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# Transforming Ambulance Services

## National Audit Office Review



09 June 2011

National Audit Office  
157-197 Buckingham Palace Road  
London  
SW1W 9SP

09 June 2011

Dear Sirs

### Transforming Ambulance Services – National Audit Office Review

This report was commissioned by the National Audit Office (“NAO”) and has been prepared in accordance with our Contract with the NAO dated 25 January 2011. The report sets out the results of Deloitte’s independent review on the potential benefits from transforming ambulance services.

Information has been redacted from this version of the report at the request of the National Audit Office to remove individual trust data which could be seen as commercially sensitive. Specifically, the NAO requested that we remove appendices 1, 2 & 3 and unit costing data from pages 16, 18 and 20 of this report.

### Use of this report and legal responsibility

This report was prepared for the sole and confidential use of the NAO and for the purposes set out in the Contract. It was not prepared for or in contemplation of any other purpose or for the use of any other person. In preparing this report our only responsibility and duty of care was to the NAO. We did not, and do not by consenting to publication of this report, assume or accept or owe any responsibility or duty of care to any other person.

The NAO has asked for our consent to making this report publicly available by posting it on their web-site. We have agreed to provide such consent on the following conditions:

This report will not be suitable for the use of any person other than the NAO. Accordingly, publication of this report to persons other than the NAO is for information purposes only and no person other than the NAO should place any reliance on this report.

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We do not assume or accept or owe any responsibility or duty of care to any person other than the NAO. Accordingly, any person other than the NAO who, contrary to the above, chooses to rely on this report, does so at their own risk and we will not be responsible for any losses of any such person caused by their reliance on this report.

### Scope and limitations of our review

As per the Invitation to Tender (GEN/10/57) dated 23 December 2010, Deloitte was appointed to produce a report estimating : i) the current costs to the NHS of patients taken to A&E by ambulance, and the cost of processing those taken to A&E who could have been dealt with better elsewhere (the routes described in section 4 of the tender), and ii) the potential benefits that would accrue if patients were to be taken to the most appropriate end-point of care, for example, reduced overnight admissions by A&E.

We do not express any opinion as to the achievability of the benefits set out in this report. As realisation of these benefits will require significant change and transformation in the approach to Ambulance services across the NHS, the actual benefits and costs are likely to be different from those anticipated in the report.

### Our reliance on information

In preparing this report, we have used information and data provided by several sources to enable us to estimate the potential benefits from transforming the ambulance service. In addition, we have used information and data which has been provided to us by the NAO. In either case, we have relied upon such information and data as being true, correct and complete and have not audited, tested or checked any such information or data.

Yours faithfully

Deloitte LLP

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# Executive Summary

# 1.1 Review context

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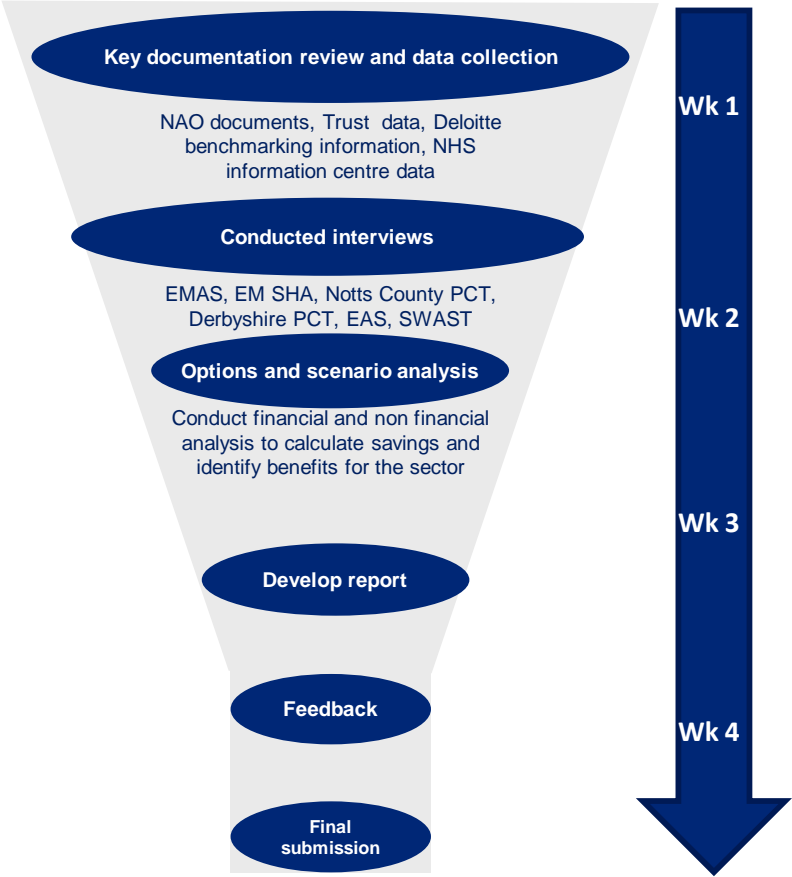
**A period of unprecedented change in the ambulance sector is driving a series of initiatives which could provide significant benefits to the NHS if successfully and consistently implemented across the country**

- The ambulance sector is going through a period of unprecedented change due to a number of external factors including the introduction of Call Connect, the development of NHS Direct, an increased provision of community services across the NHS and continuing growth in activity while needing to make significant efficiency savings. These factors are influencing a number of innovations such as the introduction of clinical triage desks, the adoption of integrated triage and capacity management systems and the roll-out of up-skilled Paramedics and Rapid Response Vehicles
- The dynamics in the market are essentially driving a series of initiatives which are fundamentally aimed at changing the way calls are handled, the way patients are treated at the scene and diversifying the ultimate destinations of the patient
- The rate and scale of change is variable across the country with some trusts at a very early stage but the successful implementation of a common response model facilitating increased telephone triage, lower levels of conveyance and less reliance on A&E departments could reap significant benefits to both the ambulance sector and the wider NHS
- Against this backdrop, the National Audit Office has commissioned this study to review the potential benefits to the ambulance sector, the wider NHS and the patient if the whole ambulance sector was to transform its response model to respond to the changing market environment

# 1.2 Scope of work and our approach

We have followed a robust approach in conducting a review of the key initiatives to transform the ambulance sector, quantify savings and analyse non financial benefits

Review criteria	Section reference
Overview of the ambulance sector and current state analysis	2.1, 2.2
Current costs to the NHS of the ambulance sector	2.1, 2.3
Unit cost of processing patients for ambulance sector and wider NHS	3.2, 3.3, 3.4
Benefits accrued if patients were to be taken to the most appropriate end-point of care.	4.1, 4.2, 4.3
Options description and non financial analysis	3.1, 3.2, 3.3, 3.4
Overall savings	1.2, 4.3
Key challenges in achieving desired level of benefits	1.3, 3.1, 3.2, 3.3, 3.4

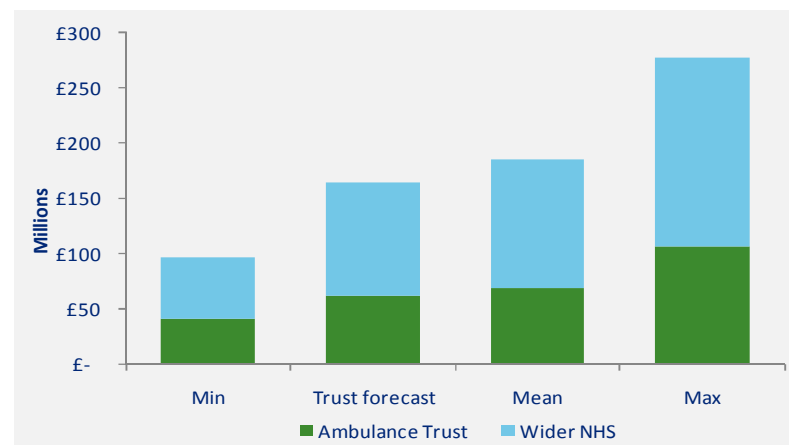
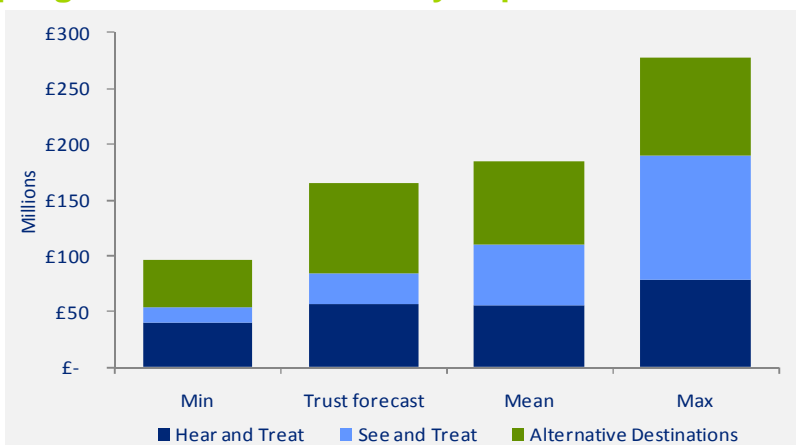


# 1.3 Key benefits summary

The ambulance sector has limited influence over the volume of calls but there are three critical points where it has significant influence over how a call is ultimately resolved...transforming the response model in these areas will have significant benefits to the NHS

		Key initiatives		
		Hear & Treat	See & Treat	Alternative Destinations
		Resolution of calls using telephone triage without need to despatch vehicle	Resolution of incident at scene without need to convey to another provider	Conveyance of patients to a non-A&E destination such as MIU, UCC, Walk-in Centre, etc.
Key benefits	Ambulance sector	<ul style="list-style-type: none"> <li>Reduction in the number of despatches</li> <li>Incidents will be dealt with more promptly</li> </ul>	<ul style="list-style-type: none"> <li>Reduction in call cycle as no journey or turnaround</li> <li>More effective use of crew clinical skills</li> </ul>	<ul style="list-style-type: none"> <li>Reduction in turnaround times</li> <li>Potential reduction in journey time</li> </ul>
	Wider NHS	<ul style="list-style-type: none"> <li>Most appropriate pathways chosen</li> <li>System capacity better utilised</li> <li>Reduction in A&amp;E attendances</li> </ul>	<ul style="list-style-type: none"> <li>Significant reduction in A&amp;E attendances</li> <li>Potential reduction in hospital admissions</li> </ul>	<ul style="list-style-type: none"> <li>Lower cost setting for attendance</li> <li>Reduced hospital admissions</li> </ul>
	The Patient	<ul style="list-style-type: none"> <li>Appropriate and immediate resolution</li> <li>Care closer to home</li> </ul>	<ul style="list-style-type: none"> <li>More immediate access to clinical treatment</li> <li>Shorter treatment times</li> <li>Signposting to most appropriate setting</li> <li>Care closer to home</li> </ul>	<ul style="list-style-type: none"> <li>Improved convenience and choice</li> <li>Shorter treatment times</li> <li>More coordinated patient service</li> <li>Car closer to home</li> </ul>

