

# HIGHWAY INFRASTRUCTURE ASSET MANAGEMENT PLAN FOR TRAFFIC MANAGEMENT AND MANAGEMENT OF ELECTRONIC TRAFFIC EQUIPMENT

JANUARY 2020

AN ELEMENT OF THE HIGHWAY INFRASTRUCTURE  
ASSET MANAGEMENT SYSTEM

## Document Information

Title	Highway Infrastructure Asset Management Plan for Traffic Management and Management of Electronic Traffic Equipment
Author:	Teri Ford/Bronwen Terry
Reviewed:	Julian Gould

## Document Issue Status

### Table of Amendments

NO	APPROVAL DATE	SECTION	DETAILS	AUTHOR
1	23/01/2020	All	First Issue	TF/BT
2	09/04/2021	All	See Review schedule 1	BT

If this document is printed or copied it must be treated as an uncontrolled version as it will only be correct at the dates published in the document when it was printed or copied.

## Contents

1. INTRODUCTION .....	4
2. SCOPE .....	4
3. ASSET CAUSES OF DETERIORATION.....	5
4. NATIONAL/LOCAL GUIDANCE AND RELATED DOCUMENTS .....	5
5. LEVELS OF SERVICE AND CRITICAL ASSET IDENTIFICATION.....	5
6. IDENTIFICATION OF NEW ASSETS - DATA CAPTURE .....	7
7. INVENTORY UPDATE AND ASSET CAPTURE.....	8
8. AS BUILTS PROCESS AND DATA CAPTURE.....	8
9. INSPECTIONS AND SURVEYS .....	8
10. ASSET CONDITION AND ASSESSMENT.....	11
11. LIFECYCLE PLANNING .....	12
12. MAINTENANCE PROCESSES .....	15
13. BACKLOG.....	16
14. VALUE MANAGEMENT/ENGINEERING APPROACH .....	17
15. CROSS ASSET CONSIDERATION .....	17
16. FORWARD PROGRAMME.....	17
17. ANNUAL PROGRAMME.....	17
18. RISK REGISTER .....	17
19. COMPETENCY AND TRAINING .....	20
20. PERFORMANCE MANAGEMENT FRAMEWORK.....	20
21. COMMUNICATIONS.....	21
22. CLIMATE CHANGE ADAPTION AND CIVIL EMERGENCIES AND SEVERE WEATHER EMERGENCIES PLANS.....	21
23. HERITAGE AND CONSISTENCY WITH CHARACTER.....	21
24. CARBON REDUCTION.....	22
25. ENVIRONMENTAL IMPACT, NATURE CONSERVATION AND BIODIVERSITY .....	22
26. SUPPLY CHAIN COLLABORATION AND COLLABORATION IN SERVICE DELIVERY 22	
27. DELIVERY .....	22
28. PROCUREMENT .....	22
29. OPERATIONAL POLICIES .....	22
30. APPENDICES.....	23

If this document is printed or copied it must be treated as an uncontrolled version as it will only be correct at the dates published in the document when it was printed or copied.

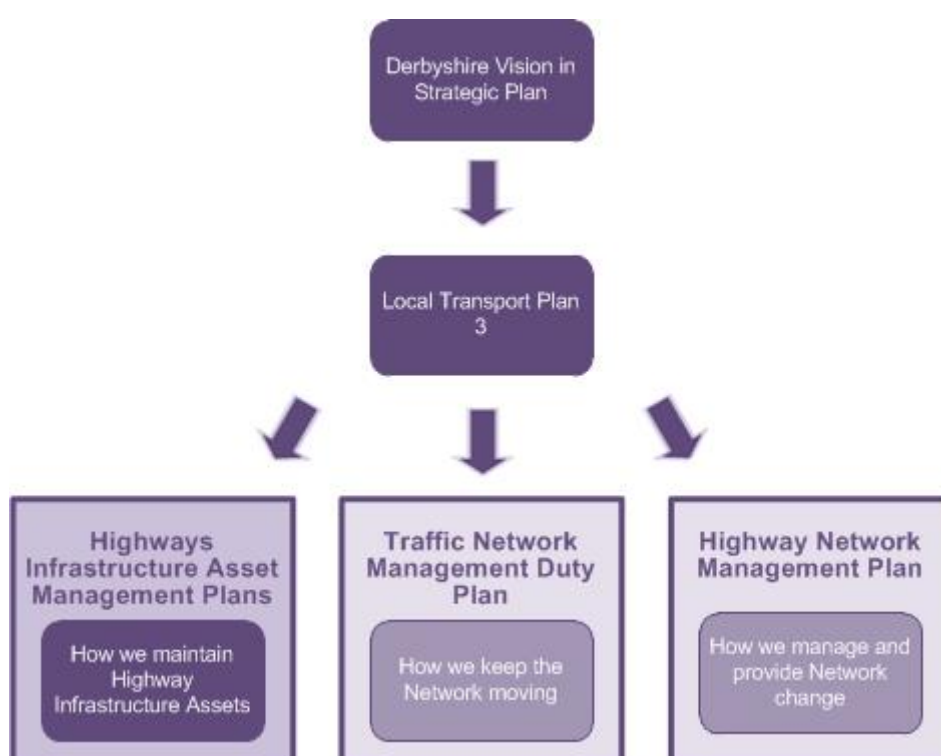
## 1. INTRODUCTION

This document provides the technical details that supports the Highways Infrastructure Asset Management Strategy and Plan and forms part of the Highways Infrastructure Asset Management suite of documents. It is a working document that provides the processes and information used internally by staff undertaking roles in delivery of service.

This document will recognise a number of Development Areas where Derbyshire has recognised potential improvements to the service they deliver. These development areas are aspirations only and will be reviewed on an annual basis to assess whether they are deliverable from a financial and resource perspective. A breakdown of these Development Areas can be found in [Appendix A](#).

The following figure shows this document in context with other key documents in how the network is managed, maintained and changed:

**Diagram 1: Plans and Policies Framework**



## 2. SCOPE

This document covers the electronic traffic equipment on the Derbyshire highway network that Derbyshire have a responsibility to maintain. This includes traffic signals and crossing signals, vehicle activated signs, flashing amber warning lights, zebra crossings, fixed enforceable road safety cameras, traffic counters and real time bus information. It does not include those items maintained by third parties such as:

- Traffic signals at level crossings – Network Rail
- Fixed enforceable road safety cameras – Derby and Derbyshire Road Safety Partnership (DDRSP)
- Traffic signals on the trunk road/motorway network – Highways England
- Car park monitoring and information – District/Borough Council/businesses

If this document is printed or copied it must be treated as an uncontrolled version as it will only be correct at the dates published in the document when it was printed or copied.

- Closed circuit television – Districts/Borough Council

### 3. ASSET CAUSES OF DETERIORATION

The main causes of traffic management deterioration are itemised below:

**Table 1: Deterioration and Associated Defects**

Cause of Deterioration	Description	Typical Defects
Weathering	Damage from wind action, water ingress and freezing	Deterioration of plastics, rubber seals, coatings to poles. Corrosion of metals
Degree of exposure of the site	Sites in exposed locations are at higher risk of severe weather conditions eg greater wind loading	Deterioration of plastics, rubber seals, coating to poles. Corrosion of metals
Vegetation, overhanging trees	Dirt and dust adhere to assets due to leaf sap and other residues	Illegible signs, obscured signals
Rutting in carriageway	Plastic deformation of bituminous construction layers	Damage to loops
Vandalism/Graffiti	Spray painted words, bending of sign face, damage to brackets	Sign illegible
Ageing	Assets approaching end of design life, affected by sunlight	Fading/signs illegible
Salting	Assets can be damaged by excess salt spray	Screen cracking
Road Traffic Accidents	Assets damaged by collisions	Damage to weather stations

### 4. NATIONAL/LOCAL GUIDANCE AND RELATED DOCUMENTS

The maintenance of electronic traffic equipment is governed by a series of national documents and guidance including:

- [Well Maintained Highways A Code of Practice 2016](#)
- [Management of Electronic Traffic Equipment A Code of Practice \(22 September 2011\)](#)
- [DMRB – Volume 8 Traffic Signs and Lighting Section 1 Traffic Signals and Control Equipment Part 2 TD 24/97](#)
- [MCH 1540 Loop Detectors Standards for Highways](#)
- [Traffic Management Act](#)

These documents are held on the internet and the links are above.

This document is a live document that will be reviewed biennially or whenever a significant change is required to any of the processes or procedures documented within it.

### 5. LEVELS OF SERVICE AND CRITICAL ASSET IDENTIFICATION

The Highways Infrastructure Asset Management Policy, Strategy and Plan have developed and documented the overarching Levels of Service derived from the authority's statutory duties, the national and regional guidance, the management and mitigation of risk both to the service user and the authority and the volume and type of traffic using the network.

If this document is printed or copied it must be treated as an uncontrolled version as it will only be correct at the dates published in the document when it was printed or copied.

