

Evaluation of Street Works Permit Schemes

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Note on Terminology

This report makes use of the following terminology:

- The term 'local highway authority' (LHA) refers to a highway authority as defined in Section 329 of the Highways Act (1980) which was amended by the Infrastructure Act (2015).
- The term 'permit authority' refers to an LHA with a permit scheme in legal effect.
- The term 'notice authority' refers to an LHA that does not operate a permit scheme, and therefore operates just a notice regime.
- The term 'promoters' is used to collectively describe the organisations which undertake street works and those which undertake road works, unless a specific distinction needs to be drawn.
- Street works and road works are collectively referred to as 'works'. More specifically:
 - The term 'street works' refers to works defined in Section 48 (3) of the New Roads and Street Works Act (NRSWA), "street works means works of any of the following kinds (other than works for road purposes) executed in a street in pursuance of a statutory right or a street works licence: (a) placing apparatus; or (b) inspecting, maintaining, adjusting, repairing, altering or renewing apparatus, changing the position of apparatus or removing it, or works required for or incidental to any such works (including, in particular, breaking up or opening the street, or any sewer, drain or tunnel under it, or tunnelling or boring under the street". These works are typically carried out by the statutory undertaker.
 - The term 'road works' refers to works for road purposes as defined in Section 86 (2) of NRSWA, "works for road purposes means works of any of the following descriptions executed in relation to a highway: (a) works for the maintenance of the highway; (b) any works under powers conferred by Part V of the Highways Act 1980 (improvement); (c) the erection, maintenance, alteration or removal of traffic signs on or near the highway; or (d) the construction of a crossing for vehicles across a footway or grass verge or the strengthening or adaptation of a footway for use as a crossing for vehicles". These works are typically carried out by, or on behalf of, the LHA.

Executive Summary

Street works and road works are a major cause of delay and disruption for road users, resulting in significant costs to the economy and society. With previous studies estimating that the cost of congestion resulting from street works is £4.3 billion a year¹, successive governments have taken steps to support the effective management and coordination of works.

These steps have included the ability for local highway authorities (LHAs) to introduce permit schemes. Such schemes provide the authority with the ability to proactively manage all works as a way to reduce and control the associated disruption. This increased control is achieved by requiring all promoters to seek permission before undertaking works and for those works to comply with conditions which the LHA can apply. Initially, permit schemes required government approval before they could be brought into operation, but this requirement ceased in 2015.

In March 2017, the Department for Transport (DfT) commissioned Ecorys and Open Road Associates to undertake an evaluation of permit schemes. The mixed methods approach has included impact evaluation (including estimating the effects that permit schemes have on relevant outcomes, such as works durations) and elements of process evaluation (looking at how schemes were designed and implemented in practice).

Evaluation framework

The overall aim is to explore how the permit scheme regulations have been implemented, whether they are effective and where improvements could be made to the regulations or the way in which they are operated.

More specifically, the evaluation tests some of the underlying assumptions about how permit schemes are implemented and their effects, including the assumption that LHAs use the levers that the scheme provides and that permit schemes lead to improved coordination and shorter works durations. Changes in the way that works are managed and undertaken would be expected to reduce the disruption to road users caused by these works, leading to wider societal benefits.

A number of hypotheses were developed setting out how permit schemes are expected to generate their intended impacts, and which were subsequently tested by the evaluation research:

¹ Estimation of the costs of delay from utilities' street works (Halcrow, 2004). Figure expressed in 2002 prices.

1. Permit schemes provide a way to reduce the disruption caused by works (tested by analysis of works durations).
2. Permit schemes provide increased levels of control over all works (tested by a review of evidence relating to the steps taken to control and coordinate works).
3. Permit schemes provide a lever, which can influence the way that works are undertaken (tested through considering the effects on promoter behaviour).
4. Permit schemes balance income and costs (tested through exploring the income generated and comparing this to the costs of running a scheme).
5. Permit schemes generate a positive return for society (tested through cost benefit analysis).
6. The design and operation of permit schemes is effective and supports the generation of the desired outcomes (explored through discussion of processes and linking this to the available evidence of impact).

Methodology

The evaluation involved:

- A counterfactual impact evaluation, drawing on available works data to make a statistical comparison of outcomes for a matched sample of works completed under both permitting and noticing regimes (a strong research design that meets Level 3 on the Maryland Scientific Methods Scale²).
- Review and analysis of the available works data from the EToN (Electronic Transfer of Notifications) system, as well as reports produced by permit authorities, which aim to provide an assessment of the performance of the scheme in question.
- An indicative cost benefit analysis, which considers the balance between the costs to LHAs and promoters which are associated with permit schemes and the resultant benefits to society.
- Online surveys targeted at LHAs (both those with a permit scheme and those without) and promoters. These aimed to capture high-level information on operation and interaction with permit schemes, as well as experiences and perceptions of their effects.
- Qualitative research, which took the form of in-depth interviews and case study visits involving a sample of LHAs and promoter organisations to explore in more detail how schemes work and how this compares to noticing, as well as capturing the effects of schemes in practice.

² The scale was developed to assess the methodological quality of outcome/impact evaluations. See: <http://www.whatworksgrowth.org/resources/the-scientific-maryland-scale>

The impacts and costs of permit schemes

The counterfactual impact evaluation shows that works completed under a permit scheme were, on average, completed in a shorter time than works completed under noticing, for most works categories. The greatest effect related to major works completed by statutory undertakers which revealed an average reduction of 3.19 days in the time taken. The views expressed by LHAs in a survey (where 83% agreed or strongly agreed that their permit scheme had led to a reduction in the duration of the works) and interviews undertaken as part of the evaluation supported this finding. Interviewees did acknowledge, however, that at LHA level it is difficult to robustly demonstrate this effect in quantitative terms, in part because of the influence of other factors such as changes in local policies or fluctuations in promoter activity.

Analysis of works data shows an increase in the recorded volume of works following the introduction of a permit scheme due, at least in part, to the requirement for a permit scheme to apply to the LHA's own works as well as statutory undertakers. Furthermore, counterfactual impact evaluation shows that works were less likely to over-run when completed under a permit regime, except for standard and major highways works. These findings imply that permit schemes provide LHAs with more control over their network, which the LHA interview findings support. Almost all (98%) of the permit authorities responding to the survey agreed that their permit scheme had led to improved coordination of works.

Promoters expressed concern about attempts to influence the duration or approach to the work but LHAs interviewed felt they had taken the time to consider the specific features of each job to inform this challenge. The data suggests that there is more to do to ensure that the available levers are used to their full effect as the use of directions and application of conditions varies. Scenario analysis shows that increased or more systematic application of conditions could lead to a substantial increase in the benefits (i.e. reduction in the cost of delays) generated.

There is limited data available to quantitatively assess the extent to which permit schemes change the behaviour of promoters in terms of how works are undertaken and mixed views emerged from interviews. While some LHAs interviewed were able to provide specific examples of where they felt the presence of a permit scheme had led to changes in how work was undertaken (for example, an increase in the use of innovative approaches or out of hours working), others did not agree. Some expressed a view that the financial incentives available are too small to change behaviour to the degree that they would like. Promoters interviewed listed a range of other factors as being more influential in determining how works are undertaken.

The primary impact on promoters (statutory undertakers) is an increase in costs, which includes permit fees, the cost of complying with conditions (working differently) and the additional time taken up by administration (compared to noticing). LHAs also incur additional costs, although they are able to use permit fees to fund certain allowable costs.

An indicative cost benefit analysis based on the change in duration of works under permit schemes suggests that, overall, the schemes generate a positive return to society, with a benefit to cost ratio of 1.34. However, it was not possible to include wider impacts (such as improved works safety, increased co-ordination of works and changes to working practices) in this analysis.

Development and operation of permit schemes

Evidence from a survey and interviews with LHAs suggests that the decision to explore the introduction of a permit scheme is typically prompted by a need to reduce disruption and improve control of the road network. Impact evidence suggests that positive outcomes of this type are associated with permit schemes, although the lack of quantified evidence at scheme level means that such decisions have been based on the anticipated advantages of permits rather than data. The opportunity to work together with neighbouring authorities is also a factor, which has prompted action to develop a scheme. Support from senior staff and council members is essential for scheme development to progress.

Both LHAs and promoters interviewed felt that there will be a continued upward trend in the number of LHAs operating a permit scheme. This is supported by LHA survey findings which revealed a number of authorities that are currently considering or are in the process of developing a scheme. However, the LHA survey highlighted that some authorities do not consider a permit scheme to be necessary for their area, generally because they felt existing systems were adequate.

All of the permit authorities interviewed reported that some degree of external support (typically the appointment of consultants) had been required to develop their scheme, which represented a cost to the authority; these costs are incurred upfront and so not offset by permit fee income, unlike the ongoing costs of operation. Related to this, the need for resources (staff time and funding) in the development phase was highlighted as a potential barrier to some authorities, particularly given current public-sector budget constraints, and also a factor which can extend the time taken to develop a scheme. Use of an existing scheme design was thought to reduce the burden of scheme development to some extent.

The introduction of permit schemes has helped to increase parity in the treatment of street and road works. This is supported by the analysis of works data which typically shows an increase in the number of works being recorded post introduction of a permit scheme. However, promoters interviewed expressed concerns that current efforts do not go far enough to create a fair system.

The need to comply with the permit scheme regulations means that, in theory, there is limited variation in scheme design. The survey and interviews with LHAs reveal differing perspectives, with some actively choosing to adopt an existing scheme design and/or align with neighbouring authorities and others wanting to create something specific (although the latter category applies largely to early adopters who did not have a great deal of other scheme designs to work with at that time). The key decisions to be made are whether a scheme should cover all roads or a selection and which incentives to provide. An increasing proportion of schemes apply to all streets, although it was not possible to explore whether this has led to a difference in impact compared to a more focused approach due to an insufficient sample size for the latter group.

A lack of consistency across schemes is a key challenge for promoters (reported in both the survey and interviews). Promoters typically engage with multiple schemes and reported differences in approach and interpretation between LHAs, which leads to increased compliance costs. The introduction of national conditions is seen as a positive but there are concerns that there is still scope for inconsistency in application. Compliance was the key challenge identified by LHAs (in survey and interviews), and this is recognised to have implications for the level of behavioural change that can be achieved.

Conclusions and recommendations

Permit schemes provide a way of reducing disruption to road users. The counterfactual impact evaluation shows a reduction in average durations for most types of works undertaken under permit schemes, compared to noticing. This analysis also shows a reduced likelihood that permitted works will over-run. This finding is supported by the perceptions of LHAs, but it has proved difficult to evidence at local level.

Analysis of works data indicates that the levers associated with permit schemes do not currently appear to be applied consistently, which suggests that there is potential for schemes to generate greater benefits. LHAs with permit schemes reported that they have increased control of the road network but analysis of works data shows limited and inconsistent use of directions and conditions. Scenario analysis based on this data illustrates that significant cost savings (reduced disruption) could be achieved through the increased application of conditions.

Permit schemes offer potential to create changes in the duration and timing of works but there is limited evidence that they prompt changes in the approaches or techniques used by promoters, such as the use of trenchless (or ‘no dig’) techniques which allow the laying of cables or pipes with minimal excavation. It is likely that this is due to the costs of applying alternative techniques being substantially higher than the discounts offered.

The existence of permit schemes creates additional costs for LHAs and works promoters (particularly statutory undertakers which are subject to permit fees). While LHAs can offset some of these additional costs with the fees generated by the scheme, promoters must either absorb the associated costs within the business, pass them on to customers, or take steps to avoid costs where possible.

Permit schemes offer a more proactive approach to the management of works compared to noticing. Resources must be invested in the development of schemes and this appears to act as a barrier to take-up for some authorities, or to slow the pace of scheme development in others. Permit fees also provide a way to cover the additional costs of operating the scheme; noticing authorities are under-resourced in comparison. In theory, differences in the format of permit schemes are limited due to the need to comply with legislation; however, there are differences in interpretation of certain elements (such as the national conditions) and how the scheme is applied in different LHAs (such as the basis for decisions to challenge the permit request).

Based on the evidence gathered across all sources, the evaluation team has developed a number of recommendations.

For LHAs:

1. Permit schemes: those LHAs that have not already done so should give consideration to the introduction of a permit scheme, given that this report has identified that such schemes can support a range of benefits.
2. Development: LHAs seeking to develop a permit scheme should draw on the experiences of others who have already been through this process. Steps should also be taken to involve promoters in discussions about scheme development from an early stage and to support ongoing positive engagement.
3. Fairness: it is recommended that LHAs are required to set out a clear statement on parity, including making clear how the scheme applies to highways works and how resources are used/focused (such as inspection activity).
4. Collaboration: LHAs should work with promoters to explore the potential for increased collaborative working, as the evaluation revealed that both parties felt this was an area for development which could yield benefits in terms of reduced

disruption. Steps should also be taken to ensure that instances of collaborative working are comprehensively recorded.

For DfT:

1. Scheme evaluations: the quality of existing LHA scheme evaluation reports suggests that guidance on these should be revised and steps taken to ensure adherence to the regulatory requirements regarding timing and publication.
2. Application of conditions: more practical advice on the application (and recording) of conditions should be provided and commitment to complying with this should be sought from LHAs as this could lead to better outcomes and less ambiguity within the coordination process (helping to promote consistency).
3. Transparency: there should be increased transparency in the level and use of permit fee income. Clarification should be provided on the allowable costs for operating a permit scheme, together with a cost model for LHAs to complete which details costs and income.
4. Oversight: a body such as HAUC should be tasked with oversight of scheme development (including a register of schemes that are in development) and operation (including checking that evaluation reports are made available). A statutory role should be considered.
5. Incentives and fines: further research should be undertaken to establish which incentives are most effective along with a review of the current level of fines and charges to ensure that they are proportionate and also capable of impacting on behaviour.
6. Costs and benefits: further resource should be invested in the analysis of costs and benefits at national level, particularly in the estimation of costs to LHAs and promoters.

1.0 Introduction

Ecorys and Open Road Associates were commissioned by the Department for Transport (DfT) to undertake an evaluation of permit schemes in March 2017. This is a mixed methods study which has included elements of process evaluation (looking at how schemes have been designed and implemented in practice) and impact evaluation (including the effects that permit schemes have on relevant outcomes relative to a counterfactual).

1.1 Background

Street works and road works are a major cause of delay and disruption for road users, resulting in significant costs to the economy and society.

The New Roads and Street Works Act (NRSWA) and the Traffic Management Act (TMA) place a duty on highway authorities³ to coordinate street and road (or highway) works and also to facilitate the expeditious movement of traffic within their areas (the network management duty).

These acts also set out the powers which are available to local highway authorities (LHAs) to fulfil this duty; the former requires that street works promoters provide advance notice of certain works to the LHA (a practice known as noticing) and the latter introduces the possibility of implementing a permit scheme. Additional information on the legislative background to the management of street and road works is provided in Annex 1.

The requirement for notices and the possibility of introducing a permit regime are intended to support the ability of LHAs to manage and coordinate works in their areas in order to minimise disruption.

A permit scheme requires promoters to apply for permission to undertake their works in advance and for the LHA to consider whether this will be granted and what conditions are applied⁴. This represents a major change compared to the practice of noticing where promoters are merely required to submit notice of their intentions. LHAs may also apply a fee to applications from statutory undertakers to cover the costs associated with the processing of permits.

³ This evaluation is focused on local highway authorities (typically the county council or unitary authority for a particular area).

⁴ Conditions are applied to permits by the works promoter, as part of their initial application or permit variation. If a LHA wishes to amend or add to the permit conditions they must request this and the works promoter will then action the addition or amendment accordingly in a revised notification. LHAs are required to use a set of national conditions, which cover aspects such as the date and timing of works, traffic management, consultation and publicity, and works methodology (full details are provided in Annex 1).

Another important difference between the two regimes is the principle of parity which means that permit schemes should apply to works promoted by utility companies (statutory undertakers) as well as the authority's own works, while only utility companies are required to submit notices. Further detail on the features of permit schemes are provided in Annex 2.

The first permit schemes came into operation in 2010 and uptake of this approach has increased over time to a current level of over 60% of all LHAs in England (see Annex 3 for more information on uptake of permit schemes). Schemes must align with regulatory requirements although LHAs can determine the coverage (whether the requirements apply to all streets or not) and are able to add further discounts and incentives if required.

