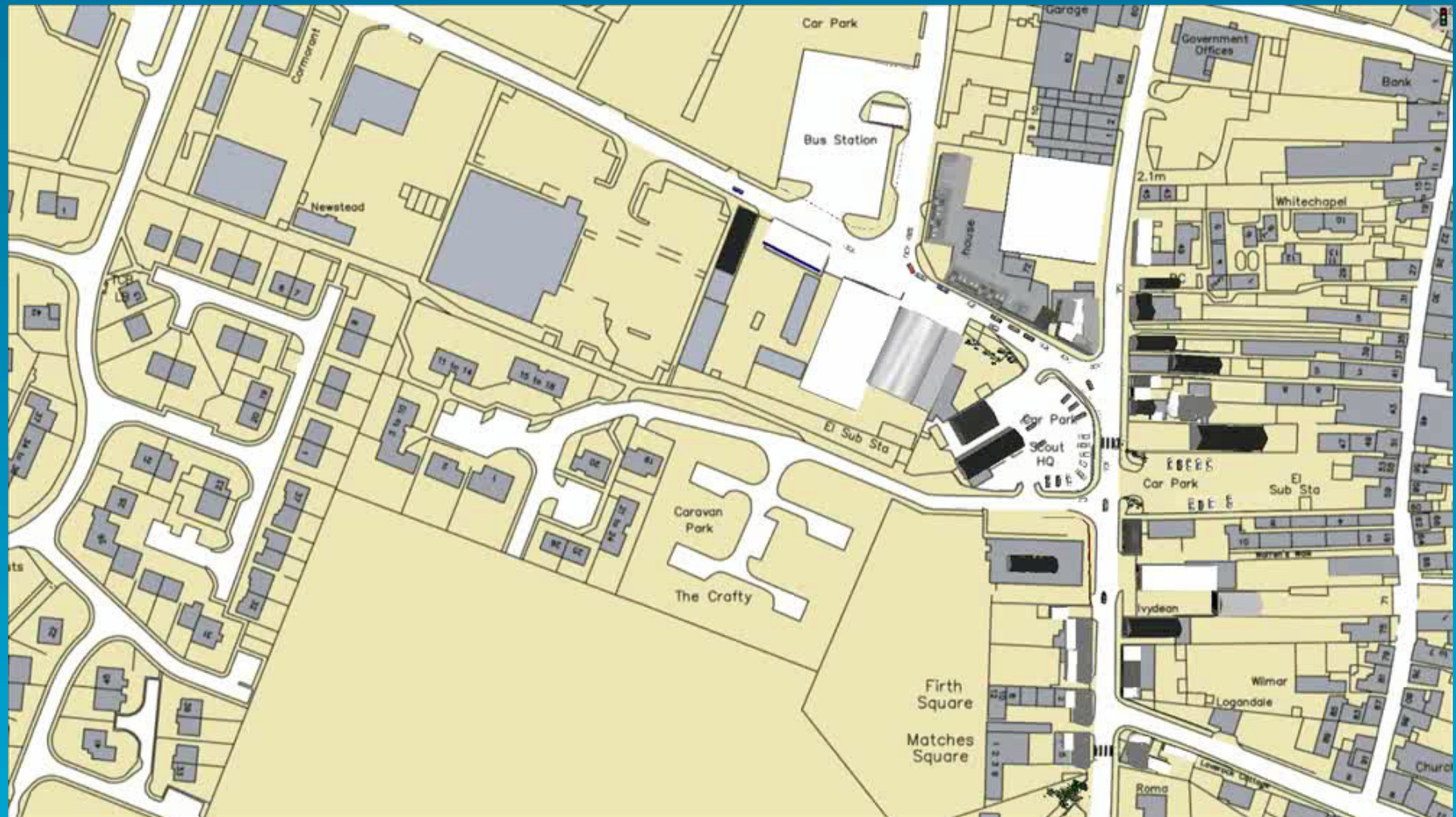












Investment costs	781719	781719
Developer Contributions	0	0
Grant/Subsidy Payments	0	0
Indirect Tax Revenues	-73357	-73357
NET IMPACT	708362	708362

TOTAL

TOTAL Present Value of Costs (PVC) 708362

Note: Costs appear as positive numbers, while revenues and developer contributions appear as negative numbers.
 Note: All entries are present values discounted to 2002, in 2002 prices

Analysis of Monetised Costs and Benefits

Non-Exchequer Impacts

Consumer User Benefits	236420
Business User Benefits	395148
Private Sector Provider Impacts	0
Other Business Impacts	0

Accident Benefits Not assessed by TUBA

Net present Value of Benefits (PVB) 631568

Local Government Funding 0

Central Government Funding 708362

Net present Value Costs (PVC) 708362

Overall Impact

Net present Value (NPV)	-76794
Benefit to Cost Ratio (BCR)	0.892

Appraisal Period 2021 to 2080

Note: There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.