

23 March 2015

Quarterly Report to end March 2015

Enhanced spending plans in 2014/15 spell progress for roads damaged during the winter of 2013/14

The winter of 2013/14 was the wettest winter since records began. Prior to this there was a trend of winters where we experienced prolonged periods of sub-zero temperatures. These extreme weather events created a legacy of damage to our roads. For example, as well as an increased incidence of potholes – which we all find annoying – there was also damage to the foundations of roads.

One of the primary causes of damage to roads is water. Saturated ground swells and causes movement of the roads which creates cracking and subsidence; similar damage occurs when the ground eventually dries out and shrinks. Water then penetrates the road surface and creates a break-down of the construction layers, especially during freeze/thaw conditions. Water can also travel underground, particularly where there is inadequate drainage, and subsequently cause damage to the foundations of roads. The scale of damage is perhaps more readily understood when it is realised that there are approximately 5,000 miles of roads in Essex.

Essex County Council (ECC) and the Department for Transport (DfT) have been quick to acknowledge this maintenance challenge and to respond with substantial additional funding for 2014/15. ECC has combined these funding streams to provide an enhanced strategy of maintenance activities which will make an invaluable contribution to restoring condition to roads and drainage infrastructure. Included within the ECC funded element of works are also restoration works to footways and a programme to refresh white lining.

When combined with original spending plans, the additional funding increases the overall budget to £64.7m. Included within this sum is £11.2m of additional funding by ECC, and £9m of additional funding by the DfT.

At the heart of these maintenance activities are practices developed through the Highways Maintenance Efficiency Programme (HMEP). The HMEP is a central government funded programme to drive transformation within the highways industry to deliver efficient and effective services. For more information about the HMEP please access the website via the link below:

<http://www.highwaysefficiency.org.uk/>

The Highways partnership between ECC and Ringway Jacobs is delivering these maintenance activities in a manner guaranteed to deliver value for money outcomes for residents. For example, the overall strategy includes a cost effective combination of works: durable pothole repairs, value for money low cost treatments such as surface dressing to seal the road surface, improvements to drainage, and higher cost strengthening treatments to make roads resistant to extreme weather events. Some of the pothole repairs will serve as preparatory works for sites to be surface dressed in 2015/16

– hence the value for money benefits will be extended beyond this year of additional funding.

These spending plans are steeped in HMEP principles which include ‘intervening at the right time’ with low cost preventive treatments, and ‘getting it right first time’ with permanent pothole repairs to minimise costs associated with revisits. Economies of scale and Ringway Jacobs purchasing power within the industry also strive to drive down costs and deliver good value. These plans are also supported via effective communication with the public through press releases as well as website publications designed to provide clarity and transparency. For example, the capital resurfacing programme for roads can be accessed via the link below:

<http://www.essexhighways.org/Transport-and-Roads/Roads-and-Pavements/Capital-maintenance-works-2014-15.aspx>

In keeping with HMEP guidance, ECC carried out a review of the categorisation of its roads in 2013/14, to determine if the allocation of resources was closely aligned with use. This led to the identification of a new hierarchy which divided the road network in to Primary Routes (primary routes 1 and primary routes 2) and Local Roads (all other roads, typically minor rural roads and roads on urban housing estates). The Primary Routes carry the majority of traffic across the county, especially commercial traffic. This review included the assigning of roads to these respective categories, and facilitated a redistribution of resources so that the primary routes could be supported at a higher standard.

This hierarchy revision has proved highly successful in providing value for money, and the enhanced spending plans for 2014/15 will ensure that this approach is sustained. Whilst maintenance works will be carried out on the primary routes to safe guard the flow of commerce, however, a significant investment is also being made in the Local Roads network. ECC funded works will also be carried out on footways, kerbs and surface covers. The current salient maintenance activities are listed below (note that this list is not complete and therefore does not show the allocation of all available funding)

1. £38.75m for substantive capital resurfacing works which will prolong the life of roads
2. £7.8m for routine, general minor repairs on the highway, particularly on the primary routes
3. £5.5m to carry out minor repairs on urban local roads, footways, kerbs and drainage covers
4. £3.9m to carry out minor repairs on the primary routes (this links with item 2 above, but this funding is in addition to the £7.8m)
5. £3m to carry out minor repairs on rural local roads
6. £2.7m to carry out works on drainage infrastructure
7. £1.25m to refresh white lining
8. £1m to carry out ditch clearance and other works to improve drainage
9. £1m for additional general repairs
10. £1.4m for hedge cutting on main routes

- Note that a typical ‘minor repair’ is a permanent repair to a pothole, using a methodology which complies with best practice guidance promoted by the HMEP
- See below for detail relating to the maintenance activities to which the additional DfT funding has been allocated
- See below for more information on the most notable of these maintenance activities