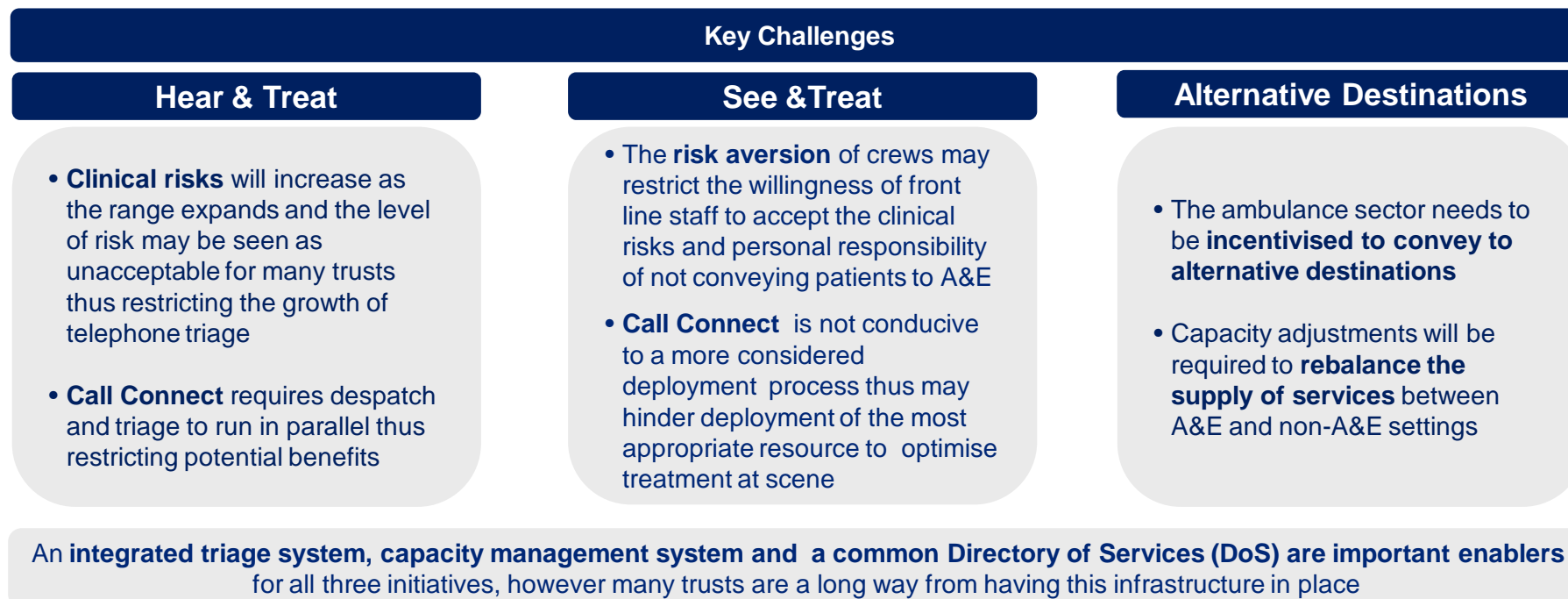
Our analysis suggests potential benefits in the region of £185m per annum to the NHS if the transformation programme is successfully implemented



\*All savings based on 09/10 prices

## 1.4 Key challenges & next steps

Realisation of the full benefits will require a collaborative and coordinated approach across the health economy and will need to address a number of fundamental challenges and obstacles



### Next steps

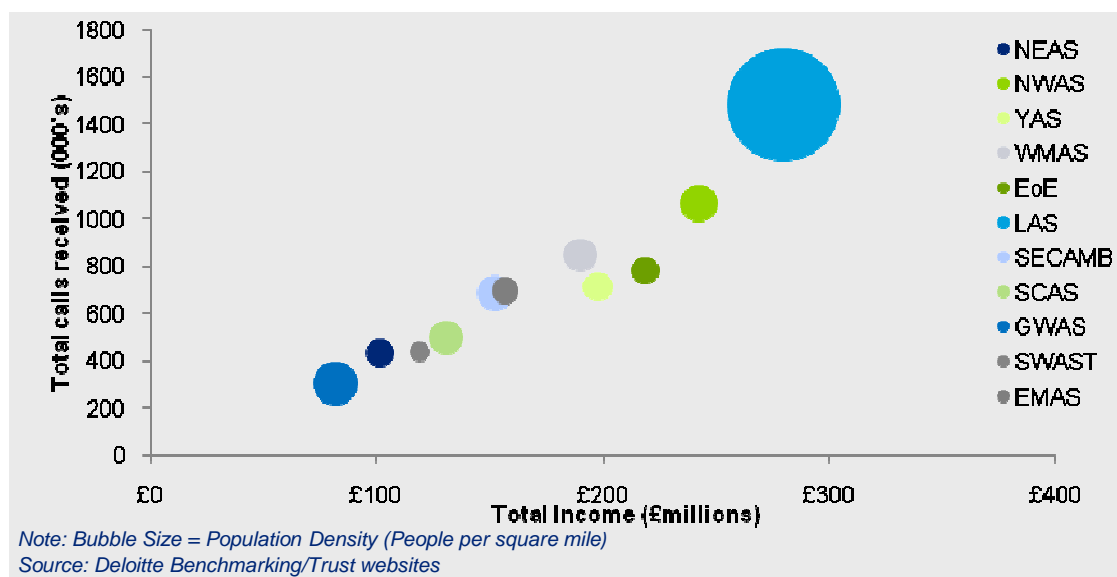
- i. Present high level findings of review at ambulance trust Chief Executives forum in March
- ii. Consider need for more detailed analysis, in close cooperation with ambulance trusts and other key external stakeholders, to further validate, refine and develop assumptions
- iii. Discuss findings with key stakeholders at DH to ensure findings are considered in context of key national initiatives and in particular policy work relating to ambulance response targets, Call Connect, NHS Pathways CMS and changes to the ambulance tariff
- iv. Incorporate key findings in NAO report to Public Accounts Committee



# Ambulance Sector Overview

## 2.1 Sector overview and configuration

- The NHS invested £1.9 billion in the ambulance sector in 09/10, of which £1.5 billion relates to A&E services
- The eleven ambulance trusts cover a population of c.51 million, ranging from 2.2m in the Great Western region to 7.7m in London, and responded to 7.9 million calls in 09/10. Population density also varies significantly, ranging from 358 people per square mile in the South West to 12,419 in London
- Patients are predominantly transported to a network of A&E departments across 166 acute trusts but also have access to other destinations including 125 Walk-in Centres and 241 MIUs



		NWAS	WMAS	GWAS	SWAST	SCAS	SECAMB	LAS	EOE	EMAS	YAS	NEAS	Total
Health Economy	A&E Income	£190,058,013	£152,684,000	£66,073,000	£91,227,575	£104,463,757	£134,274,214	£251,350,511	£171,478,000	£123,753,972	£154,325,504	£75,222,540	£1,514,911,086
	Other Income	£52,162,434	£37,215,000	£15,628,000	£27,605,719	£26,544,076	£18,154,707	£28,515,078	£47,189,000	£32,795,196	£43,585,069	£26,167,009	£355,561,288
	Emergency Calls	1,064,095	844,082	301,604	435,494	494,716	685,625	1,480,275	778,099	692,936	710,916	431,776	£7,919,618

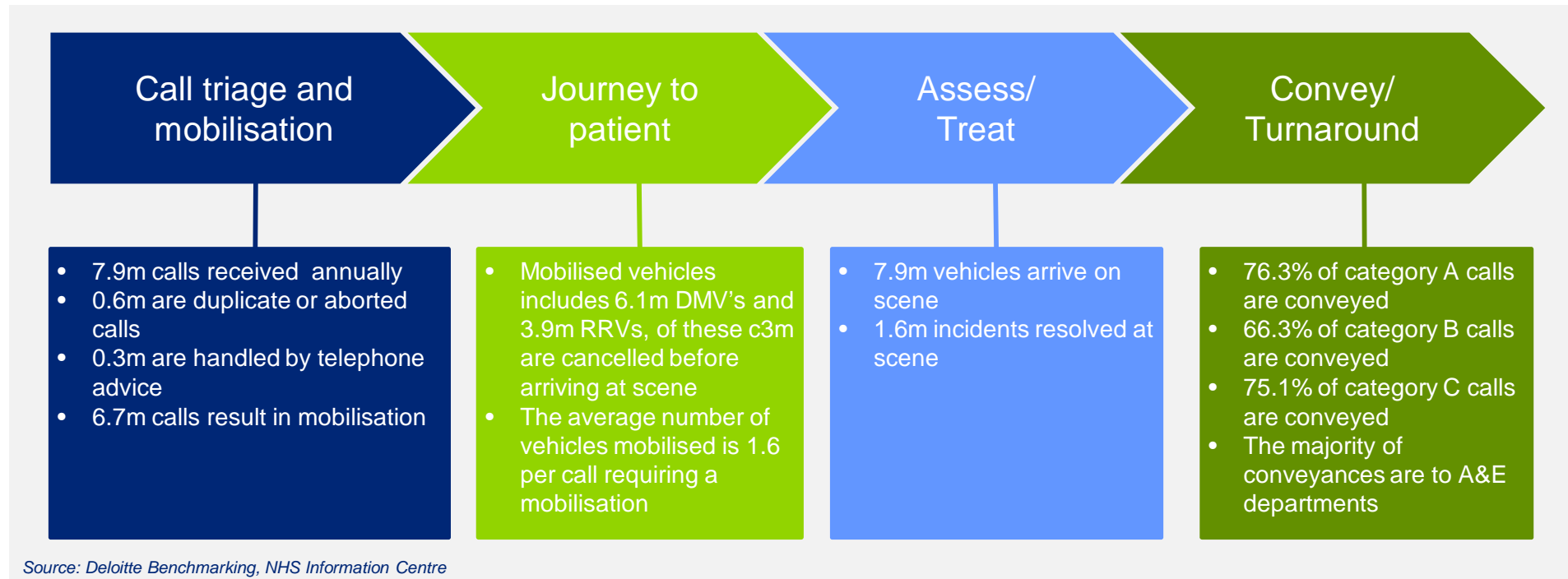
Source: Deloitte Benchmarking (09/10 financials)

