

# Technical Report

## **Lincolnshire Permit Scheme - QUADRO Assessment and Cost-Benefit Analysis**

February 2016

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# Document Control Sheet

Project Title            Lincolnshire County Council TMA Permit Scheme - QUADRO  
Assessment Review

Report Title            Technical Report (QUADRO and CBA)

Revision                1

Status                  Draft

Control Date           18 February 2016

## Record of Issue

Version	Status	Author	Date	Checked by	Date	Approved by	Date
1	Draft	KH	11/01/16	PJH	13/01/16		
1	Draft	KH	14/01/16	PJH	14/01/16		
2	Draft	AP	26/01/16				

## Distribution

Date	Organisation	Contact	Format	Copies
18/01/16	Mouchel Internal	Alex Postlethwaite	Electronic	1
19/01/16	Lincolnshire County Council	Paul Rusted, Mick Phoenix & Mandi Robinson	Electronic	1

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# 1 Introduction

- 1.1 Mouchel was commissioned by Lincolnshire County Council to review and update its business case for a proposed Traffic Management Act (TMA) permit scheme. The purpose of the scheme is to reduce the disruption to traffic as a result of road works. As part of this business case it was a requirement to conduct an economic appraisal using the QUEues And Delays at Road works (QUADRO) assessment tool.

## 2 Permit Scheme Options

2.1 Two scheme options were proposed.

- Option 1 assumes a scheme that applies to 100% of the network but waives or discounts part or all of the fees on non-strategically significant streets
- Option 2 assumes a scheme that only applies across an area largely defined by its strategically significant streets

2.2 Two scheme options were proposed It should be noted that strategically significant streets include traffic sensitive streets as defined under regulation 16 of The Street Works (Registers, Notices, Directions and Designations) (England) Regulations 2007 as well as streets which fall into reinstatement categories 0, 1 or 2 as defined in section 1.3 of the Statutory Reinstatement of Highways 2010. [It should be noted that from time to time, to ensure effective traffic management, other streets may be included].

2.3 Lincolnshire County Council preferred option is Option 1 and so in the economic appraisal only Option 1 was assessed.

## 3 Economic Appraisal

3.1 This chapter details the methodology used to undertake the QUADRO economic appraisal and includes details of the guidance used, data collected, assessment process and assumptions made.

### 3.2 Guidance Used

3.2.1 The methodology was developed by referring to and to ensure consistency with the following guidance documents:

1. 'Assessing the Extent of Street Works and Monitoring the Effectiveness of Section 74 in Reducing Disruption: Third Annual Report - April 2003 to March 2004, Volume 3 - Estimation of the Costs of Delay from Utilities' Street Works' (July 2004)  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/4821/f0007955-street-works-report-vol-3.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/4821/f0007955-street-works-report-vol-3.pdf)
2. 'Traffic Management Act 2004: Permit Schemes Decision Making and Development (2nd Edition) (November 2010)  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/49524/permitscheme.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/49524/permitscheme.pdf)
3. 'Traffic Management Act 2004 (part 3 - permit schemes) Additional Advice Note - for developing and operating future Permit Schemes' (January 2013)  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/49797/permit-schemes-additional-advice-note.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/49797/permit-schemes-additional-advice-note.pdf)
4. The QUADRO Manual
5. WebTAG

