

Resilience network plan

Contents

1.0 Executive summary.....	2
1.1 Introduction.....	2
1.2 Background	3
1.3 Objectives.....	4
2.0 Agencies involved	5
2.1 The network	1
2.2 Cross boundary resilience	2
2.3 Key attributes on the network	3
3.0 Preparations for an event.....	4
3.1 Weather alert hierarchy	4
3.2 Emergency response.....	6
3.3 Emergency contact details	7
3.4 Highways drainage	7
3.5 Winter service.....	11
3.6 Structures	13
3.7 Embankments	14
3.8 Carriageway condition	14
3.9 Trees	15
4.0 Traffic management.....	15
4.1 Traffic management command and protocol	16
4.2 Highways England diversion routes	17
4.3 A-route diversions	17
4.4 Bridge diversion.....	17
4.5 Diversions for remaining network	17
5.0 Testing and Review	17
6.0 Protocol.....	18
6.1 Protocol agreed by	18
6.2 Amendments to the strategy and network	18

1.0 Executive summary

- This report details our strategy to achieve a defined highway network that is resilient to incidents of severe weather.
- We've defined our resilience highway network as the key strategic routes that:
 - enable the borough's economic activity to continue during extreme weather events
 - ensure connectivity with the key neighbouring authority's network, its major transport and food hubs, hospital, and emergency services infrastructure
- The Resilient Network includes links to:
 - the M1
 - London Luton Airport
 - public transport hubs
 - major supermarkets
 - emergency service centres
 - hospital
 - major utility infrastructure
 - major Industrial and business parks
- The Resilient Network should be resilient to:
 - flooding caused by 1:100 year storms
 - snow, fall of up to 2 cm per hour
 - extremities in heat of temperatures of in excess of 35 degree centigrade
- Resilience is about ensuring recovery of this network within space of time that allows normal service resumption as quickly as possible. This has been defined as **two hours from cessation of the event**.
- We have access to the latest forecast data and radar to monitor rain fall, and snow utilising this data to co-ordinate the services response to a severe weather event.
- We have procedures and personnel in place to respond to any emergency as a result of severe weather including an out of hours call centre, standby officer, and contractor response.
- Our Highways Service has reviewed our **highway infrastructure asset maintenance plan** (HIAMP) as a response to the risk-based approach prescribed in the new code of practice: [well managed highway infrastructure](#). As part of this review, Luton's Highways Service has aligned its inspection and maintenance strategies to achieve resilience by restoring this network to serviceability within 2 hours of the cessation of the event.
- We'll develop a **capital works programme** to alleviate flooding and ensure this network is resilient to weather events.
- Other parties such as Thames Water and the Environment Agency are engaged to resolve flooding issues, as often the flooding is as a result of flooding to a sewer capacity or problem or rivers.
- Traffic management plans have been formulated to manage traffic flows due to any disruption caused by an event to the Resilient Network.
- A communications plan is in place to highlight disruption, impact and the network to members of the public and the key stakeholders

1.1 Introduction

We've defined our **resilience highway network** as the key strategic routes that:

- enable the borough's economic activity to continue during extreme weather events
- ensure connectivity with:
 - the key neighbouring authority's network
 - major transport and food hubs

- hospital
- emergency services infrastructure

The network encompasses Luton’s principal, classified and traffic sensitive routes

Luton’s highway network has a critical role in ensuring a thriving economy. Luton has some of the key transport infrastructure within the East of England. The town is served by two junctions of the M1, and is home to London Luton Airport, the fifth largest airport in Britain. There are also three mainline train-line stations that have direct links into London within 25 minutes.

The report by Climate UK for creating and managing resilient local highways states:

“...highway infrastructure improvements require long term planning; significant financial investments are expected to operate decades into the future. It is essential for highway authorities to build climate change into the decision making process for major schemes and routine maintenance activities.”

The report cites the reasons for taking action now are:

- **economic growth:** a resilient and reliable transport network is essential for local economy and future growth
- **reputation:** maintain or enhance the council’s reputation and avoid adverse publicity through infrastructure failure
- **duty:** the Local Transport Act 2008 placed a duty on local transport authorities to have regard to the government’s adaption policies on their local transport plans

This document details:

- the rationale and objectives for ensuring a highway Resilience Network
- how the network has been defined
- how we’ll ensure resilience from the threat of severe weather

The document forms part of the asset management framework for Luton.

The resilience of a highway network from extremes of weather has been seen increasingly important to ensuring the continued economic activity of towns and cities within the United Kingdom.

As weather becomes more unpredictable, the ability of key strategic routes to withstand periods of flooding, snow, extreme heat and storms has become a priority for our Highway Service as part of our corporate objectives.

1.2 Background

The Department for Transport’s (DfT) resilience review followed periods of flooding in 2013-14 that compromised the capacity of some of the UK’s transport Infrastructure.

The transport review states that:

“The high variability of rainfall in the UK makes trends hard to detect. However, there’s an increasing body of evidence that extreme daily rainfall rates around the world are becoming more intense, and that the rate of increase is consistent with what is to be expected from fundamental physics (i.e. warm air holds more moisture).

There is evidence in the UK that the character of rainfall is changing with very heavy rain becoming more frequent. A rainfall event which might have been expected on 1 in 125 days in the 1960s and 1970s might now be expected once in every 85 days. Very recent research has also

developed a climate model that can reproduce summer storms and suggests increases in the most extreme summer rainfall events.”

1.21 Flood alleviation in Luton

Luton did not experience the severe flooding seen in other parts of the country. However, Luton has not been immune to incidents of flooding.

Luton has worked closely with the Environment Agency and Thames Water to mitigate flooding that it has experienced. There have been significant capital investments to deliver flood alleviation schemes in New Bedford Road, Bushmead Road, Black Swan Lane, Swifts Green Road and Icknield Way.

Together with our partners, we've developed a surface water management plan for Luton and a strategy for managing Luton's drainage assets.

Our Highway Service is continuing to deliver schemes to resolve flooding on the highway; the most recent example seen in Hatters Way.

1.22 Snow and ice

The flooding of 2013 was preceded by three years of severe winters. For the purposes of this network severe weather not only includes periods of intense rain fall, but also wind, prolonged periods of snow and ice, and also extreme heat.

The Department for Transport (DfT) defines resilience in the context of their review. It's described as 'the ability of the transport network to withstand the impacts of extreme weather, to operate in the face of such weather and to recover promptly from its effects'.

For the DfT, 'it's about increasing the physical resilience of transport systems to extreme weather, so when extreme weather is experienced, people and goods can continue to move'.

The DfT recognises that 'it would be both very difficult and prohibitively expensive to ensure total physical resilience, so they state that resilience is also about ensuring processes and procedures to restore services and routes to normal as quickly as possible after extreme weather events have abated'.

1.3 Objectives

- The HIAMP will prescribe the highest priority in terms of inspection and maintenance to the Resilience Network. This will ensure that routes can recover within 2 hours after cessation of a severe weather event to ensure the continued economic activity in Luton.
- Our Highway Service will review its various strategies on an annual basis to mitigate against severe weather events, including the:
 - surface water management plan
 - winter service plan
 - highways drainage plan
- We'll work with our partners to provide a multi-agency approach to:
 - mitigate against the risk of severe weather
 - coordinate the management of Luton's roads during a major incident - this should include detailed communications coordinating structures between key organisations
- This plan will identify the key roles and responsibilities for managing and maintaining the network, protocols, roles and responsibilities for responding to an event
- We'll ensure the provision of timely information to the travelling public on events affecting the network via the use of social media, radio and our website.
- The potential risks to differing parts of the network are assessed against the severity and the likely hood of the impact occurring. This will drive differing maintenance priorities

response times and strategies to mitigate risk and build the case for capital work programmes to ensure resilience on the network.

- Traffic management plans are in place to divert traffic on different parts of the network in the event of an incident affecting parts of the network.
- The plan will be reviewed every two years as part of the resilience review and after a major weather event.