Provider Landscape	Acute Trusts	Walk In Centres	MIUs	PCTs
Acute Trusts	28	19	8	10
Walk In Centres	29	8	5	4
MIUs	28	20	14	61
PCTs	24	16	8	7

Source: NHS Choices

## 2.1 Call activity and resolution

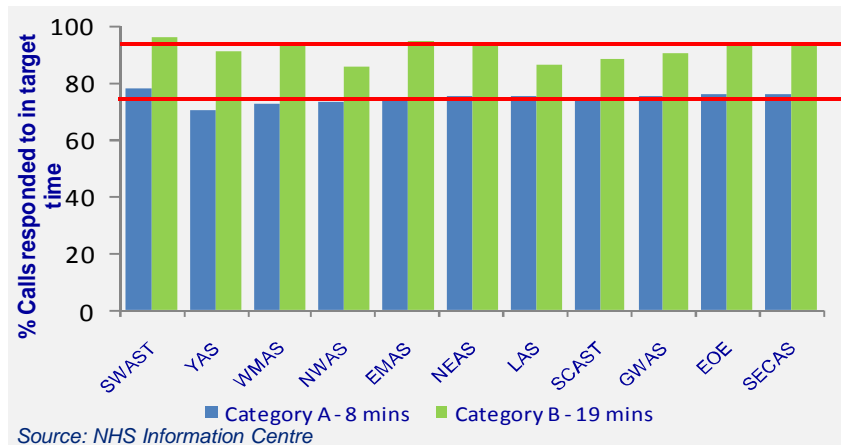
The 11 ambulance trusts handled 7.9m calls in 09/10 of which 0.3m were resolved over the telephone, 1.6m were treated at the scene and 72% resulted in a conveyance, invariably to A&E departments



- There has been significant growth nationally in the number of calls received over recent years (c.3-5% pa) and the consensus view of the ambulance sector and the wider NHS is that this growth will continue into the future
- There are a number of national initiatives to try to curtail the number of 999 calls received, including NHS Direct, Out of Hours Services, Minor Injury Units and the piloting of a single point of access for non emergency services ( '111' ), however the impact of these initiatives in managing activity growth is yet to be realised
- The ambulance sector has little influence over the number of 999 calls received and has a statutory obligation to resolve a call once received. ***The sector can essentially influence and manage demand at 3 points within the call cycle i) deciding on the appropriate action when the call is received (treat over phone or despatch a vehicle); ii) treating the patient at the scene so that a conveyance to a provider is not required and iii) deciding on the most appropriate destination for those that are conveyed, typically to an A&E department***

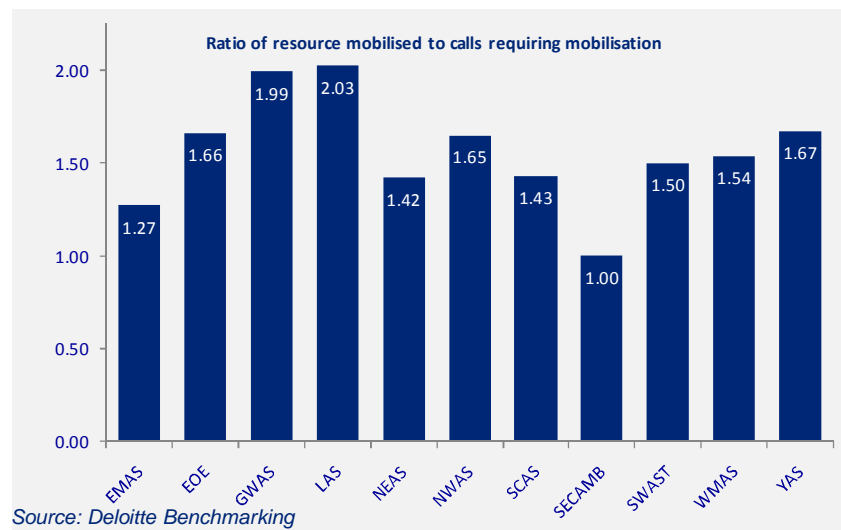
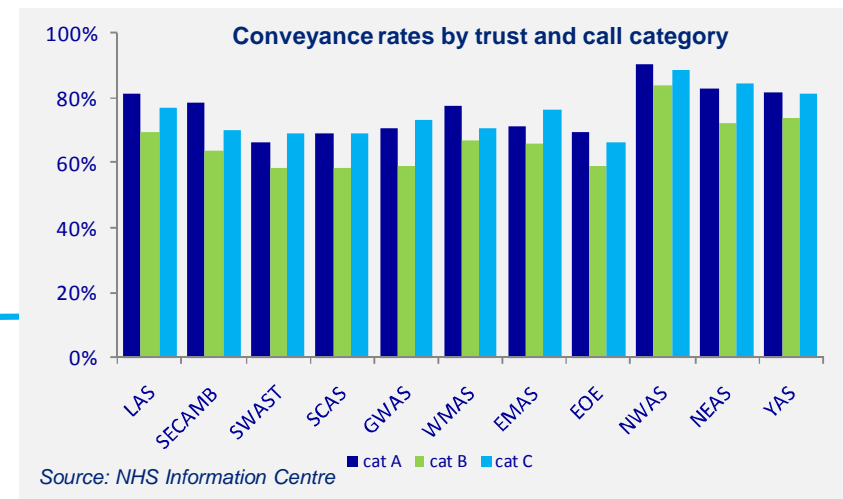
## 2.2 Meeting performance targets

The ambulance operational response model is heavily focused on performance targets (A8 and B19) and has been substantially influenced by “Call Connect” in recent years



- Ambulance trusts are set the national performance targets of arriving at the scene within 8 minutes for 75% of Category A calls, and within 19 minutes for 95% of category A and B calls – the average response time performance in 09/10 was 74% for category A and 92% for category B calls, however there is wide variation across the sector with very few trusts meeting both targets
- From 1 April 2011 the category B19 target will be replaced with a set of 11 clinical quality indicators to better reflect patient care and experience

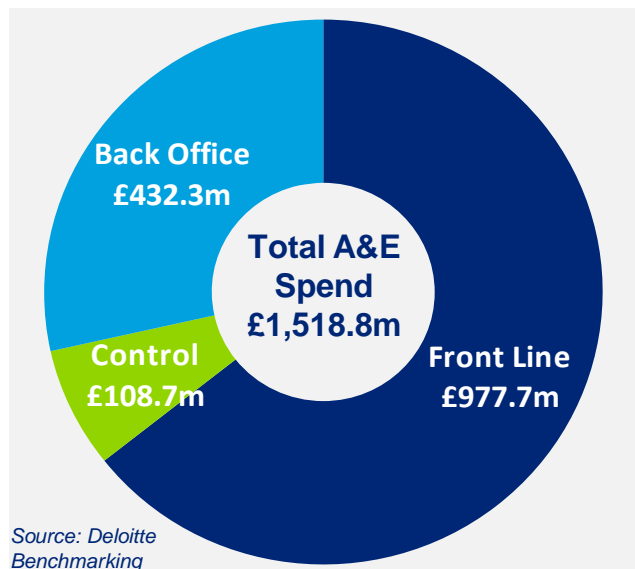
- Conveyance rates vary across call types and between Trusts with overall conveyance rates between 64% and 87%
- All Trusts convey substantially fewer category B calls than category A and C



- The introduction of “Call Connect” in April 2008, where the ‘clock starts’ when the call connects to the emergency control room, is estimated to require a 60-90 seconds saving in the call cycle and has required significant investment by all ambulance trusts
- Under Call Connect, trust’s typically mobilise more than one vehicle immediately on receiving the call so the despatch is running in parallel to assessing the call. This significantly increases the probability of arriving at the scene within the response target times but also: i) results in a high number of vehicles being stood down as the assessment progresses, and ii) the most appropriate vehicle type is not always despatched

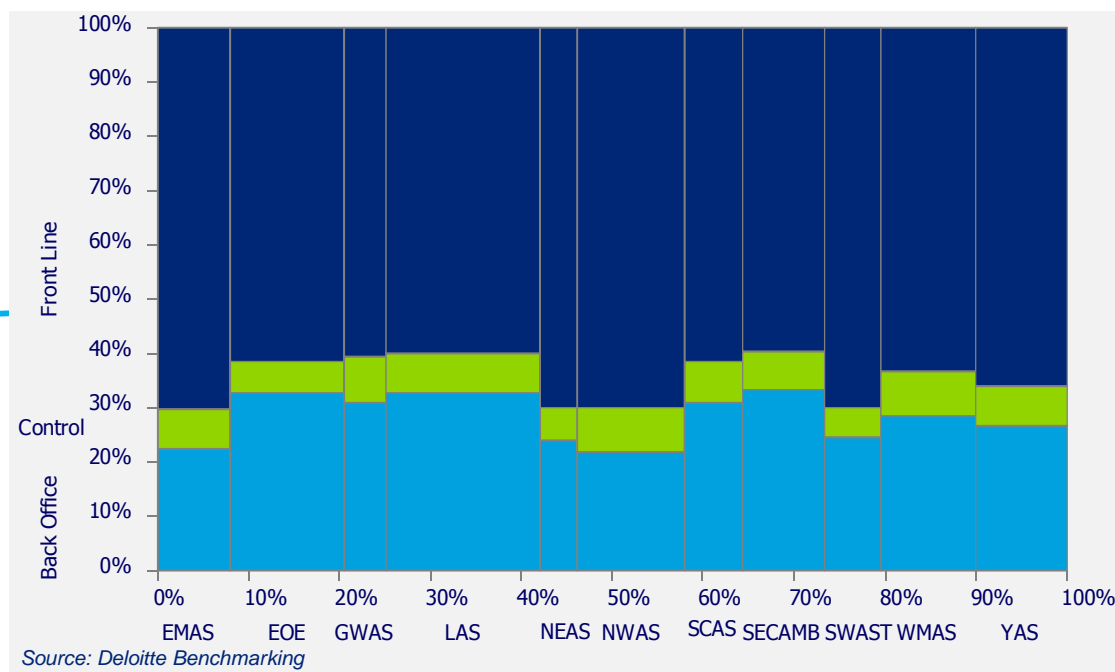
## 2.3 Cost of ambulance emergency services