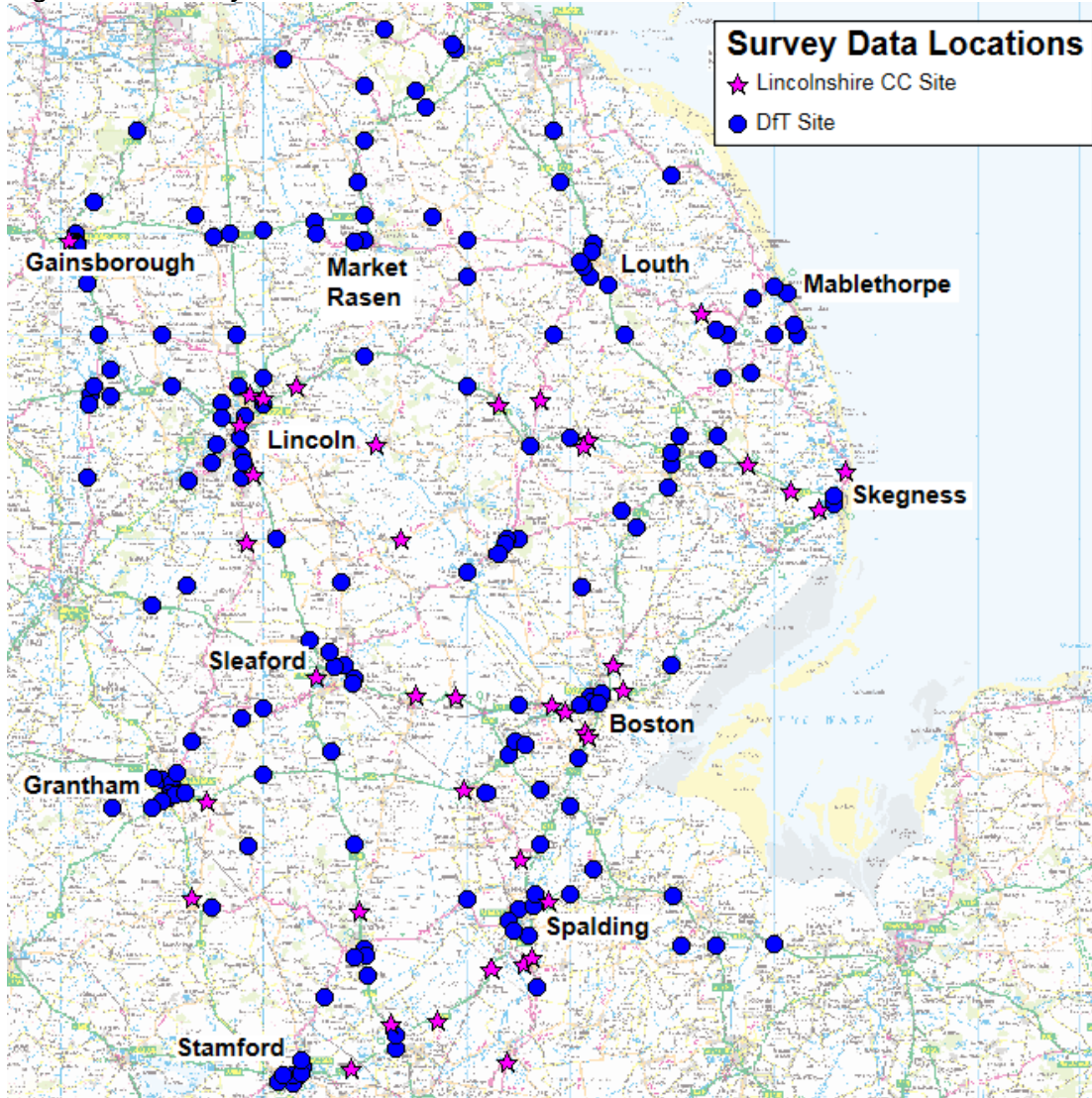
### 3.3 Sources of Data

3.3.1 Lincolnshire County Council provided Mouchel with Annual Average Daily Traffic (AADT) flow data for 35 sites across the county. The data at 26 of these sites was collected daily throughout 2014 and included hourly flow profiles but not vehicle category proportions. The data at the remaining 9 sites was collected on one day during a neutral month and one day during a summer month and included vehicle category proportions but not hourly flow profiles.

3.3.2 To provide additional count site coverage, AADT flow data from 159 DfT count sites across Lincolnshire was utilised. These DfT sites were all based on 2014 data and included vehicle category proportions but not hourly flow profiles.

3.3.3 The location of all the count sites is shown in Figure 3.1 overleaf and illustrates good coverage across the rural and urban areas of the county.