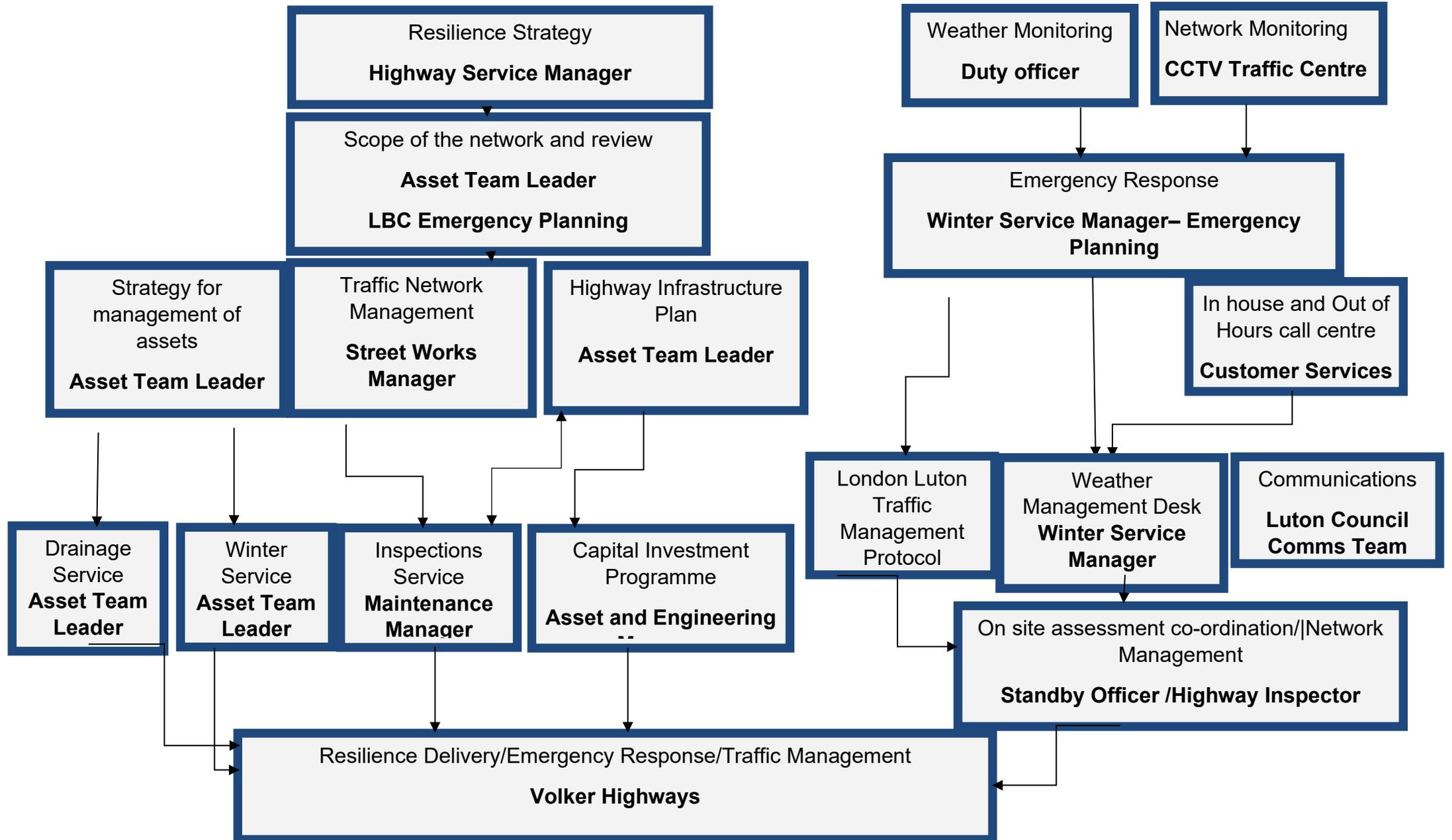
2.0 Agencies involved

Our Resilient Network plan is compiled in partnership with a number of agencies that have either an interest or a role to play in ensuring resilience of the network. The plan has been designed and delivered by in consultation with its stakeholders.

The list of stakeholders includes:

- Bedfordshire Fire and Rescue
- Network Rail
- London Luton Airport
- public service vehicle operators
- utilities
- term maintenance contractors
- Highway Service contractors
- Luton BID
- local businesses
- community groups
- elected members
- Luton Civil Protection
- Bedfordshire Prepared
- Bedfordshire Police
- East of England Ambulance Service
- neighbouring authorities

Figure 1: operational structures



2.1 The network

Figure 3 below illustrates the Resilient Network. This network encompasses the strategic and main distributor component of network but does include some other roads that are central to the continued economic activity in Luton.

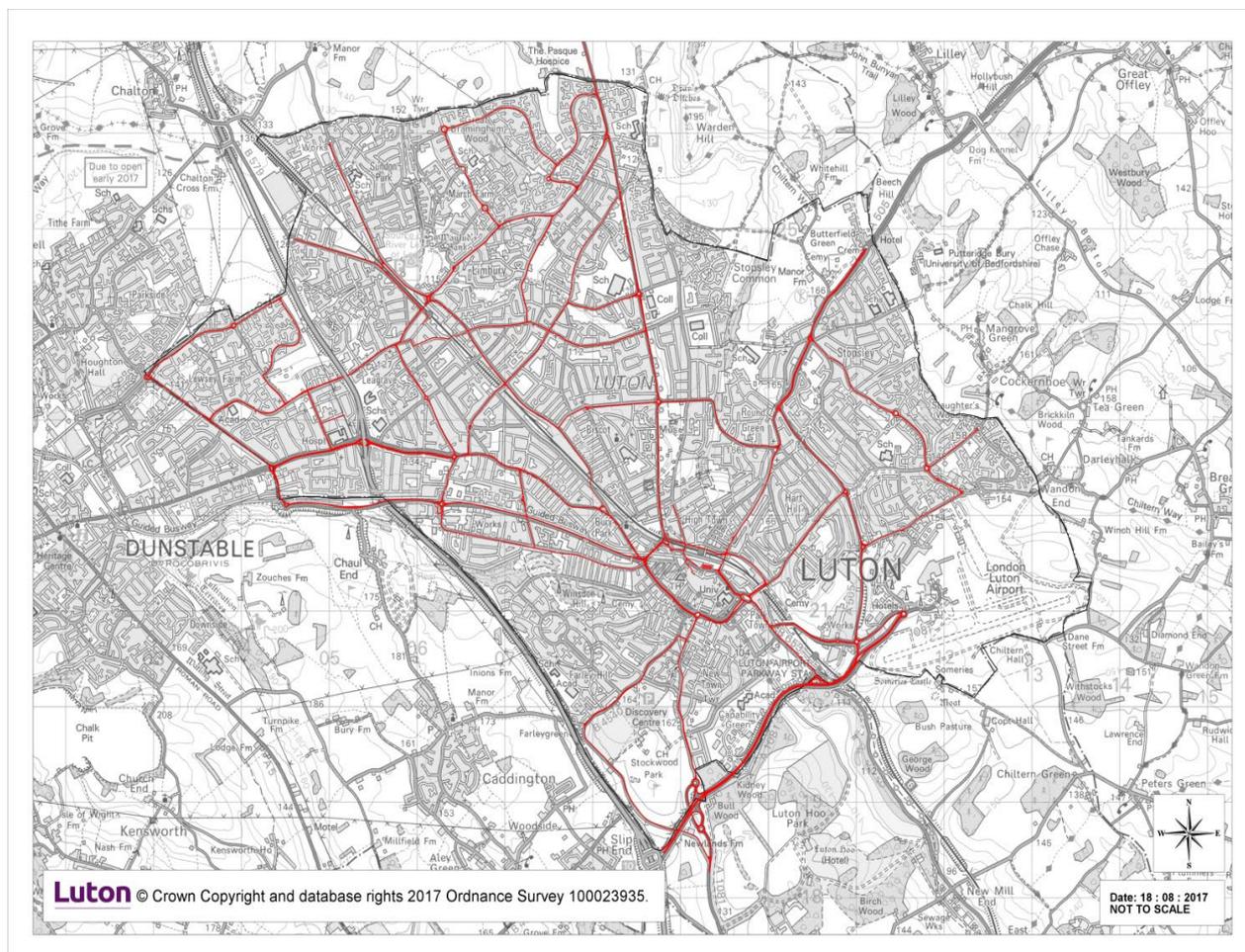
The following attributes have been considered in the rationale for the network:

