Essex Highways

Contingency Planning: Essex Highways Resilient Network

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RINGWAY JACOBS

Essex County Council

Foreword – Contingency Planning: Essex Highways Resilient Network

The highways network plays a vital role in the lives of our residents as well as the travelling public and local businesses, but while we celebrate the benefits of our transport network, we must also strive as far as practicable to enable activity to be sustained during extreme weather events and other emergencies.

It is essential, therefore, that the categorisation of our roads and other assets remains relevant to their strategic importance and intensity of use, and that we identify the most important routes and prioritise these for investment for resilience measures. It is these routes that are our Resilient Network, that we maintain to a higher standard of resilience than others.

The aspiration to maintain a Resilient Network is becoming ever more vital as we endeavour to protect and enhance the Essex environment for the people who live here and the businesses that drive our economy. The general pattern of change in the UK is towards warmer and wetter winters, hotter and drier summers, with high variability. These changes will increase the exposure of the highways network infrastructure assets to weather-related hazards. The Council must continue to rise to these increasing environmental challenges, to sustain a safe, accessible, serviceable, and sustainable Resilient Network, to minimise disruption from these anticipated impacts. We acknowledge there may be times when weather becomes so extreme that our assets become temporarily overwhelmed, but by maintaining a Resilient Network this positions us well as to recover from such events as quickly as possible.

This statement verifies how the Resilient Network is an outcome of our Asset Management contingency planning and strategic preparedness, and it demonstrates how the Resilient Network is a key consideration in the prioritisation of all Highways related decision making. In short, the Resilient Network supports the Council's strategic priorities documented in Everyone's Essex.

Cllr. Tom Cunningham
Cabinet Member for Highways, Infrastructure and Sustainable Transport

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1. Introduction to the Essex Highways Resilient Network

The winter of 2013-14 saw the highest winter rainfall across southern England since records began in 1766, resulting in widespread flooding and extensive wind and coastal damage. In addition, the east coast contended with a significant tidal surge.
On 5th December a major storm surge, combined with high tides, produced the highest water levels experienced since the great coastal floods of 1953 for parts of the east coast, and in some areas the water levels were even higher than in 1953. The impact of this extreme weather on the country's transport systems was considerable.

In November 2014 the Secretary of State for Transport published the Government Response to Richard Brown's Transport Resilience Review (July 2014), which endorsed the recommendations made in the review and set out expectations for the delivery of actions to improve the resilience of our transport network.

Resilience in the context of the Transport Resilience Review is 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. However, it recognised that with continued public expenditure reductions some local authorities would be unable to maintain the condition of all their roads, which inevitably would impact on the resilience of some of the less important roads. In view of this, it promoted the establishment of a 'resilient' network to which priority is given through maintenance and other measures.

The Essex Highways Resilient Network is its Priority Routes 1 network (PR1); it is categorised as of highest importance in terms of enabling access to key services and supporting economic activity. It is this part of the network which is given highest priority to maintenance and other measures to enable access and activity to be sustained as far as practicable during extreme weather events and other emergencies.

Essex County Council (ECC) designated its PR1 network as its Resilient Network, following a review of its road network categories in 2013, when a new, Essex specific hierarchy was developed to categorise roads regarding their strategic importance and intensity of use. This new hierarchy was produced in response to widespread change over time to the importance and use represented by the original road classifications of A Class, B Class, C Class, and Unclassified roads established with the Department for Transport (DfT).

The road network review resulted in roads being categorised as either PR1, PR2 or Local Roads. PR1 routes specifically carry large volumes of high-speed traffic around the county, providing access to essential facilities and services, and PR2 routes function as essential traffic distributors between the Local Roads and the PR1 routes network. PR1 roads are comprised largely of A Class roads with some B Class roads, PR2 roads are largely B Class roads with some C class roads, and Local Roads are largely Unclassified

roads with some C Class roads. Local Roads are typically urban housing areas but are also rural roads.

The road hierarchy review was undertaken though an extensive engagement process which included liaison with transport operators (via our Passenger Transport Team) and key stakeholders such as National Highways (formerly Highways England) as well as neighbouring authorities for cross boundary considerations. The interests of hauliers were represented through a role within the Asset Management Team whereby day to day contact with hauliers was undertaken in respect of transport routes and the requirement to avoid 'weak' structures. Interests of the Emergency Services was represented through feed-back from Essex Highways officers who are members of the Emergency Planning Team and engage in training events. The Network Assurance Team was a key participant in the identification of the PR1 routes through its understanding of the requirement of local businesses and the corresponding requirement to create an environment suitable for economic growth.

The development of this Essex specific hierarchy is in keeping with the recommendations within the 'UKRLG Well Managed Highway Infrastructure – A Code of Practice' published in October 2016. It is also in keeping with the recommendations within the DfT Transport Resilience Review published July 2014.