1.2 Policy objectives and rationale

With previous studies estimating the cost of congestion resulting from street works alone at £4.3 billion a year⁵, successive governments have put in place a set of powers, tools and guidance in order to support the effective management and coordination of works.

The fact that the costs of road delays and disruption are largely external to the market means that those experiencing the negative effects of delays differ from those who are responsible for causing this disruption, leading to a situation where the level of works-related congestion will be higher than that which is desirable from the perspective of society as a whole.

The existence of this likely market failure provides a rationale for government intervention with the objective of providing LHAs with the means to increase control of works taking place in their area, in order to ensure that the effect on road users is minimised.

Permit schemes were introduced as a way to bring increased control by requiring promoters to seek permission before undertaking works and giving LHAs a greater ability to direct and place conditions on these works in an attempt to reduce the disruption likely to be caused.

This evaluation considers the impact of permit schemes (compared to noticing) on measures of disruption, as well as exploring how such schemes have been implemented and identifying good practice lessons.

⁵ Estimation of the costs of delay from utilities' street works (Halcrow, 2004). Figure expressed in 2002 prices.

1.3 Navigating this report

The remainder of this report is structured as follows:

- Section 2 sets out the evaluation framework and methodology.
- Section 3 considers evidence on the impacts and costs of permit schemes.
- Section 4 discusses the development and operation of permit schemes.
- Section 5 presents conclusions and resulting recommendations.

Additional material is also provided in a separate document containing the following annexes:

1. Legislative background.
2. Description of permit schemes.
3. Uptake of permit schemes.
4. Detailed logic map.
5. Analysis of works data.
6. Analysis of scheme evaluation reports.
7. Counterfactual impact evaluation.
8. Cost benefit analysis.

2.0 Evaluation Framework

This section provides an outline of the framework which underpins the evaluation and details the methods which have been used.

2.1 The logic of permit schemes

The logic map presented overleaf (Figure 2.1) is intended to summarise the theory of change⁶ behind the introduction of permit schemes, setting out the assumed relationship between the inputs (resources invested) and activities that are being undertaken and their desired outputs (deliverables), outcomes (short and medium term effects) and impacts (on longer-term societal objectives)⁷.

The logic of the programme can be summarised as follows:

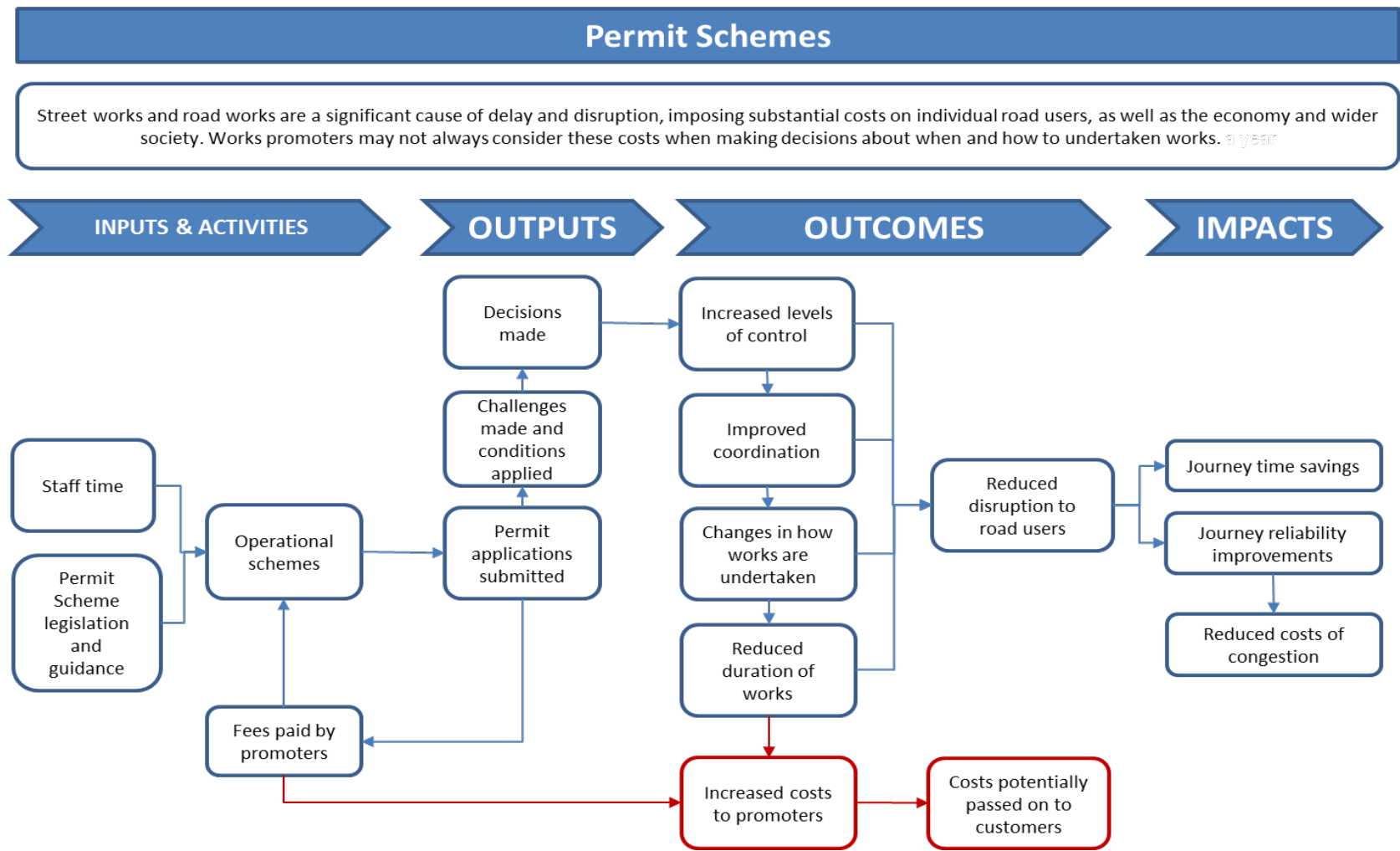
- Inputs: LHAs invest staff time and resources into the development and operation of permit schemes, with reference to the applicable legislation and guidance.
- Outputs: this investment would be expected to result in well-designed schemes that deliver a series of outputs, specifically the submission, review and decision-making related to permit applications (including challenges or directions from the LHA or the use of conditions which may lead to revision or modification of applications). The logic map also shows that fees are paid by promoters and that income from these fees support the costs of running the scheme (inputs).
- Outcomes: this process is expected to contribute to a range of outcomes, reflecting changes in the behaviour of both LHAs (concerning the control and coordination of works) and promoters (in terms of how works are undertaken and their duration).
- Impacts: the logic map also shows the expected consequences of these changes which are to reduce disruption to road users, ultimately leading to shorter and more reliable journey times and a reduced cost to society.

A more detailed logic diagram, which is aligned to the powers and regulatory requirements built into the New Roads and Street Works Act (NRSWA) and the permit scheme regulations, is presented in Annex 4.

⁶ The theory of change explicitly considers 'how' and 'why' a policy might cause an effect. These assumed relationships are explored and tested by the evaluation.

⁷ The development of logic maps is one of the key principles of DfT's evaluation guidance, which notes that evaluation strategies can be strengthened if initial logic mapping of the intervention is undertaken as a way of enhancing the focus and robustness of evaluation activities. See Tavistock Institute (2010). Logic mapping: hints and tips for better transport evaluations. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/3817/logicmapping.pdf

Figure 2.1 Logic map



Note: boxes outlined in red show potential negative effects of permit schemes.

2.2 Evaluation framework

The overall aim is to explore how the Permit Scheme Regulations have been implemented, whether they are effective and where improvements could be made to the regulations or the way in which they are operated. The findings will add to the evidence base concerning the effectiveness of methods to control works and support future policy decisions in this area.

More specifically, the evaluation tests the theories set out by the logic map (using the methods outlined in Section 2.3), exploring some of the underlying assumptions about how permit schemes are implemented and their effects, including the assumption that LHAs use the levers that the scheme provides (such as the ability to challenge and apply conditions) and that permit schemes lead to improved coordination and shorter works durations. Changes in the way that works are managed (by LHAs) and undertaken (by promoters) would be expected to reduce the disruption to road users caused by works, leading to wider societal benefits.

These theories and assumptions imply a number of hypotheses which are tested by the evaluation research:

1. Permit schemes provide a way to reduce the disruption caused by works (tested by analysis of works durations⁸).
2. Permit schemes provide increased levels of control over all works (involving a review of evidence related to the steps taken to control and coordinate works).
3. Permit schemes provide a lever which can influence the way that works are undertaken (considered based upon evidence on the effects on promoter behaviour).
4. Permit schemes balance income and costs (explored based upon the income generated and comparing this to the costs of running a scheme).
5. Permit schemes generate a positive return for society (tested through cost benefit analysis).
6. The design and operation of permit schemes is effective and supports the generation of the desired outcomes (explored through discussion of processes and linking this to the available evidence of impact).

⁸ The outcome measure for which the most comprehensive information was available in the works data.

The first five hypotheses relate to the impact of permit schemes while the final one is focused on implementation (or evaluation of processes). Key questions which have been explored as part of the evaluation (divided into the themes of impact and implementation) are set out in Table 2.1.

Table 2.1 Research themes

Theme	Sub-theme
Impacts of permit schemes	What are the impact of permit schemes on work durations and promoter behaviour?
	What are the variations in nature and duration of works in areas with different management approaches?
	What are the impacts of permit schemes on local authority works?
	What are the variations in impact by scheme design?
	What are the variations in impact associated with other factors?
	What are the costs and benefits associated with permit schemes?
Implementation of permit schemes	What are the factors affecting the decision to implement permit schemes?
	What are the steps involved in implementing and operating permit schemes?
	What are the variations in implementation of permit schemes?
	What are the barriers/enablers to operating schemes?
	What are the perceptions of differences between approaches?

2.3 Methodology

The evaluation has used multiple methods to gather evidence. These methods are summarised below, with further detail provided in the following sub-sections:

- A counterfactual impact evaluation, drawing on available works data to make a statistical comparison of outcomes for a matched sample of works completed under both permitting and noticing regimes.
- Review and analysis of the available works data from the EToN (Electronic Transfer of Notifications) data archive as well as reports produced by permit authorities which aim to provide an assessment of the performance of the scheme in question.
- An indicative cost benefit analysis which considers the balance between the resource costs to LHAs and promoters which are associated with the scheme and the benefits to society.
- Online surveys targeted at LHAs (covering those with a permit scheme and those without) and promoters which aimed to capture high-level information on the operation of permit schemes, as well as experiences and perceptions of their effects.
- Qualitative research which took the form of in-depth interviews and case study visits involving a sample of LHAs and promoter organisations to explore in more detail how schemes work and how this compares to noticing, as well as capturing the effects of schemes in practice.

- A review of literature concerning the impacts of approaches to works management⁹.

Table 2.2 sets out how each element of the methodology contributes to the testing of the different hypotheses set out in Section 2.2.

Table 2.2 Testing our hypotheses

	Counterfactual impact evaluation	Works data analysis	Cost benefit analysis	Survey	Qualitative research
1. Permit schemes provide a way to reduce the disruption caused by works	X	X		X	X
2. Permit schemes provide increased levels of control over all works		X		X	X
3. Permit schemes provide a lever which can influence the way that works are undertaken	X	X		X	X
4. Permit schemes balance income and costs		X		X	X
5. Permit schemes generate a positive return for society			X		
6. The design and operation of permit schemes is effective					X

2.3.1 Counterfactual impact evaluation

Counterfactual impact evaluations are used to estimate the causal effects of a specific programme, policy or intervention on an observed outcome of the population. In this instance, the approach aims to answer two questions:

- ‘Do we see positive outcomes for works after the introduction of a permit scheme?’, and,
- ‘Is the introduction of the permit scheme responsible for these outcomes?’

⁹ However, this review provided only limited useful evidence.

Most outcomes can be affected by many factors other than the programme itself. Impact evaluation aims to exclude those alternative explanations to attribute changes in the outcome to the programme by comparing outcomes between the treated (permit works) against a statistically similar control group (notice works). The better the design is at excluding alternative explanations, the more robust are its results.

In this case, the objective is to a) describe the characteristics of notice and permit scheme authorities, highlighting any significant differences, and b) estimate the impact of implementing a permit scheme on a set of relevant outcomes. The specific research questions for this analysis were:

- Is there any difference between permit and non-permit schemes with regards to:
 - Population size
 - Network structure and length
 - Volume and type of works conducted
- What is the impact of the permit scheme on¹⁰:
 - Work durations
 - Working days
 - Overrun work
 - Weekend working

A propensity score matching approach was chosen for this evaluation given the large database available and the need to maximise the robustness of quantitative evidence on the effects of permit schemes. This design, explained further below, meets Level 3 on the Maryland Scientific Methods Scale, a scale used in evaluation to assess how robustly an approach can ‘rule out’ alternative explanations for the observed impacts.¹¹ Given the nature of permit schemes, the purpose of the evaluation and the available data, this is the highest point on the scale that was realistically achievable but should still be viewed as a strong research design.

To correct for differences in the composition of works in permit and notice groups, works within permitting authorities were statistically ‘matched’ to works within noticing authorities. Such methods provide an opportunity to mimic an experimental setting by establishing a comparator group that contains works that are similar to those in the treatment group. Therefore by creating two groups which are as similar as possible, except for whether they are a ‘permit’ or ‘notice’ works, the two groups can be compared in terms of outcomes such as works durations. Because they have been matched on the basis of certain criteria, these criteria can be ruled out as ‘reasons’ for differences in works

¹⁰ It was not possible to incorporate other potential variables of interest (such as collaborative works and safety considerations) into this analysis as suitable data either did not exist or had been inconsistently recorded so we could not be confident in any impact assessments generated.

¹¹ <http://www.whatworksgrowth.org/resources/the-scientific-maryland-scale>

durations, meaning that the 'reason' for the difference can more confidently be inferred to be permitting itself. Matching is undertaken on relevant observable variables, such as the type of work being undertaken and road network characteristics within a LHA. If matching is successful in establishing 'balance' on the observable variables between the treatment and comparator group, estimates of the causal impacts of permit schemes on works outcomes can be made.

To account for differences that occur over time, baseline data prior to the introduction of permit schemes was assessed. Aggregate statistics were generated for each LHA and comparisons made between LHAs that went on to use permits and those that did not. This revealed that, at the baseline, there were very few statistically significant differences in terms of key LHA characteristics, network composition and works level outcomes (such as durations). Aggregate baseline statistics were considered as matching variables in the models to account for differences that occur over time. However, these do not feature in the final models as these are correlated with/subsumed under other LHA level matching variables.

The counterfactual impact evaluation presents average treatment effect on the 'treated' works, i.e. the average change experienced on the relevant outcome indicators under permit schemes. The model provides information on the size and significance of this effect. By combining works level variables with LHA characteristics this methodology has the additional benefit of controlling for constant, unobservable characteristics of permitting and noticing works (i.e. it allows us to rule out further alternative explanations for any observed impacts and infer stronger causal links between permitting and works durations).

Data

Works data was obtained from Elgin (see Section 2.3.2). The analysis has used data from 2016 (the latest year of complete data) and, for LHAs with permit schemes, the year immediately before the introduction of the permit scheme was used as the baseline year¹².

The data was cleaned to exclude outlier works (in terms of their duration) and LHAs where the data recorded in Elgin, predominantly at baseline stage, appeared inconsistent and was deemed unreliable. Data from 72 LHAs was determined to be suitable for use in the analysis. Further details of the data cleaning process can be found in Annex 7.

Descriptive statistics on permit and notice LHAs

Analysis of works data for the 72 LHAs which form part of the counterfactual impact evaluation, found limited significant differences between those LHAs that apply a permit

¹² Analysis of works in a baseline year was necessary to explore potential differences between notice and permit LHAs before the introduction of a scheme.

and those that apply a notice scheme in terms of their traffic levels and composition of works (see Annex 7). This is a positive finding in terms of the use of a matching approach as it suggests that there are limited differences between the two groups. These findings refer to a comparison of contextual information, prior to matching, and should not be interpreted as relating to the impacts of permit schemes (impact findings are set out in Section 3).

