Major Projects' Instructions	
Issued By: MP Programme Hub	**Author: Rob Keep**
Document Name: Requirement and guidance for new schemes to perform a metal theft risk assessment	**Reviewer: Members of the Metal Theft Working Group, the Technical Advisory Group, Kevin Hamer and Stewart Young**
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To: ***All Major Project Managers, Assistant Project Managers, Supply Chain***	
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1. Purpose

This MPI is to highlight the need for project teams to undertake a metal theft risk assessment process during the design phase of future schemes and for Delivery Partners and Main Contractors to undertake a risk assessment during the construction phase. This is to ensure that proportionate measures are put in place in order to mitigate the risk of metal theft impacting Highways England's assets.

2. Who will use it

All Highways England Major Projects project managers and their scheme designers engaged in the design of new schemes. Delivery Partners and Main Contractors should complete a risk assessment and identify the measures they intend to put in place to protect cable, materials and plant during construction, paying attention to the increased threat created by the specific nature of construction work (see works periods /operational phase section of the Metal Theft Toolkit).

3. Background

Metal theft has impacted a range of UK organisations infrastructure since 2007. It has been estimated that this organised criminal activity costs the UK economy £770 million a year. In recent years the level of reported incidents has reduced for Highways England with reported repair and reinstatement costs of £120,000 for FY 15/16 and £300,000 for FY 16/17. However, the impact of metal theft goes well beyond the financial cost as it can create serious safety issues for road users and road workers, cause project staff to be diverted from important project duties for long periods and potentially cause delays to project delivery.

Highways England has been predominately targeted for its copper cabling, which provides a healthy return for thieves, although other metal items have also been stolen or vandalised, such as electrical cabinets and generators. The copper cabling

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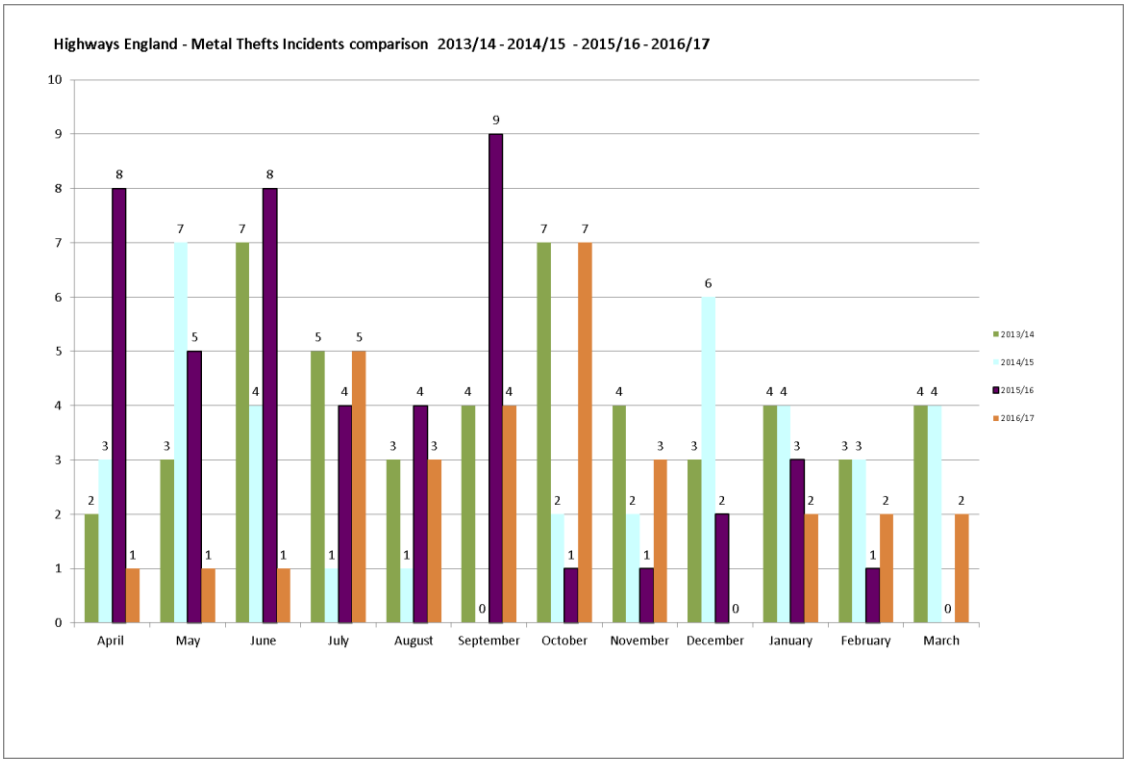
most commonly targeted is that which provides power and communications to technology on the road side, for example smart motorway gantries.