- links to other strategic networks
- inclusive of all classified network
- links to major industrial, business parks, and major supermarkets
- links to the three main railway stations and Luton and Dunstable Busway Interchange
- links from the major routes into the airport including from the M1 A505 Herts Borough Boundary, Parkway Station, Kimpton Road
- links from junction 10 of the M1 to junction 11 of the M1
- critical Infrastructure, water works, main electricity stations
- main bus routes and bus depots
- ambulance, fire and rescue and police services
- routes to and from Luton and Dunstable Hospital

A detailed version of the network including attributes is available on request. Please [email Mark Aaronson](#), Asset Manager for Luton.

Figure 2: Resilient Networks

A detailed copy of the network and its attributes can be found in the our GIS database.



2.2 Cross boundary resilience

Luton is bordered by Hertfordshire and Central Bedfordshire councils. The network has been created in consultation with both local authorities to ensure network integrity and parity in maintenance regimes. See figure 4 and 5 for Hertfordshire and Central Bedfordshire.

Figure 3: Herts Resilient Network

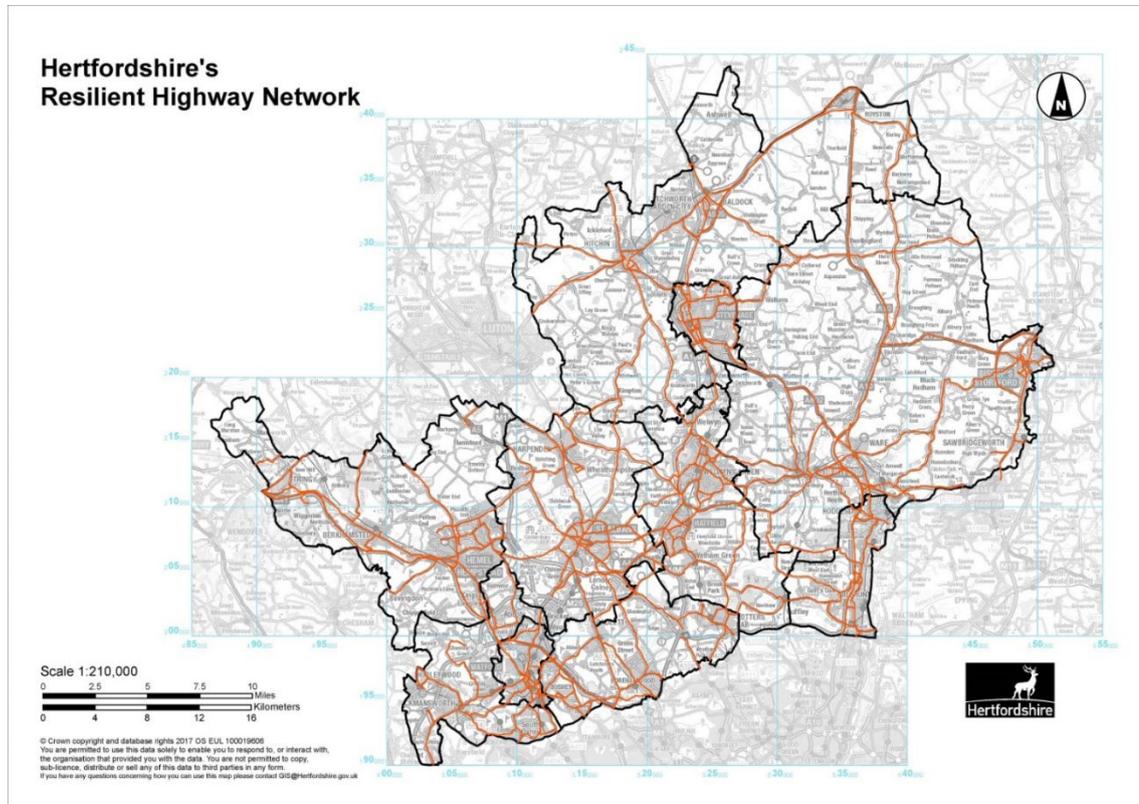
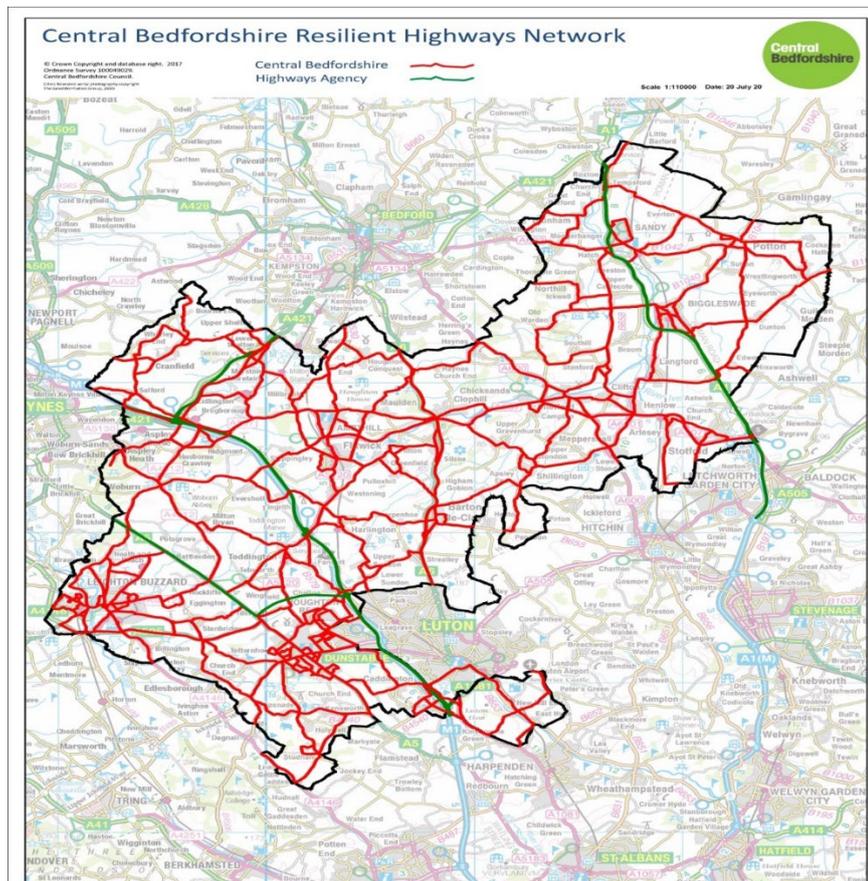


Figure 4: Central Bedfordshire Resilient Network



2.3 Key attributes on the network

The following list identifies the key economic, emergency service, utility, and transport infrastructure on the network, along with their owners. They're displayed geographically on our GIS system.