The Levels of Service that define the Council's approach to the management of the carriageway assets have been defined against the Network Hierarchy and the Resilient Network. These can be found online [here](#). There are two levels of service in regards to safety on the network due to budgetary constraints. Levels of Service will be reviewed and amended regularly to take into account the budgetary position. This asset group is important in that it is supportive of the goals and objectives relating to the promotion of walking and cycling and improving accessibility. Some signals have been installed as a direct result of casualty reduction objectives. The carriageway critical assets are defined as those on the resilient network and the network hierarchy.

The table overleaf shows how the Levels of Service relate to the different network hierarchy levels:

**Table 2: Traffic Management and Management of Electronic Traffic Equipment**

	<b>Traffic Management on Resilient Network and Critical Assets</b> <b>(x% of total assets – <u>Development Area 1</u>)</b> <b>Level of Service 1</b> <b>Safety + Serviceability + Sustainability + Customer Service</b>	<b>Traffic Management on Network Hierarchies 1 to 7</b> <b>(x% of total assets – <u>Development Area 1</u>)</b> <b>Level of Service 2</b> <b>Provision of safety related issues and Customer Service only</b>
<b>Objective</b>	Comply with statutory obligations and to provide Network Safety and customer service  RN to be prioritised to ensure availability and minimise costs where budgets allow	Comply with statutory obligations and to provide Network Safety and customer service
<b>Standard</b>	Comply with Code of Practice and apply asset management techniques to optimise whole life costs.	Comply with Code of Practice and apply asset management techniques to optimise whole life costs.
<b>Impact/ Risks/ What it means</b>	<p>Programme of inspections and determination of condition.</p> <p>Lifecycle planning and programme to tackle backlog of improvements. Conversion of assets to LED technology where appropriate.</p> <p>Safety inspections and identified safety defects prioritised according to risk based approach.</p> <p>Officer observation and all other non-safety repair requests added to the programme to be dealt with in accordance with the timescales set out in the HIAMP.</p> <p>All signals to be maintained to highest standard and capable of operating in vehicle-actuation mode</p> <p>Signal timings to be reviewed a minimum of once a year.</p>	<p>Programme of inspections and determination of condition</p> <p>Lifecycle planning leading to 3-10 year forward programme with prioritised annual programming.</p> <p>Predominantly reactive maintenance Minimal intervention to prevent asset deterioration</p> <p>Safety inspections and identified safety defects prioritised according to risk based approach.</p> <p>Likely increase in non-safety defects with potential for increase in third party insurance claims.</p>

If this document is printed or copied it must be treated as an uncontrolled version as it will only be correct at the dates published in the document when it was printed or copied.

## DEVELOPMENT AREA 1: Full Asset Capture

There is currently a lack of complete asset information to enable allocation of assets to levels of service. Once full asset capture is completed this will be a possibility.

## 6. IDENTIFICATION OF NEW ASSETS - DATA CAPTURE

**Table 3: Processes to Identify and Record New Assets**

Asset Type	Level of Service 1 and 2
Traffic Signals	Traffic Signals team to add to database as part of scheme commissioning procedure
Flashing Amber Warning Lights (FAWLS)	Street Lighting team to add to the database and carry out random checks of newly commissioned lights.
Zebras	<u>Development Area 2</u>
Vehicle Activated Signs (VAS) on speed cameras	<u>Development Area 3</u>
Fixed road safety cameras	CREST determine if needs adding to network
Real Time Passenger Information	PTU officers identify sited based on usage and suitability. <b>The process for this can be found in Appendix B.</b>
Car Parking Metres	<u>Development Area 4</u>
Traffic Monitoring Equipment	These are requested as part of a scheme and if a desktop survey identifies a lack of information around a certain area
Weather Stations	This is carried out in house as and when required.
Rising Bollards	<u>Development Area 5</u>
CCTV	<u>Development Area 6</u>

## DEVELOPMENT AREA 2: Zebra Crossing Digitisation

All Zebras need to be recorded within database to allow asset control and lifecycle planning.

If this document is printed or copied it must be treated as an uncontrolled version as it will only be correct at the dates published in the document when it was printed or copied.

### **DEVELOPMENT AREA 3: Speed Camera Digitisation**

Currently limited data on speed cameras. Road Safety to send all digitisation upgrade to traffic signals team.

### **DEVELOPMENT AREA 4: Car Parking Metres in Introduction**

Currently car parking metres are not recorded on our asset management system. These are to be added to the asset management system in a similar way that lighting assets are added.

### **DEVELOPMENT AREA 5: Rising Bollards Introduction**

Rising Bollards are not currently a Derbyshire assets but will become one of Derbyshire's assets within the next 12 months. Once this happens lifecycle planning, inspection and maintenance processes will be incorporated into this document.

### **DEVELOPMENT AREA 6: DHHART (Derbyshire Highways Hub Real Time Information) Project:**

The DHHART project will initiate the use of technology to increase the visibility of the network and improve communications. This will involve the use of Close Circuit TV (CCTV).

## **7. INVENTORY UPDATE AND ASSET CAPTURE**

Electronic traffic management and traffic equipment have already got a fully updated asset inventory.

## **8. AS BUILTS PROCESS AND DATA CAPTURE**

All traffic signals have an as built drawing kept onsite. Development Control processes will support the gathering of new as built information for new developments.

As BUILTs for real time information systems are attached to the internal asset management system. These are split into different sections due to the complexity of the asset.

## **9. INSPECTIONS AND SURVEYS**

The following documents are to be referenced and followed when undertaking any site work:

- [DCC Emergency Information Handbook](#)

### **Traffic Signals Inspections**

Traffic Signals assets are inspected twice yearly to ensure they remain safe for public use. The inspections also provide the data required to support good asset management practice. Inspections are conducted by a number of methods:

- visually by the inspector with evidence gathered using photographs
- electronic testing

### **DEVELOPMENT AREA 8: Increasing Inspections**

Non signals electronic traffic equipment is not currently inspected regularly. Derbyshire would aspire to inspect these assets annually.



The procedures to complete an inspection of traffic signals by these methods and to input the resultant data are found in [Appendix B](#). Non signals electronic traffic equipment will have procedures written once [Development Area 8](#) is instigated.

### **Speed Camera Inspections**

Speed cameras are inspected on rolling basis annually by the camera provider. Power issues for these are reported to the relevant council. Housing units are also included in these inspections.

### **Permanent Traffic Monitoring Site Inspections**

The current process map for inspecting permanent sites can be found in [Appendix B](#). Inspections cover checks on all equipment including SIM cards.

### **Car Parking Metre Inspections**

The inspection of car parking metres is currently managed by district and borough councils. See [Development Area 9](#).

#### **DEVELOPMENT AREA 9: Car Parking Metre Inspections**

Derbyshire would like the inspection of car parking metres brought in house.

#### **DEVELOPMENT AREA 10: One Single Asset Management System**

Derbyshire would like to move to just using one system for storing signals and traffic monitoring data.

### **Highway Infrastructure Asset Safety Inspections**

Safety inspections are undertaken by Highway Inspectors and are designed to identify, assess, record and prioritise the repair of identified safety defects which may present an immediate danger or significant inconvenience to users of the highway. The information detailing the processes involved in completing safety inspections and the risk based approach to safety defect assessment and repair are detailed in the [Highway Infrastructure Asset Safety Inspections Manual](#).

The Inspections Manual acknowledges that the Highway Inspectors do not possess the specialist knowledge required to risk assess any safety defects identified. Therefore the process allows for an initial make safe situation with all defects forwarded to the Traffic Signals section for risk assessment and prioritisation for reactive repair.

### **Commissioning Inspection /equipment**

At the point where a new electronic traffic equipment asset has been identified an initial inspection will be undertaken. The information gathered will depend on the asset type. For traffic signals [Appendix B](#) shows the desired process if [Development Area 10](#) is implemented. [Appendix C](#) is the relevant forms that need to be completed during commissioning inspections. For traffic monitoring equipment, information relating to new assets is provided to the strategy scheme on completion.

### **Enquiry/Adhoc Inspection**

As a result of a highway safety inspection requesting investigation into a recorded safety defect or due to a customer enquiry, an adhoc inspection may be undertaken of an electronic traffic management asset. The inspection includes the entire asset.

If this document is printed or copied it must be treated as an uncontrolled version as it will only be correct at the dates published in the document when it was printed or copied.

The following document should be followed:

- Traffic Management and Management of Electronic Traffic Equipment Procedures for dealing with calls reporting Traffic Signal issues See [Appendix B.](#)

### **DEVELOPMENT AREA 11: Timings of Inspections**

A rolling programme of inspections is required to take into account customer enquiries regarding the signal timings and to ensure reviews of AM and PM peak times take place.

#### **Traffic Control Maintenance Technician Inspection**

An inspection is conducted by the Authority's maintenance technician on an annual basis.