Matching process

A variety of matching methods were applied to the data and the most appropriate was selected based on the expected robustness of estimates and the levels of balance achieved on the matching variables. Further details of the matching methods implemented are provided in Annex 7.

Normal practice is to seek to identify matching variables through regression analysis which are both significant predictors of being in the treatment group (in this case being subject to a permit scheme) and being a significant predictor of the outcome (in this case measured as works duration). In this case, the regression analyses revealed that no variables were significant predictors of both treatment and outcome. This was somewhat expected as qualitative research with LHAs suggested that permit schemes are typically introduced based on the strategic approach and preference of the LHA towards works management rather than quantitative analysis of the road network and composition of works within an LHA.

To deal with this context, the following matching variables for the analysis were selected on a combination of empirical and theoretical grounds:

- Works level:
 - Strategic significance of street
 - Traffic management in place for the work
- LHA level:
 - Type of LHA (unitary or county)
 - Traffic density (within a LHA)

The works category and the type of promoter undertaking the work were both significant predictors of outcomes. Following a number of tests, the decision was taken not to include these predictors as matching variables. This was due to the substantial variability on the key outcome of durations for these variables. For example, the difference in durations for minor works (many lasting one day) and major works (some lasting up to 200 days). Including these factors as matching variables ran the risk of this variability being diluted, and thus not adequately accounted for amongst other matching variables, and/or other matching variables (see above) being less significant in the computation of propensity scores. To account for the category of work and type of promoter, analysis was

undertaken and presented separately for the following sub-categories¹³. This ensures the robustness of the impact estimates and allows for greater insight compared to an overall estimate of impacts.

- Immediate works carried out by statutory undertakers (i.e. utilities)
- Minor works carried out by LHAs
- Minor works carried out by statutory undertaker
- Standard works carried out by LHAs
- Standard works carried out by statutory undertakers
- Major works carried out by LHAs
- Major works carried out by statutory undertakers

However, it was not possible to calculate impacts for immediate works carried out by LHAs. This was due to a significant increase (relative to notice LHAs) in these types of works following the introduction of permit schemes¹⁴. These additional works were typically short in duration (1.6 days on average) compared to other immediate works and did not share the same characteristics, in terms of the matching variables, to those in the comparison group. A range of matching algorithms were implemented but none were able to converge and/or achieve sufficient balance to estimate impacts with confidence. This reinforces the decision to estimate the impacts by subcategory. If we just relied on an overall impact estimate, this important detail would have been missed and immediate works by LHAs included in the calculations.

The matching variables and sub-categorisations selected are logical and supported by statistical analysis. Further information on selection of variables is available in Annex 7.

Impact estimates

Notice and permit works were matched for each works category and the impact of the permit scheme calculated – this is referred to as the average treatment effect (ATE).

¹³ We also investigated the possibility of undertaking analysis of impacts by coverage of scheme (all roads or a selection) and start date. However, this was not possible due to the distribution of the available data (i.e. that the majority of schemes now cover all roads and that scheme start dates are not evenly distributed over time, with a fairly limited number up to 2014 followed by a cluster in 2015 linked to the change in the approvals process – see Annex 1).

¹⁴ Strongly suggesting that under-recording of such works occurred prior to the introduction of a permit scheme.

The following outcome variables were compared across the treatment and comparison groups:

- Duration of works
- Number of working days
- Works overrun
- Number of days works overrun
- Work included weekend working
- Number of weekends worked

Out of hours working was also investigated as an outcome of interest. However, due to the very low proportion of works flagged in the appropriate works data field as including out of hours working, and the potential inconsistency in the use of this field, the impact could not be calculated.

The impact study used all available data that was of sufficient quality to perform robust analyses. It draws on raw data for 554,627 works that were started and completed in 2016 across 72 LHAs; minor works accounted for more than half (55%) of all works¹⁵. Several matching methods were explored and the most suitable one was selected based on the reliability of the ATEs generated. In order to have confidence in the ATE estimates, there must be a good level of balance on the matching variables between our treatment and comparison groups following the matching process. Reasonable balance was achieved on most matching variables. Further information is provided in Annex 7.

2.3.2 Works data analysis

The evaluation has involved review and analysis of the available EToN (Electronic Transfer of Notifications) data archive which has been obtained from Elgin¹⁶.

This archive dataset contains details of works undertaken in the UK since 2010¹⁷ making it the most comprehensive source of evidence for this element of the evaluation. LHAs started submitting their works data to Elgin at different points in time, although the number of authorities doing so has been increasing over time. In 2016, data was submitted by 145 LHAs in England. Data is submitted according to a specified structure which facilitates aggregation and comparison, although analysis has shown that there is some inconsistency in application of certain fields (such as the field denoting out of hours working) as well as variation in the amount of information provided by some LHAs (for example, condition text data is only collected by Elgin for a small proportion of permit authorities) which has limited the analysis in some respects. In addition, the process of

¹⁵ These figures relate to the raw data, during the matching process samples are reweighted to achieve balance.

¹⁶ <https://www.elgin.org.uk/>

¹⁷ Some LHAs reported street works to Elgin as early as 2000 but the total numbers were small up until 2010.

cleaning the data revealed some errors in data entry (such as works start and stop dates which implied a negative duration); although the number of such errors was relatively small, these led to some adjustments being made. Further information on this dataset and the analysis which has been undertaken is presented in Annex 5.

In addition, scheme-level evaluation reports published by LHAs have been collected and reviewed. This review served two purposes, firstly to identify and extract data to support the works data analysis and secondly to assess how far published reports meet the requirements set out relevant regulations and statutory guidance. The results of this second exercise are set out in Annex 6.

2.3.3 Cost benefit analysis

To establish the impact that permit schemes have had on works management, and whether they have delivered value to those authorities which have adopted them requires an analysis of the benefits of the scheme, set against the costs of scheme operation.

The methodology adopted for the cost benefit analysis follows DfT guidance on transport scheme appraisal as set out in WebTAG, and is consistent with the guidance presented in the DfT advice notes for permit schemes.

The steps involved in the analysis can be summarised as follows:

- Identify the volume and type of works occurring nationally, both within the permit authorities and the notice authorities.
- Quantify the societal impacts of these works.
- Estimate the reduction in works resulting from permit schemes and quantify the benefits of this reduction.
- Define the costs to LHAs of operation of permit schemes, and the costs borne by works promoters.
- Undertake cost benefit analysis of permit schemes at a national level.

Discussion has taken place with DfT analysts about the approach and the assumptions which have been used. Efforts have been made to use the best available evidence. However, the analysis is subject to a range of caveats and these are clearly stated alongside the results. Further details of the approach and assumptions are set out in Annex 8.

2.3.4 Survey of LHAs and promoters

To understand the implementation and perceptions of permit schemes, primary evidence was collected via online surveys of LHAs and promoter organisations. It should be noted that the evidence gathered by the survey is largely based on individual perceptions and is therefore a less robust measure of quantitative impacts compared to other methods.

That said, we have sought to triangulate this, where possible, with other sources to strengthen any inferred impacts. Equally, perceptions of impacts are relevant given their potential relationship with decisions around whether and how to implement schemes (discussed further in Section 4.2)

Regarding the survey of LHAs, questionnaires were designed to capture the views of those involved in the day-to-day operation of permit schemes on the impact of the scheme on key outcome measures, as well as views on costs and benefits to different stakeholder groups. Additionally, questions for non-permitting LHAs were included to understand why they had not introduced a permit scheme and if they planned to do so in the future. The survey was sent to all LHAs in England and 68 responses were received, of which 48 operated a permit scheme and 20 did not (suggesting a slight over-representation of permit authorities compared to overall uptake figures – see Annex 3).

Table 2.3 LHAs responding to survey

	Number
County council	16
Unitary authority	15
London borough	15
Metropolitan district	12
District/borough council	4
Other (please state)	3
Total	65

Note: 3 LHAs did not respond to this question

The purpose of the survey of promoters was to understand their experience and level of interaction with permitting LHAs, their views on the impact of permits on key outcome measures and the financial implications for promoters. A sample of 40 promoters was invited to complete the survey (using details provided by the National Joint Utilities Group) and 29 responded. Table 2.4 provides a breakdown of the types of organisations that responded.

Table 2.4 Types of organisation responding to survey

	Number
Water	12
Gas	8
Electricity	5
Telecommunications	5
Other	2

Base = 29. Note: multiple response permitted

2.3.5 Qualitative research

At the outset, interviews were undertaken with DfT officials and industry representatives to support the scoping phase and also inform the rest of the research. These interviews provided valuable background information and also highlighted issues which should be explored during the data gathering phase.

Further qualitative research was then undertaken to provide more detailed evidence on the decision-making process and the steps in implementing a permit scheme, as follows:

- Interviews with five permit authorities – to discuss the design and operation of permit schemes with the sample of authorities chosen to provide examples of different scheme characteristics.
- Interviews with five works promoters – to find out about promoter views of permit schemes and the impact the introduction of schemes has on their organisation, with a sample of promoters chosen to reflect different sectors of activity.
- Interviews with four non-permit authorities – to explore their current approach to works management and reasons for not introducing a permit scheme, as well as future plans.
- Case studies focused on the process of implementation - which involved visits to three LHAs which had implemented permit schemes at different points in time, and which represented different types of authority, to explore their experiences and views on performance.
- Case studies focused on the experience of promoters – to explore the processes introduced by promoters to comply with permit schemes and the resulting impact of these in the business.

It should be noted that the evidence gathered during the qualitative research is largely based on individual perceptions but we have sought to triangulate this, where possible, with other sources.

3.0 The Impacts and Costs of Permit Schemes

This section presents evidence on the extent to which permit schemes have impacted on the way in which works are undertaken, as well as the associated costs.

3.1 Summary

- The counterfactual impact evaluation analysis shows that works completed under a permit scheme were, on average, completed in a shorter time than works completed under noticing for most works categories. The greatest effect related to major works completed by statutory undertakers where an average reduction of 3.19 days was revealed. This finding is supported by the views of LHAs expressed through the survey and interviews undertaken as part of the evaluation, although it was acknowledged by interviewees that at LHA level it is difficult to robustly demonstrate the effect on durations in quantitative terms.
- Analysis of works data shows an increase in the volume of works notified to LHAs following the introduction of a permit scheme. Counterfactual impact evaluation analysis shows that works were less likely to over-run when completed under a permit regime, except for standard and major LHA works. These findings show that permit schemes provide LHAs with more control over their network. This is supported by the views of LHA interviewees who noted that permit schemes provide a way to increase staffing which enables them to review all applications and challenge where necessary. However, data suggests that the use of directions and application of conditions varies and that more could be done to ensure that these available levers are used consistently and to their full effect.
- There is limited data available to quantitatively assess the extent to which permit schemes change the behaviour of promoters in terms of how works are undertaken and mixed views emerged from interviews. While some LHAs interviewed were able to provide specific examples of where they felt the presence of a permit scheme had led to changes in how work was undertaken, others expressed a view that the financial levers available are too limited to change behaviour to the degree that they would like. Promoters interviewed listed a range of other factors as being more influential in determining how works are undertaken.
- The primary effect on promoters (statutory undertakers) is an increase in costs which includes permit fees, the cost of complying with conditions (working differently) and the additional time taken up by administration (compared to noticing).
- Indicative cost benefit analysis shows that permit schemes generate a positive return to society, although more effective application of the levers provided could be expected to increase the benefits generated.

3.2 The impact of permit schemes

3.2.1 Effects on the disruption caused by works

A key objective of permit schemes is to reduce the disruption to road users caused by works. It has not been possible to measure changes in disruption directly but data is available on variables such as works duration which would be expected to provide some indication of the disruption caused.

Table 3.1 presents findings from the counterfactual impact evaluation concerning the impacts of permit schemes on work durations (measured in days¹⁸), broken down by works category¹⁹ and whether work is completed by statutory undertakers (abbreviated to SU) or the LHA. It provides the average values for the matched notice works, followed by the average for the matched permit works and then the difference between the two.

Table 3.1 Works durations (days), permit scheme and matched notice LHAs, 2016

		Notice LHAs	Treatment effect of permits		Significant difference
		Average (days)	Average (days)	Difference (days)	
Average duration of works (days)	Immediate works – LHA*	-	-	-	-
	Immediate works – SU	4.56	4.70	+0.14	Yes***
	Minor works - LHA	2.08	1.89	-0.19	Yes***
	Minor works – SU	2.25	2.43	+0.18	Yes***
	Standard works - LHA	8.35	7.71	-0.64	Yes***
	Standard works – SU	7.68	7.56	-0.12	Yes**
	Major works - LHA	15.9	14.87	-1.03	Yes**
	Major works – SU	22.94	19.75	-3.19	Yes***

Note: Significance tests from impact model, *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

The analysis shows that most types of works subject to permit schemes were, on average, completed in a shorter time than works subject to noticing. The greatest average reduction in works duration relates to major works undertaken by statutory undertakers (3.19 days fewer on average) followed by standard works by LHAs (0.64 days fewer). By their nature, these works have longer timeframes and so perhaps provide more potential for durations to be reduced. Major works in particular are often the subject of extensive

¹⁸ More detailed measurement of duration (i.e. in hours) was not possible with the available data.

¹⁹ The balance was poor on overall impact estimates so these are not reported.

planning, including discussions between the promoter and LHA, and permit schemes provide a mechanism through which the LHA can challenge the proposals being made and request that work is completed more quickly.

The increases in duration for immediate (0.14 days) and minor works (0.18 days) completed by statutory undertakers are perhaps explained by their being less room for improvement, i.e. these works, by their nature, have shorter durations and the need to comply with various standards to ensure safety and quality restricts the scope for this work to be completed more quickly. It is also possible that the conditions attached to permits add to the duration of works (when measured in days), i.e. by restricting the number of hours in any given day that the work can take place²⁰.

Analysis of immediate works by LHAs was not possible due to the seeming surge in the number of these works (relative to what was recorded before) following the introduction of permits. This in itself is an interesting finding which strongly suggests that these works are not recorded consistently when an LHA is operating a notice scheme.

²⁰ There may be cases where duration (in days) increases but overall occupation (in hours) does not; however, it has not been possible to quantify this with the available works data.

With the exception of standard and major works undertaken by LHAs (findings for the latter were not statistically significant), all types of works were less likely to over-run when undertaken under a permit scheme (Table 3.2). This could be explained by permit works being planned with greater accuracy in timings and/or disincentives to overrun being built into permit schemes (i.e. fines). The characteristics of schemes could also explain why some LHA works are more likely to over-run, as permitting could be seen as a less effective instrument in these cases (as LHA works are typically not subject to permit fees and fines). The average number of days of works overrun was reduced for all works categories following the introduction of permits.

Table 3.2 Works overruns, permit scheme and matched notice LHAs, 2016

		Notice LHAs	Treatment effect of permits		Significant difference
		Average	Average	Difference	
Works overrun (%)	Immediate works – LHA*	-	-	-	-
	Immediate works – SU	4.56%	3.24%	-1.32%	Yes***
	Minor works - LHA	4.09%	1.87%	-2.22%	Yes***
	Minor works – SU	1.96%	1.71%	-0.25%	Yes***
	Standard works – LHA	8.42%	11.90%	+3.48%	Yes***
	Standard works – SU	10.56%	7.92%	-2.64%	Yes***
	Major works - LHA	9.51%	9.64%	+0.13%	No
	Major works – SU	17.26%	13.08%	-4.18%	Yes***
Average number of days overrun ²¹	Immediate works – LHA*		-	-	-
	Immediate works – SU	2.23	2.06	-0.17	Yes*
	Minor works - LHA	1.88	1.44	-0.44	Yes***
	Minor works – SU	1.77	1.38	-0.39	Yes***
	Standard works – LHA	4.03	3.55	-0.48	No
	Standard works – SU	3.55	3.00	-0.55	Yes***
	Major works - LHA	7.11	4.50	-2.61	Yes***
	Major works – SU	10.96	9.92	-1.04	Yes*

Note: Significance tests from impact model, *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Another source of information on the effect on works durations is LHAs' own evaluation reports. A review of these reports (see Annex 6) revealed that there is substantial

²¹ Only includes works that overrun (23,863). Number of calendar days.

variance in how the published reports attempt to demonstrate the benefits of operating a permit scheme. Whilst all authorities state that the introduction of a permit scheme has had a positive impact on their network, much of the supporting information provided is anecdotal and not supported by data that shows a quantifiable benefit has resulted from the scheme. Where the stated benefits are supported by data, there are many other unexplored factors that may, or may not, have influenced these metrics. For example, network occupation and average duration of works can be influenced by the volume and type of activities which promoters decide to undertake, regardless of whether or not a permit scheme is in operation.