- **Water supply:** Affinity Water
- **Electricity sub stations:** UK Power Networks
- **M1 junction 10 and 11 inclusive of diversions on local road network:** Highways England
- **London Luton Airport:** London Luton Airport
- **Luton Parkway station:** ThamesLink
- **Luton Leagrave station:** ThamesLink
- **Luton and Dunstable busway interchange:** Luton Council's Busway team
- **Luton and Dunstable busway:** Luton Council's Busway team
- **Luton and Dunstable hospital:** The L&D Hospital NHS Foundation Trust
- **Capability business park:** n/a
- **Butterfield business park:** n/a
- **Key food hubs:** Sainsbury's Lidl, Asda and Tesco
- **Police station:** Bedfordshire Police
- **Stopsley fire station:** Beds and Herts Fire and Rescue
- **Studley Road fire station:** Beds and Herts Fire and Rescue
- **Luton ambulance station:** Beds and Herts Ambulance and Paramedic Services
- **Arriva bus depot:** Arriva
- **Centrebus depot:** Centrebus
- **Daily Express print works:** Kimpton Road
- **Napier Park:** Kimpton Road
- **IBC Plant:** Kimpton Road
- **Vauxhall headquarters:** Osborne Road
- **SKF:** Sundon Park Road

Table 1: responsibilities shown on next page.

Table 1: responsibilities details areas of responsibility on the Resilient Network, and the detailed strategies for maintenance.

Asset	Owner	Strategy document	Delivery organisation
Severe weather Response	Luton Council Rebecca White, Emergency Planning Officer 01582 547240	Emergency response plan	Luton Council
Highway emergency response	Luton Council Mark Aaronson Asset Team Leader 01582 547179	Resilient strategy	Luton Council
Highway drainage	Luton Council Mark Barnett Senior Engineer 01582 547056	Highway drainage strategy	Volker Highways
Surface water and foul drainage	Thames Water		Thames Water
Embankments	Luton Council Derek Wright Engineering Manager 01582 547168	HIAMP	Luton Council
Subways	Luton Council Derek Wright Engineering Manager 01582 547168	HIAMP	Luton Council
Flyovers	Luton Council Derek Wright Engineering Manager 01582 547168	HIAMP	Luton Council
Bridges	Luton Council Derek Wright 01582 547168	HIAMP	Luton Council
Rail bridges	Network Rail		Network Rail
Carriageway network	Luton Council Mark Aaronson Asset Team Leader 01582 5471478	HIAMP	Volker Highways
Street lighting and traffic lights	Luton Council Ken Seeley 01582 547398	HIAMP	Volker Highways
Highway trees	Luton Council Parks Robbie Barnes 01582 546703	Highway infrastructure plan	Luton Council Parks/Cleansing

3.0 Preparations for an event

A weather operations desk will be initiated upon receipt of a red alert or weather warning from the Environment Agency and the Met Office. The desk will be run by the winter service manager, who coordinates the authority’s response to the event.

3.1 Weather alert hierarchy

The following Met Office alerts are the key triggers and thresholds to be used in this plan.

- **Green alert:** no warnings of severe weather in force
- **Yellow alert:** severe weather is possible between 2 and 5 days ahead. **Be aware!**
- **Yellow warning:** severe weather is possible within the next 24 hours. **Be aware!**
- **Amber alert:** severe weather with significant disruption to the community POSSIBLE in the next 2 to 5 days. **Be prepared!**
- **Amber warning:** severe weather with significant disruption to the community POSSIBLE in the next 24 hours. **Be prepared!**
- **Red alert:** severe weather with significant disruption to the community HIGHLY LIKELY in the next 2 to 5 days. **Take action!**
- **Red warning:** severe weather with significant disruption to the community HIGHLY LIKELY in the next 24 hours.

The winter service manager will liaise with our emergency planning officer to ascertain whether we should be following the BLRF adverse weather plan.

The following sections detail how different weather events are managed for the Resilient Network.

3.12 Rainfall

- Inspect and clear blocked gullies at known current flooding sites on the network.
- Check all known vulnerable structures.
- Ensure response crews are available with traffic management and 200 sand bags.
- Gully crew placed on standby.
- Briefing to highway inspectors and staff.
- Briefing of Customer Call Centre and Out of Hours Call Centre.
- Liaison with London Luton Airport and Highways England.
- Coordination with emergency planning officer.
- Brief council Communications team to inform the public via radio and social media, advertising:
 - highways contact details - working and out of hours
 - response times
- Monitor network via CCTV.
- Prioritise response during working hours, standby officer out of hours.
- Highway inspector checking all known flooding sites.
- Implement diversions where necessary.
- Update members of the public with the effects to the network via radio and social media.

3.13 Wind

- Check the highways trees at following locations: New Bedford and Old Bedford Road, London Road and Stocking stone Road for visible loose branches.
- Check all known vulnerable structures.
- Confirm any areas of vulnerable street lighting on the network.
- Ensure response crews are available for traffic management.
- Liaison with London Luton Airport and Highways England .
- Coordination with emergency planning officer.
- Brief council Communications team to inform the public via radio and social media, advertising:
 - highways contact details - working and out of hours
 - response times
- Monitor CCTV network.
- Inspect New Bedford and Old Bedford Road, London Road, Hitchin Road and Stockingstone Road trees for visible loose branches after the storm.
- Inspect areas of known vulnerable street lighting.
- Liaise with Parks Department to co-ordinate response.
- Implement diversions where necessary.
- Update members of the public of the effects to the network via radio and social media

3.14 Snow and ice

- Inform contractors of pending conditions.
- Ensure resilience in plant, crews, and salt.
- Instigate night shift /day shift for decision maker.
- Initiate Airport Corridor Route to be operated out of London Luton Airport.
- Coordinate response with airport and Highways England.
- Coordination with emergency planning officer.
- Brief council Communications team to inform the public via radio and social media, advertising:
 - highways contact details - working and out of hours
 - response times

- Monitor network through weather stations data, CCTV, weather forecasting radar, and on spot checks by highway inspectors during working hours and standby officer out of hours.
- If necessary, plough minimum winter network.
- Implement diversions where necessary.
- Provide live updates to the Communications team who will inform members of the public via radio and social media, including information about:
 - gritting activities
 - network problems
 - self-help advice

3.2 Emergency response

We have a customer service centre and an out of hours customer centre as a point of contact for members of the public and stakeholders to report problems on the network.

We also have the following staff to respond to any incident on the network within two hours of a report:

- four highway inspectors
- a bridge engineer
- two street lighting engineers
- a traffic signals engineer
- highway engineers

The highway service also has an out of hours standby service to respond to any incident on the network outside normal working hours.

We have an emergency response service to make safe any highway or structural defects that may occur that disrupts the network within two hours. The contractor has a facility to provide gully clearing during flooding out of hours. This will ensure that the network is reopened within 2 hours of the incident.

The standby officer has robust communications procedures that are enabled in the event of a major failure of the phone networks.

Our Highway Service and our maintenance contractor have a business continuity plan to ensure that the service is resilient in the event of major weather or another extreme event that comprises the services ability to function as normal.

These include:

- severe weather events
- terrorist incidents
- industrial action
- industrial accidents
- major disease breakout
- supply chain collapse
- cyber security breach

3.3 Emergency contact details

- Luton Council out of hours: 0844 8476648
- Highways standby: 07768287643
- Highways structures standby: 07796185002
- Parks standby: 07768096913
- Volker Highways out of hours call centre: 08456017087
- Luton Council emergency first response: 01582 546072