DfT Additional Funding for 2014/15					
Date Awarded	Description of Maintenance Initiative to which funding allocated	Revenue Funding	Capital Funding	Total Funding	Comments
2012/13 Winter Recovery Funding	Capital Resurfacing	£ -	£ 1,854,000	£ 1,854,000	
2013/14 Winter Recovery Funding (awarded March 2014)	Capital Resurfacing	£ -	£ 990,967	£ 990,967	
2013/14 Winter Recovery Funding (awarded March 2014)	Rural Local Roads	£ 1,709,419	£ -	£ 1,709,419	
2013/14 Winter Recovery (awarded March 2014)	Total	£ 1,709,419	£ 990,967	£ 2,700,386	
2014/15 Pothole Pledge Funding	*Rural Local Roads	£ -	£ 500,000	£ 500,000	May be spent on repairing localised defects such as potholes as well as capital resurfacing
2014/15 Pothole Pledge Funding	*PR1 & PR2 Defect Backlog	£ -	£ 3,931,611	£ 3,931,611	May be spent on repairing localised defects such as potholes as well as capital resurfacing
2014/15 Pothole Pledge Funding	Total	£ -	£ 4,431,611	£ 4,431,611	
Total Additional DfT Funding				£ 8,985,997	
*Note that in anticipation of an increase in defects on the primary routes from October onwards, arising from the winter weather, £400,000 has been moved from the Rural Local Roads Initiative (which receives adequate joint funding from ECC), to the PR1 & PR2 Initiative, in order to keep the defects on these main routes to a low level					

1. Capital Resurfacing Works

These works are generally far more substantial than minor works such as localised repairs to potholes, and invariably involve replacing the road surface for a considerable length. These types of treatment add many years of life to the road (7 to 15 or even 20 years depending on the type of treatment applied). Locations are determined by experienced engineers with reference to information collected from annual road condition surveys which are carried out to a national methodology and standard.

1.1 A Strategy for Prevention

Wherever possible, capital resurfacing treatments are implemented to arrest the early stages of road deterioration, rather than the entire budget applied to the worst conditioned roads. This 'preventative approach' is a key recommendation under the HMEP, as it is far more cost effective in the long term than a 'worst first' approach.

At times, however, this strategy may appear confusing to the public, when roads which appear in relatively fair condition receive priority for treatment over roads which are clearly in more advanced stages of deterioration.

A 'preventative' approach does include a programme of strengthening treatments for roads in more advanced stages of deterioration, however, so that these roads are eventually eradicated over current and future years. Reference to road condition in this context applies to the structural integrity of the road rather than localised defects such as potholes (all roads are subject to routine, safety inspections to identify localised defects which require repair).

A strategy focused purely on the worst roads is known to be less cost effective and to be unsuccessful in the long run. This is because the cost of the treatments required is much higher than those required for arresting early deterioration. It is understood within the industry that if insufficient budget is allocated to arresting early stages of deterioration the overall condition of the road network will eventually decline. Table 1 & 2 below show the current lengths of treatments to be undertaken in 2014/15 in a 'By District' format, as well as the corresponding funding allocations. Note that Table 1(a) shows the lengths in miles.

District	Programmed Treatment Lengths (km) (All Treatment Types)	Programmed Strengthening Treatments (km)	Programmed Preventative Treatments: Surface Dressing & Micro Surfacing (km)	Programmed Traditional Patching and Surface Dressing Pre-Patching (km)
A127	3.1	3.1	0.0	0.0
Basildon	21.6	5.0	4.2	12.4
Braintree	93.9	5.5	32.4	56.0
Brentwood	101.2	5.5	36.0	59.7
Castle Point	17.5	9.3	3.1	5.1
Chelmsford	122.1	9.2	47.3	65.6
Colchester	157.5	12.9	73.0	71.6
Epping	102.7	28.5	48.7	25.5
Harlow	26.4	5.2	5.6	15.6
Maldon	30.5	5.3	7.6	17.6
Rochford	27.6	1.3	8.1	18.2
Tendring	94.8	4.9	45.5	44.4
Uttlesford	140.1	8.2	56.0	75.9
Total	939.1	103.9	367.5	467.7

District	Programmed Treatment Lengths (miles) (All Treatment Types)	Programmed Strengthening Treatments (miles)	Programmed Preventative Treatments: Surface Dressing & Micro Surfacing (miles)	Programmed Traditional Patching and Surface Dressing Pre-Patching (miles)
A127	1.9	1.9	0.0	0.0
Basildon	13.4	3.1	2.6	7.7
Braintree	58.3	3.4	20.1	34.8
Brentwood	62.9	3.4	22.4	37.1
Castle Point	10.9	5.8	1.9	3.2
Chelmsford	75.9	5.7	29.4	40.8
Colchester	97.9	8.0	45.3	44.5
Epping	63.8	17.7	30.3	15.8
Harlow	16.4	3.2	3.5	9.7
Maldon	19.0	3.3	4.7	10.9
Rochford	17.2	0.8	5.0	11.3
Tendring	58.9	3.0	28.3	27.6
Uttlesford	87.1	5.1	34.8	47.2
Total	583.5	64.6	228.3	290.6