However, some LHAs have provided more detailed analysis which provides indications of permit schemes having a positive impact in those areas (see box below).

Evidence on the impact of permit schemes on durations

'This study [as part of the evaluation] sought to evaluate the effects of the Permit scheme intervention on the average duration of highway excavation activity per month. An ARIMA time series analysis model positively demonstrated that the Permit scheme reduced the average duration of excavations by 1/3rd of a day per job; in [LHA] this is equivalent to around 886 days, equivalent to £769,048/\$1,179,777 per annum.'

'The overall reduction in average duration following the introduction of the Permit Scheme is maintained at 2.5 days; reducing from 3.3 days under Noticing. This is a 25% reduction in average works duration. The reduction constitutes 21,500 fewer days worked compared with the situation under Noticing, an overall 33% reduction in working days.'

'Whilst the data indicates an increase in the number of works with temporary signals, the average duration of works with temporary signals has reduced year on year since the start of the scheme and is now is at a level below the scheme. This meets the scheme objective of reducing the inconvenience and disruption caused by activities.'

The survey conducted as part of this evaluation showed that the majority of responding permit authorities agreed that their permit scheme had led to a reduction in the duration of works (83% agreed or strongly agreed with this statement). In interviews, officers from a sample of permit authorities also expressed a view that the permit scheme in their area had led to reduced work durations/reduced occupation of the highway, and there was general agreement that permit schemes were more effective than the previous noticing regime. However, it was acknowledged that it was difficult to objectively evidence this point due to limitations in the available data which reflects the above finding that individual scheme evaluation reports tend to assert the benefits of the scheme but were not generally able to provide quantified evidence to back this up.

The findings from the above sources contrasted with the views of promoters. Only a minority of promoters responding to the survey agreed that permit schemes had led to reduced works durations, with the majority (19 out of 27) disagreeing with this statement. In interviews, promoters confirmed this view and noted the importance of other factors in driving more efficient completion of works (such as internal strategies and targets). Promoters also highlighted the difficulties of evidencing this point given the multitude of factors which influence works schedules and planning.

In summary, the results of the counterfactual impact evaluation suggest that, on average, permit schemes reduce the duration of works, which supports the hypothesis that permit schemes provide a way to reduce the disruption caused by works. LHAs themselves also believe that schemes have impacted positively on disruption but generally they have been unable to quantify this impact due to methodological and data challenges.

3.2.2 Effects on control and coordination of works

Permit schemes are intended to give LHAs more control over their network and an increased ability to coordinate works.

Analysis of works data shows an increase in the volume of works notified when a LHA becomes a permit authority²². Interviews with permit authorities confirm that this is partly a consequence of the requirement that the LHA's own works are subject to the same system as works undertaken by statutory undertakers (in contrast to noticing which typically applied only to the latter group). The data also shows an increase in immediate and minor works undertaken by statutory undertakers which suggests that permitting leads to a more comprehensive record of works undertaken, providing the LHA with increased visibility which would be expected to leave them better able to fulfil their network management duty.

However, the available data also shows limited use of the levers provided by permit schemes (such as reducing the planned duration of works, moving the works to a more suitable date or requesting changes to the traffic management). For example, EToN data shows limited use of directions (and resulting quantifiable outcomes) which would be expected to be used more frequently under permit schemes to control or support coordination of works²³, although it is recognised that these may be missed or not

²² Detailed analysis was undertaken for a sample of 15 LHAs that offered data on works notified for a period of two years before and two years after a permit scheme was introduced. With a few exceptions, the volume of works notified to the councils increased for all works promoters, within all works categories. The most significant increase was made by the highways works promoters, which demonstrates the implications of parity treatment of different promoter types under a permit scheme (see Annex 5).

²³ The volume of directional notifications identified in the works data was low, indicating that the powers available to LHAs under NRSWA were not used, or are being undertaken outside of the EToN system. Results of further analysis show that changes are occurring between the initial application and the different works stages in both permit and

captured by the system. Further analysis shows changes are occurring between the initial application and works stages which result in changes in duration and changes in start date. Such changes are more frequent under a permit regime, although the majority of changes are not linked to an LHA intervention or permit response and the number of occurrences is low which means that it is not possible to draw conclusions on this point (see Annex 5).

The option for the LHA to apply conditions/constraints on the way in which works are undertaken by a works promoter is one of the key powers (or levers) within a permit scheme. The LHA can apply conditions that the works promoter must follow during and sometimes before the works take place. Application of conditions provides a way for permit authorities to exert more control over how works are undertaken (see Annex 1 for more details of the conditions that can be applied). The available data²⁴ suggests that use of conditions is limited but has been increasing since 2014 and 95% of conditions applied over the period of analysis appear to be well-defined (supported by parameters in the condition text²⁵).

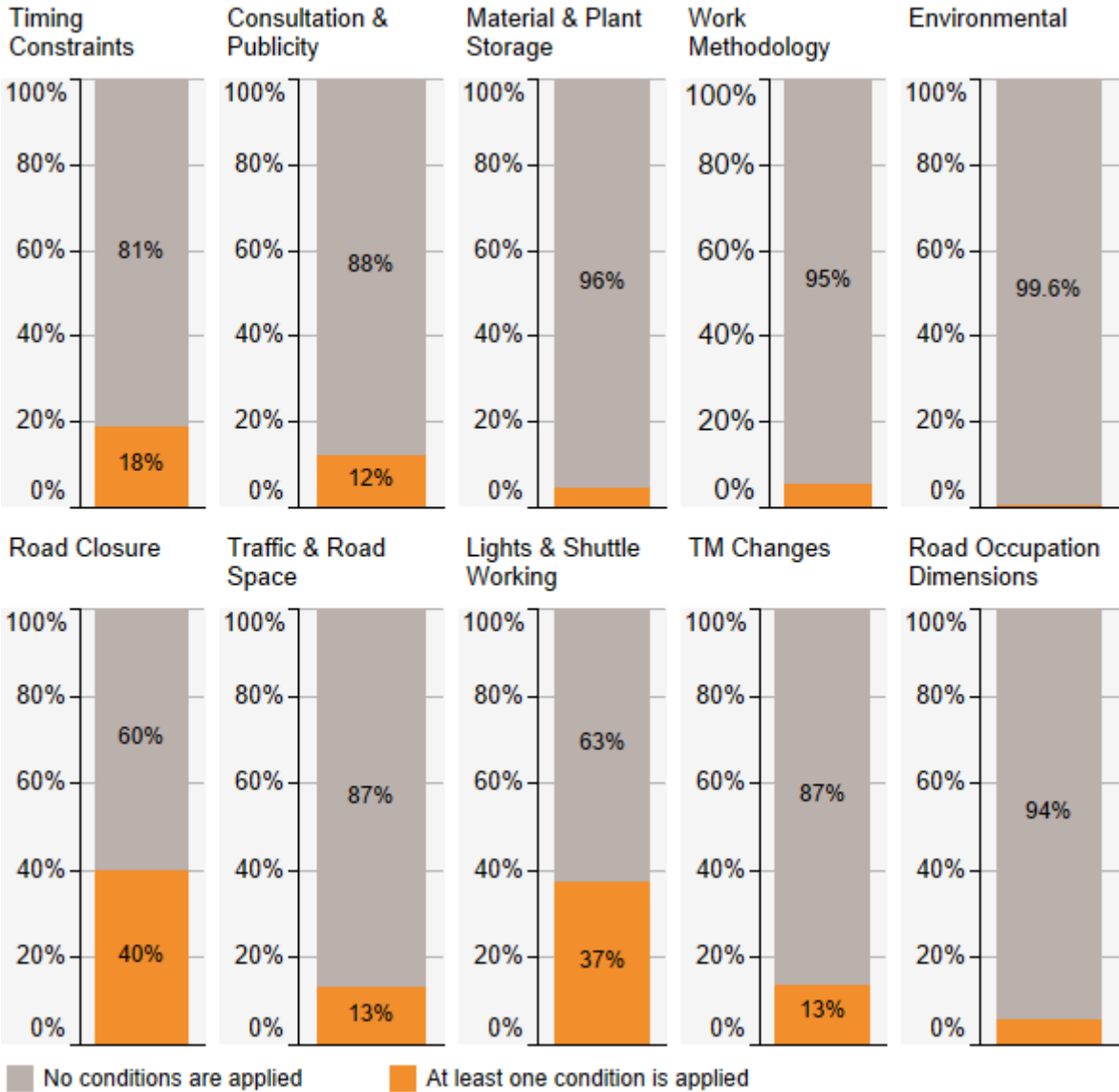
notice authorities but the volume of these occurrences is also low and most are not attributed to intervention from the LHA (see Annex 5).

²⁴ Analysis of conditions could only be undertaken for a sample of 24 LHAs as information on the conditions applied (condition text) is not available for all authorities (see Annex 5).

²⁵ Except for conditions that are 'standard' and applied to all (relevant) permits, it is assumed that a condition must contain relevant parameters so that it can be applied, carried out and where necessary checked for compliance. Without these parameters, it could be assumed that the condition was undefined and therefore not fit for purpose.

Figure 3.1 shows the extent of conditions applied to work undertaken in 2016, by condition type.

Figure 3.1 Conditions applied to works undertaken in 2016, by condition type²⁶



Source: own analysis of EToN data.

More detailed analysis of the use of conditions has been undertaken for the period 2014-2016 (see Annex 5). Overall, the application of conditions varies considerably by type²⁷

²⁶ Further information on the conditions referenced can be found in Annex 1.
²⁷ It should be noted that NCT1a, NCT1b and NCT11a are conditions that are applied to all (relevant) permits. The statutory guidance for permits clearly states, “there is no reason to attach these conditions to a permit application as the appropriate condition will still apply if omitted”. Therefore, the low application of these conditions should not be viewed as an issue.

and is more common for works on strategically significant streets. In some cases, it is not possible to determine at a works level how many and which conditions could have been applied but the relatively low use of conditions identified by the analysis suggests that there is scope for use of this power to be increased.

Almost all (98%) of the permit authorities responding to the survey undertaken as part of this evaluation agreed that their permit scheme had led to improved coordination of works. In interviews, the primary effect identified by permit authorities is improved control of the road network. One LHA summed up by saying that having a permit scheme had given them the ability 'to say no'. Another LHA reported a fall in complaints about works from members of the public since the introduction of the permit scheme, which was seen as an illustration of the effects of having more control²⁸. A related point was an improved awareness of what was happening on the network (where works are taking place and when) which supported efforts to reduce disruption. Non-permit authorities also perceive that permit schemes would offer more control and this was recognised as a potential advantage of this approach. A key point for consultees was that having a permit scheme provides the authority with more resources which they can use to review works and challenge where necessary (see also Section 3.3).

However, a majority of statutory undertakers (14 out of 27) responding to the survey disagreed with the statement that permit schemes have led to improved coordination of works. Promoters interviewed acknowledged that permit schemes can bring increased control of the road network but expressed concerns that some LHA attempts to influence the duration of approach to the work are unreasonable and not sufficiently justified, with one feeling that some LHAs do this 'just because they can'. One promoter felt that some LHAs make judgements about duration without taking the specifics of the work into account; also that permit authorities challenge harder because they are able to do so not because they have a basis for this. To counter this, a number of the LHAs interviewed stated that they make efforts to understand the specific nature of different jobs before challenging, while one described an example where they had looked at the time taken for specific activities in a previous phase of a major project (including evidence collected by inspectors on site visits) and had used this information as the basis for challenges to permit applications for the current phase.

3.2.3 Impacts on ways of working

The application of challenge and conditions to works by LHAs that is enabled by permit schemes would be expected to impact on the behaviour of promoters in the sense that

²⁸ It should be noted that it was not possible to collect wider evidence on this point but the number of complaints related to works is a metric that is likely to be recorded at local level and could be monitored as a further indication of the impact of permit schemes.

they are required to adapt their ways of working. This may impact on the times at which work is undertaken as well as the approach or technique used.

With regards to the timing of works, the counterfactual impact evaluation found an increased proportion of immediate and minor statutory undertaker works completed under permit schemes involved weekend working (see Table 3.3)²⁹. Major works undertaken by the LHA also showed an increase but this was not statistically significant. For other works categories, there was a decrease in weekend working (for example, the proportion of standard works involving weekend working completed by statutory undertakers decreased by 2.92%). This may be explained by works having shorter durations on average (see Section 3.2.1), potentially reducing the need for working at weekends.

Table 3.3 Weekend working, permit scheme and matched notice LHAs, 2016

		Notice LHAs	Treatment effect of permits		Significant difference
		Average	Average	% change	
Works with weekend working (%)	Immediate works – LHA*	-	-	-	-
	Immediate works – SU	52.40%	53.97%	+1.57%	Yes***
	Minor works - LHA	19.00%	12.79%	-6.21%	Yes***
	Minor works – SU	21.00%	24.86%	+3.86%	Yes***
	Standard works - LHA	63.00%	59.79%	-3.21%	Yes***
	Standard works – SU	71.20%	68.28%	-2.92%	Yes***
	Major works - LHA	58.60%	59.24%	+0.64%	No
Major works – SU	77.80%	71.34%	-6.46%	Yes***	

Note: Significance tests from impact model, *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

This finding that permit schemes have led to an increase in weekend working for some works categories was supported by the findings of the LHA survey in which 40% of responding permit authorities agreed that there had been an increase in out of hours working. Furthermore, almost half (49%) felt that there had been an increase in the use of innovative approaches (i.e. use of newer techniques such as core and vac³⁰).

A majority of promoters responding to the survey also agreed that permit schemes had led to an increase in out of hours work but there was disagreement in response to the statement that permit schemes had led to an increased use of innovative approaches.

²⁹ It was not possible to analyse the effect of permit schemes on other forms of out of hours working (i.e. evenings) as this did not appear to have been consistently recorded in the available works data.

³⁰ Coring and vacuum extraction is a technique that allows buried equipment to be repaired faster than conventional excavation. See <https://www.gov.uk/government/publications/coring-and-vacuum-extraction-technique-tal-214>

Promoters who took part in interviews noted that health and safety is paramount when it comes to determining the approach to be taken while internal factors are also important (such as the drive to improve efficiency and also customer satisfaction).

Interviewees had mixed views on the extent to which permit schemes have driven new ways of working. A number of LHAs felt that promoters have been slow to adapt their ways of working to incorporate more innovative techniques which could potentially reduce durations and/or disruption yet some LHAs provided examples of changes to working practices (such as a reduction in the handover period between repairs and reinstatement) or the adoption of innovative techniques (such as core and vac) and felt that permits had helped to bring forward these changes.

However, promoters interviewed highlighted a range of internal influences and other pressures which were driving them to minimise occupation (such as meeting the commitments made to the regulator or improving the efficiency of operations), and felt that these factors presented a stronger influence on behaviour than the existence of permit schemes.

Fines³¹ and inspections

Analysis of the issue of fixed penalty notices (FPNs) and the findings of inspections could provide an indication of whether the application of constraints/conditions is effective in changing promoter behaviour (i.e. a high level of non-compliance would imply that these conditions are being ignored). The works data did not provide information to support this analysis and information from LHAs' own evaluations was also limited³².

Table 3.4 shows that, amongst those LHAs which had published such data, the most common FPN offence was working in breach of a permit condition. This data shows that a substantial number of FPNs are being issued but the information provided is insufficient to provide a more meaningful context to this (i.e. to show the proportion of works where an offence was found).

Table 3.4 Fixed penalty notices

FPN type	Number
Working without a permit	3,238
Working in breach of a permit condition	12,364

Source: own analysis of scheme evaluation data.

Published information on the number of permit compliance inspections was also limited. Table 3.5 shows that the majority of works inspected were compliant (84%), although

³¹ The introduction of the Permit Scheme Regulations provided a permit authority with two additional offences and sanctions: regulation 19 (undertaking works without a required permit) and regulation 20 (to breach a permit condition).

