

Highways Efficiency Toolkit 2006

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1. Introduction

The purpose of this Toolkit is to give advice and guidance to local authorities over and above, but not superseding, [general DCLG advice](#) on:

- How to identify and measure efficiency gains in Highways
 - Quality cross checks
 - Cashable and Non cashable efficiencies
 - Efficiency from use of capital expenditure
- Examples and experiences

The 2005/06 backward looking Annual Efficiency Statement (AES) now has a separate line for reporting gains achieved in Highways. Local Authorities may wish to show individual efficiency initiatives within the Highways total.

The Toolkit has been developed in consultation with a reference group sponsored by Highways Efficiency Liaison Group which includes representatives of government, local government and industry. It builds on the 2005 Toolkit and now includes additional advice, methods of calculation, examples and experiences.

A number of possible areas for achieving efficiencies and methods of measurement have been shown which authorities may find useful. Some generic areas identified mainly from authorities returns last year are shown in Section 2, with examples in the Appendices. Of course local authorities may wish to find efficiencies in other aspects of their Highways services and use other methods of measurement.

Advice is included on quality cross-checks to enable authorities to demonstrate that service quality has remained the same or improved.

If Local Authorities have any enquiries or suggestions for improvement on this Toolkit please contact the Collaboration and Efficiency Team on CETeam@highways.gsi.gov.uk.

2. Efficiency and Measurement

Construction Inflation

The deflator to be used for highways is the ROADCON index. The index to be used for the 2005/06 Efficiency statement is 7.0%.

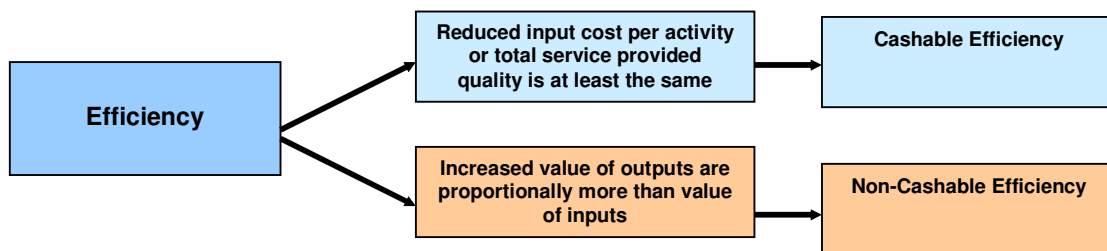
Revenue and Capital Expenditure

Efficiencies can result from either revenue or capital expenditure if services are improved or reductions in revenue expenditure result.

Cashable and Non - Cashable Efficiency

Cashable efficiencies result if services are provided to at least the same level of quality for reduced cost. They are self assessed by local authorities and the level of service must be demonstrated to be at least the same by use of quality cross checks, see section 3.

Non cashable efficiencies result if service quality improves for the same cost, or proportionally more service is delivered if costs do increase.



Cashable Efficiency

Scenario 1 No change Value and ↓ Cost Cashable efficiency reported.

Non-cashable Efficiency

Scenario 2 ↑ Value and no change Cost Non-cashable efficiency reported.

Scenario 3 ↑ Value > ↑ Cost Non-cashable efficiency reported.

Cashable and Non-cashable Efficiency

Scenario 4 ↑ Value and ↓ Cost Cashable and non-cashable efficiencies reported.

No Efficiency

Scenario 5 ↑ Value < ↑ Cost No efficiency.

Scenario 6 ↑ Value = ↑ Cost No efficiency since the changes cancel each other out.

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Cashable Efficiency Calculation

Self assessed by local authorities and verified using a quality cross check, see section 3.

Non cashable Efficiency Calculation

The Highways Agency has a formulaic approach which calculates both cashable and non cashable efficiencies, see Appendix D. The same principles can be used for local roads, but modified to retain the self assessed approach for cashable efficiencies and to avoid double counting.

Efficiency Gain = net improvement in value minus net increase in cost, ie
% change in performance multiplied by base year spend (allowing for inflation)
minus any increase between base and current year spend (allowing for inflation).

An adjustment is needed to avoid double counting cashable efficiencies.

$$\text{Efficiency Gain (£)} = (P \times B) - (C - B)$$

Where:

P = Percentage change in performance from 2004/05 to 2005/06

B = 2004/05 base spend, inflated using Roadcon, see above (£)

C = 2005/06 spend (£)

If (C - B) is negative, ie costs have reduced, (C - B) is not included in the calculation since a cashable gain will have been claimed elsewhere.