The Essex Hierarchy was established in the amendments to Essex Highways Maintenance Strategy Policy and Standards April 2008, approved by the then Cabinet Member in 2013. It is sustained in subsequent updates to this document, such as the 'Maintenance & Inspections Strategy: Carriageways, Footways and Cycleways July 2019', published on the Essex Highways website, and it will be sustained in any subsequent planned reviews and updates to maintenance and inspections strategies.

The Maintenance and Inspections strategy sets out respective risk-based safety inspection frequencies and defect repair response times for each hierarchy, with the Resilient Network (PR1 network) receiving priority for inspection frequency and repair priorities and associated resources.

This hierarchy is unique to Essex, enabling inspection and maintenance resources to be prioritised in a way which not only supports the Council's priorities, provides the greatest benefit to users and delivers best value, but ensures that a Resilient Network is maintained.

The establishment of the Resilient Network (PR1 network) is documented in the ECC Highways and Transportation Asset Management Strategy:
https://www.essexhighways.org/roads-strategies

Map based information showing the Resilient Network (PR1 network) is also published on the Essex Highways website, under 'interactive maps' https://www.essexhighways.org/getting-around/bus/public-transport-maps

2. The Resilient Network Review Process – Engagement and Liaison

The Resilient Network (PR1 network) is subject to continuous monitoring and review by the Asset Management Team as part of contingency planning, in accordance with asset management principles, as recommended in the Transport Resilience Review (July 2014). It is reviewed by assessing the impact of additions and changes to the road network as well as changes in road user demand. For example, the ECC Transport Strategy Team analyses traffic flow data to determine the growth of transport demand and its traffic composition and can refer to the Asset Management Team to consider amendments to the Hierarchy, especially regarding the Major Road Network (MRN). The MRN is a classification of local authority roads in England. It incorporates the National Highways-controlled Strategic Road Network (SRN) and the more major local authority-controlled A roads.

The Network Assurance team can also be a consultee as they understand not only local business interests but also the strategic requirement for creating an environment suitable for attracting economic growth. The Passenger Transport Team can also be a consultee, as they represent the views of transport operators. The Asset Structures Team has responsibilities for liaison with hauliers, and therefore their views are also important.

The Resilient Network can also be reviewed following any relevant events and lessons learned which can be referred to Asset Management from Essex Highways Emergency Planning representatives following 'trial' emergency exercises. For example, Emergency Planning has historically carried out mock incidents, such as widespread flooding, industrial action, terrorist attacks, major incidents such railway or airport disasters, and other local risks, to identify any issues with access to key destinations and services which can lead to the requirement to amend the Resilient Network.

3. Prioritising Investment to the Resilient Network

Asset management processes, such as lifecycle planning, ensure that priority for maintenance investment favours the Resilient Network (PR1 network), but without the exclusion of addressing safety related issues on other hierarchies. This does not only relate to investment for road maintenance but also for maintenance of other assets such as Structures, Highway Lighting and Traffic Signals, Vehicle Restraints and other infrastructure assets.

3.1 Revenue Based Reactive Repairs Prioritise the Resilient Network

Our Strategic approach to reactive repairs prioritises resources to the Resilient Network. Allocation of revenue funded repair resources for roads is detailed in the Maintenance & Inspections Strategy: Carriageways, Footways and Cycleways July 2019, published on the Essex Highways website, which details inspection frequencies and repair priority response times. This includes responses to extreme weather events such as flooding and trees falling, to minimise disruption to traffic, and it includes 'out of hours' responses to emergency incidents. Pothole filling remains a crucial activity and in recent years has received additional funding from the DfT as well as ECC.

The strategic approach to reactive repairs for other assets is detailed in related inspection strategies published on the Essex Highways website, and all prioritise the Resilient Network: Maintenance and Inspections Strategy, Structures July 2019; Maintenance and Inspections Strategy, Street Lighting, February 2021; Maintenance and Inspections Strategy, Winter, February 2021; Maintenance and Inspections Strategy, Intelligent Transport Systems, (ITS) February 2021.

3.2 Capital Funded Road Repairs Prioritise the Resilient Network

Maintaining an appropriate standard of road condition is a significant requirement for maintaining a Resilient Network. The condition of roads is measured and monitored annually, not just through regular, routine highway safety inspections which identify localised defects but through industry standard surveys which focus on the more structural aspects of road condition. The outcome of road condition surveys, together with reports from customers and Councillors regarding road condition concerns, informs the identification of sites requiring extensive road resurfacing treatments to enhance asset life.

Capital funded road resurfacing schemes are delivered within the overall investment strategy which sets separate road condition performance targets (standards) for each road hierarchy, with the most demanding condition performance target being set for the Resilient Network (PR1 network).