Total emergency spend of £1.5bn in 09/10 of which £978m relates to front line operations, £108m to control room and £432m to allocated back office costs



- Total NHS spend on emergency ambulance services was c.£1.5bn in 09/10
- 64% of spend was on front line services including vehicle staff, front line management and support and vehicle costs
- Control (call taking and despatch) makes up c. 7% of A&E spend
- 29% of spend is on back office /support function allocated costs
- Front line spend is largely variable and is influenced by activity levels and performance requirements while back office spend is generally independent of activity levels. Control room spend is semi-fixed and may change marginally with significant changes in activity levels

- Total emergency spend across the sector ranges from £251m in London to £62m in the North East . This compares to a cost per incident of £253 and £175 and a cost per capita of £33.38 and £23.84 in London and the North East, respectively
- Spend on front line as a percentage of total A&E spend varies from 59.8% in South East Central to 70% in the East Midlands
- Spend on control ranges from 5.4% in the South West to 8.3% in the Great Western Ambulance Trust. There is significant variation between trusts in the proportion of spend on back office costs although this will be influenced by variations in the way in which trusts allocate overheads across service lines
- The variation in cost profiles is indicative of inconsistencies in the response model suggesting potential scope for optimisation



# Transforming Ambulance Services

# 3.1 Transformation of the response model

The response model for emergency services changed little for decades but a series of initiatives are driving change in the way calls are handled, the way patients are treated at the scene and the ultimate destination of patients...

**Traditional Response Model**

Emergency calls come through the ambulance control centre which triggers the despatch of a Double Manned Vehicle (DMV) with the patient being conveyed to the local hospital A&E department on most occasions

**Evolution of the Traditional Model**

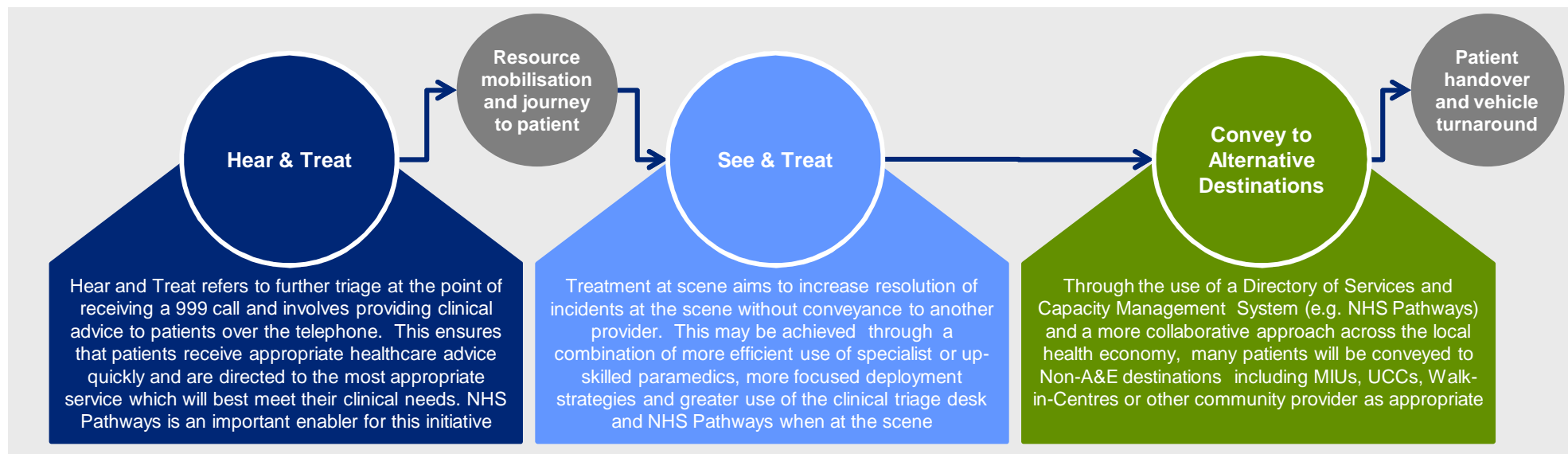
The traditional model remains largely intact but a number of external factors are influencing changes in the market:

- Call Connect and the increased challenge to meet response time targets
- NHS Direct and an increased provision of community services including MIUs, Walk-in-Centres and UCCs
- Continuing year on year growth in call demand and the need to make efficiency savings to service growth within the existing financial envelope

These factors are driving a number of innovations such as the introduction of clinical triage desks, the adoption of integrated triage and capacity management systems and the roll-out of up-skilled Paramedics and Rapid Response Vehicles.

These innovations are essentially aimed at fundamentally changing the way calls are handled (Hear & Treat), the way patients are treated at the scene (See & Treat) and diversifying the ultimate destinations of the patient (Alternative Destinations)

...the rate and scale of change is variable across the country with some trusts at a very early stage, but the successful implementation of a common response model facilitating increased telephone triage, lower levels of conveyance and less reliance on A&E departments could reap significant benefits to the ambulance sector and the wider NHS





## 3.2 Initiative analysis - Hear & Treat

There is potential to increase telephone resolution rates, facilitated by the widespread adoption of integrated triage systems, thus delivering better patient outcomes and wider benefits to the NHS



- The key transformational initiative in the call handling process is to substantially increase the resolution rate of incidents over the telephone while keeping stand-down times to a minimum
- All ambulance trusts have introduced some triage capability to date but the type and scale is variable. The models adopted include internal triage, clinical telephone advice, transfers to NHS Direct and NHS Pathways. For example, NEAS has piloted and fully implemented Pathways and is resolving c4% over the phone through using non-clinicians (not fully reflected in graph which only includes those resolved by clinicians) while others are triaging only 2-3% of calls using the internal triage desk or passing to NHS Direct
- Going forward, the implementation of NHS Pathways will be the most significant enabler for increased telephone triage. This is unlikely to require significant investment in resource but will need a major training drive to up skill call takers and change the mindset

Implications for ambulance sector	Implications for system	Implications for patients	Key challenges
<ul style="list-style-type: none"> <li>• The key implication for the ambulance sector is a reduction in the number of despatches as calls are resolved over the phone without the need to send a crew to the scene. This will free up resource and therefore enable management of growth in demand within the existing financial envelope</li> <li>• Incidents will also be dealt with more promptly and if needed patients directed to the most appropriate pathway</li> <li>• Ambulance trusts will need to invest in training and potentially clinical supervisors to expand telephone triage activity</li> <li>• There may be additional clinical risk in resolving more calls over the phone therefore effective risk management processes will need to be in place</li> </ul>	<ul style="list-style-type: none"> <li>• Greater resolution of incidents over the phone reduces demand on other NHS providers and in particular for A&amp;E attendances as 66.3% of Category B and 75.1% of Category C calls currently result in conveyance to A&amp;E</li> </ul>	<ul style="list-style-type: none"> <li>• Patients will receive appropriate and immediate resolution which will better meet their clinical needs</li> <li>• This treatment model is also in line with the policy of care closer to home</li> </ul>	<ul style="list-style-type: none"> <li>• H&amp;T can only be used for a limited but expanding range of conditions. <b>Clinical risks</b> will increase as the range expands and the level of risk may be seen as unacceptable for many trusts thus restricting the growth of telephone triage</li> <li>• <b>Call Connect</b> requires multiple vehicles to be mobilised immediately and before the nature of the call is determined. This means that the despatch and triage are running in parallel and in many cases a vehicles can arrive at the scene before the call is triaged and categorised over the phone</li> <li>• <b>An integrated triage system</b> such as NHS Pathways CMS is an important enablers however many trusts are a long way from having this infrastructure in place</li> </ul>





## 3.2 Hear and treat – unit savings

The average net saving per call resolved by Hear & Treat is estimated at £66.35 for the Ambulance Trust and £13.96 for the wider system

Ambulance Sector							System Wide			
Call Cycle Savings			Triage Investment			Net Savings per unit	% A&E discharge without follow up	A&E Tariff - Minor	Unit cost per unit	
Average call cycle (mins)	Cost per hour (£)	Gross Savings	Average Triage call time	Cost per hour	Gross savings					
HT1	HT2		HT3	HT4			HT5	HT6		
Commercially sensitive data redacted at request of National Audit Office										
Average	66.75	£62.42	£69.45	10	£18.57	-£3.09	£66.35	24%	£59.00	£13.96

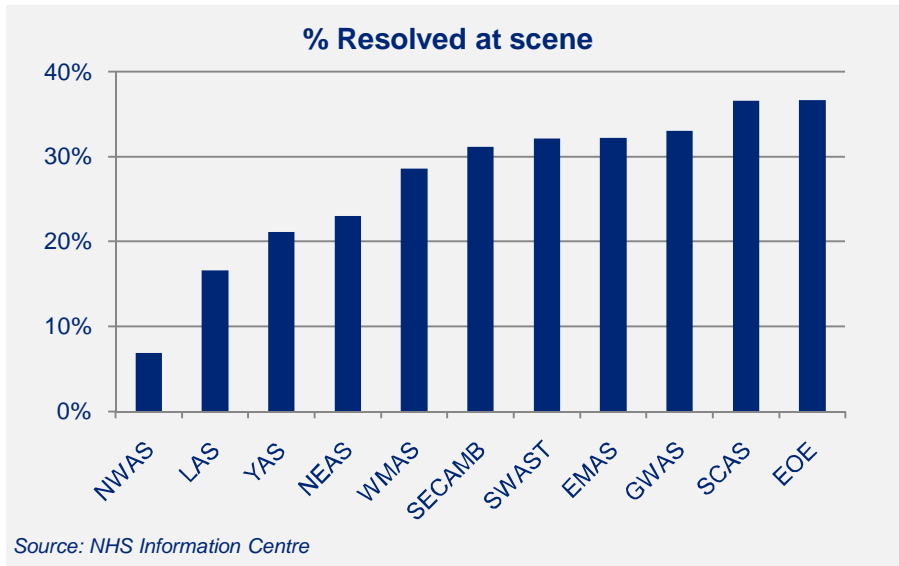
- **HT 1** - Assumes all those treated over the phone would have been low acuity category C patients therefore category C **average call cycle time** has been used
- **HT 2** – **Call cycle cost per hour** assumes a DMV attends the incident and is based on 09/10 WTE and vehicle costs adjusted for trust skill mix
- **HT 3** – **Average triage call time** is based on 10 minute call time. This estimate is based on views from trusts ranging from 7-10 minutes
- **HT 4** – **Triage cost per hour** is based on the 09/10 ECA pay grade rates. Triage cost does not include non-recurrent investment in training to up-skill call takers