Highways England has had some success in countering metal theft through its association with the British Transport Police (BTP) and local police forces. This provides a basis to identify emergent hotspots and therefore inform police operations to achieve arrests; joint operations with local police forces in 2015-2017 have led to arrests and significantly reduced or stopped thefts from emerging hot-spots.

The table below shows the work we're doing to combat metal theft is working. The combination of undertaking metal theft risk assessments and applying proportionate mitigation measures and our close working with the police have helped to reduce metal theft. However, with metal theft set to continue for many years, it remains vital for Highways England to continue to reduce the vulnerability of its infrastructure through appropriate risk mitigation and asset protection measures. From this perspective schemes can 'design in' security to counter metal theft.



Number of Highways England metal theft incidents reported FY2013/14 – 2016/17

The HE metal theft lead can provide risk assessors with information regarding current and historic metal theft activity to help them understand the threat level in their area. Risk assessors can also approach local police and other Highways England stakeholders to gain further understanding.

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4. Instruction and Guidance

4.1 Metal Theft Risk Assessment required for new schemes

All new Major Projects schemes are required to undertake a metal theft risk assessment process in order to identify the parts of their scheme that are at highest risk from metal theft. At an early stage of the process it is important that those carrying out the risk assessment meet with those receiving the scheme to ensure that a proportionate mitigation plan to address high priority risks can be agreed. A recommended metal theft risk assessment process is set out below.

4.2 Metal Theft Risk Assessment - Guidance

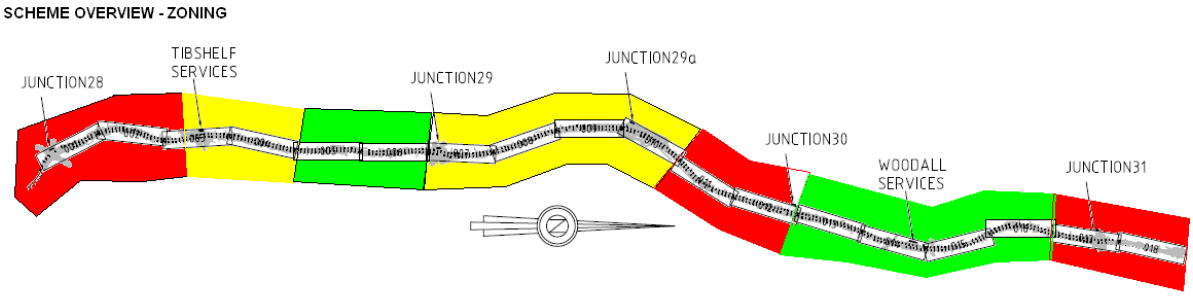
This section sets out a recommended metal theft risk assessment process for schemes to reference. Under this five stage process vulnerability is assessed based upon the attractiveness, remoteness, accessibility and removability of metal infrastructure locations. Impact is assessed based upon the level of disruption, safety, cost and reputational impact that would be realised from thefts at these locations. The vulnerability and impact scores are then combined to give a metal theft risk score for each metal infrastructure location. Based on the overall risk profile for a scheme mitigation measures can then selected and prioritised.

Annex B contains a suggested template for recording the metal theft risk assessment:

http://share/Share/llisapi.dll/properties/55492347

Stage 1: Identify Metal Infrastructure Locations

The risk assessment process aim is to highlight the areas of a scheme that will be most vulnerable to metal theft. Therefore, the first step is to identify the key metal infrastructure locations within a scheme:



The risk assessment process should then be applied to these scheme locations.

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Stage 2: Location Vulnerability Assessment

Based on an understanding of the threat, and following discussions with BTP, the following have been identified as key vulnerability factors:

Vulnerability Factor:	Definition:
Attractiveness of Cable Infrastructure	Concerns the potential value of cable infrastructure to thieves with heavy duty power cable known to be a priority target
Remoteness of Cable Infrastructure	Concerns the extent to which cable infrastructure is located in secluded areas where prospective thieves would not risk detection
Accessibility of Cable Infrastructure	Concerns the ease of access for prospective thieves for example via overbridges, underbridges or adjacent side roads
Removability of Cable Infrastructure	Concerns the ease with which prospective thieves could extract and remove cable infrastructure depending on how it is installed