The methodology for measuring road condition by Essex Highways is primarily SCANNER survey, although in recent years considerable exploration of Artificial Intelligence (AI) to inform road condition assessment has also been undertaken. Going forward, Essex Highways anticipates reviewing its road condition methodology annually, as new permitted technologies become available, and may change its methodology where there are benefits or if so directed by the DfT.

SCANNER is a vehicular, machine-based process that uses laser-based technology to identify defects of the road surface to produce a Road Condition Index score (RCI). The RCI information is also presented in map base format for our engineers to review for the identification of maintenance treatment sites.

Essex Highways also measures the skid resistance of its Resilient Network annually. Skid Resistance is the term given to the frictional properties of the road surface in wet conditions. It is the contribution of the road surface to the overall friction available between the tyre and the road surface. A required standard of skid resistance has been defined for all sections of the Resilient Network, and skid resistance measurement is compared to the required standard to identify sites which are skid resistance deficient. This highlights sites where maintenance treatments are needed to restore the level of skid resistance to the required standard.

Extreme weather has a substantial impact in accelerating the rate of road condition deterioration, with water erosion and ingress, frost, and summer heat all having a damaging impact. Engineers are trained to identify these problems on the network which may occur after formal condition surveys have been undertaken.

3.3 Precautionary Salting

Precautionary salting is the application of a treatment to the highway surface prior to the onset of frosty, icy conditions or forecasted snow or icy precipitations. The term may also be used to describe a subsequent or repeat treatment to top up or replace the loss of residual salt on the network where salt was applied after the onset of freezing conditions.

The Resilient Network (PR1 network) is included in the ‘precautionary salting network’ to maintain access and activity during below zero conditions and occurrences of snow. For more information, refer to the Maintenance and Inspections Strategy: Winter, February 2021 published on the Essex Highways website.

https://www.essexhighways.org/roads-strategies

The main aims of precautionary salting are to;

- minimise delays caused by the presence of snow or ice on the highway,
- minimise delays to the Emergency Services and Police in carrying out their functions,
- maintain a network of highways as detailed in the strategy where the risk of an incident, where snow and ice is a contributory factor, is reduced.

3.4 Addressing Flooding on the Resilient Network

Essex Highways has implemented all the recommendations of the 2012 HMEP Guidance on the Management of Highway Drainage Assets published by HMEP (Highways Maintenance Efficiency Programme), and practice is reviewed against the guidance annually to ensure it meets the requirements of the Resilient Network.

Localised flooding incidents are dealt with under the Maintenance & Inspections Strategy: Carriageways, Footways and Cycleways July 2019, whereas more complex surface water problems are addressed through capital funded surface water alleviation schemes (SWAS) which considers the importance of the Resilient Network for prioritising schemes.

Gully cleansing resources are prioritised for the Resilient Network (PR1 network).

Coastal issues are considered through liaison with the ECC Coastal Flooding officer as well as Essex Highways' attendance of the Regional Flood Coastal Committee meetings where appropriate.
Considerable progress and benefit have been made in recent years with working collaboratively with the Anglian Water and Thames Water as well as the Environment Agency, to unlock additional funding for works to address highway flooding, where there are mutual benefits. These relationships continue to be developed strongly through mutual attendance at the ECC Flood Partnership Board meetings.

3.5 Highway Lighting

Investments for the repair of lighting faults, as well as the capital funding replacement of assets reaching the end of their service life, takes into account the Resilient Network for prioritising works.

3.6 Intelligent Transport Systems (Traffic Signals and other assets)

Maintenance agreements for fault repairs, as well as programmes for capital asset replacement, takes into account the Resilient Network for prioritising works.

3.7 Bridges and other Structures

Bridges and other Structures are by their nature very complex and have been designated with their own hierarchy which is influenced by the Resilient Network. Prioritisation for works, General Inspections, Principal Inspections, Structural Reviews, and Assessments consider all key data including the Resilient Network.

3.8 Supporting Bids for Investment

Asset Management continues to support bids for funding, promoting wherever practicable the need to improve the resilience of the network in general as well as maintaining the Resilient Network in particular.

4. Communications – Minimising Impact and Disruption

Asset Management liaises with the Communications Team to ensure clear and effective communications to highway users and transport users during extreme weather events so that disruption on people and businesses is minimised.

The communications team strives to ensure content is accessible wherever possible, through a flexible approach that can respond quickly to changes in how residents use social media, through regular monitoring of audience behaviours and by acting on advice from the ECC Communications and Marketing team. The Essex Traffic Control Centre also plays a key role in contributing to the smooth flow of traffic on the Resilient Network during extreme weather.

Asset Management planning will include contingency planning for how to manage disruption, such as implementing effective diversion routes in the event of temporary road closures, as well as implementing diversion routes to cater for increased traffic from ad hoc closures on adjoining National Highways' roads.