- **HT 5** - The proportion of patients discharged from A&E without follow-up has been used as a proxy for the percentage of calls resolved over the phone that would previously have resulted in an **A&E attendance**
- **HT 6** – Assumes those previously conveyed to A&E would have attracted the **A&E Minor tariff** given low acuity



## 3.3 Initiative analysis – See and Treat

An increase in the number of incidents treated at the scene will take considerable pressure off the health system and deliver patient benefits but progress may be hindered by structural issues and risk aversion



- If a call cannot be resolved over the telephone, the next opportunity for the ambulance sector to resolve the call is by treating at the scene or at the home without the need to convey to another NHS provider
- The number of calls resolved at the scene varies widely and ranges from 7% to 37% of incidents attended. The willingness to resolve at the scene does have a cultural aspect attached to it as crews move from the traditional model. However, it is also heavily influenced by the deployment model and in particular the skill mix sent to different types of incidents. For example, a highly skilled ECP may be able to resolve a category B or C call but be unable to do much more than a Paramedic if deployed on a category A call.
- The primary goal of meeting the response target has historically led to sub-optimal deployment but many trusts are moving towards a more sophisticated deployment model. The additional flexibility introduced by the removal of the B19 target from April 2011 is a key driver for this change
- Trusts are also able to influence the need for conveyance by making ongoing use of the clinical triage desk while at the scene and also by accessing the DoS/CMS to determine whether other pathways are available

### Implications for ambulance sector

- Treating patients at home and in the community will reduce the need to convey. Although more time is required at scene, it is less than the combined journey and turnaround time thus reducing the overall call cycle and releasing DMV crews for other calls more quickly
- There may be some investment required to improve the sophistication of deployment and also to upskill crews to resolve more incidents at scene. However, the working assumption is that additional costs will be offset by an increase in the ratio of single to double manned crews
- Clinical risk of non conveyance sits with the trust therefore appropriate risk management systems will be required

### Implications for system

- Resolution at the scene will significantly reduce A&E and non-A&E attendances
- See & Treat may have a secondary impact on hospital admissions but for the purposes of this analysis we have assumed that those treated at the scene would not have resulted in a hospital admission given the low acuity levels

### Implications for patients

- Reduce clinical risks and improved safety by having the most experienced and skilled clinicians providing a first response and signposting patients to the most appropriate setting to manage their ongoing needs
- Shorter treatment times and reduced wait as no secondary care provision
- Improved choice of care through collaboratively planning treatment with the patient.
- Provision of care in the home setting as opposed to an acute or community service

### Key challenges

- The current primary **focus on response targets** and in particular the demands of Call Connect are not conducive to a more considered deployment process and may hinder progress with this initiative.
- A common **DoS and real-time CMS** are important to enable direct referrals and signposting to appropriate services for ongoing treatment
- The **risk aversion** of crews may restrict the willingness of front line staff to accept the clinical risks and personal responsibility of not conveying patients to A&E



### 3.3 See and treat –unit savings

The average net saving per call resolved by See & Treat is estimated at £32.32 for the Ambulance Trust and £70.44 for the wider system

Ambulance Sector				System Wide				
Call Cycle Savings								
	Call cycle savings	Cost per hour (£)	Net Savings per unit	A&E Tariff	Non A&E Tariff	% currently conveyed to A&E	% currently conveyed to non A&E	Weighted unit cost per avoidance
	ST1	ST2		ST4	ST5	ST3	ST3	
Commercially sensitive data redacted at request of National Audit Office								
Average	31	£62.42	£32.32	£73.00	£50	89%	11%	£70.44

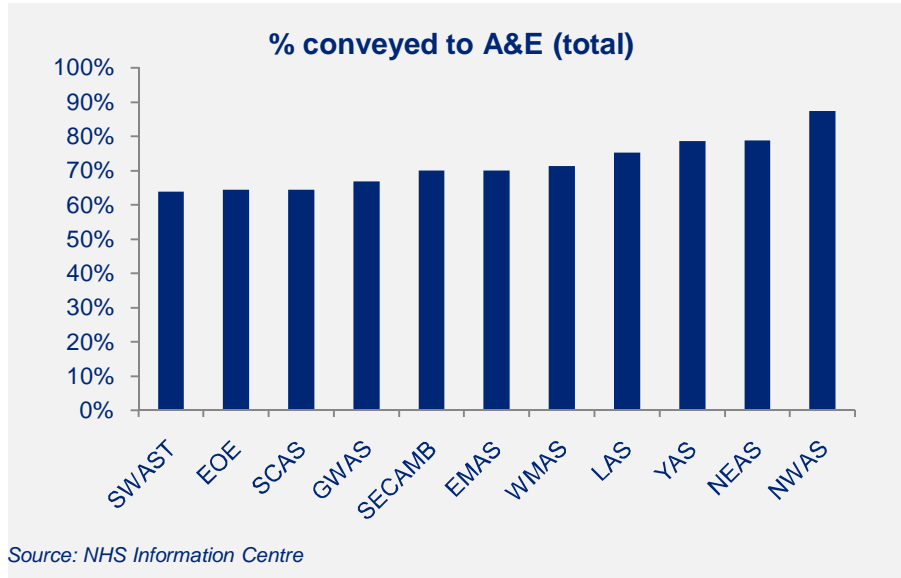
- **ST 1 - Call cycle saving** assumes that the crew will spend longer on the scene but will save time on conveyance and vehicle turnaround at A&E. This is based on trust data or an average of those trusts providing data where data not provided
- **ST 2 – Call cycle cost per hour** assumes a DMV attends the incident and is based on 09/10 WTE and vehicle costs adjusted for trust skill mix

- **ST 3 – Current conveyance rates to A&E and non-A&E destinations** is based on NHS information centre data
- **ST 4 –** Assumes those conveyances previously resulting in an **A&E attendance** would have attracted an average of the A&E Minor and Standard tariff
- **ST 5 –** Assumes those conveyances previously resulting in an **non-A&E attendance** would have attracted a local tariff of £50

# 3.4 Initiative analysis – Alternative Destinations



The roll-out of an integrated CMS will facilitate conveyance to a wider range of non-A&E destinations, but incentivising the ambulance sector needs to be resolved



- The majority of conveyances are to A&E departments, with only a handful going to alternative destinations such as MIUs, Walk-in-Centres, Urgent Care Centres and other community facilities
- Approximately 75% of category C calls are conveyed to A&E and 24% of attendances are discharged with no follow-up thus suggesting that A&E level facilities may not be required for a large proportion of attendees. Furthermore, although the available data is limited, anecdotal evidence suggests that non-A&E providers are lower cost than A&E departments
- The fundamental reason for ambulance trusts not regularly conveying to non A&E destinations is that prescribed pathways are not in place, they do not have visibility over available capacity and the sector is not incentivised to consider alternative destinations. The former two points will be addressed with the roll-out of integrated triage systems but the latter remains an issue

Implications for ambulance sector	Implications for system	Implications for patients	Key challenges
<ul style="list-style-type: none"> <li>• Reduced cycle time through shorter turnaround times at alternative destinations and potentially shorter journey times in many instances thus freeing crews quicker to respond to other 999 calls</li> </ul>	<ul style="list-style-type: none"> <li>• Savings for commissioners if the alternative destination has lower cost than the national A&amp;E tariff</li> <li>• Reduced A&amp;E attendances will reduce hospital admissions as 1 in 2 attendances results in an admission</li> <li>• Investment may be required by the system to build the alternative destination capacity while acute trusts may not be able to reduce infrastructure costs as level of A&amp;E attendances come down</li> </ul>	<ul style="list-style-type: none"> <li>• Improved convenience and choice of where care is delivered with options most suited to their clinical needs and closer to home</li> <li>• Reduced waiting times at alternative providers in comparison to A&amp;E</li> <li>• Promotes integrated working with community and other trust partners to provide a more coordinated patient service</li> <li>• Reduced admissions and the associated clinical benefits such as lower risk of HCAI etc.</li> </ul>	<ul style="list-style-type: none"> <li>• The success of this initiative is largely dependent on the <b>successful roll-out of an integrated triage system</b></li> <li>• The ambulance sector needs to be <b>incentivised to convey to alternative destinations</b> and a cultural swing will also be required to move away from the traditional model</li> <li>• Capacity adjustments will be required to <b>rebalance the supply of services</b> between A&amp;E and non-A&amp;E settings</li> </ul>

# 3.4 Alternative Destinations – unit savings



The average net saving per incident conveyed to an Alternative Destination is estimated at £15.61 for the Ambulance Trust and £170.56 for the wider system

Ambulance Sector					System Wide						
Call Cycle Savings				Net Savings per unit							
Turnaround time at A&E	Turnaround time Non-A&E	Call cycle savings	Cost per hour (£)		A&E Tariff	Non A&E Tariff	Unit cost per avoidance	Average cost of admission	Admissions conversion adjustment	Unit cost per admission	Net savings per unit (£)
AD1	AD2		AD3		AD4	AD5		AD6	AD7		
Average	30	15	15	£62.42	£73.00	£50	£23	£732	20%	£147.56	£170.56