Figure 3.1: Survey Data Locations



### 3.4 QUADRO Assessment Process

3.4.1 As recommended in Guidance Document 1, QUADRO was used to evaluate the impact on highway traffic of a range of street works varying by road classification, traffic flow and works characteristics.

3.4.2 Consistent with Guidance Document 1, this assessment was undertaken on a county wide sample of both urban and rural sites using survey data obtained as described above. The urban and rural count sites were grouped together based on their reinstatement category, which is used as a proxy for traffic flow. The groupings are shown in Table 3.1.

Reinstatement Category	Typical AADT Flow	
	Urban	Rural
0	40,000	< 32,000
1	24,000	16,000
2	16,000	12,000
3	10,000	8,000
4	6,000	4,000

Table 3.1: Typical AADT flows by reinstatement category

- 3.4.3 For reinstatement category 0 roads only dual carriageways were considered.
- 3.4.4 Within each reinstatement category the rural and urban sites were each broken down into three groups based on whether they were located on either an A-road, a B-road or an unclassified road.
- 3.4.5 The data from all sites within each one of these three road groupings was averaged to produce average “typical” A-road, B-road and unclassified road site for each urban and rural reinstatement category.
- 3.4.6 Instead of assuming a diversion route, the maximum queuing delay allowed for in QUADRO was capped at 20 minutes for all groups.
- 3.4.7 Four different works types were assessed based on those given in Guidance Document 1:
- 10m shuttle working
  - 30m shuttle working
  - 50m shuttle working
  - 100m shuttle working
- 3.4.8 Instead of assuming a diversion route, the maximum queuing delay allowed for in QUADRO was capped at 20 minutes for all groups.
- 3.4.9 For the dual carriageway sites, instead of shuttle working, single lane closures of the same four lengths were assessed.
- 3.4.10 The works were coded in QUADRO as being at the centre of the affected road length and site lengths were determined using Table 1 in Guidance Document 1 which is reproduced in Table 3.2.

Speed Limit / Road Type	Excavation Length (m)	Total Site Length (m)
30mph S2	10	56
40mph S2	10	92
50mph S2	10	123
40mph D2	10	107
60mph D2	10	153

*Table 3.2: Relationship between excavation length and site length*

- 3.4.11 The results from the three “typical” sites by road standard were averaged to produce a “typical” site for each urban and rural reinstatement category. The daily results from each group were combined together to produce the daily cost (in 2010 prices discounted to 2010) of works by reinstatement category and works length for both rural and urban street works, shown in Table 3.3.



Reinstatement Category	Daily Cost of Street Works in Lincolnshire in £			
	10m Excavation Length	30m Excavation Length	50m Excavation Length	100m Excavation Length
Rural 0	447	544	628	746
Rural 1	4,025	5,510	6,778	10,273
Rural 2	1,488	1,739	1,987	2,597
Rural 3	844	973	1,101	1,410
Rural 4	334	386	436	560
Urban 0	734	872	993	1,216
Urban 1	8,793	16,748	25,503	50,651
Urban 2	2,262	3,958	5,843	11,742
Urban 3	577	775	969	1,436
Urban 4	230	309	387	575

Table 3.3: Average daily cost of street works by reinstatement category in Lincolnshire in 2010 prices and values discounted to 2010

3.4.12 Guidance Document 1 provided average daily reinstatement category rates for street works in 2002 prices discounted to 2002. These rates, adjusted to 2010 prices discounted to 2010, are shown in Table 3.4.

Reinstatement Category	Daily Cost of Street Works in £		
	10m Excavation Length	50m Excavation Length	100m Excavation Length
Rural 0	4,014	4,817	5,299
Rural 1	12,605	14,531	16,458
Rural 2	2,585	3,372	4,175
Rural 3	1,252	1,558	1,927
Rural 4	538	666	827
Urban 0	40,142	40,142	40,142
Urban 1	14,451	19,268	24,085
Urban 2	5,540	8,269	11,240
Urban 3	618	859	1,140
Urban 4	321	450	602

Table 3.4: Guidance - Average daily reinstatement category rates for street works in 2010 prices and values discounted to 2010

3.4.13 Comparing Tables 3.3 and 3.4 it can be seen that the Lincolnshire rates are predominantly similar to or lower than those given in the Guidance, except for urban reinstatement category 1. However, given that the majority of works undertaken fall within reinstatement category 4 (as shown in table 3.6) it is deemed that this appraisal provides a robust assessment.