The table below provides guidance for vulnerability reduction scoring:

Factor:	Scoring Criteria:	
Attractiveness:	4 = Very High	Presence of installed heavy duty power cabling (e.g. 3 or 4 core) indicated by electrical infrastructure items, such as cabinets; with cable installed over several hundred metres. Cable, therefore, likely to be subject of repeat targeting.
	3 = High	Power cabling, heavy duty, installed over one hundred metres or more.
	2 = Medium	Power and communications cabling installed together, no heavy duty cabling present.
	1 = Low	Installations containing only communications cabling.
Remoteness:	4 = Very High	Cable infrastructure in secluded locations where thieves could go undetected.
	3 = High	Cable infrastructure in partially secluded locations (thieves might be detected).
	2 = Medium	Cable infrastructure in quite visible locations where thieves would risk detection.
	1 = Low	Cable infrastructure in very visible locations where unusual activity would be spotted.
Accessibility:	4 = Very High	Very easy access to / from cable infrastructure locations (e.g. bridge / side road).
	3 = High	Quite easy access to / from cable infrastructure locations (e.g. bridge / side road).
	2 = Medium	Some access to / from cable infrastructure locations (e.g. bridge / side road).
	1 = Low	Limited access to / from cable infrastructure locations (e.g. bridge / side road).
Removability:	4 = Very High	Cable infrastructure can be quickly extracted (e.g. cable in surface troughing).
	3 = High	Cable infrastructure can be extracted fairly quickly (e.g. cable in secured troughing).
	2 = Medium	Cable infrastructure can be extracted with some difficulty (e.g. cable in ducting).
	1 = Low	Cable infrastructure is very difficult to extract (e.g. buried / concrete in chambers).

An example illustration of a location vulnerable to metal theft is provided on the next page.

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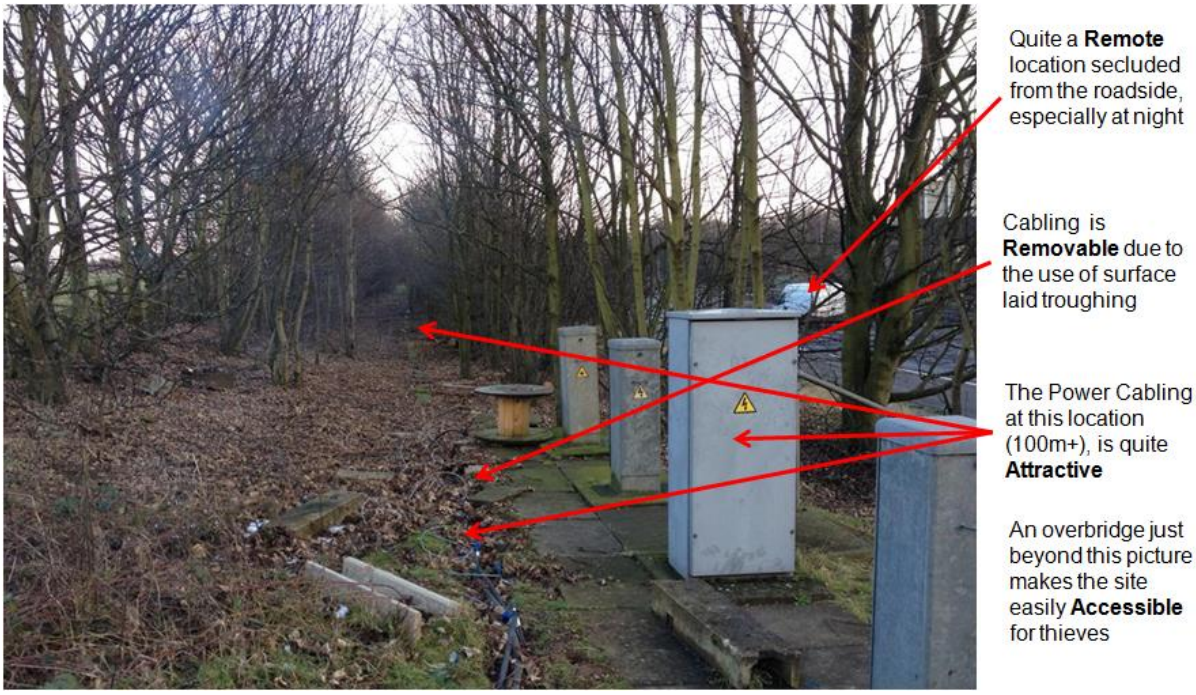
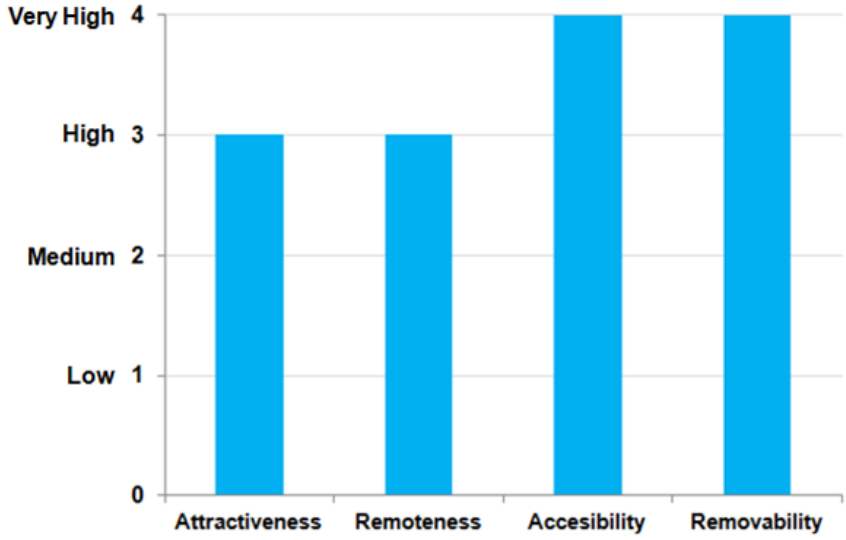