³² A review of local evaluation reports found that 34 had provided usable data on the issue of fixed penalty notices and 38 had provided information on inspections.

again this figure would be more meaningful if further detail had been provided (such as the reasons for failure and delineation by the type of works and promoter).

Table 3.5 Number and results of inspections

	Number or percentage
Number of inspections	72,992
No. of inspections passed	61,492
Percentage of inspections passed	84%
Number of inspections failed	11,500
Percentage of inspections failed	16%

Source: own analysis of scheme evaluation data.

Given the limited data on this topic it is not possible to draw any meaningful conclusions about rates of compliance, although the fact that offences are being committed and the number of failed inspections reported suggest that permit schemes could be more effective when it comes to bringing about the desired behaviours.

Collaborative working

A limited number of permit authorities publish data on collaborative working³³ as a percentage of all works; this percentage ranges from 0.2% to 9.95%. Table 3.6 provides the available data on instances of collaborative working and days of network occupation saved.

Table 3.6 Collaborative working

	Number
Total number of collaborative works sites	1,876
Network occupation days saved	6,728
Average network occupation days saved per work site	3.59

Source: own analysis of scheme evaluation data.

Many authorities interviewed stated that more work can and should be done to improve the instances of collaborative working but cite resistance from works promoters as a reason for the lack of improvement. In addition, difficulties in capturing data from ETon systems, or challenges due to local processes, have also been mentioned.

The promoters interviewed agreed that LHAs could do more to coordinate work. For example, in some cases, promoters felt that LHAs had refused permits due to clashes when instead the situation could have provided an opportunity for collaboration. One promoter suggested that some LHAs could help to facilitate collaboration by proactively putting the relevant companies in touch with one another. One promoter perceived that LHAs were only interested in coordinating the largest works while another felt there was

³³ This is where an activity involves more than one promoter collaborating in a single coordinated set of works.

a lot of potential that LHAs could support promoters to explore in order to make work more efficient.

The extent to which LHAs are able to encourage collaboration between promoters was acknowledged by some interviewees as an area with potential for improvement. One LHA officer interviewed noted that they had made efforts to highlight opportunities for collaboration but found that these were seldom taken up due to practical issues and also a perceived preference from the utilities for working alone (to avoid any issues which may be caused by sharing a site and the need to agree and allocate responsibilities). Another felt that issues with timing often prevented collaboration (for example, even if promoters had plans to do works in the same location it may not be possible to align their timescales given lead-in times or resource availability).

Summary

Overall, there is limited evidence with which to quantitatively assess the extent of change in behaviour amongst promoters which has been generated by permit schemes. The data that is available, along with the qualitative evidence obtained from interviews with both LHAs and promoters suggests that currently permit schemes are limited in the degree to which they can drive change in the approaches/techniques used to undertake works, likely because the incentives provided by permit schemes to encourage these behaviours are not able to outweigh the costs to promoters of applying them.

3.3 The costs of permit schemes

The permit scheme regulations allow LHAs to apply permit fees to recover the additional costs associated with operating such a scheme (compared to noticing) in relation to statutory undertakers. Such fees represent a cost to these promoters, as does the required administration and any adaptation in the way that work is undertaken.

Of the 60 authorities that had published their own evaluation reports within our review period, 13 (22%) published specific information relating to permit fee income and operating costs, while a number of others published statements that the scheme was operated on a cost-neutral basis but did not include evidence to support this (see example statements below).

“Having reviewed the fees, this authority is satisfied that there is no need to change the fee structure for the coming year, as this is continuing to show a cost neutral status”.

“The operation of the scheme has been cost neutral, as all costs have been covered by the permit fees income”.

The LHA survey undertaken as part of this evaluation provided another opportunity to request information on costs and income associated with permit schemes. It should be

noted that these are self-reported estimates and it has not been possible to validate this information so the figures should be treated with caution. A total of 18 LHAs responding to the survey provided annual estimates of operating costs. The average cost was £620,277. County councils experienced greater costs (with the highest annual cost recorded as £1.6m), likely reflecting the scale of these areas. The lowest reported cost was £160,000 and occurred in a metropolitan district.³⁴ Three of the 18 LHAs providing financial estimates in their survey response reported an income that exceeded their costs (based on the most recent annual figures). Whilst for two LHAs the reported surplus was very small (£1,000 and £2,000 respectively) one county council indicated that their scheme had generated a surplus of over £100,000. The greatest deficit was reported as £500,000³⁵. Four LHA schemes reportedly broke-even. There does not appear to be any strong trends between type of authority and the financial position of the permit scheme.

The income generated by permit fees represents an important benefit to LHAs. In interviews, LHAs talked about how they have used this to provide more resources to coordinate works, allowing them to do more than had been possible under noticing.

LHAs interviewed referenced the difficulties in forecasting the fee income which will be generated by permit schemes and also in balancing the costs and income each year. One LHA reported that their scheme had made a surplus in the first year, but this was thought to be due to it not being fully staffed for this period as they spent time building up the team. Another felt that the amount of works was decreasing year on year which would be expected to lead to a decrease in income from permit fees but this was being offset by an increase in variation fees and also fees paid for permits which are later cancelled. It was considered helpful to be able to review costs and income over a period of several years to accommodate any year-on-year fluctuations.

The ability to fund the additional activity related to applications from statutory undertakers through fee income was also identified as a positive effect by non-permit authorities who took part in interviews, as it was recognised that this would help to support increased coordination work.

It is also important to explore costs from the perspective of promoters (in particular statutory undertakers as promoters for highway works are generally not required to pay permit fees). The majority of promoters responding to the survey said that permit schemes had led to increased costs for their own organisation. Promoters responding to the survey reported a range of costs, including training and staff time (for administration tasks) as well as permit fees and the cost of adaptations/meeting conditions. In some cases, permit fees can be recovered from customers (for example in the case of some connections

³⁴ The low number of LHAs that were able to provide a response to this question means that caution is required in using this data.

³⁵ Outlier of £650,000 loss removed as income recorded as zero – potential reporting error.

work) but in most cases they are borne by the organisation undertaking the work. Again, this information is self-reported so should be treated with caution.

Approximate annual costs were provided by most promoter organisations responding to the survey³⁶. The cost of applying for permits was the greatest cost with organisations, on average, spending £288,000 on this. Four organisations were spending more than £1m (one reported £65m), although these were organisations which operate over larger geographic areas. Adaptation costs (costs associated with compliance) tended to be estimated at less than £500,000. Reported costs to promoter organisations are detailed in Table 3.7.

Table 3.7 Estimated costs resulting from permit schemes, per annum

	Median ³⁷	Less than £100k	£100k to £500k	£500k to £1m	More than £1m	Did not respond
Permit fees	£288,000	5	5	3	4	12
Adaptation	£50,000	8	3		2	16

Source: promoter survey.

Fines resulting from non-compliance were, on average, in the region of £49,000 per annum. Seven organisations reported annual fines totalling above £100,000. It should be noted, however, that fines can be avoided by complying with legal requirements.

Promoters interviewed expressed concern about the lack of transparency regarding the costs to LHAs of operating a permit scheme and how this compares to the income generated. Furthermore, a number of promoters felt that some LHAs try to maximise income from permit schemes in order to ease the financial pressures faced by public authorities. This suggests a need for greater transparency from LHAs in order to demonstrate compliance with the regulations and provide clear justification for the fees being charged.

In summary, a lack of detailed reporting from LHAs makes it difficult to assess how far existing schemes are able to balance fee income and operating costs, so it is not possible to draw a conclusion on this hypothesis. In addition to fees, promoters also incur costs related to administration and adaptation (complying with conditions/directions) which are additional to the costs of undertaking works under a noticing regime.

³⁶ It is not possible to say how representative these figures are so they should be treated as indicative only.

³⁷ Median selected over mean to account for outliers.

3.4 Cost benefit analysis

3.4.1 National assessment

As part of this evaluation, an indicative overall assessment has been made of the costs and benefits of the permit schemes currently in operation. This has been conducted in line with DfT guidance, drawing on estimates of the impact of roadworks in all permitting authorities, the scale of reduction in roadwork costs as a result of the permit schemes, and the costs of operation of the scheme to the LHA and works promoters.

Full details of the methodology adopted and the modelling undertaken are provided in Annex 8. The approach taken has involved the following steps, the findings of which are summarised below:

- Identify the volume and type of works occurring nationally and quantify the societal impacts of these roadworks in the form of monetised costs.
- Estimate the reduction in the impact of roadworks resulting from the permit scheme and quantify the benefits of this reduction.
- Define the costs of operation of the permit schemes.
- Undertake cost benefit analysis of permit schemes.

Quantifying the impact of works

A societal cost for each work recorded in the dataset has been estimated, based on modelling using Highways England's QUADRO³⁸ model. Impact costs vary by duration, road classification (affecting typical traffic flow) and type of traffic management. The impact cost consists of time delays and increased vehicle operating costs resulting from delay at roadworks, to both consumers and business. It also includes monetised costs relating to increased incidence of accidents and of carbon emissions, and also indirect tax revenue resulting from increased fuel consumption. These elements are all calculated within QUADRO.

³⁸ QUADRO (Queues and Delays at Road Works) is a model which estimates the effects of road works on travel time, vehicle operating costs and accident costs.

Having established an impact cost for each work, an estimate of the overall impact of works occurring nationally can be calculated. Table 3.8 summarises the societal cost of all works, with disaggregation shown by both permitted and non-permitted works.

Table 3.8 Works impact cost (2016)

	Noticing	Permit	Total
Works total (no.)	694,880	813,916	1,508,796
Total duration (days)	3,623,105	3,747,029	7,370,134
Impact cost (£)*	578,130,079	1,053,019,904	1,631,149,983

* 2010 market prices

The total societal cost of all works occurring in 2016 (street and highway works, permitting and non-permitting authorities) is estimated at £1.63 billion. This implies an average societal cost of a day of roadworks to be £221. A proportion of works do not, however, encroach on the carriageway. For works impacting on the carriageway the average daily cost is £261. The average cost of a day of permitted roadworks is higher at £323 (again this excludes works with no incursion into carriageway). This is likely to be reflective of different conditions within permitted authorities in terms of traffic volumes and types of works. Some authorities only permit works on traffic sensitive streets which will also have a bearing on average works impact values.

Estimating the impact of permit schemes

To estimate the impact of permit schemes requires an estimate of how the impact of works has changed under the permit scheme. The counterfactual impact evaluation compared durations of works completed under permit schemes with those under noticing and found that for most categories of works, average durations were lower under a permit scheme. Other things being equal, a reduction in duration should lead to a reduction in the impact of works, and in the absence of other usable data, this has been used as a basis for developing indicative estimates of the impacts of permit schemes.

Table 3.1 set out the reduction in duration (presented as the number of days) identified in the counterfactual impact evaluation for each category of works. Applying the estimated reduction (expressed as a percentage) attributable to permit schemes to the observed works durations under permit schemes, has resulted in an estimate of the likely duration of works in the absence of the scheme (i.e. the counterfactual). Using the estimated cost of each type of roadwork, an estimated overall cost of roadworks with and without the permit scheme has been established (Table 3.9).

Table 3.9 Estimation of the impact of permit schemes

	Duration			Impact		
	Permit	Change	Noticing	Impact /day (£)	Impact – permit (£)	Impact – noticing (£)
Highways						
Major	317,709	-6.50%	339,796	1,335.78	424,390,207	453,893,270
Standard	148,546	-7.7%	160,938	408.49	60,679,775	65,741,901
Minor	265,145	-8.9%	291,048	329.21	87,287,228	95,814,740
Immediate	382,664	0%	382,664	224.59	85,942,546	85,942,546
Statutory undertaker						
Major	361,796	-13.90%	420,204	403.13	145,851,570	169,397,875
Standard	348,626	-1.6%	354,295	165.30	57,626,678	58,563,697
Minor	569,274	8.1%	526,618	102.52	58,360,342	53,987,365
Immediate	858,719	3.0%	833,708	150.77	129,473,275	125,702,209
Highways	1,114,064	-5.1%	1,174,446	590.90	658,299,756	701,392,457
Statutory undertaker	2,138,415	0.2%	2,134,825	182.99	391,311,865	407,651,146
Total	3,252,479	-1.7%	3,309,271	322.71	1,049,611,621	1,109,043,603
Difference						59,431,982

At the national level, the difference between the estimated impact of permit schemes, and the impact if the schemes were not in place (the counterfactual) amounts to £59.4 million per annum (2010 prices). This represents a 5.4% reduction in estimated impact.

This finding sits broadly in line with the DfT guidance which recommends that a 5% reduction in roadwork impact is used for the appraisal of permit schemes.

However, it should be noted that works durations are only one dimension of impact. Better reporting of works and changes to working practices or the timing of works are also likely to be influential so the estimates presented should be seen as only a partial estimate of the benefits of permit schemes. Also, works categories where average durations were found to have increased are presently treated as having a negative impact yet it is

possible that these works could have features which bring benefits that offset the costs of increased duration.

Scheme costs

A cost benefit analysis should include the additional costs to the LHA of operating the scheme (staffing costs, overheads and any hardware or software requirements) as well as the cost to works promoters of operating under the scheme.

In the absence of comprehensive data on the costs incurred by each LHA, permit fee income has been used as the basis of an estimate of the costs of scheme operation to the LHA. This assumption is based on the existence of a regulatory requirement that permit fees should be set at a level which reflects the costs of operation (related to work on applications from statutory undertakers).

In 2016, permit fee income from statutory undertakers was estimated to be £35.8 million. Using permit fee values as a proxy for the costs associated with LHA and other works, the total 'permit fee value' of all works was estimated to be £64.4 million. This figure has been used as the proxy for permit scheme operating costs.

Establishing an estimate of the cost to works promoters of additional administration and changes in working practices associated with permit schemes has also been challenging. Based on a review of information provided by respondents to a survey undertaken as part of this study, supported by wider evidence derived from permit scheme evaluations³⁹, promoter administration costs have been estimated at 20% of the cost to the LHA, giving a value of £7.15 million⁴⁰ in works promoter administrative costs (excluding permit fee payments which, in terms of the conventions of cost benefit analysis, are treated as financial transfers rather than resource costs). Promoters may also incur costs as a result of any changes to working practices which are required in order to ensure compliance but it has not been possible to estimate these at a national level therefore the assessment only provides a partial estimate of promoter costs.

Further details on the estimation of costs is contained within Annex 8. The assumptions required to generate this estimate mean that the resulting figure should be treated with caution and the costs associated with permit scheme operation should be considered as an area worthy of further research.

³⁹ See Leicestershire Permit Evaluation, https://www.leicestershire.gov.uk/sites/default/files/field/pdf/2017/4/6/CBA_Report-CONSULTATION.doc

⁴⁰ This cost is only borne by statutory undertaker works promoters.

Cost benefit analysis

Bringing together the estimates of benefits⁴¹ and costs⁴², and projecting and discounting these over a 25 year period, results in the following modelled assessment of permit scheme performance at national level:

Net present benefits	£709,734,447
Net present costs	£528,936,941
Net present value	£180,797,506
Benefit to cost ratio	1.34

At the national level, based on the 5.4% assumed reduction in roadwork impact, permit schemes are shown to deliver a benefit which exceeds the scheme operating costs. The net present value is therefore positive, and the benefit to cost ratio greater than 1. However, as it falls between 1 and 1.5, the benefit to cost ratio would be classified as low value for money.

Sensitivity testing demonstrates that, based on the typical assumptions of impact reduction (a 5% reduction in impact as recommended by DfT guidance and a 10% reduction used in ex-ante evaluation of London Borough schemes and supported by a recent published scheme evaluation), the permit scheme delivers positive value (see Annex 8).

The approach makes the best use of the available data although it should be noted that the analysis above is not able to capture some of the wider anticipated impacts resulting from changing working practices, such as improved safety at works and greater co-ordination of works.

In practice, the value delivered by the permit schemes will depend greatly on how effectively the powers to manage and co-ordinate roadworks are used. Findings from the analysis of works data (see Section 3.4.3) suggest that there is scope for these powers to be used more effectively, which would offer the potential to deliver significant savings.