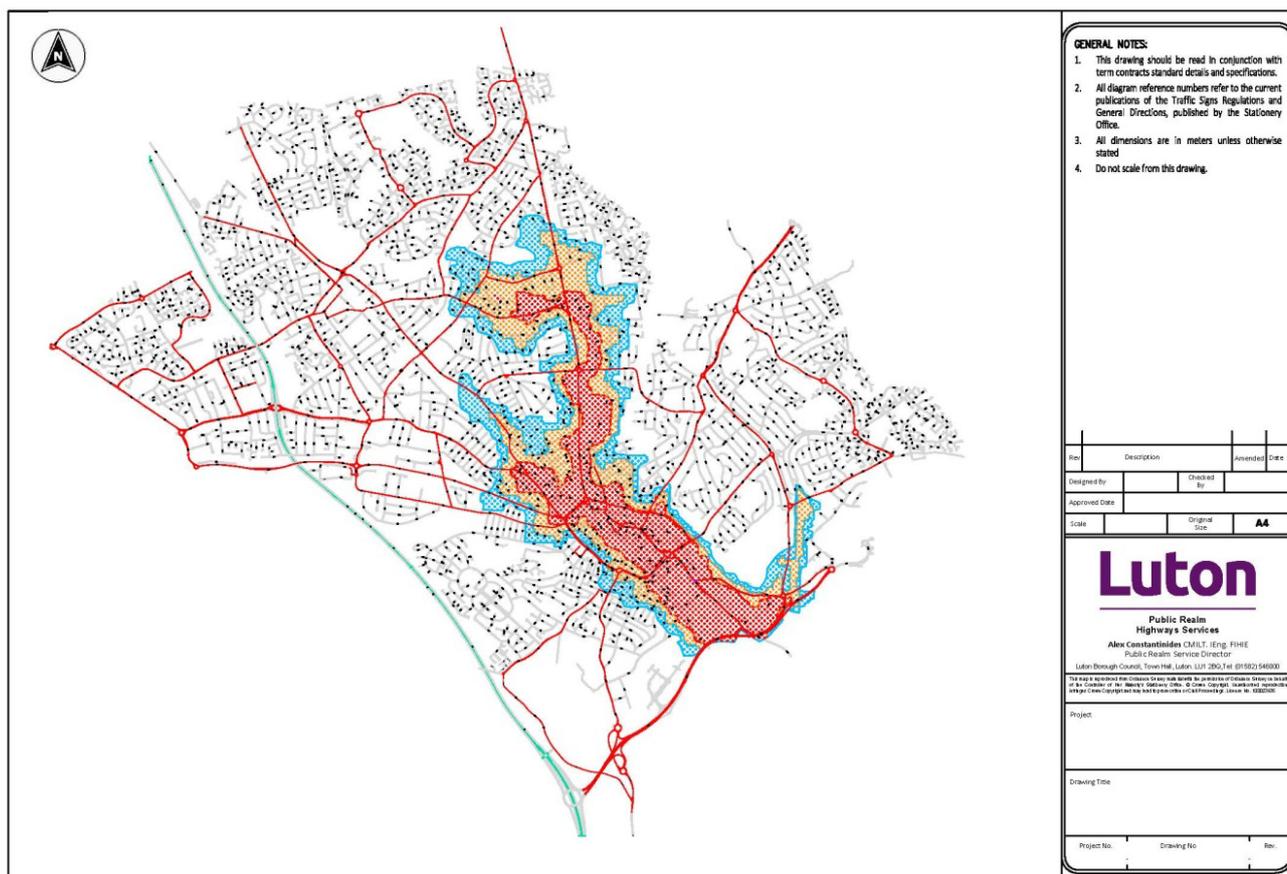
3.4 Highways drainage

We have a **surface water management plan** and **highways drainage strategy** to mitigate the effects of flooding in the town. Please email mark.aaronson@luton.gov.uk for copies.

The parts of the network susceptible to flooding have been identified on figure 5. below The surface water management plan details these areas and the plan we've adopted to manage the risk of flooding.

The drainage systems within the network should maintain resilience against a 1:100 year rain event, with a network recovery within 2 hours of the cessation of the rain.

Figure 5: parts of the network susceptible to flooding



3.41 Rain gullies

The following list shows Luton's cyclical gully cleansing frequency.

- **Priority 1a:** Resilient Network - areas susceptible to flooding, (including properties), tree lined roads and bottom of gradients > 5%
 - **Frequency:** 6 monthly
- **Priority 1b:** remaining part of Resilient Network
 - **Frequency:** once a year
- **Priority 2:** all remaining roads with gradients >8%
 - **Frequency:** once a year
- **Priority 3:** Victorian areas of the town
 - **Frequency:** once a year
- **Priority 4:** estates built after 1930's
 - **Frequency:** every 18 months
- **Priority 5:** estates built after 1980's
 - **Frequency:** every 24 months
- **Priority 6:** footway gullies in prestige and primary walking routes
 - **Frequency:** once a year

Rain gullies within the high and medium flood risk area predominately within the River Lea will be cleaned twice a year. Roads lined with mature trees will be cleaned twice a year, with one clean in December. These include:

- New Bedford Road
- Stockingstone Road
- Old Bedford Road
- London Road
- Limbury Road

Roads that have a gradient of 10% and above will be cleaned twice a year. The remaining road gullies on the resilient network will be cleaned annually.

Reported flooding hotspots that have been identified on the network will be cleaned quarterly until the capacity problem has been resolved.

The detailed maintenance regime is documented in the highway drainage link strategy document, available on request by email to mark.aaronson@luton.gov.uk.

3.42 Drainage maintenance

The majority of the surface water system has been identified as belonging to Thames Water. However, there are systems identified as specifically highway drainage that are on the resilient network. They're identified in detail in the Highways Drainage Strategy and include:

- Hatters Way
- Junction 10a
- Luton Busway

These systems will be inspected annually which will drive a programme of maintenance.

Luton has a set of structural assets that, are considered to be critical from the point of view that there's a high probability of rapid onset of extensive flooding of highways, public open spaces and, potentially, properties if any of them become:

- blocked, in the case of a water course

- damaged, in the case of a structure

These assets will be inspected on an annual basis, generating a yearly works programme to remedy any structural asset that may contribute to flooding of the network.

3.43 Flooding

Figure 6 illustrates the procedure that is followed in the event of a report of flooding on the network.