The inspection regime follows the [Management of Electronic Traffic Equipment A Code of Practice \(22 September 2011\)](#) and [Design Manual for Roads and Bridges TD24.](#)

The output from each inspection is an inspection record sheet kept in the site maintenance files and are held by the Traffic Control Section – any faults identified are attended to under the reactive maintenance procedure and an overall assessment score is stored within the Signals Database lifecycle planning program.

This process covers signals only.

#### **Maintenance Contractor Engineer Inspection**

An inspection is conducted by the Authority's maintenance contractor's engineer on an annual basis.

The inspection regime follows the [Management of Electronic Traffic Equipment A Code of Practice \(22 September 2011\)](#) and [Design Manual for Roads and Bridges TD24.](#)

The output from each inspection is an inspection record sheet kept in the site maintenance files and are held by the Traffic Control Section – any faults identified are attended to under the reactive maintenance procedure and an overall assessment score is stored within the Signals Database lifecycle planning program.

This process covers signals only.

#### **Electrical Testing Inspection**

Every site is tested for electrical safety on a 5 yearly basis. Records are kept in the site maintenance file in the Traffic Control office. Assets covered by electrical testing also include solar and wind powered assets. Street Lighting electricians will be carrying out electrical testing on the assets not currently tested via the external contract.

### **DEVELOPMENT AREA 12: Electrical Testing Contract**

When the electrical testing contract is due for renewal consideration could be given to adding in all TM electrical assets to the testing regime. Consideration could be given to increasing the inspections to at least every 5 years.

#### **Other Inspections**

Specific surveys are undertaken if needed to supplement the inspection data where an inspection identifies particular issues potentially needing attention. Sites for further

If this document is printed or copied it must be treated as an uncontrolled version as it will only be correct at the dates published in the document when it was printed or copied.

inspection are identified from the condition information detailed in the Periodic Inspection Data. Derbyshire technicians carry out site inspections on our permanent traffic monitoring equipment. Derbyshire also carry out online diagnostics of asset traffic monitoring equipment to show condition data. Derbyshire also commission external surveys and inspections of our traffic monitoring equipment.

### **DEVELOPMENT AREA 13: Remote Monitoring**

There are certain assets that are remotely monitored. These include traffic signalled junctions and crossings. There is a need to upgrade the systems to enable remote monitoring to be cloud based.

### **Real Time Traffic Information Sites Inspections**

Real time traffic information sites are inspected on a regular basis by both the installing and manufacturing contractor. These inspections are covered by our warranty period with the providers. In the event of a road traffic accident which has affected a site then the DNO electrical contractor would inspect the site. The process map for this can be found in Appendix B.

### **Weather Station Maintenance Inspections**

Weather station have an annual maintenance inspection by an external company.

## **10. ASSET CONDITION AND ASSESSMENT**

### **Condition**

The County Council monitor and record the condition of the asset through:

- The inspections as part of the maintenance and inspection element of the managing/maintenance contract
- Equipment age
- Equipment functionality (fitness for purpose)
- Compliance with latest standards and legislation

### **Assessment**

#### **Traffic Signals Assessment**

Any faults identified in an inspection are attended to and a score provided for consideration in relation to the future renewal programme. Some sites (approximately 150) are equipped with remote fault monitoring.

In general, the condition assessment is an amalgamation of the above reports and observations by the Authority, the equipment supplier, and where applicable, information collected by the managing/maintenance contractor.

Priority in terms of treatment is identified by using a condition score with associated objective commentary. This results in a recommendation of priority for treatment.

### **DEVELOPMENT AREA 14: Increasing Signal Timings Assessments**

Policy states that each set of signals timings is assessed on an annual basis. Given more resource Derbyshire would like to be able to increase the signal timings assessments.

If this document is printed or copied it must be treated as an uncontrolled version as it will only be correct at the dates published in the document when it was printed or copied.

## **Traffic Monitoring Mobile Sites Assessment**

Temporary Mobile Sites are not regularly condition assessed as they are only on site for a limited time. There are various checks included when equipment is installed. Radar units are calibrated when required using a hand held radar gun. This is completed on site. The radar gun is calibrated in house by Derbyshire. If issues arise with the SDR units then they will be sent to the manufacturers once a certain number require intervention. Miovision cameras do not have a specific calibration timescale but issues are raised directly with the provider when required.

## **11. LIFECYCLE PLANNING**

There is an increasing realisation that traffic signal and information systems have become a key element in implementing schemes which will meet Local Transport Plan targets. Thus the equipment population is increasing at an increasing rate. It is therefore essential to ensure that a robust Lifecycle Management Plan is developed for traffic control systems so that revenue investment is allocated to meet the needs identified in the plan.

A simple deterioration model has been applied for lifecycle planning within the Signals Database. Deterioration is affected by a number of factors including quality/type of kit, weathering exposure and amount of traffic usage. The starting score for every asset is 20 and is amended after each inspection. Intervention occurs when an asset reaches a score of 4 – 5.

Lifecycle planning for permanent traffic monitoring equipment is based on a database which records all end of life data using supplier recommended product life. Once equipment reaches the end of its shelf life then the equipment is assessed and the date can be adjusted dependent on condition.

The table overleaf shows lifecycles for all our Traffic Management assets:

**Table 4: Lifecycles of TM assets**

Structure Type	Lifecycle
Traffic Signals	15 – 20 years
Flashing Amber Warning Lights (FAWLS)	10 - 15 years – See <a href="#">Development Area 15</a>
Zebras	11 years – See <a href="#">Development Area 18</a>
Vehicle Activated Signs (VAS) on speed cameras	10 years
Fixed road safety cameras	Not feasible to state as through the digitisation process the cameras have had numerous parts replaced which have extended the lifecycles of the cameras
Fixed road safety camera housing units	Unless damaged these assets are expected to never require replacement
Real Time Passenger Information	10 – 15 years
Car Parking Metres	No current lifecycle planning completed See <a href="#">Development Area 16</a>
Permanent Traffic Monitoring Equipment	10 years
Weather Stations	No current lifecycle planning completed. If inspections raise issues then upgrades are funded by capital funding.

Temporary traffic monitoring equipment is not lifecycle planned and simply serviced/calibrated when required.

Derbyshire consider traffic signals lifecycle planning as a whole asset including the tactile paving, zig zag lines and the entire asset including the loop and the signal head. Derbyshire have identified 100 sites and the methodology to inspect these are included in [Appendix B](#).

#### **DEVELOPMENT AREA 15: Upgrading FAWLS**

FAWLS currently have a lifecycle plan of 10 - 15 years and each asset requires programming annually. Consideration needs to be given to purchasing the software to programme these assets automatically or to hand the control of FAWLS to local schools.

#### **DEVELOPMENT AREA 16: Replacement of Car Parking Metres**

Derbyshire aim to replace all parking metres within the next 5 years to ensure lifecycle planning is feasible.

#### **DEVELOPMENT AREA 17: Upgrading Traffic Monitoring at Weak Bridges**

Derbyshire aspire to upgrade all permanent traffic monitoring equipment on weak bridges to enable monitoring of HGV usage where required. This will involve consultation with structures team to identify potential locations.

## DEVELOPMENT AREA 18: Cross Asset Considerations

Zebra Crossings: A Derbyshire aspiration is to consider the Zebra crossing asset as a whole in terms of replacement including the tactile paving, lines and beacons. As part of this aspiration Derbyshire have identified 100 sites where an annual inspection and upgrade to halo lighting would be improve the service.

### Current Ages of Assets

The table below shows the current age of all the assets:

**Table 5: Asset age**

Equipment	0-5 years	6-10 years	11-15 years	16-20 years	20 years +
Traffic Signals	30	24	28	47	
Pelican Crossing	0	0	0	10	
Puffin Crossing	46	72	96	49	
Toucan Crossing	6	4	6	9	
Pegasus Crossing	1	2	2	2	7
Zebra Crossing	122	46	10	15	46
Permanent Electronic Warning Signs	39	77	54	3	
Mobile Electronic Warning Signs	0	43	24	0	
Flashing Amber Warning Signs		402			
Real Time Passenger Information	136				
Fixed road safety cameras DA *					
Fixed road safety camera housing units	17		12	4	34
Car Parking Metres		9	21	12	
Traffic Monitoring Equipment Miovision Cameras	8				
Traffic Monitoring Equipment SDR units	11	10		24	
Traffic Monitoring Equipment Speed Guns	2			2	
Weather Stations	3			4	

\*The Crest 10 road safety cameras were upgraded in 2017/18 however they do use parts that have been replaced over a number of years which makes it difficult to age the camera's themselves

Gross Replacement Costs are based on similar asset installations in recent years.