3.4.14 As also noted in Guidance Document 1, the delay costs are lower for reinstatement category 0 than reinstatement category 1 but this is logical as reinstatement category 0 roads are all dual carriageways and on dual carriageways one lane in each direction remains open throughout the works, unlike with shuttle working on single carriageway roads.

3.4.15 To ascertain the proportion of notices for each works type in each reinstatement category the percentages provided in Guidance Document 1 were used and are shown in Table 3.5.

Reinstatement Category	Proportion of Notices			
	10m Excavation Length	30m Excavation Length	50m Excavation Length	100m Excavation Length
Rural 0	0.45	0.22	0.11	0.22
Rural 1	0.67	0.13	0.07	0.13
Rural 2	0.79	0.06	0.06	0.09
Rural 3	0.83	0.07	0.03	0.07
Rural 4	0.83	0.06	0.04	0.07
Urban 0	0.67	0.08	0.08	0.17
Urban 1	0.82	0.07	0.04	0.07
Urban 2	0.87	0.05	0.03	0.05
Urban 3	0.88	0.05	0.02	0.05
Urban 4	0.90	0.04	0.03	0.03

Table 3.5: Proportion of notices, by excavation length, within each reinstatement category

3.4.16 Data on the annual average number of street work notices undertaken by reinstatement category was provided by Lincolnshire Council. This is shown in Table 3.6.

Reinstatement Category	Average Annual Number of Rural Works Undertaken	Average Annual Number of Urban Works Undertaken
0	14	0
1	151	293
2	1,519	457
3	2,184	489
4	11,450	1,905

Table 3.6: Annual number of street works undertaken by reinstatement category

3.4.17 The data provided on numbers of works together with their durations enabled the calculation of the average works duration. This was found to be 3.21 days.

3.4.18 Combining the amount of works, their relevant notice percentage, the rates output from QUADRO and the average works duration the total annual street works user delay cost was found to be £48.8 million in 2010 prices discounted to 2010.

3.4.19 As advised in Guidance Note 2, a 5% reduction in the number of street works was assumed following the implementation of the permit scheme and the present value of transport economic efficiency benefit for the first year was calculated, as shown in Table 3.7.

First Year Delay Cost Savings (£)	Base
<b>Consumer User Benefits</b>	1,380,516
<b>Business User Benefits</b>	1,127,086
<b>Accident Benefits</b>	-3
<b>Fuel Carbon Emission Benefits</b>	20,977
<b>Indirect Tax Revenue Benefits</b>	-88,412
<b>Present Value of Transport Economic Efficiency Benefits (PVB)</b>	<b>2,440,164</b>

Table 3.7: First year delay cost savings in 2010 prices and values discounted to 2010

## 4 Sensitivity Tests

4.1 Sensitivity tests, detailed in Table 4.1, were undertaken to assess the effect on delay cost savings resulting from changes to the number and duration of the works, assumed in the 'Base' scenario.

Test	Description
1	The reduction in works achieved was decreased from 5% to 4%
2	The reduction in works achieved was decreased from 5% to 3%
3	The reduction in works achieved was decreased from 5% to 2%
4	The reduction in works achieved was decreased from 5% to 1%
5	The average duration of works was increased from 3.2 days to 5 days
6	The average duration of works was increased from 3.2 days to 4 days
7	The average duration of works was reduced from 3.2 days to 3 days
8	The average duration of works was reduced from 3.2 days to 2 days
9	The average duration of works was reduced from 3.2 days to 1 day