The calculation looks at the performance of the whole service. Cost is therefore the total revenue and capital expenditure and performance change is calculated using a basket of indicators.

Since this is the first year the formula has been included, and retrospective claims are not allowed, the base year for performance is 2004/05.

Local policy priorities can be reflected through published local indicators and through weighting indicators within the basket.

The method is described in more detail in Appendix C.

Cross-service Efficiency Gains

Efficiencies must be in local authority highways expenditure. It is recognised that some efficiencies may have an effect on other services and can be valued, e.g. casualty reduction, but savings in other services or in other organisations expenditure cannot be counted for highways efficiency.

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Example Efficiency Areas

The potential efficiency areas below are provided to assist authorities when compiling their own returns. They are not necessarily endorsed by inclusion in this Toolkit.

Potential Efficiency Area	Potential efficiency actions	Measurement method
Procurement – procurement of highways related services, i.e. management and maintenance of roads, footways, bridges, lighting and other services	The Gershon review suggests that substantial efficiency gains are available through roads procurement. Actions should focus on better value for money, efficiency in the procurement process, delivering more for the same cost or the same or better for reduced cost. Actions could involve joint working between two or more authorities - including the Highways Agency, integration of activities, new methods, larger / longer contracts with better supply chain management, and demonstrating that reduced revenue spending has resulted from capital works.	This efficiency area is wide and potentially covers many different activities, culminating in whole service delivery to the public. Efficiency gain measurement needs to be capable of demonstrating that cashable and non-cashable gains have been achieved, and either: <ul style="list-style-type: none"> • The overall service has been maintained or improved. • A particular service element has been maintained or improved Authorities may wish to select individual or baskets of measures from the alternative quality cross-check matrices.
Capital Schemes – improve delivery and value for money on capital and possibly revenue spend	As 'Procurement', plus: <ul style="list-style-type: none"> • Preparation and delivery time improvements • Asset management approach 	As 'Procurement', plus: Asset management approach, e.g. savings as a result of investment in new or improved assets resulting in reduced life cycle cost.
E-government initiatives	<ul style="list-style-type: none"> • Electronic reporting of faults by users • Database for logging and faults and repairs • Using the internet to provide customer services 	As 'Procurement'
Recycling/reuse of waste materials	<ul style="list-style-type: none"> • Recycling of waste materials into highway and footway repairs 	As 'Procurement'
Private Finance Initiate	<ul style="list-style-type: none"> • Street Lighting • Highway Maintenance & Management 	As 'Procurement'
Redesign/restructure of service delivery	<ul style="list-style-type: none"> • Collaborative and partnership working arrangements • New contract initiatives 	As 'Procurement'
Re-engineering processes to improve work practices	<ul style="list-style-type: none"> • Sharing activities across authorities, e.g. as winter service. • Materials waste taken directly to landfill site, so reducing storage and haulage costs • Use of less expensive materials for equal quality 	As 'Procurement'
Withstanding inflation	<ul style="list-style-type: none"> • Efficiency gains can be claimed against rising costs of inflation if service levels remain the same or improve. 	ROADCON index

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Potential Efficiency Area	Potential efficiency actions	Measurement method
Administrative	<ul style="list-style-type: none">Streamlined operation for office administration and overheads	As 'Procurement'

A selection of actual efficiency gains claimed by local authorities in their 2004/05 Backward looking AES are in Appendix A.

Example Calculations

Appendix B contains cashable efficiency examples from both revenue and capital expenditure, and non-cashable examples are in Appendix C.

The Highways Agency methodology and a worked example are in Appendix D.

3. Quality Cross-checks

Efficiency improvements must not compromise quality or involve reductions in service. To enable this to be demonstrated, each sector of the AES return requires a quality cross-check and there is a descriptive box for further service quality information.

Councils are required to input values for at least one quality cross-check per sector. This should be relevant to the efficiencies being claimed. The indicator should be chosen from the set approved by the Taskforce, but this is not mandatory – if an alternative is chosen the council must justify its choice in the descriptive box and Councils can also provide further information in the box on their choice of indicators.