## 12. MAINTENANCE PROCESSES

There are three types of maintenance works undertaken:

- (a) **Keeping the Asset Safe (Reactive maintenance):**
  - **Traffic Signals:** is attending to defects and other safety matters that require urgent action arising from inspections or user information in accordance with the locally determined levels of response. The response times for reported incidents are held in the [Highways Infrastructure Asset Safety Inspection Manual](#). Repairs are categorised into immediate and routine faults. Urgent faults are those which could have a significant impact on the travelling public, for example, signals all out, red lamps not working etc. All other faults are classified as routine. Immediate faults should be attended within 2 hours of receipt of the fault report whilst routine faults should be attended within 8 hours. Reactive Maintenance Process Maps can be found in the [Reactive Maintenance Teams Operational Manual](#).
  - **FAWL assets:** the contractor will wait until a number of assets have failed and then charge a day rate to repair them all in one day
- (b) **Real Time Passenger Information:** Maintenance of real-time passenger information sites are commissioned to an external contractor to respond and fix malfunctioning or damaged units. The process map for this can be found in Appendix B.
- (c) **Keeping the Asset Serviceable (Routine maintenance):** Periodic inspections and servicing are required on the traffic signal installation to ensure it is operating safely and efficiently. Each site has the equipment cleaned a minimum of once a year.
- (c) **Maintaining and Improving the Asset (Planned or programmed works) includes the refurbishment programme:** preventative maintenance on a regular basis of the signal installations which includes repair or replacement of all components of lantern assemblies, posts, mast arms, controllers and cabinets, vehicle detection systems and all interconnecting cabling to ensure continued efficient operation. Additionally, it includes a programme of refurbishment that address sites where, due to age or outdated equipment, the future reliability of a site could be at risk. This also includes sites where there is a need to upgrade to improve traffic flows through a junction. On-going replacement needs are driven by age, outdated equipment and deterioration of condition/reliability. Current funding levels allow for the retrofitting of LED units onto existing equipment. Site around 12 years old do not benefit from this as the anticipated 20 year lifecycle does not make it viable. The refurbishment programme will include a review of whether the traffic signals are still required. Refurbishments consist of industry standard equipment based on type and layout of asset.

### DEVELOPMENT AREA 20: Development of Planned Works Process Maps

Planned works process maps are currently under review and need to be developed in the future.

All maintenance of car parking metres is split across districts. There is an external contract for Chesterfield metres, Derbyshire Dales maintain Bakewell metres and High Peak maintain Buxton and Castleton.

Maintenance of traffic monitoring tubes is dealt with by an external contractor.

If this document is printed or copied it must be treated as an uncontrolled version as it will only be correct at the dates published in the document when it was printed or copied.



### 13. BACKLOG

**Table 6: Traffic Signals Backlog**

Year	Number of assets due for replacement/refurbishment	Amount required (£)
Year 1 (2018 work not completed)	9	£580,000
Year 2 (19/20)	6	£655,000
Year 3 (20/21)	13	£780,000
Year 4 (21/22)	13	£780,000
Year 5 (22/23)	8	£780,000
Year 6 (23/24)	10	£780,000

#### DEVELOPMENT AREA 21: Calculating the FAWLS Backlog

This information is still to be captured.

#### Traffic Monitoring Equipment Permanent Sites

This is based on replacing equipment after 10 years. However, year 1 does have a number of sites that are older than 10 years. Lifecycle planning for these assets allow for a condition assessment at 10 years and then the lifespan can be extended if suitable. The backlog is based on the replacement of the recorder only.

**Table 7: Traffic Monitoring Equipment Permanent Sites Backlog**

Year	Number of assets due for replacement	Amount required (£)
Year 1	8	£10,000
Year 2	3	£2950
Year 3	18	£21,300
Year 4	69	£75,850
Year 5	15	£12,750

Lifecycle planning does not take place for Traffic Monitoring equipment at temporary sites and therefore backlog cannot be calculated.

Derbyshire are unable to specify costs for car parking metres at this point in time as this differs according to which district or borough are responsible. Once [Development Area 4](#) is implemented this will then be possible.

As referred to in [Development Area 18](#) Derbyshire plans to look at the asset as a whole as opposed to individual parts of the assets. For example, traffic signals will look at the whole installation including the signal equipment, white lining and tactile paving.

#### DEVELOPMENT AREA 22: Completing the Asset Database and Inspection Assessment in the Asset Management System

It is planned that the asset database and inspection assessments will be implemented within the Asset Management System before the end of the year. This will allow for the collection of the desired costings broken down to network hierarchy level. This will also allow Derbyshire to specify projected funding requirements.

If this document is printed or copied it must be treated as an uncontrolled version as it will only be correct at the dates published in the document when it was printed or copied.



## 14. VALUE MANAGEMENT/ENGINEERING APPROACH

### DEVELOPMENT AREA 23: Adopting a Value Management/Engineering Approach

Derbyshire would like to adopt a value management approach whereby we take into account the benefits of undertaking maintenance and the risks of not undertaking maintenance which then provides a prioritised list for Value Engineering to ensure we choose the optimal solution to ensure maintenance need is met while reducing waste and inefficiencies.

## 15. CROSS ASSET CONSIDERATION

When considering financial requirements Derbyshire will consider allocating budget to those assets that require more financial input regardless of where the money was originally allocated.

## 16. FORWARD PROGRAMME

A forward works programme of 5 years has been maintained and is published on the [Derbyshire website](#). This is updated annually based on more current information about the asset and of other schemes which may affect the asset and is therefore subject to change at this point.

Potential schemes are identified and prioritised using a variety of data: Condition assessment records, requirements for new facilities, maintenance issues raised by Maintenance Contractor and knowledge of other schemes which may affect the programme.

The prioritisation of the schemes identified within the forward programme will be determined annually by available budget, condition and risk.

Rationalisation of current FAWL assets is to take place over the next few years to inform a new maintenance contract.

## 17. ANNUAL PROGRAMME

The first year of the 5 year forward works programme forms the annual programme.

The programme is decided the previous year for all asset groups and at this point it provides some opportunity for co-ordination of works. Larger schemes which encompass several asset groups naturally lead to better co-ordination.

## 18. RISK REGISTER

A risk can be defined as an uncertain event which influences the desired performance of an asset. A risk factor is the produce of the severity of an event and the likelihood of its occurrence. Derbyshire County Council has a well-established risk management process that overarches all service areas.

The risk management process concentrates on four main issues, by applying these risk management principles, the council will be able to more appropriately target resources and to deliver services and projects in a way that ensures the council's overall exposure to risk is minimised.

The risk register overleaf identifies risks and appropriate mitigation measures:

If this document is printed or copied it must be treated as an uncontrolled version as it will only be correct at the dates published in the document when it was printed or copied.

**Table 8: Risk Register**

A. Strategic

<b>Identify Risks</b>	<b>Evaluate Risk</b>	<b>Manage Risk</b>
Understanding the Asset	Sound understanding and records of existing assets are in place	Maintain existing systems to manage risk
Budget Concerns	The absence of relevant finances will lead to deterioration and compromises the safety on the networks	Budget management and apply for additional funding where feasible Lifecycle planning Budget Management
Changes to Traffic	Changes to traffic patterns and the usage of road may alter network prioritisation of asset stock	Pre-empt network changes or travel patterns at the design and planning stages
Climate Change	Increase in the rate of replacement of existing assets	Analysis of existing asset stock to establish the need for the asset Rationalisation exercise of assets to consider future asset reduction

If this document is printed or copied it must be treated as an uncontrolled version as it will only be correct at the dates published in the document when it was printed or copied.

B. Operational

Identify Risks	Evaluate Risk	Manage Risk
Increase in cyclist movements, resulting in more crossings required to be cyclist friendly	Increase in potential conflict of different types of road user. Increase of asset stock incurring additional maintenance costs.	Apply mitigating measures to reduce conflict. Promote education of road safety. Install crossings where appropriate and justified.
Utility activity physically damaging asset	Ambiguous operation of signals to all users. Downtime of signal stock. Additional costs associated with repairs.	Appropriate noticing of temporary works to enable liaison of personnel. Installation of new signal assets remote from utility apparatus.
Increase to asset stock due to developments and safety schemes	Increase in maintenance and energy costs.	Ensure appropriate funding in place both from revenue and commuted sums.
Balancing increasing demands and delays at signalised locations	Unnecessary delays causing driver frustration. Negative financial impact on economy.	Annual inspection of signals at peak times to ensure correct strategy of control in place. Appropriate funding in place to achieve lifecycle requirements.
Increase in energy costs	LED reduces energy use by approximately 60%	Cost to change all signal heads to LED technology

If this document is printed or copied it must be treated as an uncontrolled version as it will only be correct at the dates published in the document when it was printed or copied.

**DEVELOPMENT AREA 24: Adding All Signals Risk Assessments to the Entire Resilient Network**

Traffic Signals are to update risk assessments to include the entire resilient network and whether temporary signals need to be erected on site when permanent lights fail.

**19. COMPETENCY AND TRAINING**

The Council's maintenance technician is trained in operation of all types of signals and also in the use of a handset for interrogation of the controller equipment. The maintenance contractor's engineer is also electrically trained.

All competency and training requirements are based on the HERs competency framework which is referenced in [Appendix D](#) and managed through the Derbyshire County Council MyPlan system.