3.4.2 Cost benefit analysis undertaken by LHAs

The introduction of the amended regulations in 2015 require LHAs to consider '*the costs and benefits (whether or not financial) which the Permit Authority anticipates will result from that permit scheme*'. Guidance on how this may be approached is provided in the DfT Permit Scheme Advice Note: Implementing changes required by 1 October 2015. A review of the cost benefit analysis that has been carried out by LHAs identified varying

⁴¹ It should be noted that the estimated reduction in impact associated with permit schemes is assumed to remain constant over time.

⁴² The estimates presented are likely to exclude upfront costs such as consultant fees (see Section 4.3).

methods and results, although this work typically follows the approach set out in the guidance.

The main observations from the published cost-benefit analyses (also referred to as economic evaluations) of the different permit schemes are summarised below.

Estimating the cost of works

The approach adopted for the quantification of roadwork impact was typically one of two possible options:

- taking the commonly quoted 'day of roadworks' value of £600 taken from the Halcrow study, uplifting to account for inflation, and applying to total roadwork duration, or
- detailed modelling of several types of roadworks– usually using QUADRO.

Where the modelling approach has been used, the level of detail is seen to vary according to whether an attempt was made to disaggregate by urban and rural works, by type of road (i.e. A, B, U etc.) or by reinstatement category. Many do not disaggregate by number of lanes (for A roads), although this could have a material impact on the impact of works (e.g. lane closure on dual carriageway compared to on single carriageway).

Establishing scheme impact

Practically all appraisals adopt the default assumption suggested in the DfT guidance. This states that '*until the results of evaluation schemes are known it is a standard assumption that permit schemes will reduce street works by 5%*' (by which we presume street work impacts to be reduced by 5%, rather than number of works). The validity of this assumption is clearly pivotal to every cost benefit analysis using this assumption as a basis for justifying the permit scheme.

Estimating scheme costs

The usual costs included are additional personnel costs to the council, software and set-up consultancy. The real economic costs of the permit scheme should also extend to administration costs incurred by works promoters, and also any real costs resulting from changing working practices required under the scheme (for example adherence to conditions). The main observations from a review of the treatment of scheme costs are:

- LHA costs were typically calculated and included, and maintain consistency with the permit fee valuation exercise. These should therefore represent incremental costs over and above noticing requirements.
- Very few CBAs include the cost impact of the additional administration to works promoters. Better data on this would help to ensure that this real economic cost is adequately represented in the appraisal. None of the appraisals reviewed made estimates of the cost impact to works promoters resulting from the application of conditions (for example being required to work over nights or weekends rather than at

standard times). These costs will be real, and if justifiable figures for these costs could be established, these should clearly be included in the appraisal.

Treatment of permit fees

Permit fees represent a cost to works promoters and a source of income to the LHA (which can only be used to support attributable costs). When considered in economic terms, these represent a 'transfer payment' between the parties, effectively cancelling each other out, and hence have no net economic impact on overall scheme value. However, within appraisal, treatment of income streams can have a significant impact on the benefit to cost ratio (BCR). Specifically, whether these are treated as benefits (in the numerator) or netted from costs (in the denominator) will have a material impact on the BCR. Many appraisals (correctly) net income from scheme costs. This has the effect of reducing scheme costs which has the impact of increasing the BCRs.

Conclusions

All scheme evaluations concluded that the implementation of a permit scheme delivered positive outcomes. BCRs ranged from 2:1 to 53:1 showing good value for money, with the wide variation potentially a result of the previous point on how income is treated. The robustness of the assessments is heavily dependent on the appropriateness of the assumed 5% reduction in roadworks impact and whether costs to the works promoter were adequately addressed.

3.4.3 Demonstrating benefits from the use of conditions

To demonstrate the potential benefits from the use of conditions, modelling was undertaken using the works impact cost derived from cost modelling for the cost-benefit analysis. The works impact cost modelling considered three possible works periods:

1. Works undertaken over a 24-hour period.
2. Works undertaken at off-peak times (10:00 – 16:00).
3. Works undertaken out of working hours (19:00 – 07:00).

These costs were applied to works undertaken in 2016 and analysed in conjunction with the application of a condition for timing (NCT02a) within different traffic management groups and street categories (Table 3.10 and 3.11, overleaf). For example, Table 3.10 shows that for works undertaken on all streets under a road closure:

- The total cost impact for these works if the road closure is applied for 24 hours is £184.12 million.
- If all the road closures were applied for off peak hours only then the cost impact would reduce to £60.73 million.

- Where a condition to limit the occupation to off peak times (as an assumption) has been applied to works, the difference between the 24-hour cost impact (£43.35 million) and the off-peak cost impact (£14.34 million) is £29.02 million.
- This estimated reduced cost impact equates to a 15.8% reduction in the overall cost impact (£184.12 million).

Table 3.10 Results of works impact cost analysis for works undertaken in 2016 on all streets (£ millions)

Traffic management	Occupation	Total cost impact	Condition applied	Cost impact reduction from applied condition	Cost impact (%)
Some carriageway	24 hour	5.16m	0.93m	0.57m	11.1%
	Off peak	2.14m	0.36m		
Passive traffic control	24 hour	11.65m	1.82m	1.37m	11.7%
	Off peak	2.92m	0.46m		
Positive traffic control	24 hour	62.62m	15.41m	12.20m	19.5%
	Off peak	12.85m	3.22m		
Lane closure	24 hour	195.81m	47.34m	31.15m	15.9%
	Off peak	67.38m	16.18m		
Road closure	24 hour	184.12m	43.35m	29.02m	15.8%
	Off peak	60.73m	14.34m		
Total	24 hour	459.40m	108.86m	74.31m	16.2%
	Off peak	146.01m	34.55m		

Source: own analysis of EToN data.

Table 3.11 Results of works impact cost analysis for works undertaken in 2016 on traffic-sensitive streets only (£ millions)

Traffic management	Occupation	Total cost impact	Condition applied	Cost impact reduction from applied condition	Cost impact (%)
Some carriageway	24 hour	4.56m	0.86m	0.52m	11.5%
	Off peak	1.94m	0.34m		
Passive traffic control	24 hour	6.85m	1.34m	1.01m	14.8%
	Off peak	1.74m	0.33m		
Positive traffic control	24 hour	53.81m	13.85m	10.97m	20.4%
	Off peak	11.13m	2.89m		
Lane closure	24 hour	185.99m	45.66m	30.05m	16.2%
	Off peak	64.03m	15.62m		
Road closure	24 hour	105.21m	32.05m	21.42m	20.4%
	Off peak	34.87m	10.63m		
Total	24 hour	356.41m	93.77m	63.97m	17.9%
	Off peak	113.70m	29.80m		

Source: own analysis of EToN data.

If it is assumed that the use of the timing condition would either move a work to an off-peak period or out-of-hours, modelling suggests that for 2016:

- There was a potential cost impact reduction of £74million⁴³, which is an overall impact cost reduction of 16%.
- Works undertaken with lane closure account for the largest proportion of cost impact, due to the combination of both impact and overall durations.
- The potential cost impact reduction is greater for traffic sensitive streets, no doubt because of the overall higher cost impact on these streets (due to the higher traffic flow) and the greater potential to apply conditions.

This analysis provides an illustration of the potential benefits that could be achieved by the increased application of conditions, if the stated assumptions about the change in timing hold true. It is accepted that it is not practical or relevant to apply permit conditions to all works, however recognising the potential levels of benefits to be derived from the use of conditions could support their further development and systemic application.

In summary, although LHAs report feeling more in control of their network, analysis of works data suggests that increased use of the levers associated with permit schemes could lead to a substantial increase in the benefits (i.e. reductions in the cost of delays) generated.

⁴³ This relates to the estimated cost impact of works to road users. Application of conditions may also result in a compliance cost to works promoters which would offset this reduction in impact, although it has not been possible to estimate this.

4.0 Development and Operation of Permit Schemes

This section presents evidence on the process of developing and operating a permit scheme, and an assessment of the extent to which these arrangements have been effective.

4.1 Summary

- Evidence from the survey and interviews with LHAs suggests that the decision to explore introducing a permit scheme is prompted by a need to reduce disruption and improve control of the road network. Impact evidence (presented in Section 3.2) suggests that these outcomes are associated with permit schemes, although the lack of quantified evidence at scheme level means that such decisions have been based on the expected advantages of permits rather than data. The opportunity to work together with neighbouring authorities is also a factor which has prompted action to be taken to develop a scheme. Support from senior staff and council members is essential for scheme development to progress.
- Both LHAs and promoters interviewed felt that there would be a continued upward trend in the number of LHAs operating a permit scheme, and this is supported by LHA survey findings which revealed a number of authorities that are currently considering or are in the process of developing a scheme. However, the LHA survey highlighted that some authorities do not consider a permit scheme to be necessary for their area.
- All of the permit authorities interviewed reported that some degree of external support was required to develop their scheme, which represented a cost to the authority; these costs are incurred upfront and so not offset by income generation unlike the ongoing costs of operation. Related to this, the need for resources (staff time and funding) in the development phase was highlighted as a potential barrier to some authorities, particularly given current public sector budget constraints, and also a factor which can extend the time taken to develop a scheme. Use of an existing scheme design was thought to provide an opportunity to reduce the burden of scheme development to some extent.
- The introduction of permit schemes has helped to increase parity in the treatment of street and road works, which is also supported by the analysis of works data which typically shows an increase in the number of works being notified post introduction of a permit scheme (see Section 3.2). However, promoters interviewed expressed concerns that current efforts do not go far enough to create a fair system (a point which links to the discussion of transparency in Section 3.3).

- Due to budgetary constraints, noticing authorities typically lack the resources needed to review each notification in detail which is likely to limit the impact which can be obtained by this approach. Staff numbers typically increase significantly when a LHA changes from noticing to permits. Increases in staff to process statutory undertaker permits can be funded by permit fee income and this is seen by LHAs interviewed as a significant benefit of a permit scheme.
- The need to comply with the permit scheme regulations means that, in theory, there is limited variation in scheme design although the survey and interviews with LHAs reveal differing perspectives on this with some actively choosing to adopt an existing scheme design and/or align with neighbouring authorities and others wanting to create something specific (although the latter category applies largely to early adopters who did not have a great deal of other scheme designs to work with at that time). The key decisions to be made are whether a scheme should cover all roads or a selection and which incentives to provide. Data shows an increasing proportion of schemes being applied to all streets, although it was not possible to explore whether this led to a difference in impact compared to a more focused approach.
- A lack of consistency in approach across schemes is a key challenge for promoters (reported in both survey and interviews). Promoters typically engage with multiple schemes and reported differences in approach and interpretation of regulation and guidance between LHAs. The introduction of national conditions is seen as a positive but there are concerns that there is still scope for inconsistency in application. Compliance was the key challenge identified by LHAs (in survey and interviews), and this is recognised to have implications for the level of behavioural change that can be achieved, reflecting comments made in Section 3.2.

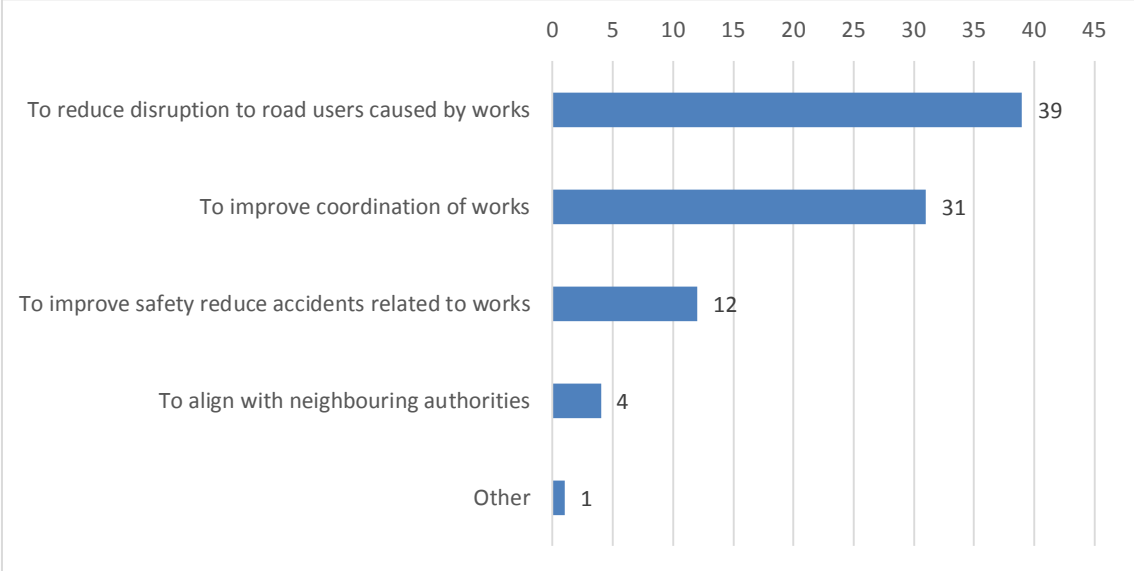
4.2 Reasons behind the uptake of permit schemes

According to the survey of LHAs, the main reason for introducing a permit scheme is to reduce the disruption caused by works (39) and/or improve the coordination of works (Figure 4.1); these factors were also mentioned by representatives of permit authorities who took part in interviews and case studies, and reflect two of the impact hypotheses being tested by this evaluation (see Table 2.2). Interviews suggest that at the time that the decision was made, it was believed (by operational staff and/or council members) that the introduction of a permit scheme would achieve these aims, although this was generally based on an understanding of how schemes operate (and their perceived effects) rather than quantified evidence of their impact in other areas.

A number of operational staff interviewed also mentioned that they felt that noticing did not give them enough control over the network (for example, because promoters ignored the directions provided) which reflects the policy rationale for permit schemes as being a way to give LHAs the tools they need to effectively manage their road network.

A quarter (12) of LHA survey respondents also mentioned safety as being a factor although this did not emerge as a key theme during interviews and no data related to safety impacts has been identified.

Figure 4.1 Main reasons permit scheme was introduced



Source: LHA survey. Base = 48 LHAs (of 48 respondents eligible to answer this question). Note: multiple response permitted

Interviews with a sample of LHAs highlighted the importance of support from senior management and/or councillors in order to get the go ahead for scheme development. In some cases, the views of councillors can be a driver for scheme development even where operational staff felt that a scheme was not needed or did not support the idea of a permit scheme at that stage. In some parts of the country, such as Greater Manchester and Yorkshire, interviews suggest that, an expectation or opportunity to work with neighbouring authorities also played a part in decision making.

Street and road works can be a visible source of congestion or annoyance for road users (reflecting the rationale for government intervention to support LHAs to manage such works) and a number of LHAs interviewed mentioned that complaints from the public to local councillors had been a trigger for the authority to look for a better way to manage works. Another interviewee mentioned that high levels of local development had resulted in an increase in congestion which had prompted a review of works management. A more proactive way of coordinating the use of road space was also a factor revealed in case study discussions by an LHA which faced multiple demands for road space from numerous events as well as works projects. These elements of local context emerged during interviews and have not been validated by other aspects of the methodology.

However, promoters taking part in interviews felt that authorities generally had financial motivations for introducing permit schemes, particularly in the climate of financial austerity

which has existed in the public sector for some years. There was also a view that outsourcing network management to a private provider could also be a driver of increased uptake as such providers may see this as a commercial opportunity. Promoters felt that the need for schemes has not been adequately demonstrated, for example, by a rigorous comparison of the performance of noticing compared to permits. Promoters also highlighted a lack of evidence to demonstrate that the principle that schemes should be cost neutral has been adhered to. This reflects the findings of a review of LHA evaluation reports which shows that only a minority of published reports provide a full and transparent analysis of costs and fee income (see Sections 3.2 and 3.3).

Non-permit authorities

It is also interesting to explore motivations from the perspective of non-permit authorities, based on the survey responses and also a limited number of interviews with such authorities. The survey revealed that ten of the non-permitting authorities which responded to our survey stated that they had no plans to introduce a permit scheme, while seven had taken some steps towards their introduction (Table 4.1)⁴⁴.

Table 4.1 Has your authority taken steps towards introducing a permit scheme?