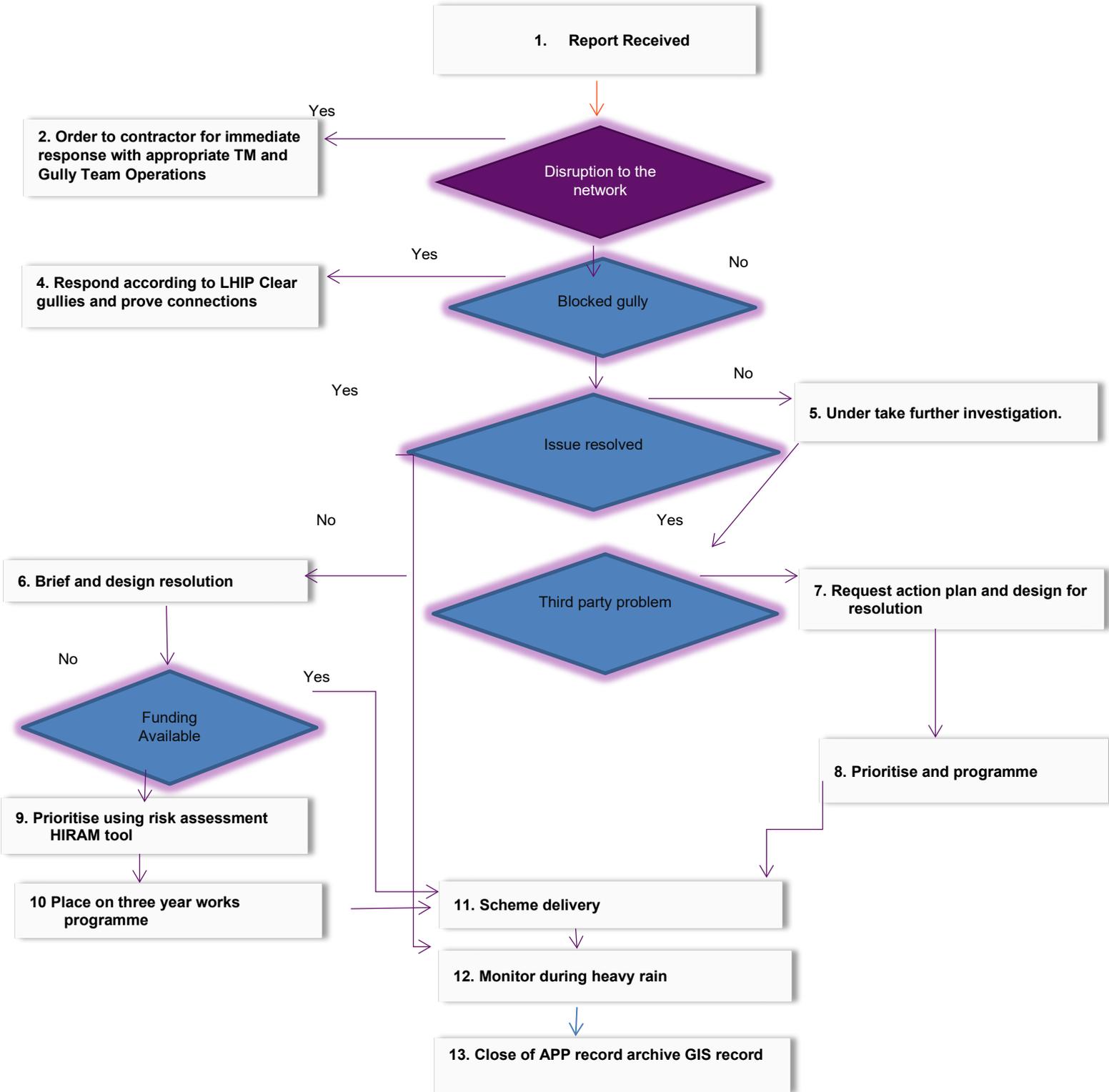


Figure 7: responsibility matrix

Key: (P) Principal Officer
(S) Supporting Officer

ITEM	RESPONSIBILITY							
	CSS	Drainage Officer	Drainage Engineer	Asset Manager	Flood Manager	Volker Highways	Third Party	
1	P							
2		P				S		
3		P						
4						P		
5		P						
6		S	P					
7			P		S			
8					S		P	
9				P				
10				P				
11			S			P		
12		P						
13		P		S				

Incidents of flooding will be logged on the APP Customer Service System and investigated by:

- the drainage officer to ascertain the extent of the problem
- the authority responsible for resolving the flooding

If the flooding is disrupting the network, an emergency response will be initiated which will include the attendance of a gully tanker, and advanced. If the road is impassable for 20 minutes or more then traffic management plans will be implemented.

When the network is clear, the officer will log incident on our corporate GIS system. If the problem cannot be resolved by clearing the gullies, the officer will also undertake further investigation and compile a report. The officer will use the HIRAM modelling tool.

The system facilitates a risk assessment, examining:

- the level of disruption to the network
- the potential cost to the economy

The engineer will prioritise the schemes to alleviate the flooding, and use the data to submit capital bids where there is a shortfall

The incident may have arisen due to capacity issues with the Thames Water surface system. There may be a problem with the water course, which is either the responsibility of the Environment Agency or the landowner. If the problem is due to a blocked surface water system, the issue will be raised with Thames Water with a request to investigate within 24 hours.

Quarterly liaison meetings with Luton Council and Thames Water are held to discuss the problem sites within Luton including on the network with the intention of formalising action plans to resolve the issues.

3.44 Communications for flooding

Upon receipt of a flooding alert, a press release will be issued to the public detailing:

- the weather report
- the potential disruption to the network
- the latest travel advice
- what we're doing to manage the network during a flooding incident

Social media will be used to advertise the latest travel information and advice on use of the network.

3.5 Winter service

We have a winter service plan that follows guidance prescribed within the 'well managed highway infrastructure'. By following this plan, the Resilient Network will be expected to be recovered to a serviceable standard within 2 hours of the cessation of snowfall.

The resilience network is included on the priority network and is pre-treated in accordance with the plan. The plough routes encompass the resilience network and are treated when snowfall settles on the carriageway in compliance with the plan.

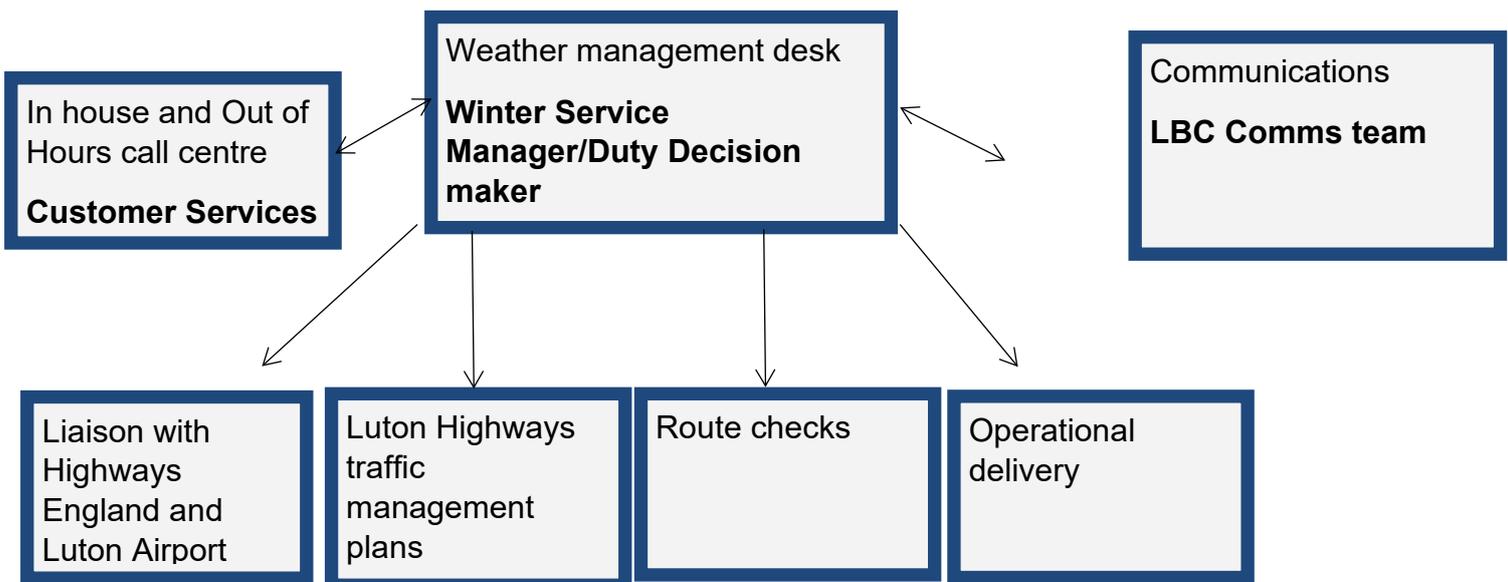
We have contingency to ensure operations continue over a 24 hour cycle for seven days.

The Highway Service has three decision makers and two reserve decision makers. Officers have access to the latest forecast technology provided by Meteogroup, and Finlay Irvine.

We have a weather management desk in operation to monitor the weather forecast and road conditions to:

- enable decision making in the management of the winter maintenance operations
- provide information to the Customer Service and Communications team

Figure 8: organisational structure.



3.51 Communications for winter service

Upon receipt of the first forecasted frost and forecasted period of snow, we'll implement a campaign to highlight:

- our winter service
- how the activities are carried out
- advice for members of the public on clearing snow and ice
- advice on travelling
- advice on maintaining a vehicle during cold weather

We'll issue a press release and place information on our website and social media sites. We'll also include information on a bulletin.

The public are kept informed of gritting activities and the condition of the network via Twitter and our website.