Table 2. All Roads Programmed Amount (£)				
District	Total Programmed Amount	Total Programme for Strengthening Treatments	Total Programme for Preventative Treatments: Surface Dressing & Micro Surfacing	Total Programme for Traditional Patching and Surface Dressing Pre-Patching
A127	£ 522,385	£ 522,385	£ -	£ -
Basildon	£ 1,814,534	£ 1,158,637	£ 99,725	£ 556,171
Braintree	£ 3,600,224	£ 1,140,427	£ 803,943	£ 1,655,854
Brentwood	£ 3,350,927	£ 1,138,678	£ 998,878	£ 1,213,370
Castle Point	£ 1,768,389	£ 1,249,442	£ 216,081	£ 302,866
Chelmsford	£ 5,092,005	£ 1,790,859	£ 1,414,768	£ 1,886,377
Colchester	£ 6,851,895	£ 3,161,535	£ 1,974,481	£ 1,715,878
Epping	£ 5,324,194	£ 2,679,081	£ 1,180,460	£ 1,464,652
Harlow	£ 898,969	£ 472,313	£ 181,609	£ 245,046
Maldon	£ 1,670,040	£ 1,083,582	£ 181,169	£ 405,289
Rochford	£ 1,119,868	£ 679,556	£ 187,006	£ 253,306
Tendring	£ 3,338,857	£ 1,480,823	£ 988,202	£ 869,832
Uttlesford	£ 3,397,715	£ 1,120,880	£ 1,400,451	£ 876,384
Total	£ 38,750,000	£ 17,678,198	£ 9,626,775	£ 11,445,027

Traditional patching works are largely shorter lengths of permanent repairs, and the pre-surface dressing patching is preparatory works for sites to be surface dressed next year. The reason that preparations are undertaken so far in advance is to allow the repairs over time to become more compatible with the surrounding material, as this makes resurfacing more successful.

When the lengths of all patching works are set aside you will see that 471km (293 miles) of resurfacing works will be undertaken in 2014/15. This is actually further than the distance between County Hall in Chelmsford and Newcastle Upon Tyne, but whilst this seems a colossal distance it still only represents around 6% of our entire road network. This provides a good indication of the size of the road network in Essex (one of the largest in the country), and also how important it is to identify the correct locations and treatments for resurfacing.

Surface Dressing and Micro Surfacing, which are cost effective preventative treatments, account for 78% of the resurfacing programme length, with only 22% of the length being applied with higher cost strengthening treatments. This exemplifies a good 'preventative approach'. Refer to Figures 1 & 2 below for photographic examples of the application of surface dressing treatments. For more information about the Capital Maintenance Programme for Roads in 2014/15 please access the website via the link below:

<http://www.essexhighways.org/Transport-and-Roads/Roads-and-Pavements/Capital-maintenance-works-2014-15.aspx>

Note that included within the figures in Table 1 are works undertaken with £2.85m of the additional capital funding provided by the DfT. This sum is comprised as follows: £1.854m awarded in 2012/13 for spending in 2014/15, and £0.991m awarded in March 2013/14 as part of the overall £2.7m awarded for winter recovery. Table 3 below shows the works which have been undertaken with this funding as well as where these works have been carried out. Table 3(a) shows the treatment lengths in miles.

Table 3. Works undertaken with the £2.85m additional capital funding from DfT (km)

Combined DfT funding (awarded in 12/13 and March 13/14)	Provisional Spend	Treated Length Completed (km) (All Treatments)	Strengthening Treatments (km)	Surface Dressing & Micro Surfacing (km)	Traditional Patching and Surface Dressing Pre-Patching (km)
Basildon	£ 89,657	3.4	0.0	3.4	0.0
Braintree	£ 251,386	7.5	0.6	1.9	5.0
Brentwood	£ 256,150	11.7	0.0	4.9	6.8
Castle Point	£ 198,145	1.2	0.5	0.7	0.0
Chelmsford	£ 394,088	9.0	0.5	2.3	6.2
Colchester	£ 724,024	15.7	2.6	13.1	0.0
Epping	£ 197,544	7.8	0.0	7.1	0.7
Harlow	£ 90,789	3.1	0.0	1.9	1.2
Maldon	£ 91,539	1.9	1.1	0.8	0.0
Rochford	£ 93,838	3.1	0.2	2.9	0.0
Tendring	£ 132,729	5.5	0.0	5.5	0.0
Uttlesford	£ 325,078	40.6	0.0	7.9	32.7
Total	£ 2,844,967	110.5	5.5	52.4	52.6

Table 3(a). Works undertaken with £2.85m of the additional capital funding from DfT (miles)

Combined DfT funding (awarded in 12/13 and March 13/14)	Provisional Spend	Treated Length Completed (miles) (All Treatments)	Strengthening Treatments (miles)	Surface Dressing & Micro Surfacing (miles)	Traditional Patching and Surface Dressing Pre-Patching (miles)
Basildon	£ 89,657	2.1	0.0	2.1	0.0
Braintree	£ 251,386	4.7	0.4	1.2	3.1
Brentwood	£ 256,150	7.3	0.0	3.0	4.2
Castle Point	£ 198,145	0.7	0.3	0.4	0.0
Chelmsford	£ 394,088	5.6	0.3	1.4	3.9
Colchester	£ 724,024	9.8	1.6	8.1	0.0
Epping	£ 197,544	4.8	0.0	4.4	0.4
Harlow	£ 90,789	1.9	0.0	1.2	0.7
Maldon	£ 91,539	1.2	0.7	0.5	0.0
Rochford	£ 93,838	1.9	0.1	1.8	0.0
Tendring	£ 132,729	3.4	0.0	3.4	0.0
Uttlesford	£ 325,078	25.2	0.0	4.9	20.3
Total	£ 2,844,967	68.7	3.4	32.6	32.7

Figures 1 & 2: A Surface Dressing treatment being applied.