Table 4.1: Sensitivity tests undertaken

4.2 Results from the tests are shown in Tables 4.2 and 4.3.

First Year Delay Cost Savings (£)	Sensitivity Test Number				
	Base	1	2	3	4
Consumer User Benefits	1,380,516	1,104,413	828,309	552,206	276,103
Business User Benefits	1,127,086	901,669	676,252	450,835	225,417
Accident Benefits	-3	-3	-2	-1	-1
Fuel Carbon Emission Benefits	20,977	16,782	12,586	8,391	4,195
Indirect Tax Revenue Benefits	-88,412	-70,730	-53,047	-35,365	-17,682
Present Value of Transport Economic Efficiency Benefits (PVB)	2,440,164	1,952,131	1,464,098	976,066	488,033

Resultant BCR	1.919	1.682	1.444	1.206	0.969
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Table 4.2: First year delay cost savings in 2010 prices and values discounted to 2010 for utility works sensitivity tests

First Year Delay Cost Savings (£)	Sensitivity Test Number					
	Base	5	6	7	8	9
Consumer User Benefits	1,380,516	2,157,056	1,725,645	1,294,233	862,822	431,411
Business User Benefits	1,127,086	1,761,073	1,408,858	1,056,644	704,429	352,215
Accident Benefits	-3	-5	-4	-3	-2	-1
Fuel Carbon Emission Benefits	20,977	32,777	26,222	19,666	13,111	6,555
Indirect Tax Revenue Benefits	-88,412	-138,144	-110,516	-82,887	-55,258	-27,629
Present Value of Transport Economic Efficiency Benefits (PVB)	2,440,164	3,812,756	3,050,205	2,287,654	1,525,102	762,551

Resultant BCR	1.919	2.587	2.216	1.845	1.474	1.103
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Table 4.3: First year delay cost savings in 2010 prices and values discounted to 2010 for works duration sensitivity tests

## 5 Costs to Benefit Analysis

5.1 The permit fee levels are derived from the completed DFT permit fee matrix which analyses and quantifies individual tasks associated with the administrative function of permit assessment. For this appraisal the operational revenue is taken from the proposed fee levels multiplied by the volume of expected permits, while the operational costs of running the permit scheme are in part taken from the expected actual costs given by the fee matrix.

### 5.2 Scheme costs

5.2.1 In the calculation and factoring of scheme costs the following have been applied as necessary

Sensitivity Factors	
Risk & Optimism Bias Factor	38.00%
Discount Factor	3.50%
Market Cost Adjustment	19.00%
Years to Discount	4
GDP deflator	94.882%
% Reduction in road works	5.00%

5.2.2 For capital costs of implementation, risk and optimism bias is set at a total adjustment of 38% as per DFT guidance (decision-making guidance).

5.2.3 A Discount rate of 3.5% has been applied to convert all annual values to net present values before allowing for inflation.

5.2.4 All revenue and capital costs have had a market cost adjustment of 19% as per DFT guidance (WEBTag).

5.2.5 All costs and revenue are given in 2013/14 prices, however since QUADRO output is in 2010 prices all costs and revenue have a 3 (financial) year discount GDP deflation of 94.882% as per Office of National Statistic GDP deflator guidance (October 2014).

5.2.6 The implementation costs for the permitting scheme in Lincolnshire are shown overleaf

<b>One off Implementation Costs</b>	
Staff costs	£24,930
Capital	£9,349
ICT / Software	£90,373
Support	£86,477
Sub-total one-off costs	£135,500
Sub-total one-off costs (inc Risk & Optimism bias)	£211,130
<b>Present Value of One-off Costs (2010 prices)</b>	<b>£211,130</b>

5.2.7 Implementation costs are based on an assumed one-off purchase; office space and furniture, and new IT equipment required to operate the scheme such as new computers, and software purchases and licences.

5.2.8 DfT state that set up costs prior to a scheme having been given agreement by the Secretary of State should not be included in the costs and benefits calculation. In May 2015 the permit regulations were amended and the Secretary of State no longer signs off schemes, instead this is done by an authorised person from the Authority, such as the chief executive.