Commercially sensitive data redacted at request of National Audit Office

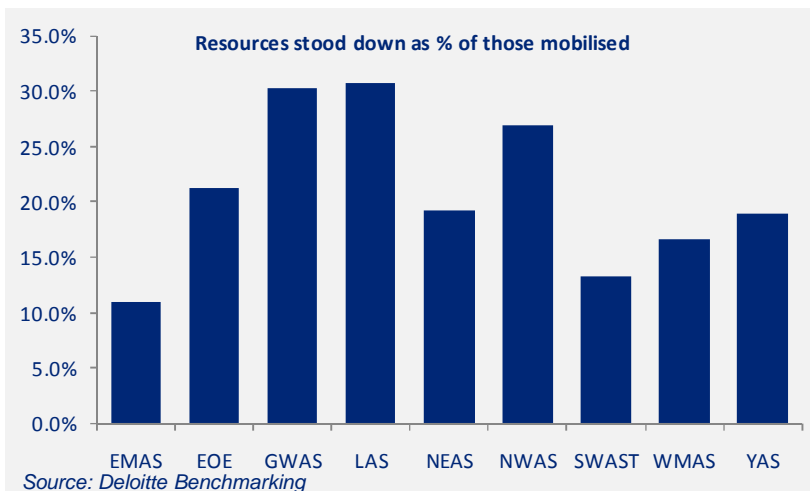
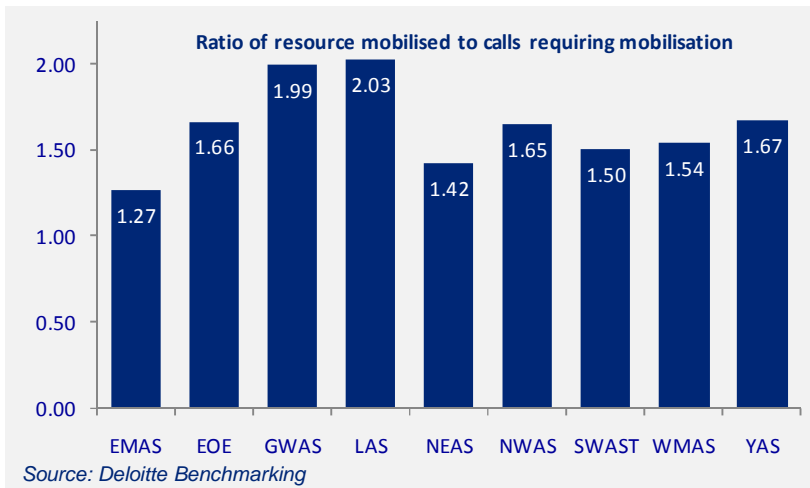
- **AD 1** - 30 minute hospital turnaround time at A&E assumed for all trusts, based on available data and information
- **AD 2** - Non-A&E turnaround time is assumed to be shorter than at A&E (shorter waits, more efficient handover). We have estimated this at 15 minutes based on discussions with trusts
- **AD 3** – Call cycle cost per hour assumes a DMV attends the incident and is based on 09/10 WTE and vehicle costs adjusted for trust skill mix

- **AD 4** – Assumes those conveyances previously resulting in an A&E attendance would have attracted an average of A&E Minor and Standard tariff
- **AD 5** - Cost of non-A&E attendance is assumed to be £50, based on evidence from a review of Walk-in-Centre costs at Notts County PCT and from the business cases from the East Midlands and Durham and Darlington 111 pilots.
- **AD6** - Admissions avoided are assumed to save £732 per unit. The actual tariff will vary widely, for simplicity we have based this assumption on average emergency short stay tariff
- **AD7** - HES data suggests admission rates of 50% for those attending A&E. We have adjusted down to 20% to reflect the lower acuity levels

## 3.5 Initiative analysis - the influence of Call Connect

The health system needs to take a view on whether the reduced flexibility offered under the Call Connect environment is outweighed by better patient outcomes

Call Connect came into effect on 1 April 2008. Under Call Connect, call response time is measured from the moment the call is connected to the ambulance control room as opposed to previously where the response time was measured after key information had been collected from the caller – it is estimated by NHS Choices that this added a 90 second efficiency requirement to the A8 response target. The net result was that significant investment was made in resource by all ambulance trusts to meet the new response target



### Impact on the Response Model

- Trusts will rapidly mobilise more than one resource for most incidents to ensure response times are met, e.g. an RRV or bike and a DMV. Mobilisation may not consider the nature of the incident and response type required as the information is not available at that time. On average 1.6 resources are mobilised for each incident requiring a response
- Many mobilised vehicles are then 'stood down' as the code is established. On average 21% of resources mobilised do not arrive on scene but this is as high as 30% in some regions. In many cases the vehicle has arrived at the scene before it is stood down

### Implications for the transformation initiatives

- Hear and Treat.* Under Call Connect a vehicle will have been mobilised prior to the call being identified as suitable for Hear and Treat. There may be reluctance to then stand down the vehicle and treat over the phone if it is on its way to the scene. Furthermore, the full benefits of Hear & Treat are not realised as the despatch is running in parallel for a period
- See and Treat.* Mobilisation will be based on the nearest resource as opposed to the most appropriate resource therefore the first crew on the scene may not have the skills to treat at scene. Additional triage time may have facilitated a more appropriate response
- Alternative Destinations:* additional triage time may allow the despatch of a lower spec. vehicle capable of transporting to non-Emergency destinations

### Implications for the Patient

- Under Call Connect the response will arrive more promptly which provides an improved patient experience and may provide a better clinical outcome, particularly in relation to cardiac arrest patients

## 3.5 Initiative analysis - the criticality of integrated triage

An integrated call triage, directory of services and capacity management system is one of the most critical enablers for all three initiatives but full implementation is still some way off

The integrated NHS Pathways Capacity Management System (CMS) telephone triage and clinical content suite can be used by ambulance service call takers to determine the clinical skills and timescales required for particular incidents thus enabling the most appropriate response to be made. It can effectively identify life threatening situations but its primary emphasis is on dealing with a broad spectrum of calls, including those that do not necessarily require an ambulance response. Pathways is fully integrated with CMS which can be populated with skills and service capability and capacity across the health economy. This ensures that the pathway recommended by the triage software is actually available in the system at a point in time.

NHS Pathways was initially piloted by NEAS and has been operating successfully for two years. Most ambulance trusts have plans to roll it out over the next 2 years.

	Currently Operating?	Plan to Introduce*?	Detail
EMAS		✓	Have not ruled out implementation but not currently pursuing due to practical considerations.
EOE		✓	Have indicated an intention to implement over the next 1-2 years.
GWAS			Have indicated an intention but no concrete detail available.
LAS			Plans to develop alternative care pathways with secure access to these from Clinical Telephone Triage and a Directory of Services but not through NHS Pathways.
NEAS	✓	✓	NHS Pathways Pilot site. All '999' emergency calls now handled using NHS Pathways. Developing a face to face triage system using NHS Pathways and CMS.
NWAS		✓	Commenced preparations for Pathways introduction during 2009/10 and currently in the process of implementing with an expected date of April 2012.
SCAS			No planned implementation.
SECAMB		✓	Modelling NHS Pathways to interact with CAD and MDT systems in a similar manner to AMPDS. Planned launch in April 2011.
SWAST		✓	Committed to launching in March 2011.
WMAS		✓	Evaluated Pathways in 10/11 and plans to launch in 10/11.
YAS		✓	Currently under review.

\*The Trust has indicated plans to introduce imminently or within 1-2 years  
Source: Trust submissions to NAO, Trust websites

### Implications for the response model

- *Hear and Treat* - The successful implementation of NHS Pathways CMS is a critical enabler of Hear & Treat to ensure that non ambulance responses are identified and also to optimise the deployment of the available ambulance resource
- *Treat at Scene* - A fully functioning CMS will enable crews to direct patients to appropriate alternative pathways which do not require an ambulance conveyance
- *Convey to Alternative Destinations* - A full CMS would enable crews to identify services at alternative destinations and have confidence that the appropriate skills and facilities to meet the patient need will be accessible on arrival

# Scenario Analysis



# 4.1 Introduction

Trust forecast resolution rates and unit costing based on 09/10 cost data have been used to estimate a range of in year savings resulting from transforming the ambulance sector

## Methodology

- Unit costing for each initiative was calculated using 09/10 data as set out on pages 16, 18 and 20
- 09/10 activity data was collated by ambulance trust for each transformation initiative (resolution rates for hear and treat and treat at scene and levels of conveyance to alternative destinations)
- Each trust was then requested by Deloitte to forecast resolution rates through each of the transformation initiatives for 15/16
- Where no activity data was provided, an average of the forecast position from those trusts providing the data was used as a proxy
- The resolution rates and unit costing have been used to estimate the in year benefits to the ambulance sector and wider NHS resulting from the trusts forecast resolution rates assuming these resolution rates are applied to the current activity levels
- In addition the range of forecast resolution rates have been used to estimate the minimum, mean and maximum potential in year annual benefits as well as identifying the benefits if all trusts moved to the position of the 09/10 top performing trust for each initiative
- We have also included some analysis to assess the sensitivity of the estimated savings to a number of key inputs where there is an element of subjectivity

## Common assumptions applied to all scenarios

- Detailed assumptions and data sources can be found in appendices 2 and 3. In a number cases detailed information has not been consistently available, where this is the case assumptions have been applied following discussions with a number of PCTs and Ambulance Trusts
- Call triage under hear and treat is assumed to be 10 minutes
- Average stand down time for a vehicle once activated is assumed to be 5 minutes
- National Tariff for A&E attendances has been used to estimate the savings from A&E avoidance. We have applied the Minor tariff to Hear & Treat and an average of the Minor and Standard tariffs to See & Treat and Alternative Destinations
- A marginal cost of £50 has been assumed for attendances at non-A&E destinations (see appendix 2)
- Average A&E and Non-A&E Turnaround times are assumed to be 30 minutes and 15 minutes, respectively
- The average cost of an avoided admission to hospital following A&E attendance is assumed to be £732
- We assume that there are no saved admissions from avoided A&E attendances as a result of Hear & Treat and See & Treat on the basis that these are low acuity cases which would be unlikely to require a hospital admission
- We assume a 20% admissions conversion rate for those taken to alternative destinations on the basis that they will be higher acuity than those resolved under Hear & Treat and See & Treat

## Unit Savings

	Ambulance sector	Wider NHS
	Average £/unit	Average £/unit
Hear and Treat	£66.35	£13.96
Treat at Scene	£32.32	£70.44
Alternative Destinations	£15.61	£170.56