Figure 1



Surface Dressing is a low cost treatment which seals the road surface and addresses the early stages of road deterioration. In this respect it is a cost effective 'preventative treatment', halting the decline of the road from reaching the point where higher cost strengthening treatments are required. This type of treatment will increase the effective life of the road by 7 to 15 years depending on the use of the road and the type of Surface Dressing applied.

Figure 2



Not all resurfacing sites are suitable for Surface Dressing, however, and due to the environmental characteristics needed to ensure successful application, the period when surface dressing can be undertaken is relatively short. The surface dressing 'season' is typically from April to September, depending on the type of surface dressing and the site in question.

2. Major Programmes for carrying out Minor Repairs

The additional ECC and DfT funding have been combined to produce a range of broad maintenance initiatives to address minor defects on our roads (ECC funding will also be used to address minor defects on footways, kerbs and surface covers):

- 2.1 Fixing road defects on Priority 1 and Priority 2 routes
- 2.2 Fixing road defects on rural Local Roads
- 2.3 Repairing road, footway, 'kerbing', and drain defects (surface covers) on identified Urban Local Roads

These programmes are arguably more extensive than ever previously undertaken. For more information see 2.4 to 2.5.2 below, or access the website via the link below:

<http://www.essexhighways.org/Transport-and-Roads/Roads-and-Pavements/Repair-programme-2014-15.aspx>

2.4 Fixing the Priority Routes to Safeguard the Flow of Commerce

With reference to 2.1 above, this activity is already well underway and is largely being funded through the £3.5m of additional DfT funding, although works will also be linked with the £7.8m of routine ECC funding for repairs. The works being undertaken are traditional patching which produces a 'right first time' permanent, high quality repair.

Chart 1 shows the progress of this project, by showing the total number of outstanding defects at the end of each month since the programme began in May. It is currently scheduled for completion in September, but may be extended. Please note that as well as addressing the quantity of defects which had been recorded prior to the commencement of the programme, a number of additional defects have since been recorded and these too have been included in the winter recovery works. These are shown separately in Chart 1 below.

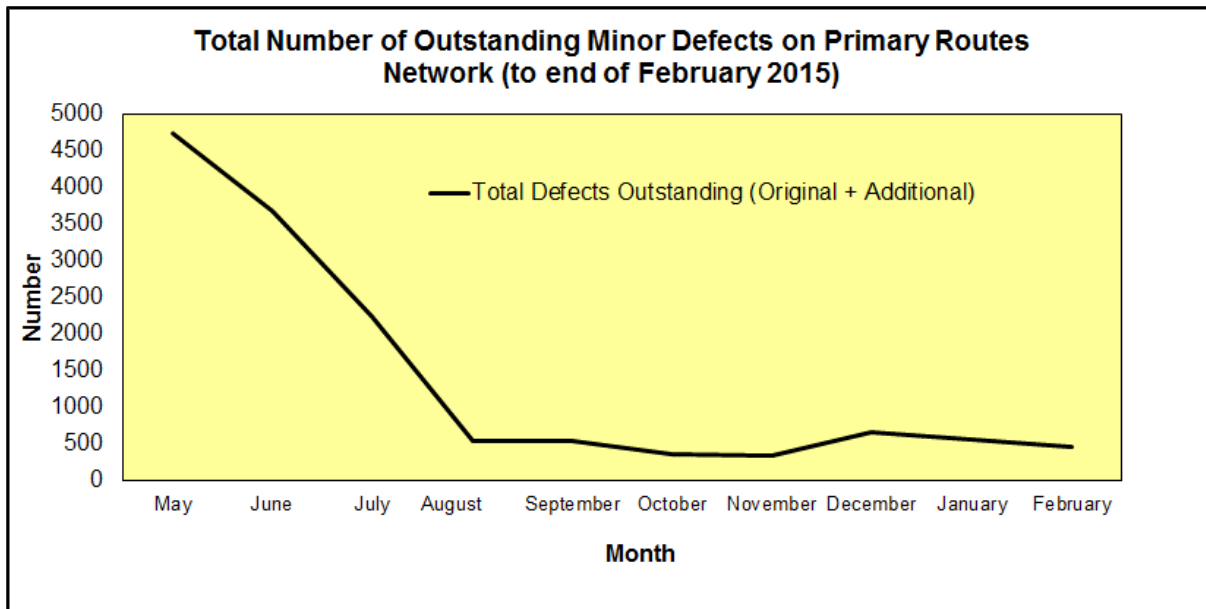


Chart 2 shows the estimated accumulative spend for this project to the end of July with regard to the additional DfT funding.

Chart 2

Note that in anticipation of an increase in defects on the primary routes from October onwards, arising from the winter weather, £400,000 has been moved from the Rural Local Roads Initiative (which receives adequate joint funding from ECC), to the PR1 & PR2 Initiative, in order to keep the defects on these main routes to a low level.