**20. PERFORMANCE MANAGEMENT FRAMEWORK**

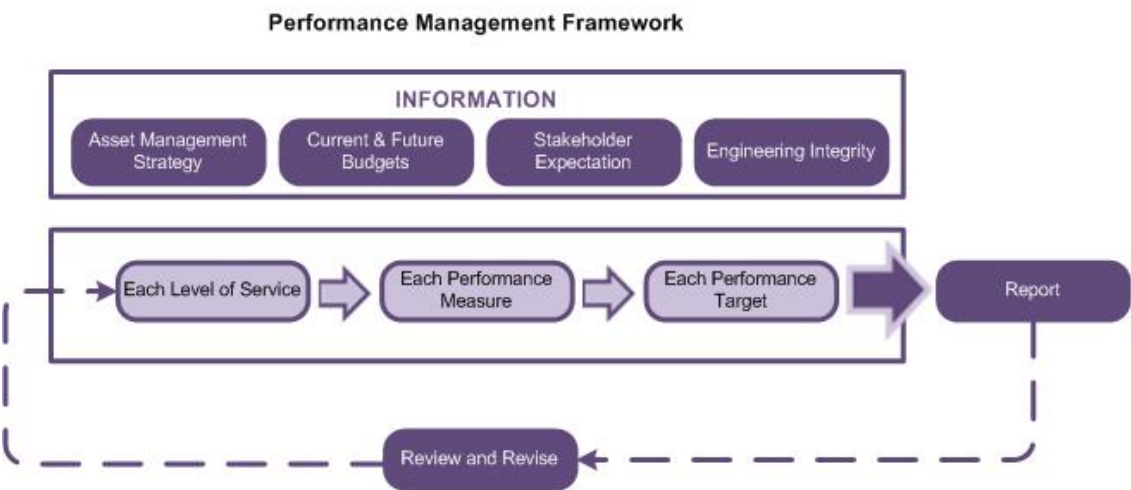
The Performance Framework is used as a tool to inform, measure, review and drive the management and decision-making processes associated with implementing corporate changes and day-to-day decisions relating to the delivery of services, linked to the network hierarchy. The figure below shows the performance management framework.

It is not intended that the Council creates a host of measurements that serve little purpose other than to demonstrate the presence of a framework. At any level, external-facing performance measures should show how well services are being delivered and whether objectives are being achieved.

Internally, a range of input and output measures may be used for monitoring purposes but the key indicators should reflect performance in key service areas to inform senior managers as well as corporate and stakeholders of the service as a whole.

The Performance Management Framework diagram is shown overleaf:

**Diagram 2 Performance Management Framework**



The table overleaf shows the performance measures and targets for traffic management.

If this document is printed or copied it must be treated as an uncontrolled version as it will only be correct at the dates published in the document when it was printed or copied.

**Table 9: Performance Measures and Targets**

Performance Measure	Level of Service 1 and 2 Targets
<b>Safety Performance Measures</b>	
Percentage of condition inspections completed with tolerance levels (monthly)	100%
Percentage of traffic signals faults resolved in a single visits	100%
Percentage of urgent signal reports responded to within 2- 8 hours between 6am – 8pm	100%
Percentage of non urgent signal reports responded to within 8 hours of notification	100%
<b>Serviceability Performance Measures</b>	
Average overall repair time for all electronic traffic equipment	3 months
<b>Sustainability Performance Measures</b>	
Backlog	Part of <u>Development</u> <u>Area 21</u>
% as-builts provided and inventory updated	100%
<b>Customer Service Performance Measures</b>	
NHT % of residents satisfied with reliability of electronic display information PTBI 19	58%
NHT % of residents happy with the provision of public transport information PTBI 20	58%

## 21. COMMUNICATIONS

This section is relevant for all plans therefore should it be separate: covered under the [Highways Communications Plan](#).

## 22. CLIMATE CHANGE ADAPTION AND CIVIL EMERGENCIES AND SEVERE WEATHER EMERGENCIES PLANS

All plans relating to this area of work are included on the [Derbyshire Prepared](#) website and Derbyshire have taken or are taking action against all of the recommendations raised in the 2009 3 Counties Alliance Partnership The Effects of Climate Change on 3CAP's Highway Network Policies and Standards.

The corporate climate change manifesto can be found [here](#).

## 23. HERITAGE AND CONSISTENCY WITH CHARACTER

Generic information that will relate to all assets and crosses all HIAM Part 2 documents and therefore are included in the [Highway Network Management Plan](#).

If this document is printed or copied it must be treated as an uncontrolled version as it will only be correct at the dates published in the document when it was printed or copied.

## 24. CARBON REDUCTION

Generic information that will relate to all assets and crosses all HIAM Part 2 documents and therefore are included in the corporate [Carbon Reduction Policy](#).

## 25. ENVIRONMENTAL IMPACT, NATURE CONSERVATION AND BIODIVERSITY

Generic information that will relate to all assets and crosses all HIAM Part 2 documents and therefore are included in the [Highway Network Management Plan](#).

## 26. SUPPLY CHAIN COLLABORATION AND COLLABORATION IN SERVICE DELIVERY

### Term Maintenance Contract

Works on this asset group are impacted by considerations relating to normal traffic sensitive conditions. Therefore, the target is to ensure that this asset will always be in full working order for the peak traffic times, or will be replaced with a suitable temporary replacement.

Framework agreements are in place for the procurement of traffic signal retention sockets.

### DEVELOPMENT AREA 25: New Framework for Signal Equipment Provision

Consideration needs to be given to creating a framework agreement for the supply of signal equipment for routine repairs by internal workforce.

Derbyshire have an external contract for provision and maintenance of traffic monitoring tubes.

## 27. DELIVERY

Electronic Works on the highway are delivered by a combination of external contractors and in-house services.

## 28. PROCUREMENT

Derbyshire use a variety of suppliers according to service need and locality requirements. We have an in-house service provider for construction works and we also use external providers which are sourced via a framework system.

### DEVELOPMENT AREA 27: Creating road materials policy

Derbyshire would like to create a Road Materials Policy which states what should be used on different sections of the hierarchy. This should be referenced in all procurement documents.

## 29. OPERATIONAL POLICIES

Operational Policies are covered in the [Highway Network Management](#)

### 30. APPENDICES

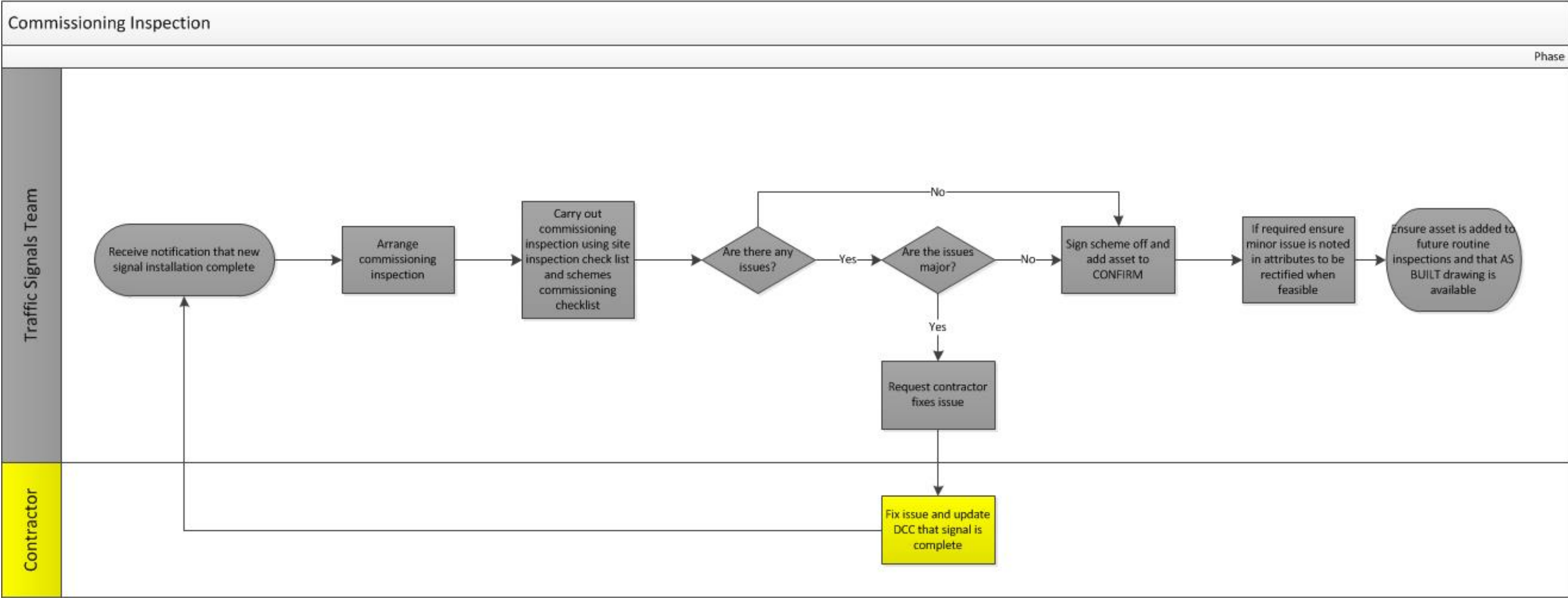
#### APPENDIX A: DEVELOPMENT AREA SUMMARY