	Number
Yes, we are currently in the process of developing a permit scheme	3
Yes, it has been discussed and agreed by councillors but no development work has been undertaken	2
Yes, it is currently under discussion but no agreement has been reached	2
No	10
Other	2

Source: LHA survey. Base =19 (out of 20 respondents asked to answer this question)

The survey also revealed that most (12) of these LHAs did not consider a permit scheme to be necessary (Table 3.2). Specific reasons why some LHAs had not considered a permit scheme necessary included notice schemes and existing legislation being an adequate means of managing their network and permit schemes being viewed as ‘income generators’ rather than a better mechanism for managing works. Whilst it is true that permit schemes do provide a mechanism to generate income, interviewees from permit authorities noted that this had allowed more resources to be devoted to the management of works which was viewed positively and our analysis of impact suggests that the presence of a permit scheme does have significant effects on average works durations (Section 3.2).

⁴⁴ The sub-group of survey respondents that did not operate a permit scheme was relatively small (20), although represents approximately 35% of the overall number of non-permit authorities in England at the time of the research.

Responses in the ‘other’ category elaborated on why permit schemes were deemed unnecessary, such as the feeling that noticing was adequate for network management, permit schemes not being fit for purpose and waiting to see whether permit schemes were effective in other areas before making a decision. The latter point was reflected in an interview with a representative from a permit authority who said that their interest in permits started at an early stage but they purposely sat back and waited to see how it would work in Kent (one of the first adopters of permitting) before going ahead and developing their own scheme. A further issue raised in interviews was the resources required to develop a scheme. One non-permit authority suggested that the financial constraints faced by the authority at present were a barrier to developing a scheme. A number of permit authorities also highlighted the resources required as being a reason why scheme development had not progressed sooner or more quickly, specifically that approval was required for consultancy costs and also that officers were developing the scheme alongside doing their day jobs (rather than having a person who could dedicate time to this task).

Table 4.2 Main reasons permit scheme not (yet) introduced

	Number
It is not considered to be necessary/needed	12
Concerns about specific aspects/features of permit schemes	3
Lack of support from senior management	1
Lack of political support	0
Other	8

Source: LHA survey. Base = 20. Note: multiple response permitted

A voluntary code of conduct is used by one LHA as an alternative to a permit scheme and one LHA mentioned that this approach was currently being considered, although there were mixed views from other LHAs interviewed about whether such a model would be effective more widely.

4.3 Steps in the design and development of permit schemes

Resources

Time and resources must be invested in designing and developing permit schemes. Reflecting points above, the required inputs appear to be a key reason why schemes tend to take some time to develop (typically upwards of 12 months, sometimes considerably longer). This issue was explored in the more detailed interviews undertaken as part of case studies. Interviewees in an authority where the scheme had been in place for some years speculated that more recent schemes should take less time to develop as there is a defined structure in place which new schemes must follow (including national conditions), as well as the potential to learn from the experiences of others who have already been through this process. This was especially considered to be the case for

LHAs which explicitly choose to adopt an existing scheme design and another interviewee gave an example of an authority that had recently developed a scheme in under a year by following this model. However, case study interviews with a LHA that has recently introduced a scheme and another that was in the process of doing so revealed longer timeframes, largely due to the need for scheme development to be undertaken alongside other tasks which limited the speed at which it could progress. Internal processes also need to be followed, such as procurement of consultants and arrangements for recruitment of new staff, which can also be time-consuming.

Other factors that were mentioned in interviews as having lengthened the time taken were the need to get agreement across multiple authorities (in the case of joint or common schemes) and the need to respond to feedback from the DfT which required changes to be made (this applied to schemes developed prior to decentralisation of the approval process). It was recognised that scheme development would be quicker if resources could be dedicated to this but, as noted, officers typically fit this work in around their existing day job.

All LHAs interviewed mentioned that they had employed consultants to support scheme development (particularly to support on more technical aspects such as the cost benefit analysis). One case study discussion revealed that the LHA estimated their expenditure on external inputs as being in the region of £40,000 (with around half of this spent on the cost benefit analysis). It was noted that consultants had typically worked on the development of other schemes and this provided a way to share learning and experience from elsewhere. In some cases, support was also provided by DfT or the Joint Authorities Group (JAG) and/or through making direct contact with those responsible for existing schemes (usually targeting neighbouring authorities or those which have similar circumstances or scheme features to those which were being considered).

In the case of common or joint schemes, the authorities involved were able to share some of the burden (in terms of time and resources), which was considered to be particularly helpful for smaller authorities which may have otherwise struggled to find the resource required for this. These interviewees agreed that it is possible to save on development time/costs by working with and/or learning from others.

Use of an existing permit scheme design

Less than half of the group of LHAs that responded to the survey and had a permit scheme in place reported that they had made use of an existing scheme design (22). Table 4.3 shows that the main reasons these LHAs made use of existing schemes were to provide consistency with neighbouring authorities (17) and to follow good practice developed elsewhere (15). Exploring this latter point further in interviews suggested that LHAs tended to draw upon personal contacts in other authorities as a source of information, with links often made through attendance at meetings or networks (usually

at regional or sub-regional level), although some LHAs specifically sought to identify areas which were thought to have similar characteristics to their own and others obtained insights from consultants who had worked on schemes in other areas. Consistency with neighbouring authorities was also mentioned in interviews and was seen as helpful in gaining acceptance and understanding from promoters (in cases where promoters and their contractors are the same in both areas). One LHA officer interviewed reported that use of a scheme design that was already used by neighbouring authorities was beneficial as it meant that promoters were already familiar with the key features of the scheme.

Table 4.3 Decision to make use of an existing scheme design

	Number
To provide consistency with neighbouring authorities	17
To follow good practice developed elsewhere	15
This was more time/cost efficient	11
There were similarities between my authority and the one that developed the scheme design	5
Other	3

Source: LHA survey. Base = 22. Note: multiple response permitted

The remaining 25 LHAs (one did not respond to this question) developed their scheme without making use of an existing scheme design. Seven felt that existing scheme designs were not suitable and five wanted to develop their own scheme although, in theory limited variation is possible now that all schemes must comply with national regulatory requirements. Interviewees elaborated that existing schemes do not take account of specific local circumstances which were thought to be important to management of the network (for example, the range of demands for road space and the seasonal variations in traffic). Other responses (14) were predominately focused on the lack of other schemes around at the time the LHA was developing their scheme (i.e. early adopters) or a decision to develop new combined or joint LHA schemes.

Table 4.4 Decision not to make use of an existing scheme design

	Number
Felt that existing scheme designs were not suitable	7
Wanted to develop a bespoke scheme	5
Did not know where to access relevant information about existing schemes	0
Other	14

Source: LHA survey. Base = 25. Note: multiple response permitted

The interviews with a sample of permit authorities support these findings. LHAs which started work on developing a scheme at a relatively early stage noted that there was

limited opportunity for them to draw on an existing scheme design. However, one of these authorities noted that if they were developing a scheme now they would model it on an existing design as they felt that this would be more efficient. One of the non-permitting authorities interviewed was in the process of developing a scheme and this was to be based on one developed by a neighbouring authority with the intention that this would provide consistency in the area.

However, anecdotally, some authorities still prefer to develop their own scheme design. One stakeholder suggested that this may be motivated by political or organisational factors. One authority in this situation commented that they wanted to develop something which better reflected their own circumstances, although noted that the model they created is now also used by a number of other authorities that will have benefited from the development and learning that has already been done. As noted, following the introduction of national conditions, in theory, variation between schemes is limited as they must meet certain criteria in order to comply with the regulation, but there are still choices to be made about coverage, fees and discounts.

Design

As mentioned above, variation in design is limited but one area where a decision has to be made is whether the scheme will cover all streets or a selection. The majority of permitting LHAs responding to the survey (40 out of 48) said their scheme applied to all streets. Two authorities interviewed were in the process of extending their scheme to apply on all streets having previously being advised by the DfT to be more focused in order to secure approval.

LHAs and promoters interviewed agree that it has become more common for schemes to require permits on all streets. However, this raises questions of proportionality. From an LHA perspective, the rationale for extending the scheme to all streets is based on a need to understand the impacts that works in category 3 and 4 roads⁴⁵ can have elsewhere on the network (rather than the impact they will have on traffic flows in those specific locations per se); also that charges need to be applied to ensure that sufficient resources are available to assess these properly. In contrast, promoters interviewed feel that permitting on these streets adds little value (based on the likely traffic flows and impacts in these areas) and that charging for permits on these streets is not justified. As indicated, it has not been possible to undertake more detailed analysis of the outcomes of schemes which cover all roads compared to those which are more selective due to the relatively limited amount of data available for the latter category.

⁴⁵ For the purposes of reinstatement, roads are classified into five types (0, 1, 2, 3 or 4) based on the expected traffic to be carried by each road over the next 20 years. Categories 3 and 4 denote roads which are expected to experience relatively lower traffic volumes.

There were mixed approaches to incentives (which include discounts on permit charges for collaborative works), with LHAs interviewed tending to only offer the mandatory incentives⁴⁶ but some stakeholders were aware of areas where a wider range of incentives/discounts had been offered (such as discounted or zero fees for the use of specific technologies). However, it is unclear how effective these additional incentives have been. Furthermore, the mandatory incentives were considered by interviewees to be too small to have any real effect on behaviour (as the potential saving in fees is small relative to the likely additional cost or effort for the promoter associated with working in a different way); looking back at the logic model (Figure 2.1) this raises questions about the extent to which permit schemes are able to encourage changes in ways of working amongst promoters.

Consultation

Consultation is a requirement for introduction or variation of a permit scheme. In order to ensure that stakeholders were consulted on the proposed scheme, interviews revealed that LHAs typically made use of existing forums or set up new ones (by drawing on existing networks) and also distributed documents to promoters that were known to be active in the area as well as making them available to a more general audience (for example, through use of an online consultation portal).

Interviews found that engagement with promoters before and after the formal consultation period was used as an opportunity to inform development and also discuss consultation responses and any proposed changes. Such groups tended to be disbanded once the scheme was in place as there was no longer a substantive agenda for them to discuss and also because any issues with schemes could be taken to the permit forum connected to the regional HAUC group (and further escalated to the national permit forum if necessary).

Learning from other schemes was highlighted by one case study interviewee as a factor that helped to reduce negative feedback at the consultation stage, while others suggested that responses tended to raise similar but more general points such as questioning the need for a permit scheme. One LHA reported that there was limited opposition to their proposed scheme as it focused on strategic routes only and so was considered to take a more proportionate approach. Some of the LHAs interviewed have also undertaken subsequent consultation on proposed variations to their schemes. None of those interviewed could recall any significant changes to scheme design occurring as a result

⁴⁶ The statutory guidance for permit schemes requires that schemes provide discounts for collaboration (where undertakers collaborate to carry out works in the same location at the same time), works on traffic sensitive streets which are wholly outside of traffic sensitive times and where a number of applications are submitted together and form part of a wider project (see Annex 2).

of consultation. It was not within the scope of the evaluation to review consultation documents in order to explore these claims in more detail.

Promoters interviewed reported that they were active in responding to LHA consultations on permit schemes, submitting responses both as part of their regional Joint Utilities Group and also as individual organisations. One promoter also noted that they also encourage their contractors to respond to consultations too. Promoters were able to give examples of where particular LHAs have engaged in early consultation with stakeholders, and it was felt that this practice can help promoters to shape some of the schemes which was seen as a positive. Some promoters questioned whether LHAs were responsive enough to comments from stakeholders during this development phase (including an example of where a company had requested a meeting with a LHA to discuss a scheme known to be in development but received no response and another where it was felt that LHAs had ignored the views of promoters).

In interviews, promoters felt that devolution of scheme approval from DfT to the local authority had made it easier to get schemes approved and this was viewed negatively. Some promoters expressed a view that there was a need for a central point of oversight of schemes (both design and operation), and a number of interviewees drew comparisons with the approach used in Scotland (where oversight is provided by a Scottish Road Works Commissioner) which was seen as bringing a greater level of fairness and transparency.

4.4 Operation of permit schemes

The operation of a permit scheme can be split into two activities: coordination and compliance. The former consists of review and processing of permit applications, as well as coordination meetings, liaison with promoters on planned works and performance discussions/meetings, and the latter relates to inspections of works to ensure compliance with permit conditions.

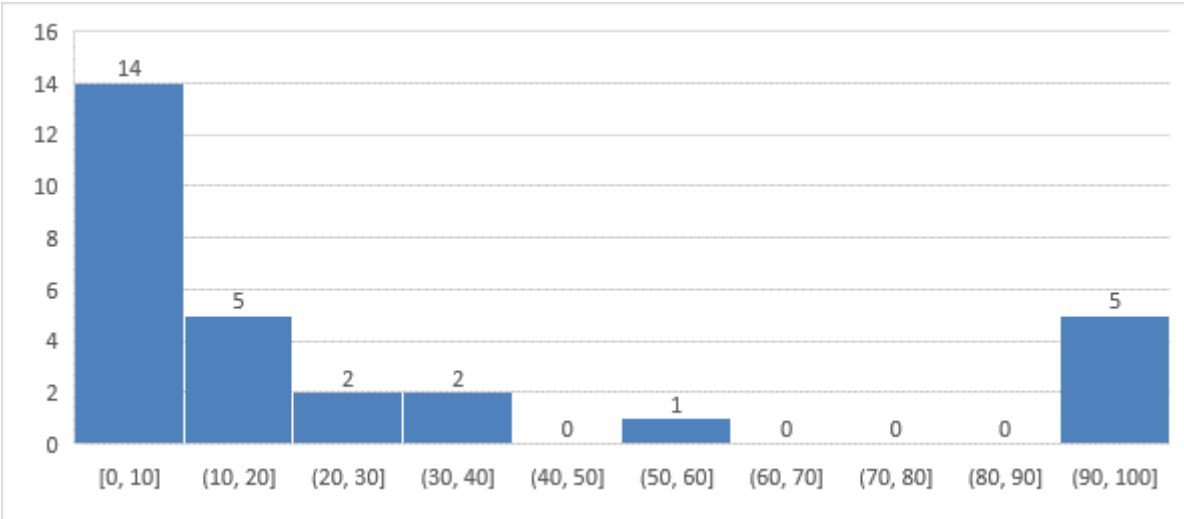
During the planning stage (before a permit application is logged in the system) discussions between the LHA and promoter may take place. The LHAs interviewed said that they encourage promoters to make contact during this time (especially for major works) so that conversations can take place about what conditions may need to be applied; this was reflected in the comments of interviewed promoters who said that they would seek to make contact with the LHA at an early stage to discuss planned major works.

These LHAs also noted the importance of making sure that all information relating to an application is logged on the electronic system (EToN) in order to provide an audit trail; promoters also recognised this as a benefit. The extent to which communication takes

place outside of this system varies; one LHA interviewed said that they encourage this as it can be difficult to fully understand the nature of the work being proposed from the relatively short description in EToN while another LHA said that the level of communication is likely to depend on the communication style favoured by each coordinator. The existence of changes between initial application and works start which are not linked to an LHA intervention or permit response (identified by the works data analysis) suggests that discussions do take place outside of the EToN system (Section 3.2.2).

All but one of the promoters responding to our survey dealt with multiple permit schemes (Figure 4.2). The geographical remit of statutory undertakers varies, with some operating on a nationwide basis and therefore interacting with all current schemes.

Figure 4.2 How many permit schemes does your organisation interact with?



Source: promoter survey. Base = 29.

The way in which promoters organise the process of applying for permits varies, with almost half of those responding to the survey (14) noting that they organise this by region/geography. Case study research with promoters provided an opportunity to explore this in more detail and some of those interviewed explained that the process also varies by works category and/or responsibility for undertaking the works. Most (20) respondents said that the responsibility of applying for permits rested with their employees; however, 11 of noted that this responsibility was shared by both employees and contractors, and further discussions in interviews indicated that this can further depend on which party has the responsibility for planning and or delivering the works in question.

More detailed discussions with one promoter which took place as part of case study work revealed that the process of planning the works is the same regardless of whether they

are dealing with a noticing or a permitting authority, as well as the process of submitting information to the LHA (although timing may be differ due to minimum lead times being applied to permit schemes). However, another promoter reported in interview that more in-depth surveys were being undertaken in the planning phase in some permitting areas as they know that the authority will expect this.

Following submission of the notification, the promoters interviewed or taking part in case studies agreed that the level of administration differs with the existence of a permit scheme creating extra work throughout the lifecycle. Waiting for approval, negotiating, managing conditions, dealing with invoices were all examples of areas where additional work is required under a permit regime. This administration represents a cost to the business. The process was described as 'more intense' by one promoter who also referenced the greater degree of 'backwards and forwards' between the LHA and promoter.