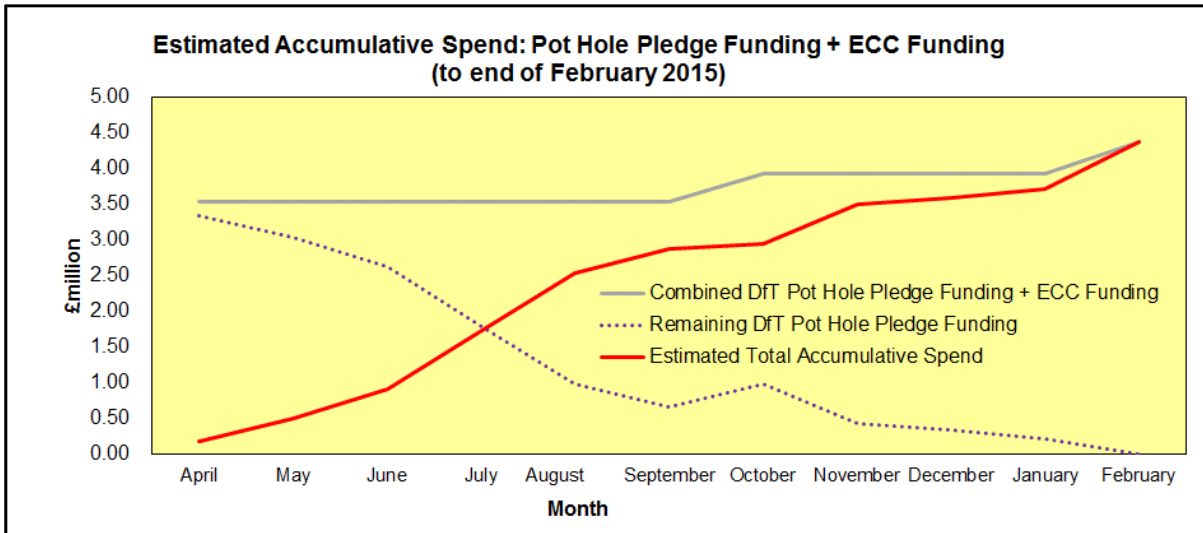
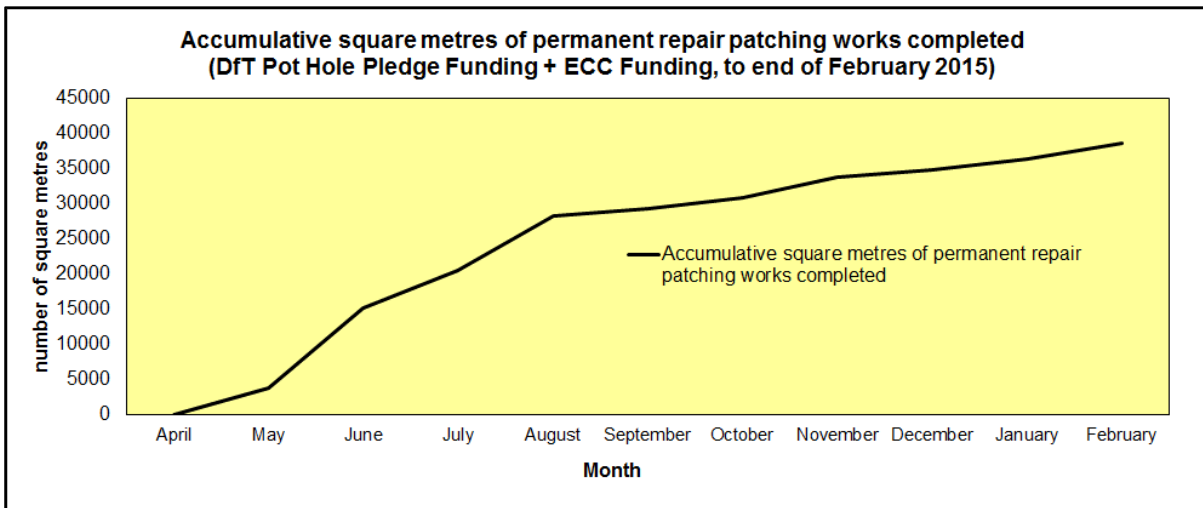


Chart 3 below shows the accumulative number of square metres of patching which have been completed since the commencement of the programme, together with an accumulative average cost per square metre.



2.5.1 Fixing the rural ‘Local Roads’ network

Whilst additional works are being carried out on the primary routes to safe guard the flow of commerce across the county, a significant investment is also being made in the Local Roads network. With reference to 2.2 above, a programme of minor repairs is well underway on the rural ‘Local Road’ network. Those sites with a greater occurrence of recorded defects have been prioritised for treatment over others.

As well as addressing the quantity of defects which were identified during preparations for the programme, a number of additional defects have since been identified and these too have been included in the winter recovery works. The approach of the operatives has been to re-identify defects as each site has been addressed, in order to avoid the time required to separate previously recorded defects from those that have arisen since the last inspection. The types of treatments being undertaken are detailed below; treatment is being chosen on a site by site basis with regard to the characteristics of the location and the requirement to achieve good value.

- Traditional patching (good quality ‘right first time’ permanent repairs)
- Thermal patching (similar to above but carried out where surrounding material requires a thermal operation for an effective seal)
- Jet Patching (a machine based patching process which produces relatively good compaction and compatibility with the surrounding material, sometimes used as a preparation for surface dressing)
- ‘Haunching’ (a localised full depth permanent repair, often carried out on the edge of a road)

Note that only permanent repairs will be funded with the additional DfT capital funding.