Table 2: details of plant and labour available to Luton Highways for winter service

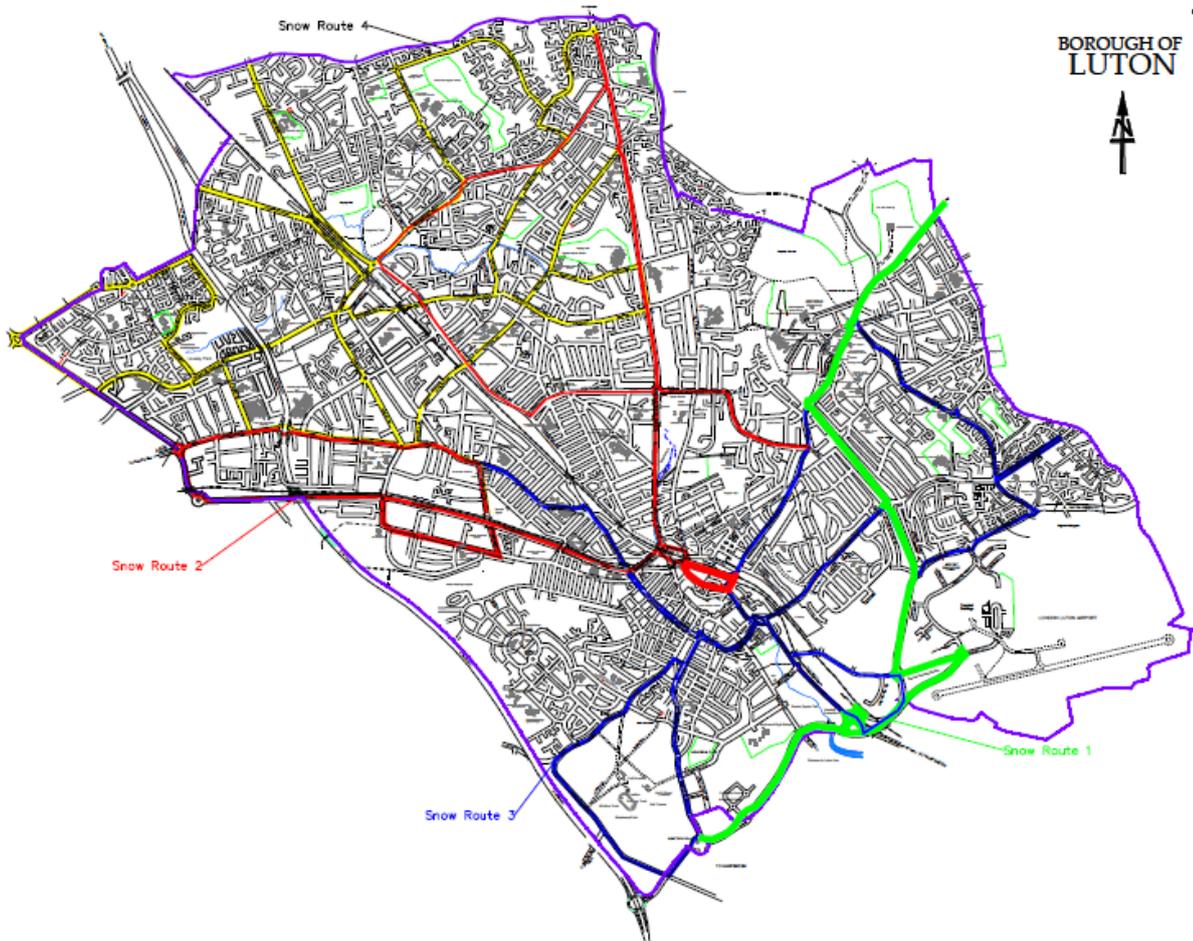
Name and address	Available equipment and plant	Available labour
Volker Highways Kingsway	<ul style="list-style-type: none"> • 3 no. 5m³ demountable gritter • 2 no. 3m³ demountable gritter • 4 ploughs for fitment to above • 1 loading shovel • 1 towable gritter 500kg • Hand tools 	30 approx.
Volker Highways Kingsway	<ul style="list-style-type: none"> • 5 x 7.5t tipper lorries • 2x3.5t Pick Up • 3 no. 3t mini digger • 1 no. JCB 3CX 	10 approx.
Cleansing D.LO	<ul style="list-style-type: none"> • 14 Vauxhall Movano • 2 Isuzu N50 Beaver tail truck • 1 Isuzu Truck with Hiab 	30 approx.

Table 3: details of Luton's minimum salt requirements

Routes	Normal salting network (tonnes/run)	Minimum winter network (tonnes/run)	Minimum stock		
			Full pre-season stock (12 days 36 runs)	Core winter period minimum network (6 days 24 runs)	From March – season end minimum network (3 days 12 runs)
Carriageways	28	14	1008	336	168

Routes	Normal salting network (tonnes/run)	Minimum winter network (tonnes/run)	Minimum stock		
Footways Cycle Routes & Salt Bins (1 per day)	25	25	300	150	75
Total			1308	486	243

Figure 9: minimum winter service



For detailed information on Luton’s winter service, email mark.aaronson@luton.gov.uk.

3.6 Structures

Our structural assets are inspected according to the Code of Practice BD63/07 Inspection of Highway Structures, which prescribes bi annual general inspections and principal inspections every five years.

These inspections generate our structured works programme. These assets include subways, culverts, parapets, and fly overs, and highway bridges.

The structures identified on the Resilient Network will be given the priority in terms of maintenance generated from Inspections. If there’s an indication of a major structural defect, a scheme will be designed and implemented as the highest priority, and an assessment made of the resilience of

the structure, and decision made of whether the route can be maintained until the remedy has been carried out.

In the event of a road traffic collision or a failure to structure, we'll respond to make safe the damage within 1 hour, and remedy the structure within 2 hours', to minimise the effect on the network. If the structure cannot be made safe within two hours, traffic management plans will be implemented until the structure is safe and the network opened.

3.7 Embankments

Luton has a series of embankments along the A505 corridor New Airport Way and Vauxhall Way.

A principal inspection will be carried out every 5 years based on our infrastructure plan

A monthly visual survey is undertaken on a driven inspection for signs of slippages.

An Inspection will be undertaken by a geotechnical engineer every two years in accordance with our strategy.

These inspections will generate a works programme that will be prioritised according to risk to the network.

Any slippages affecting the carriageway will be removed within 2 hours of incident report. Works to remedy the cause of slippages should be carried out within 28 days.

3.8 Carriageway condition

We have a carriageway strategy based on lifecycle principals where preventative maintenance is used to manage the condition of the carriageway surface. UK Pavement Management Systems (UKPMS) prescribe the use of condition surveys such as:

- detailed visual inspection
- machine assessments such as SCANNER for surface defects
- SCRIM measuring surface texture

This data is used for life cycle planning. The plans are used to form a five-year programme of investment to ensure any defective carriageway is remedied with appropriate durable materials that mitigate against failure from severe weather.

Any roads identified on the resilient network as requiring structural maintenance are included in this programme. Carriageways showing the first signs of deterioration will be considered for a surface treatment programme carried out over three years.

Any joints within the carriageway surface that are defective will be included on an annual sealant programme.

The carriageway network is inspected on a monthly basis to identify defects that meet criteria according to the risk matrices of the HIAMP.

- Category one defects > 75mm in depth and 150mm diameter are made safe or repaired with two hour
- All potholes in excess of +50mm in depth, and 150mm are repaired or made safe within 24 hours
- Any defects that are > 30mm < 49mm in depth and 150mm diameter will be identified for either a repair in 7 days for the strategic part of the network or 28 days for the remaining part of the Resilient Network.

If temperatures rise above 35 degrees for more than one day, a driven inspection of the network will take place for signs of asphalt deterioration. Any failures will be remedied with sand within two hours, and a follow up repair organised on a priority matrix according to the HIAMP.

3.9 Trees

Areas of the network with a high density of established trees have been identified as a higher priority for inspection and maintenance.

Our Parks Service inspects highway trees on an annual basis. These inspections drive a maintenance programme.

We have six contractors available to respond to tree incidents, with the aim of recovery of any fallen tree on the network within 2 hours of the request.