Table 10: Development Area Summary

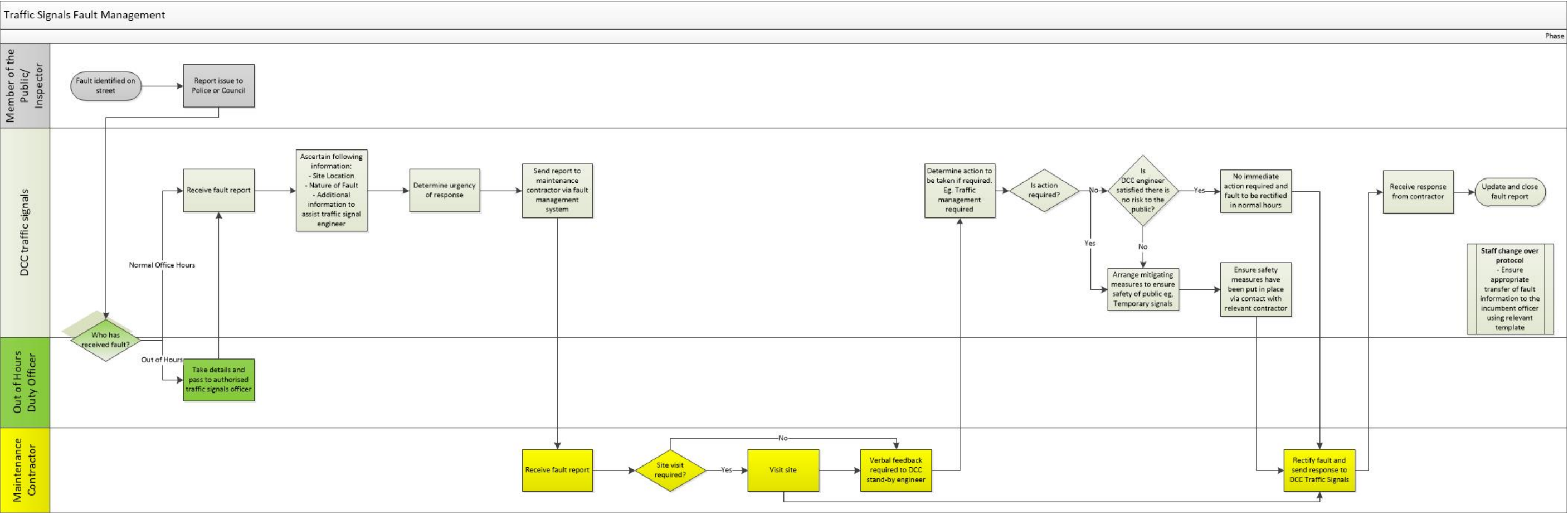
Development Area Number	Development Area Title	Action Taken
1	<u>Full asset capture</u>	
2	<u>Zebra Crossing digitisation</u>	
3	<u>Speed camera digitisation</u>	
4	<u>Car parking metres introduction</u>	
5	<u>Rising bollards introduction</u>	
6	<u>DHHART (Derbyshire Highways Hub Real Time Information) Project:</u>	
7	<u>Permanent sites inspections using the internal Asset Management System</u>	These will now be included in the new traffic signals management system and feed into the departmental asset management system
8	<u>Increasing inspections</u>	
9	<u>Car park metre inspections</u>	
10	<u>One single asset management system</u>	
11	<u>Timings of inspections</u>	
12	<u>Electrical testing contract</u>	
13	<u>Remote monitoring</u>	
14	<u>Increasing signal timings assessments</u>	
15	<u>Upgrading FAWLS</u>	
16	<u>Replacement of car parking metres</u>	
17	<u>Upgrading traffic monitoring at weak bridges</u>	
18	<u>Cross asset considerations</u>	
19	<u>Amendments to traffic signals maintenance contract</u>	The new contract now includes specific timings for repairs
20	<u>Development of Planned Works Process Maps</u>	
21	<u>Calculating the FAWLS backlog</u>	
22	<u>Completing the asset database and inspection assessments in the Asset Management System</u>	
23	<u>Adopting a value management/engineering approach</u>	
24	<u>Adding all signals risk assessments to the entire RN</u>	
25	<u>New framework for signal equipment provision</u>	
26	<u>Procuring an external contract for traffic monitoring tubes</u>	Derbyshire have now procured a new contract which allows multiple providers to supply and monitor our traffic monitoring tubes.
27	<u>Creating a road materials policy</u>	

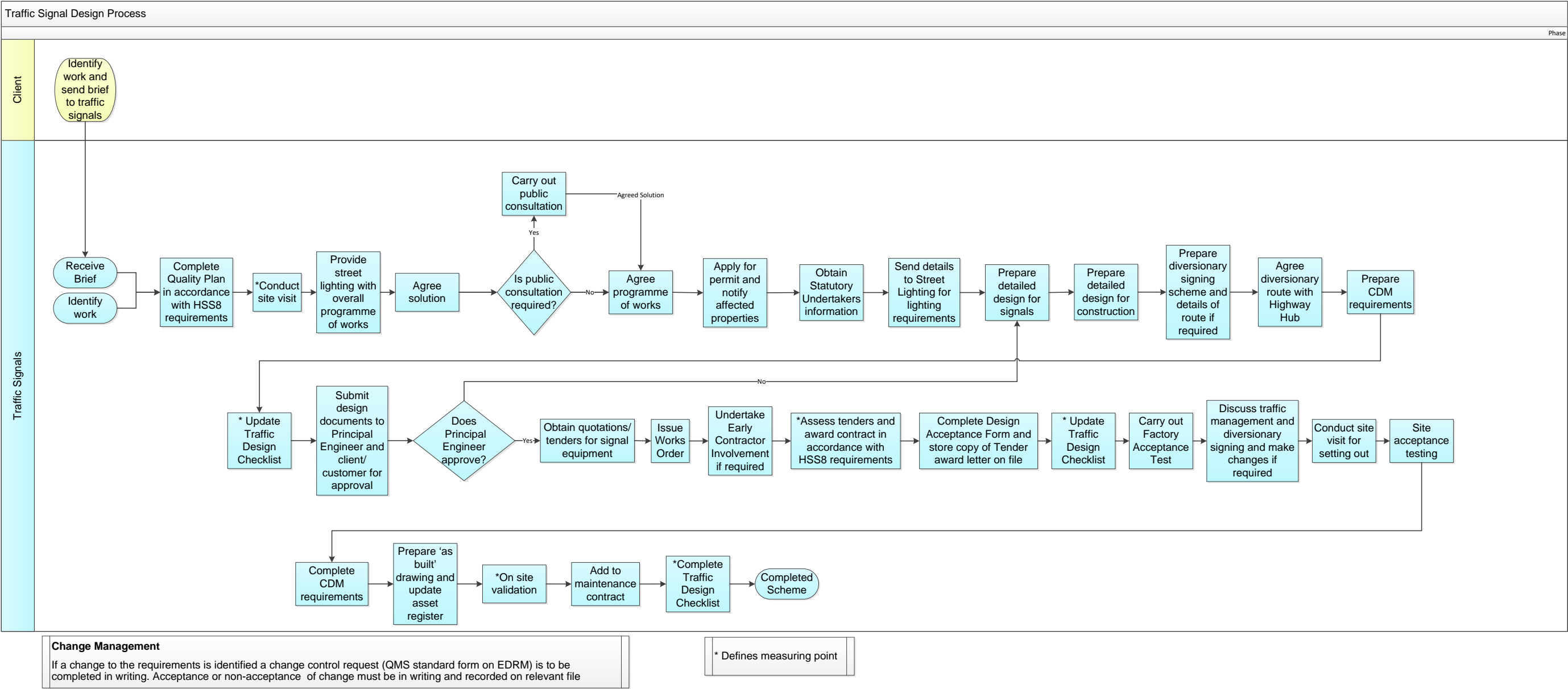
If this document is printed or copied it must be treated as an uncontrolled version as it will only be correct at the dates published in the document when it was printed or copied.