Chart 4 below shows the original quantity of defects which was identified prior to the start of this maintenance initiative, together with the accumulative number of defects which has been identified during operations. The chart also shows the accumulative number of defects which has been resolved as well as the number still outstanding.

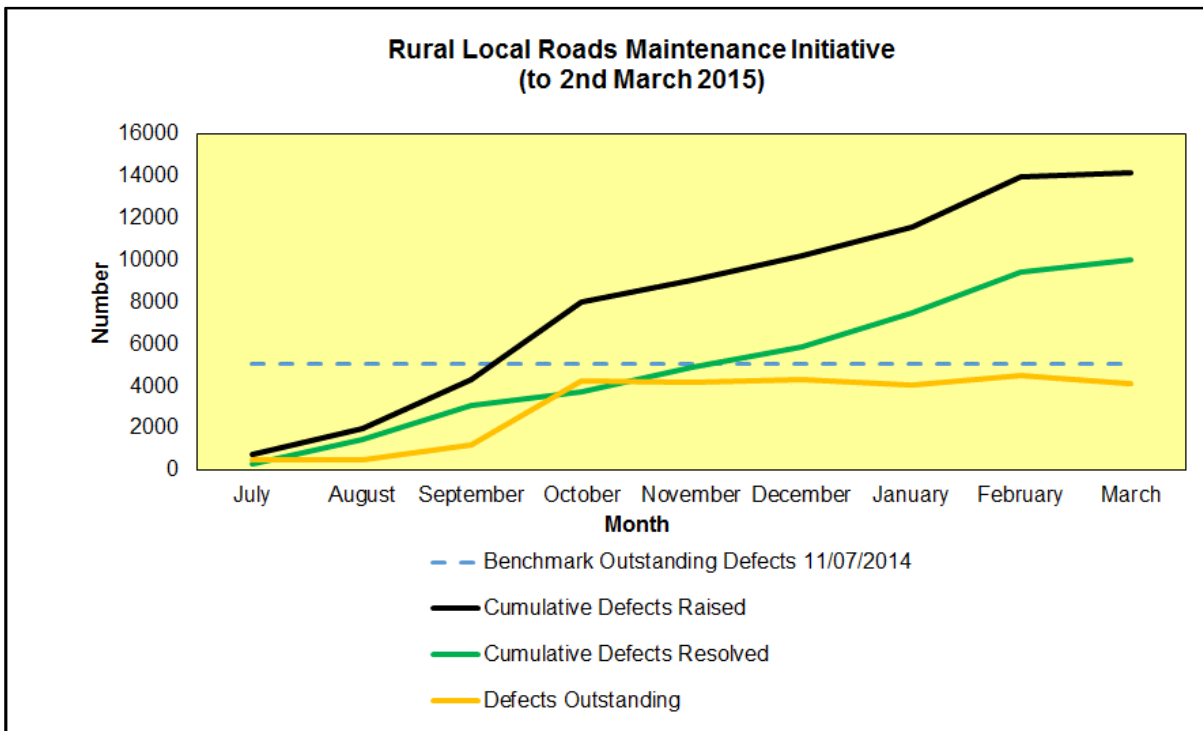


Chart 5 below shows the accumulative cost of treatments for the Rural Local Roads maintenance initiative which has been funded with additional DfT funding. Note that ECC will also be providing £800k funding for this initiative which is likely to continue to the end of the financial year.