If Luton experiences winds of over 70 mph, then a driven survey of the network will be undertaken to establish if there is any vegetation including trees obstructing the network.

4.0 Traffic management

If an incident results in the closing of a section of network for more than 20 minutes, then traffic management plans will be implemented for continuity for the travelling public.

Examples of disruption include:

- severe weather
- carriageway collapse
- a bridge strike
- road traffic collision
- severe congestion
- major industrial incident/strike
- statutory undertaker plant failure
- security threats

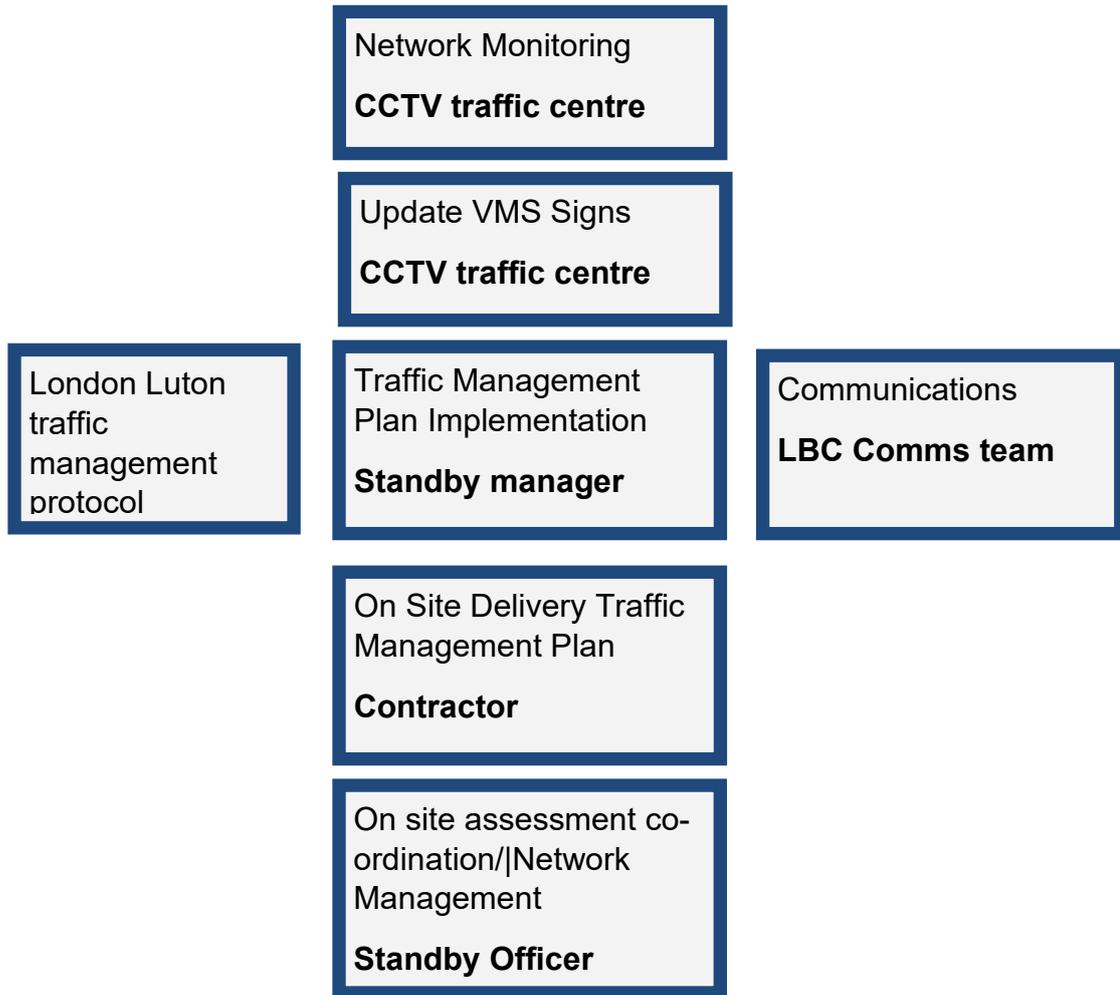
Road closures will be implemented with diversions. Members of the public will be informed by a series of variable message signs strategically placed within the network.

Social media, Twitter and Facebook will also be used for up-to-date information, as well as our website. In addition, Three Counties Radio and Heart FM will be informed.

See traffic management command and protocol on the next page.

4.1 Traffic management command and protocol

Figure 10



4.12 Airport corridor

London Luton Airport has a traffic management protocol (TMP) to manage any disruption to the roads leading to the airport or as a consequence of an event at the airport

We'll assist London Luton Airport in implementation with its TMP. Our standby manager will work under instruction from London Luton Airport's emergency manager and coordinate with Luton's emergency planning officer. All communications will be in accordance with London Luton Airport TMP.

The following are extracts from London Luton Airports TMP.

The operational procedures (OP) supports the London Luton Airport TMP. The OP provides a guide to previously agreed sectors and road closure locations for the London Luton Airport TMP.

There are seven sectors in total. These are:

1. the Trunk Road network
2. Airport Way South Luton
3. Airport Way LLA slips
4. airport approach road
5. Old Airport Way
6. Percival Way
7. Frank Lester Way

In the event of a major incident that triggers the London Luton Airport TMP, these sectors can be closed separately or in combination. Details of maps and guidance on the locations for closures can be found in London Luton's TMP, see appendix 3.

An important element of the London Luton Airport TMP is that any organisation is permitted to implement a closure in the event that the protocol is initiated, regardless of which section of the road network it is.

This is on the provision that the staff engaged in road closures have appropriate training and where necessary certification.

For example:

- Highways Agency traffic officers and Highways Agency area 8 contractors are permitted to implement closures on the local highway network
- local councils and their contractors are permitted to cross local highway authority boundaries

The over-riding aim is to implement a closure as soon as possible once it is deemed to be required.

4.2 Highways England diversion routes

In the event of an incident that closes either junction 10 or 11 of the M1, Highways England has a predefined diversion network through Luton. This route forms part of the Resilient Network.

Highways England manage the diversion with their TMP.

4.3 A-route diversions

Predefined diversions for the principal road (the A505, A6, A507, and A5065) in the event of a closure planned diversions are implemented within 2 hours.

4.4 Bridge diversion

In the event of a strike that closes a road going underneath a bridge for more than 20 minutes, then planned diversion routes will be implemented.

4.5 Diversions for remaining network

The area highway inspector or standby officer will implement diversion routes where necessary using local knowledge in conjunction with the highway contractor.

All signing, lighting and guarding should be employed according to guidelines in chapter 8 of the [traffic signs manual](#).

5.0 Testing and Review

This resilient strategy and Luton's emergency plan will be tested against severe weather scenarios and other emergencies, including:

- various scenarios will include an incident that closes London Luton Airport
- airplane crash on New Airport Way
- severe flood of the River Lee
- 12 hours snow fall followed by seven days of below freezing temperatures

This exercise will be undertaken every two years and will feed into the review process.

6.0 Protocol

The resilience plan relies on operational relationships between Luton Highways and its major stakeholders for the benefit of the travelling public. The network has been reviewed and agreed by Luton Highways and its partners.

A review will be undertaken every two years, the next being May 2026, and after a major snow event, storm or flooding incident with the purposes of assessing:

- the resilience of the network
- the continuation of economic activity within Luton

Any changes to any of the organisation’s road network will be communicated to all the stakeholders for consideration of their plans.

6.1 Protocol agreed by

Name	Position	Organisation	Signature	Date	Review date
Gerard McLeave	Director Of Place and Infrastructure	Luton Council			
Mark Aaronson	Highway Service Manager	Luton Council			
Pritesh Mistry	Emergency Planning Officer	Luton Council			
David Guy	Contracts Manager	Volker Highways			
		Bedfordshire Resilience Forum			

6.2 Amendments to the strategy and network

Owner	Approval	Changes	Signature	Date	Review date