5.2.9 For the purposes of this analysis, it has been assumed that this effectively might be the point in time the scheme documentation is finalised and an Order is written. Therefore the staff and support costs allocated include is an assumed resources allocation comprising Lincolnshire County Council staff preparing for the scheme implementation and changes in business processes, as well as the training of staff and contractors and on-going support post go-live.

5.2.10 Additional operational costs for the permit scheme are provided below:

<b>Annual Repeat Costs</b>	<b>Annual Cost</b>
Operating Costs (ICT)	£65,000
Operating Costs (Vehicles and other)	£54,000
Operating staff costs (Statutory Undertaker Works)	£1,481,310
Operating staff costs (Highways Works)	£444,393
Subtotal Annual Repeat Costs	£2,044,703
Subtotal Annual Repeat Costs (NO Risk & Optimism Bias)	£2,041,621
<b>Present Value of Annual Repeat Costs (2010 Prices)</b>	<b>£33,649,010</b>

5.2.11 Operational costs are based on the team structure and resource allocation it is predicted is necessary to carry out back office and permitting tasks in an efficiently managed and adequately resourced manner. This figure is taken in part from the fee matrix calculation, but there is assumed additional 30% cost of operating the permit scheme for highway authority works, as reflected by existing volumes of notices and noticing tasks required.

- 5.2.12 Further annual repeat costs include software licences and modules specifically for permitting as well as additional costs associated with the additional site work (including vehicle running costs).
- 5.2.13 No risk and bias were calculated since repeat costs are more predictable for a permit scheme (since the resources are dictated by the scheme itself).
- 5.2.14 Street Works costs do not include tax and therefore a Market Cost Adjustment has not been applied for this element.
- 5.2.15 Costs were deflated from 2014 to 2010 prices using a GDP deflator value of 94.882% and then the appraisal period of 25 years calculated using the a Net Present Value function.

### 5.3 Scheme benefits

5.3.1 Overall scheme benefits are shown below:

Quantified Annual Repeat Benefits	Adjusted Annual Benefit
Consumer User Benefits (£)	£1,380,516
Business User Benefits (£)	£1,127,086
Accident Benefits (£)	-£3
Fuel Carbon Emission Benefits (£)	£20,977
Indirect Tax Revenue Benefits (£)	-£88,412
Subtotal Quantified Annual Repeat Benefits (2010 Prices)	£2,440,164
<i>Annual Repeat Permit Fee Income (2014 Prices)</i>	<i>£1,583,598</i>
<i>Annual Repeat Permit Fee Income (2010 Prices)</i>	<i>£1,502,549</i>
<i>Present Value of Benefits (2010 Prices)</i>	<i>£3,942,713</i>
<b>Net Present Value of Benefits (25 Years Operation)</b>	<b>£64,981,889</b>

- 5.3.2 Operational revenue via permit fees are calculated based on the proposed charging regime and current volumes of notices within the county. Detailed time/cost analysis of individual permitting tasks has been undertaken as part of the DFT fee matrix, see appendix A for summary of fee levels.
- 5.3.3 A 5% reduction in volume is assumed to account for the operational efficiencies proposed for the permitting scheme.
- 5.3.4 See previous chapters for QUADRO assumptions and calculations.

## 5.4 Cost benefit ratio

5.4.1 The result of the economic appraisal for option 1 are summarised below

<b>Summary</b>	<b>Annual Cost</b>
Net Present Value of Benefits	£64,981,889
Net Present Value of Costs	£33,860,140
Net Present Value of Scheme	£31,121,750
<b>Benefit to Cost Ratio</b>	<b>1.92</b>