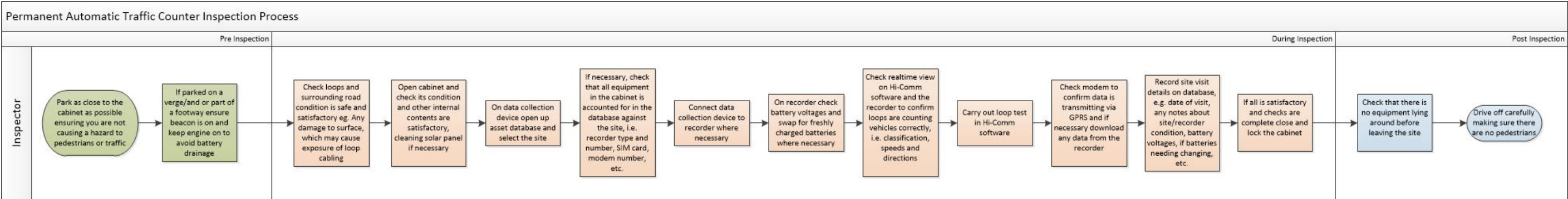
APPENDIX B: PROCESSES

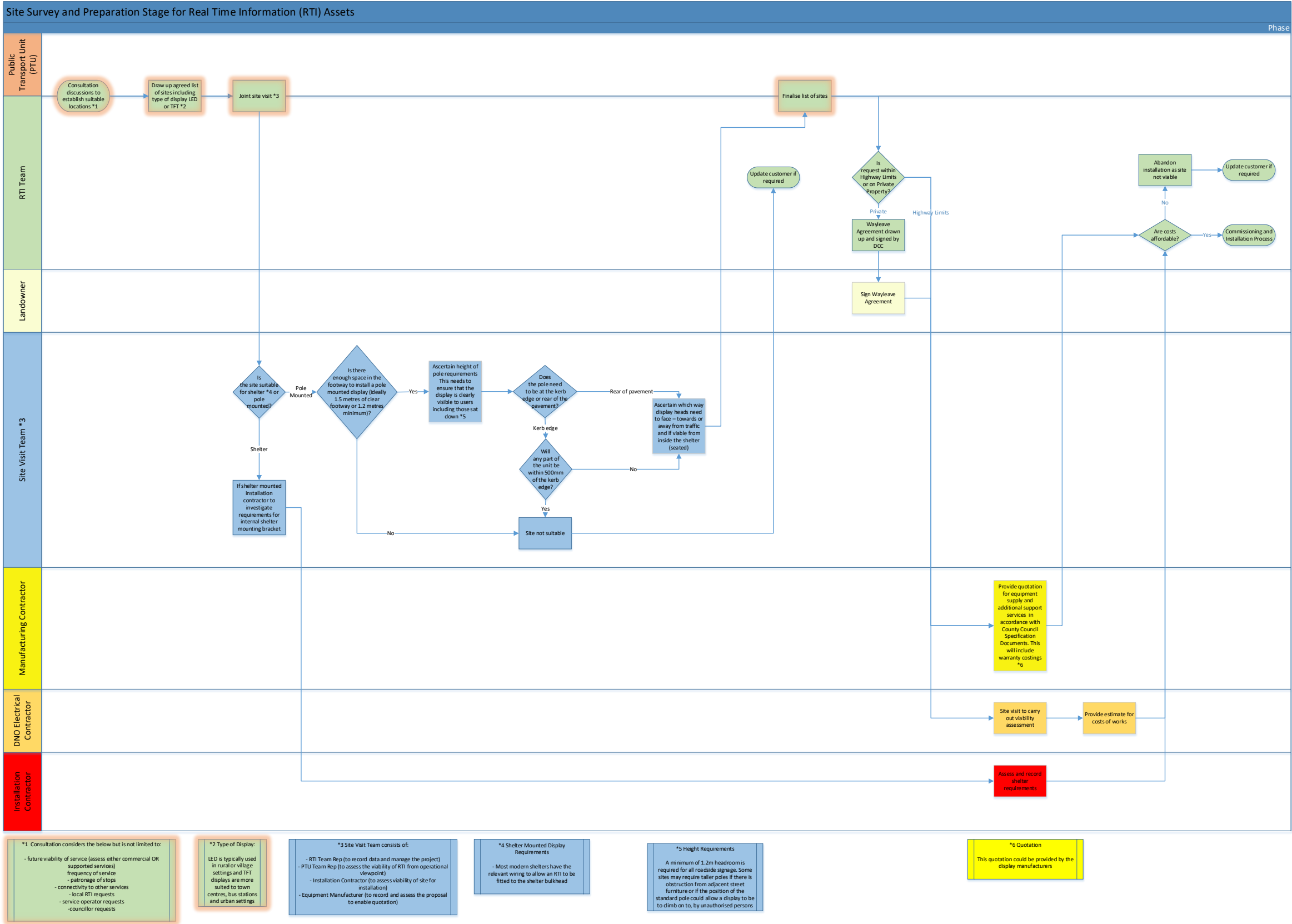


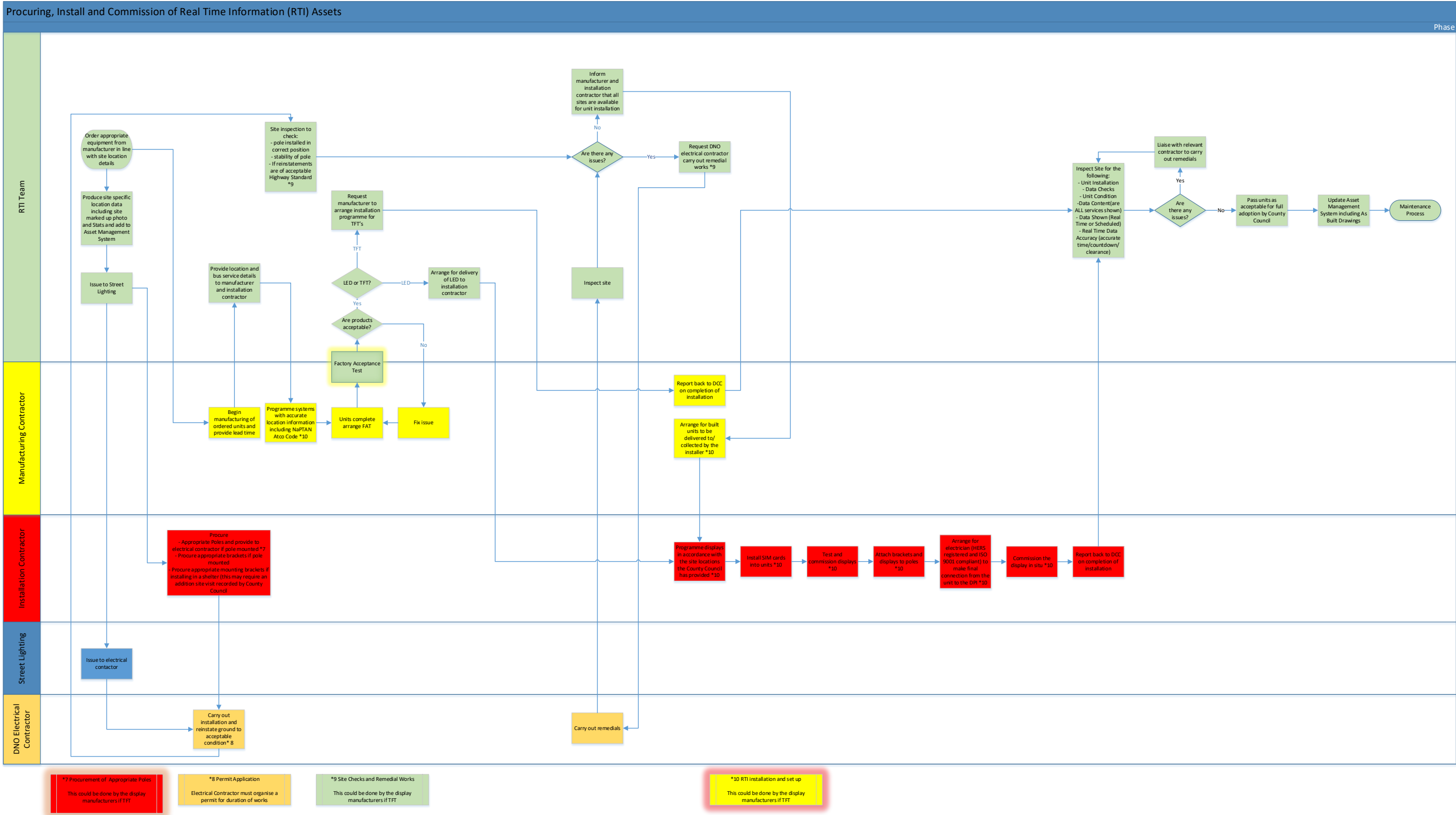


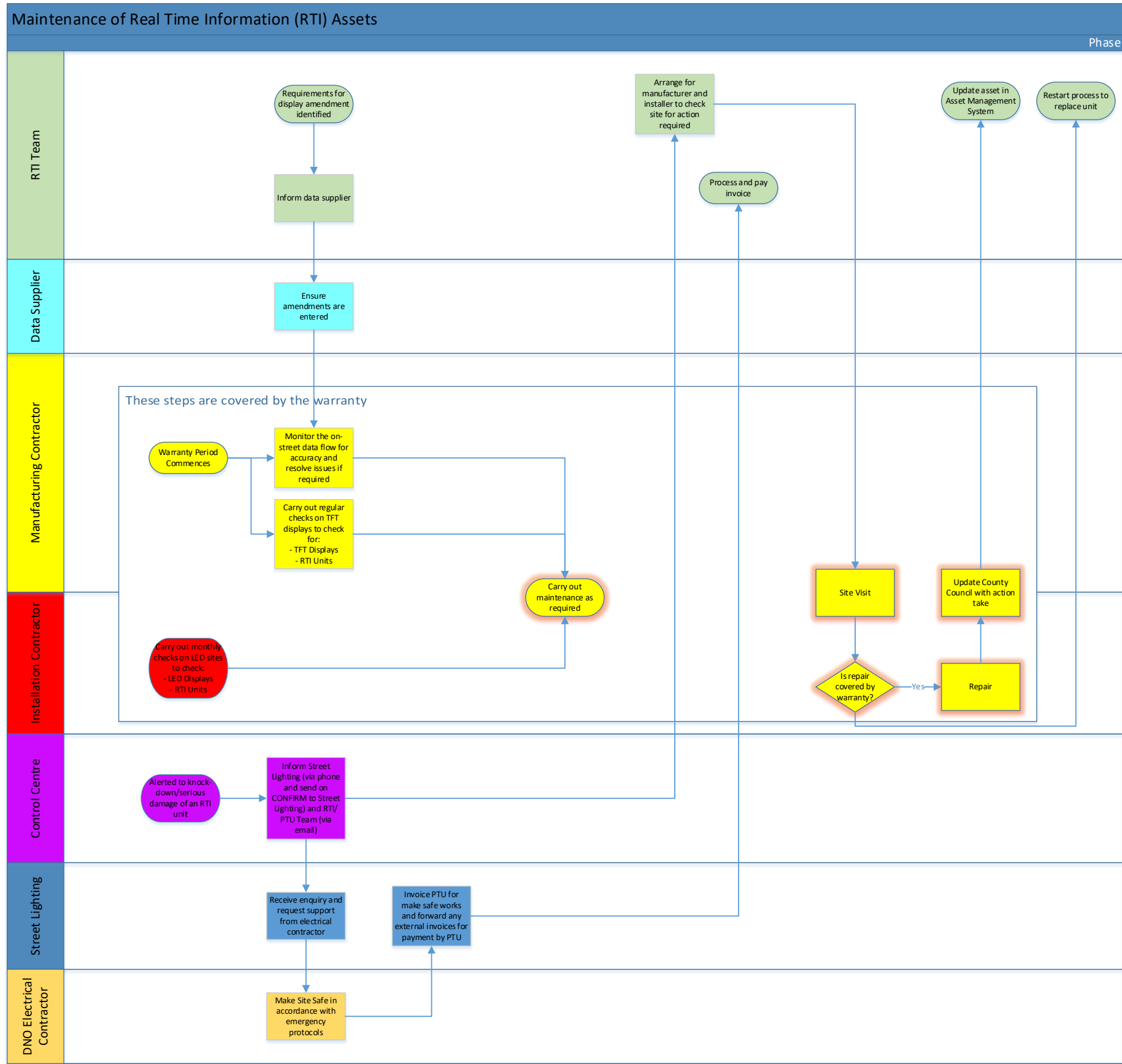












If this document is printed or copied it must be treated as an uncontrolled version as it will only be correct at the dates published in the document when it was printed or copied.

**APPENDIX C: COMMISSIONING INSPECTION FORMS**

<b>Site Location:</b>		<b>Site Reference:</b>	
<b>Serial Number:</b>		<b>Configuration No:</b>	
<b>Street Furniture</b>		<b>General</b>	
Correct heads/box signs	<input type="checkbox"/>	Correct height PBs	<input type="checkbox"/>
Correct Phase Locations	<input type="checkbox"/>	Correct height heads	<input type="checkbox"/>
Heads Aligned	<input type="checkbox"/>	Sufficient Green Times	<input type="checkbox"/>
All Lamps Lit	<input type="checkbox"/>	Sufficient Intergreens	<input type="checkbox"/>
MVD/IR alignment	<input type="checkbox"/>	OMU phase/detector	<input type="checkbox"/>
Correct loops/location	<input type="checkbox"/>	Location documents	<input type="checkbox"/>
LV push buttons	<input type="checkbox"/>	Phone line number	<input type="checkbox"/>
Tactiles/audible	<input type="checkbox"/>	Electrical tests	<input type="checkbox"/>
Correct Legends	<input type="checkbox"/>	Solar Cell/Dimming	<input type="checkbox"/>
All equipment secured			
- Head	<input type="checkbox"/>		
- Push buttons	<input type="checkbox"/>		
- Controller	<input type="checkbox"/>		
Earthing – doors/push buttons	<input type="checkbox"/>		
Lockable isolator in pillar controller	<input type="checkbox"/>		
Red Lamp Monitoring	<input type="checkbox"/>		
Green Conflicts	<input type="checkbox"/>		
Wiring tidy	<input type="checkbox"/>		
Correctly labelled wiring	<input type="checkbox"/>		
Detectors labelled/working	<input type="checkbox"/>		
Correct Detection wiring	<input type="checkbox"/>		
Correct IOP positions	<input type="checkbox"/>		
Base Sealed	<input type="checkbox"/>		
Log Book/Spec/Drawing	<input type="checkbox"/>		
SA/SD working	<input type="checkbox"/>		
<b>Signed:</b>		<b>Authority:</b>	
<b>Position:</b>		<b>Date:</b>	

**Site Acceptance Checks (Traffic Signals Equipment)**

Site:	Date:	Installer:	Controller:
	Engineer:		Serial No:
Item	Check	✓	* Comments
	<i>signal poles</i> : grommets in unused holes		
	<i>signal poles</i> : cables glanding / earthing		
	<i>signal poles</i> : pole caps secure		
	<i>signal poles</i> : stub pole caps		
	<i>signal heads</i> : illumination of all lamps / box signs		
	<i>signal heads</i> : correct aspects		
	<i>signal heads</i> : damage to reflectors		