## 4.2 Scenario analysis –Trust forecasts

### Forecast incident resolution over the phone and at scene varies significantly between trusts

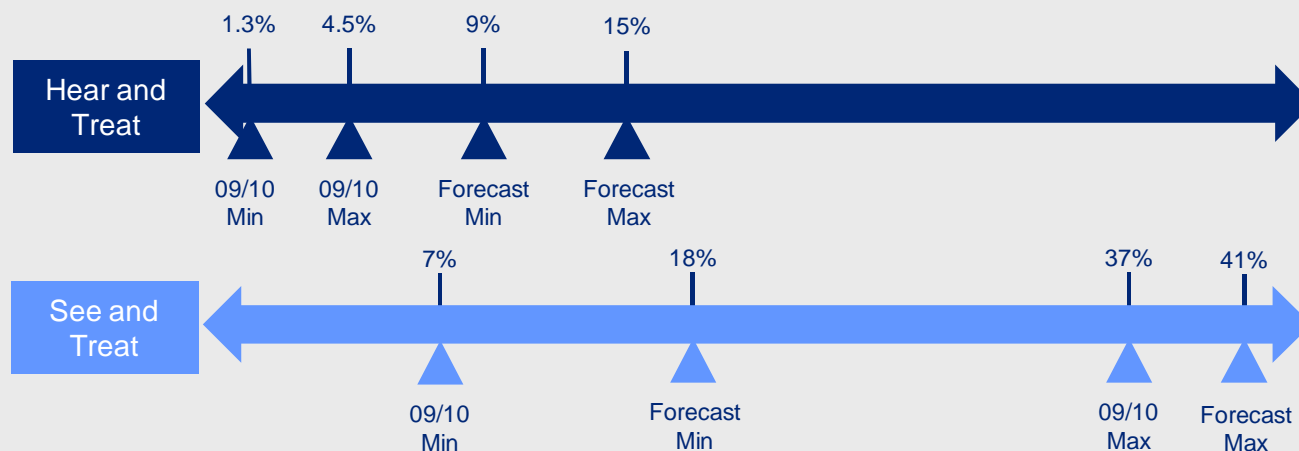
	% of calls received resolved over phone		% of incidents attended resolved at scene		% of incidents conveyed to non-A&E	
	09/10	15/16	09/10	15/16	09/10	15/16
LAS	4.5%	13%	17%	21%	2%	Limited forecast data available - scenarios model a 5-15% shift of A&E conveyances to Non-A&E destinations by 15/16
SECAMB	1.7%	10%	31%	35%	10%	
SWAST	2.7%	9%	32%	32%	17%	
SCAS	2.9%	12%	37%	41%	5%	
GWAS	1.4%	10%	33%	37%	14%	
WMAS	3.0%	14%	29%	29%	21%	
EMAS	2.9%	12%	32%	36%	3%	
EoE	2.8%	11%	37%	41%	10%	
NWAS	1.7%	9%	7%	18%	11%	
NEAS*	1.3%	10%	23%	27%	25%	
YAS	2.8%	15%	21%	21%	5%	

- A number of trusts did not provide the data requested and some returns received were incomplete. Where this was the case an average change from the current position has been applied. This is calculated from the returns received and indicated in red
- Data on future conveyance levels to alternative pathways was limited from all trusts and therefore an absolute increase of 10% has been assumed for all trusts for the base case. This estimate is subjective and is based on discussions with a number of trusts to determine what a realistic target would be
- There is a substantial variation in the forecast performance across Trusts

Source: 09/10 data NHS information Centre, 15/16 data from Trust returns except as noted. Note: NEAS also resolves calls through non clinical triage via pathways which is not included in this figure, this increases resolution to c4%

- Forecast resolution rates range between 9% and 15% for Hear and Treat compared to a 09/10 average of 2.5%
- For See and Treat the forecast range is between 18% and 41%. This is very similar to current levels for most trusts reflecting lack of visibility across the sector as well as interdependencies such as the impact of Hear and Treat on this model. (H&T may increase the acuity level of patients treated at scene, therefore may increase the need to convey)
- The ranges have been used to calculate minimum and maximum scenarios

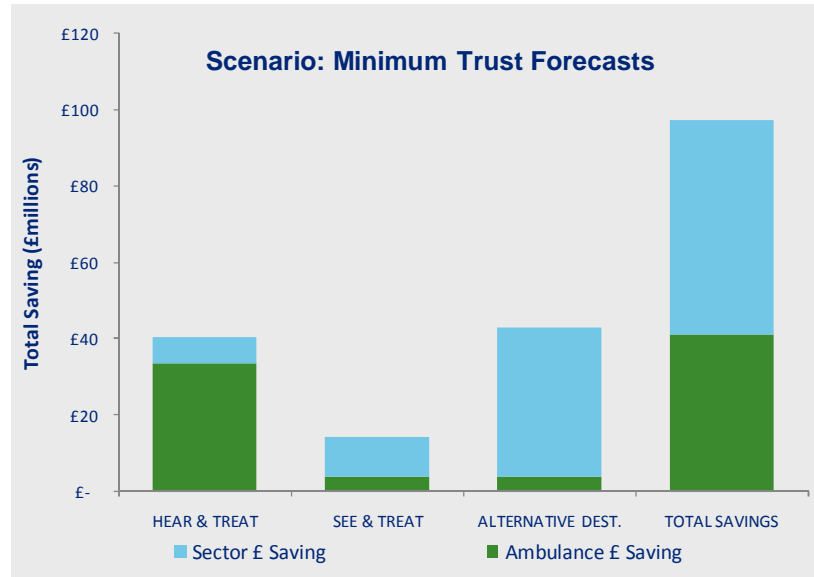
#### Range of resolution rates for trust forecasts



## 4.2 Scenario analysis – Minimum and maximum

### Assumptions

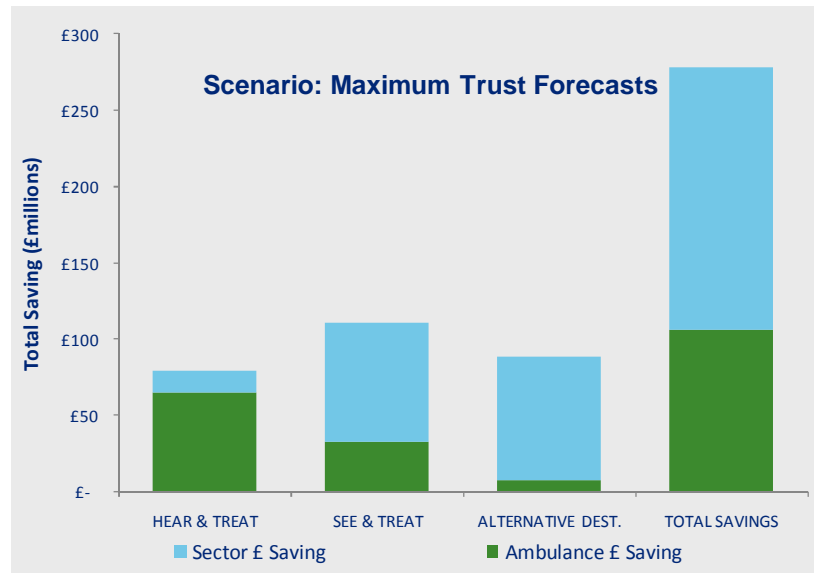
- 9% resolution rate for Hear and Treat (minimum from data returns)
- 18% resolution rate for See and Treat (minimum from data returns)
- A total shift in conveyance rates of 5%
- Where 09/10 levels exceed the range minimum, we have assumed that 09/10 levels remain constant



- Total savings of £97m, £41m accruing to the ambulance sector and £56m to the wider NHS
- Hear and Treat contributes £40.3m of these savings, of which £33.4m accrues to the ambulance trusts
- See and Treat contributes the lowest level of savings driven by the resolution rate where there is no change from 09/10 levels for a number of trusts

### Assumptions

- 15% resolution rate for Hear and Treat (maximum from data returns)
- 41% resolution rate for See and Treat (maximum from data returns)
- A total shift in conveyance rates of 15%



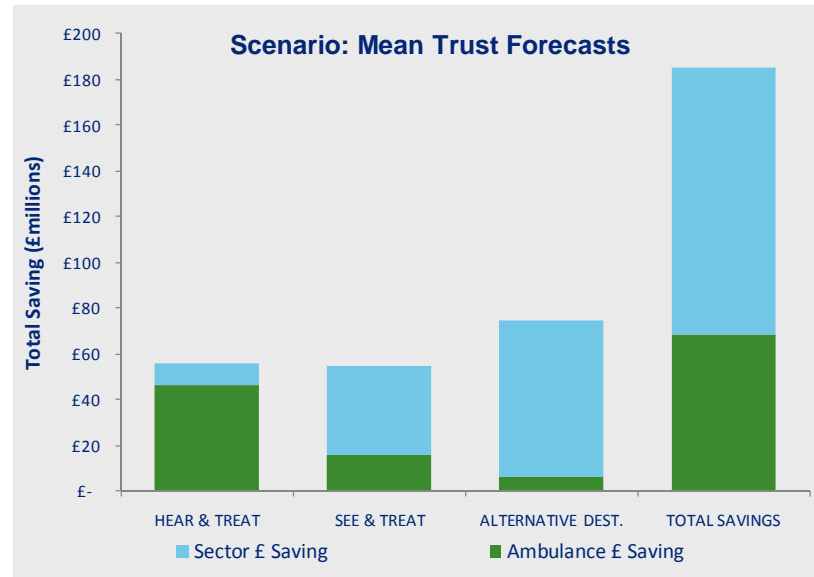
- Total savings of £277m
- £110m savings for See and Treat of which 70% accrues to the wider NHS reflecting the high resolution rate forecast by some trusts
- Alternative destinations accrues £7.5m to the ambulance trusts and £80.6m to the wider NHS driven by savings from avoided admissions as well as the differential in cost between A&E and other destinations

\*All savings based on 09/10 prices and current activity levels

## 4.2 Scenario analysis – Mean and trust forecasts

### Assumptions

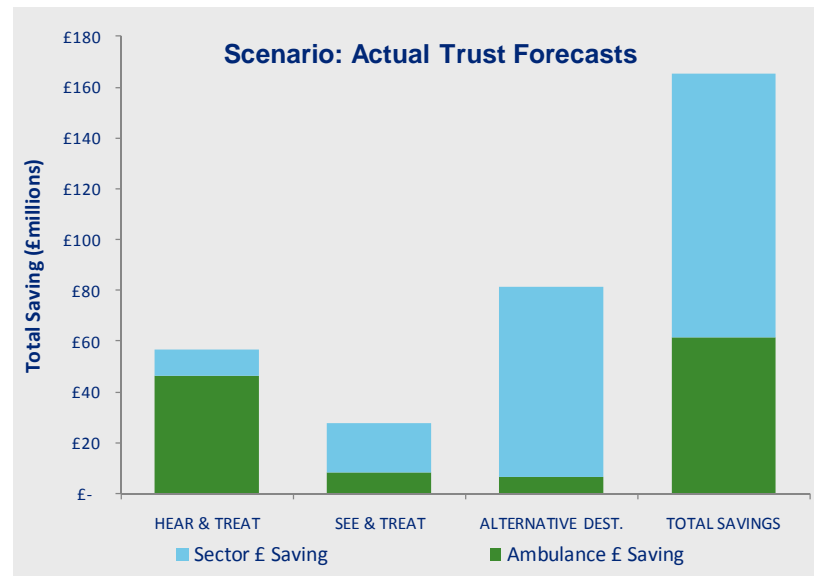
- 11% resolution rate for Hear and Treat (mean from data returns)
- 31% resolution rate for See and Treat (mean from data returns)
- A total shift in conveyance rates of 10%