## 6 Summary and conclusions

- 6.1 Mouchel was commissioned by Lincolnshire County Council to undertake an economic appraisal of permit scheme costs and benefits, making an assessment of the overall value of the scheme and an associated cost benefit ratio.
- 6.2 The methodology was developed by referring to and to ensuring consistency with the relevant guidance documents, as listed in paragraph 3.2.
- 6.3 The value assessment for Option 1, expressed as a benefit to cost ratio of 1.92 represents a lower value-for-money case (but still a positive nonetheless) primarily due to the high cost of operating the permit scheme as taken from the fee matrix (1.5M) against the benefit outcome of the traffic modelling (2.4M).
- 6.4 Sensitivity test 5 (increase in average works duration from 3.2 days to 5 days) shows an increased cost/benefit from 1.92 to 2.58. This is to be expected since the QUADRO disbenefit is calculated for one day and then multiplied up. Therefore five days has 5/4 of the disbenefits of four days etc. With this model of scheme we assume a 4.41% reduction in Statutory Undertaker disbenefits and so the more days of works the bigger this reduction (the monetary benefit) becomes.
- 6.5 While a permit scheme does try to drive decreases in network occupancy through the idea of collaborative working and reductions in the numbers of smaller/short term activities (combining them perhaps in to one slightly longer activity), in reality overall average works durations are unlikely to increase this substantially.
- 6.6 The sensitivity test 4 (reduction in number of utility works from 5% to 1%) gives a relatively low benefit (0.969). This is to be expected because a minimal reduction in road occupancy does have an overall benefit albeit it a very small one. Therefore, it may be discounted. Similarly for sensitivity tests 8 and 9 where the reductions in the duration are not likely.
- 6.7 It should be noted that the number of registerable activities for the highway authority is estimated to be around 30%. This is a relatively low figure based on recent data from the register and it is possible this will increase under permitting. The cost model used assumes a similar cost of operation for the authority as for a statutory undertaker and so any relatively small increase in authority activity numbers will decrease the overall benefit further.
- 6.8 As the economic appraisal of option 1 is a small positive, and the majority of sensitivity testing scenarios result in fairly consistent low positive benefit to cost ratios (>1.1), it has been demonstrated that the scheme is feasible as the net benefits to road users and wider society exceed the additional costs of the scheme.
- 6.9 We recommend that the permit scheme is progressed to implementation.



## 7 Future Performance Assessment

- 7.1.1 A permit scheme is not intended to generate revenue for the permit authority and so it is important to monitor income received from permits post implementation to ensure the scheme is cost neutral over time. Therefore after the first year of operation and also during subsequent years of operation the costs incurred and income generated will need to be assessed and permit fees adjusted accordingly.
- 7.1.2 The 2015 amendments to the permit scheme regulations<sup>1</sup> require re-evaluation on the first, second and third anniversary of the scheme coming into effect, and every third year thereafter. A yearly assessment of the scheme and the costs/fee levels allows scope to assess trends and enables closer scrutiny of the effectiveness of the Permit Scheme.
- 7.1.3 This evaluation should include consideration of
- whether the fee structure needs to be changed in light of any surplus or deficit;
  - the costs and benefits (whether or not financial) of operating the scheme; and
  - whether the permit scheme is meeting the key performance indicators set out in the Guidance.
- 7.1.4 It should be noted that at the present time there is no inflation proofing of fees and that this will reduce the value of the scheme in the longer term.
- 7.1.5 The 2015 amendments to the permit scheme regulations<sup>2</sup> require re-evaluation on the first, second and third anniversary of the scheme coming into effect, and every third year thereafter. A yearly assessment of the scheme and the costs/fee levels allows scope to assess trends and enables closer scrutiny of the effectiveness of the Permit Scheme.
- 7.1.6 Any future change in fee levels should be based on reassessment of the fee matrix and may require an additional consultation period.
- 7.1.7 Following assessment annually, should the current fee levels prove to be too high (ie income exceeds operational costs), it would not be effective to consider refunding excess income. It is recommended that permit fees are adjusted, or additional discounts to the charging regime are set up, to reduce permit fee income by an equivalent amount to the surplus in the subsequent financial year. Thus over time balancing out the surplus or losses made.
- 7.1.8 During the first year of the scheme Lincolnshire County Council might wish to monitor their allowable costs and fee income several times. If early on in the scheme's operation, it is considered likely that there will be a significant imbalance between costs and fees then an early adjustment of fee levels may be warranted.
- 7.1.9 Part of the assessment process should include an evaluation of the costs and benefits of the scheme. These costs and benefits are not just financial, and the annual report on the permit scheme (see below) will allow a considered analysis both quantitatively and qualitatively. For the purposes of this economic appraisal a recalculation of the activities undertaken under the permit scheme, together with the adjusted cost matrix, will provide a suitable dataset to recalculate the costs and benefits in monetary terms. In the long term additional traffic analysis