Based on the scoring table each location is scored (1-4) according to its vulnerability under each category. The mean of these scores (rounding to the nearest whole number) is taken to give the overall vulnerability score. In the example case, illustrated below, a mean score of 3.5 is rounded up to give a score of [4: Very High].



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Stage 3: Location Impact Assessment

Based on an understanding of the threat, and following discussions with BTP, the following have been identified as key impact factors:

Impact Factor:	Definition:
Disruption:	Concerns the impact of disruption that would result from metal theft at his location. This includes, for example, congestion, loss of lanes; project delays and loss of working time.
Safety:	Concerns the safety impact on workers and road users that would result from metal theft at this location.
Cost:	Concerns the cost impact on Highways England that would result from metal theft at this location.
Reputation:	Concerns the reputational damage to Highways England that would result from metal theft at this location.

Impact should be assessed on the basis of a reasonable worst case scenario and the table below provides guidance for impact scoring:

Factor:	Scoring Criteria:	
Disruption:	3 = High	Wide loss of Smart Motorway systems e.g. outage of several gantries and message signs; Loss of lanes due to immediate clear up; Significant loss of project time (e.g. a week or more) due to remedial activities.
	2 = Medium	Isolated loss of Smart Motorways systems e.g. outage of individual gantries or message signs; Loss of motorway lanes due to repair works; Project delayed by one or more days.
	1 = Low	Loss of engineers' time; lost hours of project time.
Safety:	3 = High	High likelihood of target chambers or cables in or adjacent to lanes/hard shoulder/refuge areas/verge causing potential for road users or staff loss of life or serious injury. E.g. open chamber adjacent to refuge area.
	2 = Medium	Unsafe road conditions representing a hazard to road users due to service outage; Debris left on verge/refuge area causing a hazard to road users.
	1 = Low	No significant danger to road users or staff.
Cost:	3 = High	£50,000 or greater repair and reinstatement cost; moderate reputational impact
	2 = Medium	£10,000 - £50,000 repair and reinstatement cost; moderate reputational impact
	1 = Low	Less than £10,000 repair and reinstatement cost; negligible reputational impact
Reputation:	3 = High	Significant reputational damage: national newspaper coverage e.g. reports of Smart Motorway system inoperable for a significant time frame; Lane closures required to undertake repair and remedial action, significant increase in congestion reported.
	2 = Medium	Moderate reputational damage: limited press coverage e.g. reports of message signs affected, roadside phone unserviceable, project time lost
	1 = Low	Minimal reputational damage: cable theft incidents reported in local press coverage, e.g. cable theft incidents reported in local press.

Each location is scored (1-3) according to its anticipated impact on the 4 impact categories. The mean of these scores (rounding to the nearest whole number) is then taken to give the overall impact score.