Taskforce Approved Quality Cross-checks

Description	Expressed As	QCC met If same or...
1. Progress with Local Transport Plan	1=Weak, 2=Average, 3=Good/Above average, 4=Well above average/Excellent	Increase
2. Number of killed or seriously injured road casualties, BV99a	Number	Decrease
3. Temporary Traffic Control, BV 100	Number	Decrease
4. Condition of footways, BV187	Percent	Decrease
5. Condition of non-principal unclassified roads, BV224b	Percent	Decrease
6. Non-approved indicator (see alternative cross checks)		

For whole service or wide ranging efficiencies, e.g. a major procurement or withstanding inflation, authorities may wish to choose more than one quality cross-check.

Alternative Cross-checks

Local Authorities may consider that the Taskforce approved cross-checks are not applicable for the efficiencies they are claiming and reasoned alternatives may then be sought. Matrix A in Section 4 provides an outline alignment of objectives, processes and measures for Highway services, and Matrix B contains related performance indicators.

The matrices have been developed from Local Authority guidance and indicators, e.g. Codes of Practice, statutory indicators and DfT guidance. Highways Agency indicators are also shown and may be used if authorities consider them appropriate.

Cross-checks may be devised at an appropriate level in the matrix, from a high-level, whole service approach involving baskets of indicators, to a single indicator approach.

If the indicators in the matrix are not appropriate for a particular efficiency then other indicators may be justified and used.

4. Alternative Quality Cross-checks

Highways Performance Measurement Matrix A					
		Local Transport Plans, Highways Agency Business Plan, Transport Asset Management Plan			
		Operate	Maintain	Improve	
		Traffic Management Plan Network Management Plan / Manual Traffic Operator	Highway Maintenance Plan	Capital Improvement Programme	
Public Service Objectives	Customer Service	Customer satisfaction	User satisfaction		
		Overall Transport Service	Independent audit of services		
		Responding to enquiries	Effectiveness of customer response		
	Safety	Ensuring Safety	Safety inspections. 3 rd Party Claims. Accidents and incidents on the network.		
	Serviceability / Journey time reliability	Ensuring availability	Road user network availability Effectiveness of response to emergency incidents		Impact of scheme on availability of road Predictability of times to deliver schemes
		Achieving integration	Balance of facilities for different users		Impact of scheme on integration of transport modes
		Maintaining reliability	Journey time reliability for different users Peak period traffic flows		
		Maintaining Highway Condition		Condition of various types of asset	
	Sustainability / Respecting the Environment	Minimising costs over time		Reactive maintenance costs. Whole Life costing principles	Cost predictability for delivery of schemes. Works defects
		Maximising environmental contribution		Recycled material used for Inspection of amenities	Recycled material used in schemes. Air pollution levels
		Maximising value to community	Quality of Life, e.g. social inclusion, regeneration, street scene and community safety		

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Highways Performance Measurement Matrix B					
		Local Transport Plans, Highways Agency Business Plan, Transport Asset Management Plan			
		Operate	Maintain	Improve	
		Traffic Management Plan Network Management Plan / Manual Traffic Operator	Highway Maintenance Plan	Capital Improvement Programme	
Public Service Objectives	Customer Service	Customer satisfaction	CS 1 CS 2 HA Customer Satisfaction Measures		
		Overall Transport Service	LTP / APR Score		
		Responding to enquiries	CS 3 API 3		
	Safety	Ensuring Safety	BV 99 SA 1 SA 2 SA 3 SA 4 HA Safety Measures API 2 API 11		
	Serviceability / Journey time reliability	Ensuring availability	BV 100 BV 178 API 1 API 13	SE 2 API 9	API 6
		Achieving integration	BV 165 LTP 1 LTP 3 LTP 4		
		Maintaining reliability	LTP 2 LTP 6 LTP 7 HA Congestion Measures	SE 5 SE 6	
		Maintaining Highway Condition		BV 187 BV 215 BV 223 BV 224 SE 11 L(a) L(b) L(c) L(d) B1 B2 B3 B4 API 12 API 14	
	Sustainability / Respecting the Environment	Minimising costs over time		SU 1 SU 2 SU 3	SU4 API 7 API 10
		Maximising environmental contribution	LTP 8	SU 6 SU 7 API 4	API 15
Maximising value to community			SU 5 Quality of Life Indicators		

Note: BV 223 and BV 224a not used in 2005/06

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Performance Indicators used in Matrix B