- Total savings of £184m, £68m accruing to the ambulance sector and £116m accruing to the wider NHS
- Hear and treat results in savings of £46m for the ambulance sector and saves the wider service £9.9m
- Alternative destinations accrues £68m to the wider service and £6.3m to the ambulance sector

### Assumptions

- Resolution rates for Hear and Treat are based on trust forecast rates
- Resolution rates for See and Treat are based on trust forecast rates
- A total shift in conveyance rates of 10%



- Total savings of £165m of which £62m relates to the ambulance sector and £103m to the wider NHS
- The greatest proportion of savings is from alternative destinations making up £81m of savings (£7m for trusts and £74m for the wider NHS)
- Hear and Treat saves the ambulance sector the greatest amount (£46.5m) while saving the wider sector £10m

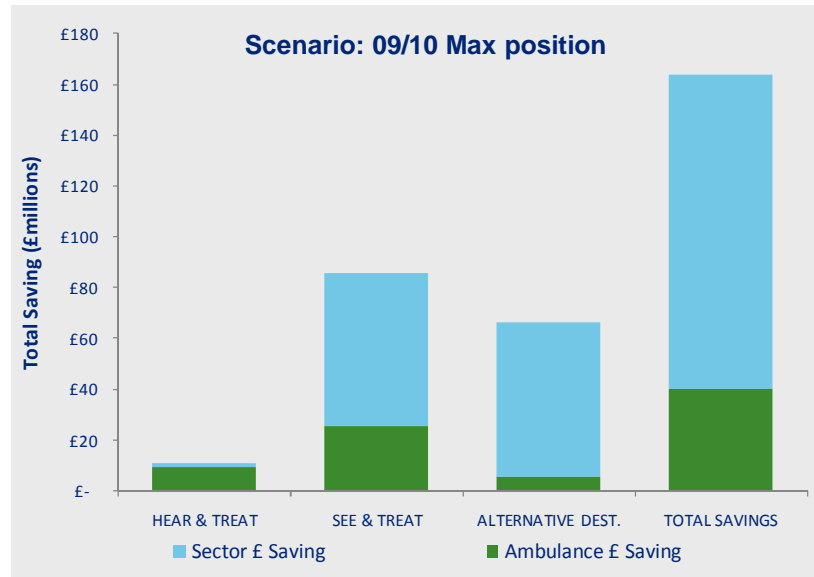
\*All savings based on 09/10 prices and current activity levels

## 4.2 Scenario analysis

### 09/10 Max position

#### Assumptions

- 4% resolution rate for Hear and Treat (highest resolution rate across all trusts in 09/10)
- 37% resolution rate for See and Treat (highest resolution rate across all trusts in 09/10)
- A total shift in conveyance rates of 10%



- Total savings of £162m, of which £123m accrues to the wider NHS.
- The majority of the savings are through see and treat due to the wide range of current implementation of this initiative across the trusts.
- Alternative destinations accrues £66.7m savings again driven by the wide range in Trusts current performance on this initiative.

### Key Assumptions – sensitivity analysis

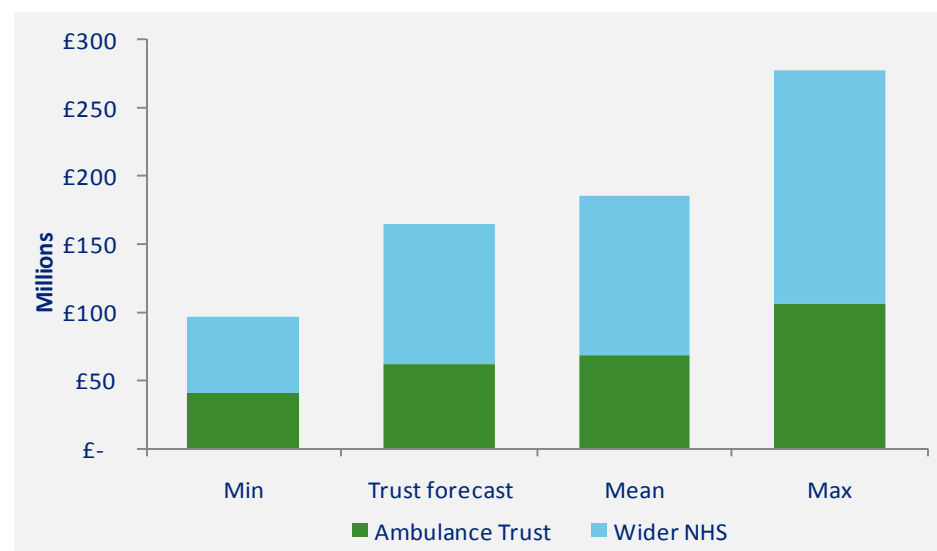
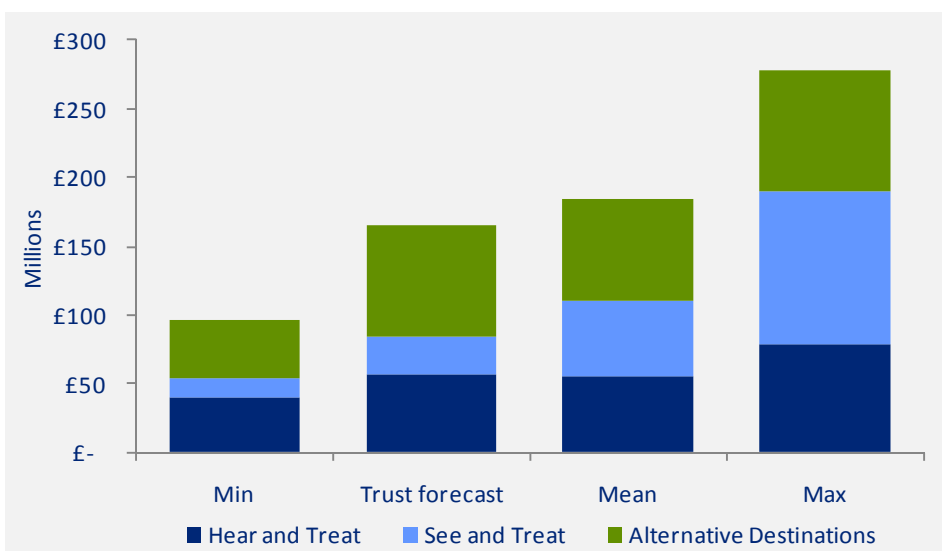
In addition to activity based assumptions, there are a number of other assumptions which feed into the scenario analysis. The sensitivity of the analysis to these assumptions is shown alongside

	Assumptions			Savings values					
	Assumption -20%	Used for mean	Assumption +20%	Assumption -20%		Mean		Assumption +20%	
				Ambulance £	Sector £	Ambulance £	Sector £	Ambulance £	Sector £
Triage Call Time	8 mins	10 mins	12 mins	£68.8m	£115.9m	£68.4m	£115.9m	£67.9m	£115.9m
Non A&E Tariff	£40	£50	£60	£68.4m	£129.8m	£68.4m	£115.9m	£68.4m	£112.0m
Net Call Cycle saving - Alternative destinations	12 mins	15 mins	18 mins	£67.1m	£115.9m	£68.4m	£115.9m	£69.6m	£115.9m
A&E Admission tariff	£586	£732	£878	£68.4m	£104.2m	£68.4m	£115.9m	£68.4m	£127.8m
Admission Conversion rates	16%	20%	24%	£68.4m	£104.2m	£68.4m	£115.9m	£68.4m	£127.8m

\*All savings based on 09/10 prices and current activity levels

## 4.3 Scenario analysis – Summary

If the ambulance response model is transformed, in year savings estimates range from £97m to £277m



- In year savings estimates range from £96.9m to £276.8m from the low to high activity forecasts. This range is made up as follows:
  - Hear and Treat - £40.3m - £78.9m
  - See and Treat - £13.8m - £109.8m
  - Alternative destinations - £42.8m - £88.1m
- Under all scenarios the wider NHS has greater savings potential than the ambulance sector. This is primarily driven by the savings from alternative destinations where c.90% of the savings accrue to the wider system driven by the significant savings from avoidable admissions
- There are a number of key challenges that would need to be overcome to increase the probability of achieving savings towards the upper end of the estimate range, for example integration of the urgent care pathway, consistent use of a CMS and triage of calls prior to despatch. To achieve these changes there needs to be a collaborative approach across the health economy

\*All savings based on 09/10 prices and current activity levels

# Appendices

# Appendix 1 - Cost breakdown: profile of front line services

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Commercially sensitive data  
redacted at request of National  
Audit Office



# Appendix 1 - Cost breakdown: profile of the control centre

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Commercially sensitive data  
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## Appendix 2 – Unit costs

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redacted at request of National  
Audit Office

## Appendix 2 – Unit costs

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Commercially sensitive data  
redacted at request of National  
Audit Office

## Appendix 2 – Unit costs

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Commercially sensitive data  
redacted at request of National  
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## Appendix 3 – Activity data

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Audit Office

## Appendix 3 – Activity data

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redacted at request of National  
Audit Office

## Appendix 3 – Activity data

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Commercially sensitive data  
redacted at request of National  
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## Appendix 4 – Meetings/calls held

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Organisation	Meeting/call date	Attendees
East Midlands Ambulance Service NHS Trust	15 February 2011	Brian Brewster
East Midlands Ambulance Service NHS Trust	15 February 2011	Medical Director
NHS East Midlands	15 February 2011	Chris Boyce
NHS Derbyshire County	16 February 2011	Kate Brown
East of England Ambulance Service NHS Trust	16 February 2011	Paul Scott, Alan Murray
NHS Nottinghamshire County	16 February 2011	Martin Kay
South Western Ambulance Service NHS Trust	23 February 2011	Ken Wenman, Jennie Kingston



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