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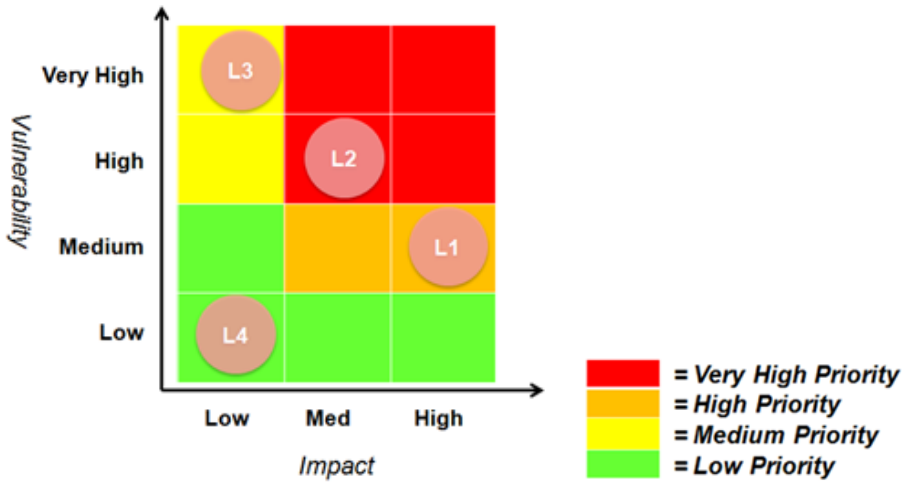
Stage 4: Risk Recording

The risk assessment results should be recorded in a risk register:

Scheme Metal Infrastructure Location	Vulnerability Score	Impact Score
L1 [M6 MP135/4-150/3]	**2**	**3**
L2 [M6 MP150/3-170/4]	**3**	**2**
L3 [M6 MP170/4-190/2]	**4**	**1**
L4 [M6 J7 HA Compound]	**1**	**1**

A prioritisation matrix can then be used to illustrate the risk profile across locations and to therefore inform risk mitigation:



Stage 5: Post Assessment

Once the risk assessment results have been recorded and agreed with key stakeholders they should be used to inform selection of mitigation measures. Mitigation measures should be focussed on those locations within a scheme identified as being at ‘high risk’ or ‘very high risk’ from metal theft.

The Highways England Metal Theft Toolkit is available in Annex A that provides details of good practice security measures that can be applied by Designers, Constructors and Operators to reduce the risk of metal theft:

http://share/Share/llisapi.dll/properties/55492807

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The Toolkit provides an initial assessment of the level of protection, cost and ease of maintenance of each mitigation measure suggested. This allows schemes to ensure those measures chosen are Maintainable, Affordable and Proportionate to the level of risk faced. Measures included in the toolkit should be enhanced and supplemented by individual and local knowledge where possible.
As a more general point of reference a set of Crime Reduction Tips advocated by the BTP are provided below:

British Transport Police Crime Reduction Tips	
Target Hardening:	Making targets less prone to criminal activities: - Fencing - Locks - Chamber hardening
Environmental Design:	Using the design of assets to reduce the chances for crime to be committed: - Specific ideas explored at length in the Toolkit
Target Removal:	Designing out unnecessary property that may become the subject of crime, in line with Highways England's zero infrastructure principle: - Removal of unnecessary metal items - Clearance of redundant metal items quickly
Remove the Means to Commit Crime:	Ensuring that anything that can be used in the commission of crime is not available: - Locking up of equipment such as ladders and tools
Access Control:	Reducing access to vulnerable areas: - Identity / swipe card access - ANPR access control at compounds - Separate entrances and exits
Surveillance:	Allowing areas to be seen or monitored clearly: - Installation of CCTV - Improved lighting - Security staff - Caretakers
Rule Setting:	The introduction of levels of acceptable behaviour and means to achieve this: - Wearing ID cards - Signing in at reception on arrival - Signage prohibiting access
Increase the Chances of Being Caught:	The greater the risk, the less chance of the crime being committed: - Proper maintenance of CCTV / lighting - Alert offenders to use of CCTV - Delay offenders escape (e.g. fencing)

5. Review Frequency/When can it be destroyed

This instruction will be reviewed when considered necessary by the Metal Theft Working Group but not more frequently than every 2 years.

6. Approved by MP Exec or other authorised governance Board / Group (where relevant)

N/A

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7. Linked to PCF Product or WwW. (where relevant).

This MPI has been linked to the following PCF Products:

1. Qualitative Risk Assessment.
2. Pre-construction Design.
3. Preliminary Design.
4. Maintenance and Repair Strategy Statement.

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