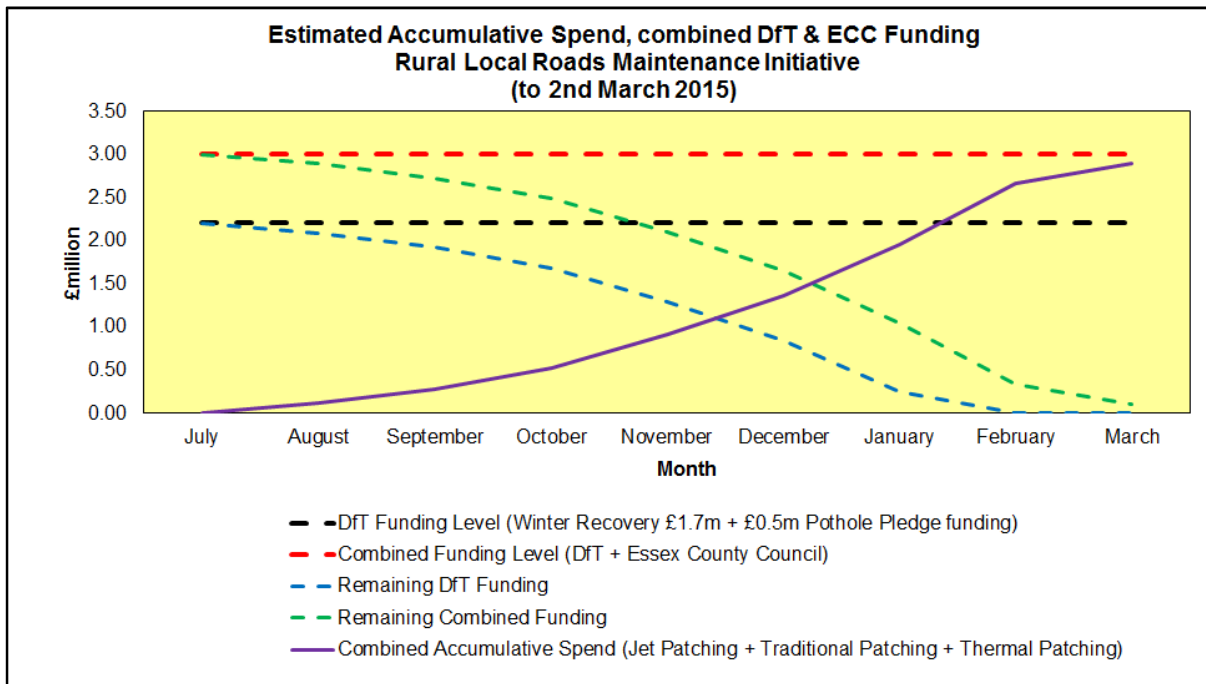
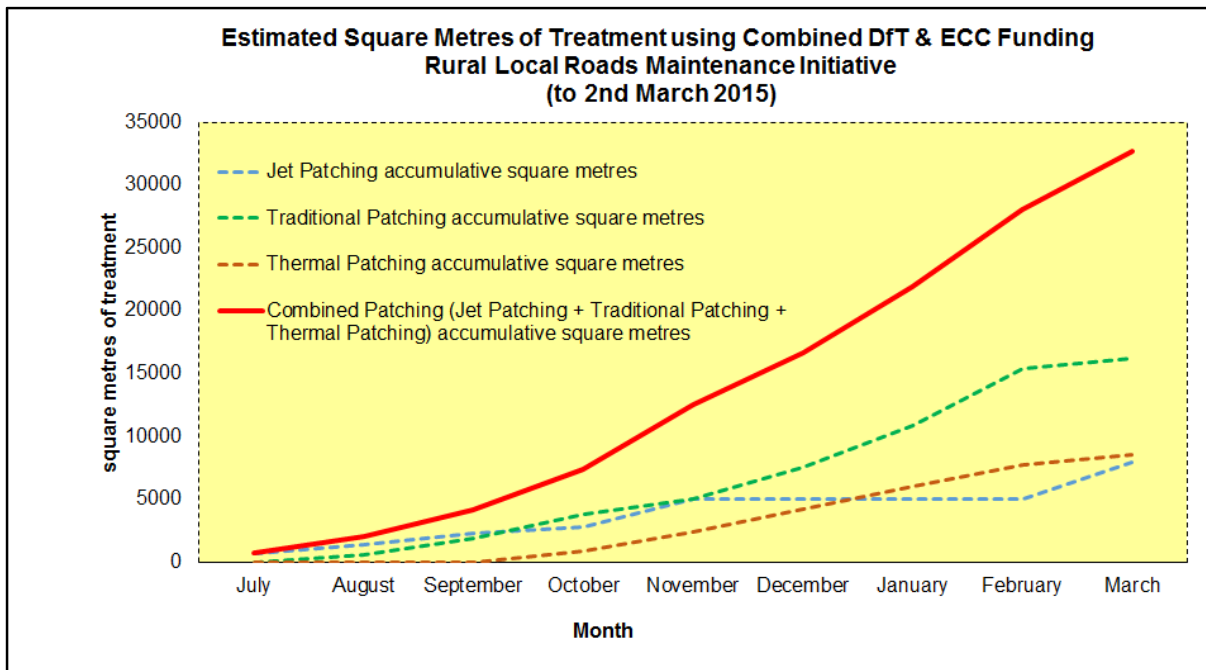


Chart 6 below shows the square metres of treatments which have been carried out using the additional DfT funding referenced in Chart 5 above.



2.5.2 Fixing Road, Footway, 'Kerbing', and Drain Defects (surface covers) on the Urban 'Local Roads' network (ECC funded only)

With reference to 2.3 above, £5.5m of additional ECC funding is being provided to carry out a range of minor repairs on the urban Local Roads network, including repairs to footways, kerbs, and drain covers (surface covers such as gully grates). The programme