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<sup>1</sup> SI 2015/958 The Traffic Management Permit Scheme (England)(Amendment) Regulations 2015

<sup>2</sup> SI 2015/958 The Traffic Management Permit Scheme (England)(Amendment) Regulations 2015

may be required if there has been significant changes in volumes and patterns, or of there has been a significant change to activity road-occupancy.

## 7.2 Other performance assessment

7.2.1 It is important to be able to assess the performance of a permit scheme. The evaluation, in the form of an annual report, should be with reference to the stated objectives of the scheme to demonstrate to what extent they have been delivered.

7.2.2 Most of the objectives of the Lincolnshire Permit Scheme are measured through the monitoring and collection of performance indicators, compared against baseline data collected prior to the operation of the scheme or for the previous year(s) of the scheme's operation.

7.2.3 However, in addition to these, assessments might include some or all of the following.

### Works Activity

7.2.4 Permit schemes are expected to reduce works amounts and/or durations through better co-ordination. This can be assessed annually by monitoring the number and average duration of works.

7.2.5 In addition, analysis could consider the changes in the breakdown of works between strategically and non-strategically significant locations and between the different street reinstatement categories.

7.2.6 In this analysis it has been assumed that the split between different works lengths is consistent with the values provided in Table 2 of Guidance Document 1. In theory it is possible that to reduce permit costs by sharing road space or working collaboratively, therefore it might be possible to analyse notice numbers by site length.

7.2.7 If traffic growth was comparatively flat during the first year of operation then the existing QUADRO analysis could be utilised without further counts and the effect of the changed works levels could be assessed.

7.2.8 If flows or vehicle proportions are expected to have changed significantly then collection of new count data would be necessary and a new QUADRO analysis would need to be undertaken.

### Network Performance

7.2.9 The reduction in, and improved co-ordination of works is expected to lead to improvements in overall network performance.

7.2.10 Improvements in network speeds and overall journey time reliability could be investigated by assessing changes in vehicle speeds (using TrafficMaster GPS data) and bus journey times on both the strategically and non-strategically significant streets, or considering similar data from neighbouring (non-permitting) authorities as a baseline comparison.

7.2.11 Work modelling the relationship between journey time and standard deviation (one measure of journey time variability) has been done for the DfT based on GPS data. However it is difficult to assess the direct impact of permitting schemes on journey time or journey time

reliability from other influences on the network, and for this reason it has not been included as a specific performance indicator or measure within the scheme.

### 7.3 Changes to Key Performance Indicators and Objective Measures

7.3.1 The LiPS scheme is committed to following guidance from HAUC(England) or the DfT with regards to its TPIs and Operational Measures.

7.3.2 Should this guidance change, the manner of reporting on these measures will be amended to comply.

## 8 Appendix A – Operational income

Reinstatement category of street	Traffic sensitive streets	Non-traffic sensitive streets
Provisional Advance Authorisation	£101	£72
Major Activity greater than 11 days duration or requiring a TRO	£210	£130
Major Activity between 4 & 10 day duration	£117	£75
Major Activity up to 3 day duration	£64	£43
Standard activity	£117	£75
Minor Activity	£64	£43
Immediate activity	£40	£26
Permit Variation	£45	£35

*Table of permit fee levels for Lincolnshire County Council*

Note that the DfT's *Additional advice note for developing and operating future permit schemes (March 1014)* sets out a revised fee structure where works classed as Major are further divided into three fee-categories based on their duration.