Conditions

In general, interviewees were positive about the introduction of national conditions (see Annex 1), although it was observed that there is still some confusion in this area and differences in how they are interpreted. Analysis of EToN data appears to show that the application of conditions is variable, although this may be due to the data on this point being incomplete.

One interviewee from an LHA that had previously worked to its own scheme conditions reported that they felt that they had not lost anything by adopting the national set, while another said that, given the choice, they would go back to the ones that they had previously as they felt this gave more information and better considered the full impact of different works.

LHAs interviewed felt that permit applications should be submitted with conditions pre-applied to show that promoters have planned the works and made an assessment of what is required (as well as reflecting any conditions which may have been discussed with the LHA during the planning phase). The promoters interviewed acknowledged this point but noted that LHAs had differing expectations with regards to the application of conditions which added to the administrative burden for their organisations. This point is supported by the analysis of EToN data which appears to show variation in use/application of conditions and also discussions with LHAs. For example, one LHA interviewee commented that they had made promoters aware that works on strategic routes would require manual control of lights so they would expect to see this condition pre-applied when relevant. However, the application of other non-mandatory conditions was considered on a case-by-case basis. Similarly, another LHA reported that all works were considered on an individual basis due to the diversity of the area and other demands on road space and that conditions would only be applied where they were necessary.

However, promoters interviewed expressed concern that some LHAs had drawn up standard sets of conditions/durations rather than looking at each job on an individual basis. One promoter noted that they try to work in a standard way for all jobs in order to provide consistency across the business; however, permit schemes can make this challenging as LHAs have different expectations and requirements. It was also said that the team had to learn the specific requirements of each LHA (or even certain individuals within an LHA) but as they worked across a large number of schemes there were a lot of details to remember and this was challenging.

Some promoters interviewed (and this was confirmed in discussions with LHAs) said that they seek to agree a standard duration to be applied to permits for immediate works. This reflects the fact that, at the time of applying for the permit, information about the nature of the problem and the repair work required could be incomplete, also that different teams may be required to visit the site and may not be available immediately.

Compliance

LHAs interviewed were of the view that compliance activity was a necessary part of a permit scheme in order to enforce the conditions that are being made. All of those interviewed expressed frustration at the level of non-compliance from promoters, as represented by the number of sanctions being applied or issues raised by inspectors. However, the lack of data on this point has meant that it has not been able to explore compliance in detail (see Section 3.2). Those LHAs taking part in case studies described the steps they had taken to promote greater compliance; one made the comment that they have adopted a 'firm but fair' approach and another mentioned that they have taken time to support promoters to improve their understanding of the system (for example by using performance meetings to highlight the reasons for penalties being incurred and how these can be avoided). Some of the promoters interviewed acknowledged that they had a part to play in increasing compliance (and reducing the burden of fines), although the prevailing view was that this was not helped by minor variations between schemes (such as differences in the format of permit numbers to be displayed on site).

4.4.1 Parity in treatment of statutory undertaker and local highway authority works

All but one of the LHAs interviewed said that a requirement for noticing of highways works was introduced prior to permitting, to some degree. In one case, this requirement had been introduced several years previously while in other cases it was done once a decision to introduce a scheme had been made as a way of preparing internal works promoters for this change, and that, at first, it applied only to bigger schemes. All authorities supported the principle of parity, although it was generally felt that this had been a significant change for those responsible for highways works and had required time to be invested in helping them to prepare and understand the scheme. In one case, the IT system used for these works also had to be upgraded and in another an IT system had to be introduced in place of the previous paper-based system. Analysis of works data also

supports the conclusion that introduction of permit schemes help to bring parity in treatment of different works promoters as it shows an increase in the volume of works (particularly highway works) being notified to authorities following the introduction of a permit scheme (see Section 3.2).

Most LHAs have a term contractor in place to undertake such works and challenges were reported where the permit scheme was introduced part-way through an existing agreement. One LHA interviewed commented that at first only bigger schemes were permitted as the contractor had not anticipated the work associated with permits when the contract was agreed; they went on to say that now a new contract is in place which has allowed all works to be permitted and that inspection is done in the same way and findings are recorded to inform assessment of KPIs.

However, promoters questioned the extent to which parity is applied, particularly in terms of the amount of time devoted to challenging and inspection of statutory undertaker works which was felt to be disproportionate compared to highway works. In order to address this point it would be helpful for LHAs to report on how teams divide their time between statutory undertaker and highway works, which links to the point about a need for more transparency in relation to scheme costs (see Section 3.3).

4.4.2 Staff resources

All but one of the permit authorities interviewed or taking part in case studies indicated that they had increased the amount of staff resource when moving from a noticing regime to permits, typically more than doubling the number of staff involved. For example, one authority reported that three full-time staff work on permits compared to one on notice assessments, while another increased the team from three posts to 7.5. One authority reported that since launching the scheme they had reduced the number of posts as they found some were not needed. The one authority that did not increase the size of their staff team acknowledged that they had been fortunate with the size of their team prior to permitting; also that modelling work had suggested a further 1.5 posts would be required but they did not feel that this was necessary and this has been borne out in practice.

4.4.3 Other approaches to street works management

Interviews with LHAs operating a permit scheme highlighted that permitting takes a different perspective where promoters must ask for permission to undertake works rather than simply informing the authority of their intentions. Permitting allows for a more proactive approach to be taken by the authority, not least because the scheme brings funding for additional resource. One LHA commented that a well-run permit scheme was likely to bring benefit to road users but could not solve everything. Noticing regimes were also seen as being less formal and reliant more on individual relationships and agreements, which was seen as less transparent.

Permission and resourcing was also mentioned by non-permitting authorities interviewed. It was acknowledged that the use of NRSWA powers was variable and one authority mentioned the need for backing from legal teams in order to follow through on this.

All but one of the LHAs interviewed or taking part in case studies reported that prior to the introduction of a permit scheme they lacked the resources required to look at all notices (due to budget restrictions) and instead had to prioritise - usually major works and/or work on traffic sensitive roads, although the findings of the counterfactual impact evaluation show that permit schemes generated the greatest impact (reduction) in average durations for major works completed by statutory undertakers, which suggests that permitting is a relatively more effective approach (see Section 3.2). The need to prioritise due to a lack of resources also emerged in discussions with non-permit authorities. This suggests that notice arrangements, in general, are poorly resourced which is likely to limit the impact which can be obtained by this approach. Permit schemes benefit from increased resource which is likely to account, at least in part, for the impacts they generate. Furthermore, as indicated, works data analysis suggests that the levers provided by permit schemes (specifically use of directions and application of conditions) are applied inconsistently, and, although a proportion of this may be due to incomplete reporting in the available data, it suggests that impacts could be increased if such levers were better used (see Section 3.2).

One permitting LHA interviewed expressed the view that legislation would be needed to ensure greater compliance and consistency and that this was a weakness of the guidance produced by HAUC (which is non-statutory).

Promoters interviewed were largely of the opinion that noticing was adequate as a means to coordinate and manage works, if authorities used the powers they had to the full extent, although it was recognised that resources may be a barrier to this and that introduction of a permit scheme did help to resolve this problem by providing a mechanism to generate income.

4.5 Key success factors and challenges

An important question for the evaluation is the extent to which permit schemes have been designed and operated effectively. The evidence gathered suggests that there is some room for improvement. This section sets out key success factors and challenges which have been identified based on detailed interviews with a sample of LHAs and promoters before drawing out the implications for effectiveness.

Key success factors

In terms of design, a good scheme is one where there is a clear justification of the need for the scheme and where thinking has been done at the outset about how its performance will be evaluated in order to inform future development as well as to provide transparency for promoters about achievements and financial aspects.

It is clear that LHAs need to ensure that sufficient resource is available to run the scheme and advice from existing schemes is to not underestimate the efforts involved in recruitment and training when setting up a scheme. Efforts should be made to ensure that works promoters have a good understanding of the scheme and what it is trying to achieve, particularly internal works promoters (officers and contractors) as this may represent a significant change compared to earlier ways of working.

Good communication is important in order to avoid misunderstandings and foster cooperation. Schemes should engage with promoters in the development stage and also during implementation to ensure that feedback can be collected and any issues discussed. Discussions between LHAs and promoters about the issues (and potential solutions) associated with collaborative working could also help to encourage cooperation.

Key challenges

Variation in interpretation and approach amongst LHAs is a key challenge for works promoters. This lack of consistency has become more of an issue over time as more schemes have been launched, and includes inconsistency in interpretation of national conditions. Increasing standardisation of schemes would be expected to reduce the administration burden for works promoters and this may, in turn, support increased compliance.

Quality of permit applications and compliance with conditions were the most challenges most commonly identified by LHAs.

Increased workload is a challenge for both promoters and LHAs, including the increased administration associated with permits and potential for a process of negotiation to take place before agreement is reached.

Demonstrating the impact of permit schemes on key variables such as durations and journey times has been a challenge for LHAs due to data availability and the need to control for the impact of other factors (external to the scheme).

Analysis of the most commonly identified success factors and challenges suggest that effectiveness of scheme design and delivery could be increased by promoting a consistent approach across all LHAs, beginning with the interpretation of the existing guidelines and national conditions. Improvements in this area may help to improve compliance and also reduce scope for misunderstandings as well as the associated administration costs. Transparency is another important factor which links to the principle of parity as well as the need to provide a justification for the scheme design and associated fees, and to demonstrate scheme impacts. Increased transparency may also help to encourage increased collaboration and cooperation between LHAs and promoters.

This evaluation has attempted to address the problems which have been experienced in robustly assessing the impact of permit schemes, notably through the use of counterfactual impact evaluation (see Section 2.3). There are many external factors which could potentially impact on the disruption caused by works. LHAs interviewed noted that fluctuations in promoter activity can be driven by investment plans and agreements with government or the regulator, including the ongoing roll-out of superfast broadband. Others mentioned that other local policies or decisions were also likely to impact on traffic speeds (such as a decision to change speed limits in a particular location). Some LHAs interviewed also mentioned the difficulties of establishing a baseline, particularly where changes have been made to the treatment of local highways works in the lead up to implementing a permit scheme, and also the limitations of local systems which made it difficult to extract data on key variables of interest such as the prevalence of collaborative works.

5.0 Conclusions and Recommendations

This section presents an overall assessment of the evidence, with reference to the hypotheses which were being tested, followed by a series of recommendations.

5.1 Conclusions

The first hypothesis was that permit schemes provide a way to reduce the disruption caused by works. The findings of the counterfactual impact evaluation support this, showing a reduction in average durations for most types of works undertaken under permit schemes, compared to noticing. This analysis also shows a reduced likelihood that permitted works will over-run. This finding is supported by the perceptions of LHAs, but it has proved difficult to evidence at local level due to methodological and data issues, as shown by the quality of material typically presented in local permit scheme evaluations (see Section 3.2.1).

Permit schemes provide increased control over all works was the second hypothesis to be tested. Analysis of works data suggests that LHAs gain increased visibility of works following the introduction of a permit scheme which would be expected to contribute to having greater control. LHAs with permit schemes reported that they perceive having increased control of the road network. However, analysis of works data shows limited and inconsistent use of directions and conditions which would be another means of exerting control (although there is a possibility of some under-reporting in this data) (see Section 3.2.3). Scenario analysis suggests that significant cost savings (from reduced disruption) could be achieved if there were increased systematic application of conditions (see Section 3.4.3).

Evidence to support the third hypothesis - that permit schemes provide a lever to influence the way that works are undertaken - was more limited. Permit schemes offer potential to create changes in the duration and timing of works (as shown by the counterfactual impact evaluation) but there is limited evidence that they prompt changes in the approaches or techniques used by promoters (see Section 3.2.3). It is likely that this is due to the costs of applying alternative techniques being substantially higher than the discounts offered by permit schemes to incentivise such behaviour.

The fourth hypothesis was that permit schemes balance income and costs. The existence of permit schemes creates additional costs for LHAs and works promoters (particularly statutory undertakers which are subject to permit fees) (see Section 3.3). While LHAs can offset the costs of processing permit applications from statutory undertakers with the fee income generated by the scheme, promoters must either absorb the associated costs within the business or pass these on to customers. Local scheme evaluation reports

typically lack transparency about the balance between income and additional costs. Indicative cost benefit analysis suggests that schemes generate a positive return for society, supporting the fifth hypothesis to be tested by the evaluation, as the value of the estimated impact on delays for road users exceeds the estimated costs of scheme operation, although further work is required to develop a more comprehensive analysis (see Section 3.4.1).

The final hypothesis concerned the extent to which permit schemes have been designed and operated effectively. The evaluation has found evidence that schemes support the generation of the desired outcomes (see Section 3), although the evidence gathered suggests that there is some room for improvement. Permit schemes offer a more proactive approach to the management of works compared to noticing (see Section 4). Resources must be invested in the development of schemes and this appears to act as a barrier to take-up for some authorities, or it slows the pace of scheme development in others. Works data shows that the introduction of schemes leads to an increase in the number of works notified which reflects the parity treatment of statutory undertakers and an LHA's own works under permit schemes. Permit schemes also provide a way to generate income to cover the additional costs of operating the scheme; noticing authorities are under-resourced in comparison.

In theory, differences between schemes are limited due to the need to comply with legislation; however, in practice, there are differences in interpretation of certain elements (such as the national conditions) and how the scheme is applied in different LHAs. This inconsistency increases compliance costs for works promoters (statutory undertakers) which typically work across multiple schemes (see Section 4.5).

5.2 Recommendations

Based on the evidence gathered across all sources, the evaluation team has developed a number of recommendations.

For LHAs:

1. Permit schemes: those LHAs that have not already done so should give consideration to the introduction of a permit scheme, given that this report has identified that such schemes can support LHAs to fulfil their network management duty and help to reduce the disruption caused by works.
2. Development: LHAs seeking to develop a permit scheme should draw on the experiences of others who have already been through this process in order to share lessons and good practice. Steps should also be taken to involve promoters in discussions about scheme development at an early stage to ensure that any

concerns can be raised at an early stage and to support ongoing positive engagement.

3. Fairness: LHAs should set out a clear statement on parity, including making clear how the scheme applies to highways works and how resources are used/focused (such as inspection activity). This would address promoter concerns that the current approach to parity treatment does not go far enough.
4. Collaboration: LHAs should work with promoters to explore the potential for increased collaborative working, as the evaluation revealed that both parties felt this was an area for development which could yield benefits in terms of reduced disruption. Steps should also be taken to ensure that instances of collaborative working are comprehensively recorded.

For DfT:

1. Scheme evaluations: the quality of existing LHA scheme evaluation reports suggests that guidance on these should be revised and steps taken to ensure adherence to the regulatory requirements regarding the timing and publication of these reports. More specifically, we recommend:
 - more focus on providing quantitative evidence that demonstrates the efficiency and effectiveness of the permit scheme (such as data on works volume and durations/occupation);
 - increased transparency in the evidence presented (including data labels on charts, use of absolute values as well as percentages);
 - comparison/analysis of change compared to previous years (including pre-permit data);
 - information and analysis of data on fines and inspections; and
 - sufficient detail to allow an assessment of the balance of the additional costs of operation and the income from fees.
2. Application of conditions: more practical advice on the application (and recording) of conditions should be provided and commitment to complying with this should be sought from LHAs as this could lead to better outcomes and less ambiguity within the coordination process (helping to promote consistency).
3. Transparency: there should be increased transparency in the level and use of permit fee income. Clarification should be provided on the allowable costs for operating a permit scheme, together with a cost-model for LHAs to complete which details their costs and fee income. There is already a regulatory requirement to undertake such a review, so further steps to introduce and enforce this would support LHAs to complete this task.

4. Oversight: a body such as HAUC should be tasked with oversight of scheme development (including a register of schemes that are in development and what stage they are at) and operations (including checking that evaluation reports are made available), which would also contribute to increased transparency. A statutory role should be considered.
5. Incentives and fines: further research should be undertaken to establish which incentives are most effective along with a review of the current level of fines/charges to ensure that they are proportionate and also capable of impacting on behaviour.
6. Costs and benefits: further resource should be invested in cost benefit analysis of permit schemes, particularly regarding the estimation of costs to LHAs and promoters. This would help to develop a better understanding of the benefit cost ratio provided by schemes and inform future policy development.

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