	<i>signal heads</i> : correct brackets / extension arms / clearance		
	<i>signal heads</i> : aligned / secure		
	<i>signal heads</i> : backing boards / white strips secure		
	<i>signal heads</i> : hoods (P&S) / louvers		
	<i>signal heads</i> : operation		
	<i>push-button units</i> : secure / correct angle		
	<i>push-button units</i> : correct 'WAIT' legends		
	<i>push-button units</i> : ELV / clearly labelled		
	<i>push-button units</i> : earth connections		
	<i>push-button units</i> : beepers / volume		
	<i>push-button units</i> : tactile units secure / earthed		
	<i>push-button units</i> : tactile units rotate freely		
	<i>signal controller</i> : case secure		
	<i>signal controller</i> : main fuse / breaker rating		
	<i>signal controller</i> : spare cores earthing		

If this document is printed or copied it must be treated as an uncontrolled version as it will only be correct at the dates published in the document when it was printed or copied.

	<i>signal controller</i> : cables labelling / tidiness		
	<i>signal controller</i> : Time & Calendar, BST adv. / rtd., week		
	<i>signal controller</i> : base seal		
	<i>signal controller</i> : condensation		
	<i>signal controller</i> : DFM lamp / lens		
	<i>signal controller</i> : detector packs labelling		
	<i>signal controller</i> : paper-work		
	<i>signal controller</i> : keys		
	<i>cabling</i> : spare capacity		
	<i>cabling</i> : spare in controller / chambers		
	<i>cabling</i> : draw ropes		
	<i>electricity supply</i> : cut out rating		
	<i>electricity supply</i> : fuse rating		
	<i>electricity supply</i> : auxiliary isolator / breaker		
	<i>street detection</i> : position / shape / backfill		
	<i>street detection</i> : sensitivity		
	<i>street detection</i> : MVD alignment		
	<i>operation</i> : illumination of lamps as phase requirements		
	<i>operation</i> : detectors demand / extend / gap-out		
	<i>operation</i> : suitability of intergreens		
<b>Item</b>	<b>Check</b>	<b>✓</b>	<b>* Comments</b>
	<i>operation</i> : hurry call		
	<i>operation</i> : red lamp monitoring		
	<i>operation</i> : remote link		
	<i>OMU</i> : configuration / operation		
	<i>OMU</i> : TRN lead		
	<i>OMU MOVA</i> : configuration / operation		
	<i>OMU MOVA</i> : detector inputs		
	<i>documentation</i> : signal company specification		
	<i>documentation</i> : take-over certificate		
	<i>documentation</i> : electrical test certificate		
	<i>documentation</i> : detector loop test certificate		
	<i>documentation</i> : cabling details		

#### APPENDIX D: HERS COMPETENCY REQUIREMENTS

The HERS competency requirements can be found [here](#).