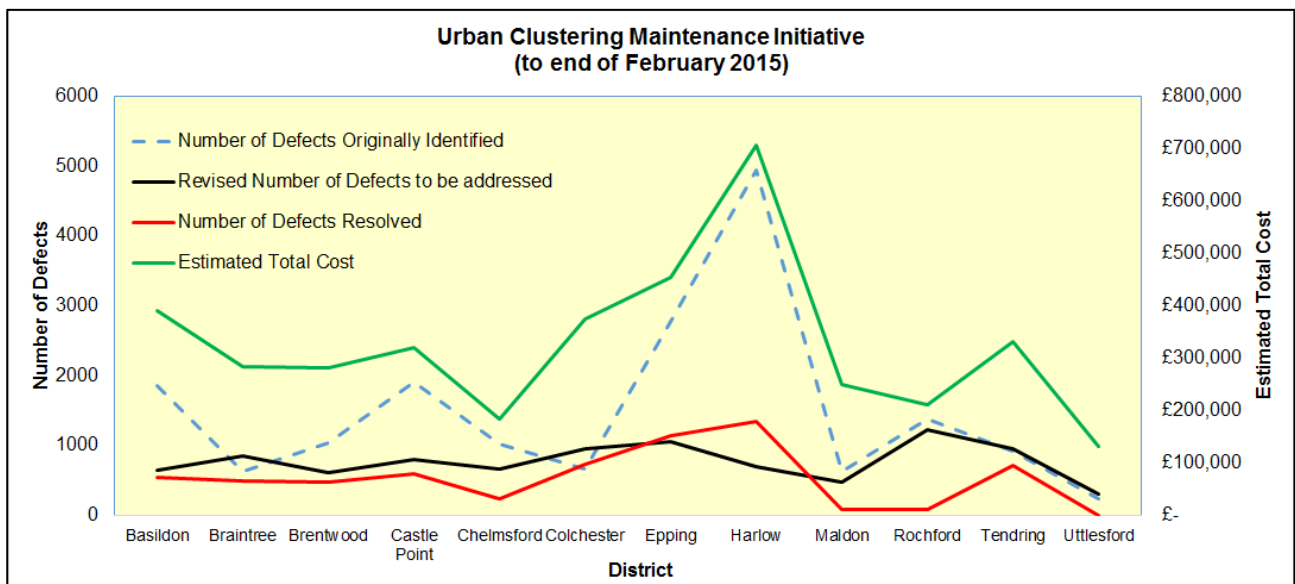
commenced at the beginning of October. The typical types of treatment being applied are localised patching on roads and footways, replacement or re-alignment of kerbs, and resetting of gully grates and other surface covers.

Sites have been determined by first identifying the presence within each road of all of the five different types of defect and their respective quantities. This information has then been combined with the respective 'density' of each type of defect present ('density' is identified by calculating the number of each type of defect per metre length of the road in question). This has produced an overall ranking and corresponding list of sites. This is believed to be the best means of identifying 'cluster' sites ('hot spots' where the greatest volume of defects is present) without disadvantaging roads of short site length. It is also believed to be the most efficient means of programming works and of achieving economies of scale to derive good value. Typical treatments are: Carriageway Patching, Footway Surfacing/Patching, Ironworks, Kerbs and Edgings. For more information on the sites to be subject to works please access the website via the link below:

<http://www.essexhighways.org/Transport-and-Roads/Roads-and-Pavements/Repair-programme-2014-15.aspx>

Chart 7 below shows the number of defects by District which have so far been resolved, as well as the corresponding estimated total spend to end of February. Note that following the original identification of defects the following has occurred:

1. New defects have been recorded
2. Some defects have been identified as requiring capital treatment (more extensive treatment), or are being addressed by a capital treatment, and therefore the corresponding locations have been removed from this urban maintenance initiative
3. Some of the locations identified in 2. above included defects which required to be treated with revenue funding in order to 'keep the sites safe', and hence are also included in the number of defects resolved



2.6 Why minor defects such as potholes are unlikely ever to be eradicated completely

We can all be proud of the programmes of works being undertaken on roads across Essex throughout 2014/15. Whilst these will make a significant contribution to addressing winter damage, however, they will not solve the problem of potholes entirely. Why not?

It can sometimes seem a mystery as to why potholes form at all, and why – after extensive minor repairs have been carried out – more potholes eventually reappear. There are a number of factors which create this phenomenon. The penetration of water is a major cause of road deterioration, but another major cause is oxidisation. Exposure to the air over time causes the road surface to harden and become brittle, and this makes the surface prone to cracking, which then allows the penetration of water. Regrettably we have an ageing network. This is not peculiar to Essex but merely describes the roads across the entire country. New and extensive resurfacing can be expected to remove any significant incidence of potholes for a number of years, but generally the older the network becomes then the more it will reveal the effects of ageing – such as the occurrence of annoying potholes.

The other contributor to the occurrence of potholes is the actual construction of the roads. Roads of modern construction are resistant to the formation of potholes, but the majority of our roads have ‘evolved’ over time and have not been constructed to the standards that would be expected of a newly built road today. These ‘evolved’ roads provide much less resilience to the effects of extreme weather.

Road construction failure mechanisms that result in a pothole have been identified as either ‘top down’ or ‘bottom up’. A top down failure is essentially a localised fault that develops into cracking and becomes progressive. A ‘bottom up’ failure results from a fault at depth, usually involving the presence of water, which causes cracking and leads to a block of material breaking away. For more information about potholes please refer to the HMEP report ‘Pothole Review: Prevention and a Better Cure’ accessed via the link below

<http://www.highwaysefficiency.org.uk/efficiency-resources/asset-management/the-potholes-review.html>

At the heart of the HMEP recommendations for addressing potholes are practices which have long been adopted by Highways:

- **Intervening at the right time** with preventative treatments (such as Surface Dressing and Micro Surfacing) to reduce the amount of potholes forming, thereby preventing bigger problems later
- **Getting it ‘Right first time’** with permanent, high quality repairs to reduce the cost of revisits
- **Providing clarity to the public** – through communicating to the public what is being done and how it is being done. Not only is ECC providing this information through its website and press releases, but it has recently launched a new interactive pothole reporting tool. A website facility to report a pothole or other highway problem has been available to the public for the better part of ten years,

but this interactive tool is a new and far more sophisticated service. The new tool will provide information on whether or not the pothole has already been reported, whether it is to be addressed through planned works, as well as when the next safety inspection is due for the road in question.

Further information on significant maintenance activities will be published in due course – monitor the Highways website for updates.