Best Value Performance Indicators – see DCLG website

- BV 99 – Road Casualties
- BV 100 – Temporary Traffic Control
- BV 165 – Pedestrian Crossings with Facilities for Disabled People
- BV 178 – Rights of way
- BV 187 – Condition of Footways
- BV 215 – Rectification of Street Lighting Faults
- BV 223 – Condition of Principal Roads (was BV 96)
- BV 224 – Condition of Non-Principal Roads (was BV 97)

Local Transport Plan Indicators – see Local Transport Plans Guidance, DfT website

LTP / APR Score

- LTP 1 – Accessibility
- LTP 2 – Change in area wide road traffic mileage
- LTP 3 – Cycling trips
- LTP 4 – Mode share of journeys to school
- LTP 6 – Changes in peak period traffic flows to urban centres
- LTP 7 – Congestion
- LTP 8 – Air quality

Code of Practice for Highway Maintenance – published by TSO, July 2005.

(Refers to similar indicators in the 2001 edition, published by the Institution of Highways and Transportation)

Where indicators are the same as BVPIs, only the BVPI occurs in the matrix.

Customer service:

- CS 1 – Net satisfaction with the service (SE4)
- CS 2 – Net satisfaction with consultation and information
- CS 3 – Dealing with requests, complaints and claims within policy timescales.

Safety:

- SA 1 – To measure the timelines of safety inspections (SA1)
- SA 2 – Safety defects repaired on time
- SA 3 – Skidding resistance of Principal Roads (SA2)
- SA 4 – Third party claims repudiation rate (SA5)

Serviceability:

- SE 1 – Temporary Traffic Control [BV100]
- SE 2 – Winter service precautionary salting (SE5)
- SE 3 – Public rights of way easy to use [BV178]
- SE 4 – Pedestrian crossings with facilities for disabled people [BV165]
- SE 5 – Schemes value managed
- SE 6 – Works completed within published dates
- SE 7 – Principal roads where maintenance should be considered [BV 223]
- SE 8 – Non - Principal classified roads where maintenance should be considered [BV224a]
- SE 9 – Non - Principal unclassified roads where maintenance should be considered [BV224b]
- SE10 – Category 1 and 2 footways where maintenance should be considered [BV 187]
- SE11 – Category A and B cycle routes where maintenance should be considered

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Sustainability:

- SU 1 – Asset preservation
- SU 2 – Reactive maintenance compared to planned
- SU 3 – Claims compared to planned maintenance
- SU 4 – Schemes subject to maintainability audit
- SU 5 – Schemes subject to sustainability audit
- SU 6 – Works undertaken with recycled and secondary aggregates (SU 3)
- SU 7 – Amenity index

[Code of Practice for Highway Lighting Management](#) – published by TSO, November 2004

- L (a) – Number of faults
- L (b) – Lights working as planned
- L (c) – Failed service connections
- L (d) – Damage incidents

[Code of Practice for Management of Highway Structures](#) – published by TSO, September 2005

- B1 - Condition
- B2 - Availability
- B3 - Reliability
- B4 - Workbank

Highways Agency Area Performance Indicators – information on APIs can be obtained from CETeam@highways.gsi.gov.uk as given in the API Handbook Issue 04 dated February 2005 (note that these are subject to continuous improvement by the Highways Agency)

- API 1 Response to Emergency Incidents
- API 2 Response to Category 1 Defects
- API 3 Customer Satisfaction
- API 4 Environmental Amenity Index
- API 6 Predictability of Discrete Schemes - Time
- API 7 Predictability of Discrete Schemes - Cost
- API 9 Winter Maintenance
- API 10 Defect Free Work
- API 11 Road Traffic Accidents at Roadworks
- API 12 Street Lighting Outages
- API 13 Network Availability
- API 14 Third Party Claims
- API 15 Recycling and Re-use

Example of using the Alternative Quality Cross Check matrices

An authority makes a cashable efficiency in its customer response service through introducing new technology and saving some manual processes. It considers that the Taskforce approved checks do not reflect this aspect of the service.

It refers to the matrix of alternative cross checks. The Service Objective of 'Customer Service' and 'Responding to Enquiries' offers a choice of using indicator CS3 from the Code of Practice or the Highways Agency indicator API3. The authority selects CS3 and is able to show that the value CS3 is at least the same as the previous year.

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LA Efficiency Experience

Appendix A

The table provides examples of Local Authority efficiency gains claimed and quality cross checks used in 2004/05, taken directly from the DCLG website (www.odpm.gov.uk)

In 2004/05 returns were for all aspects of local transport. For this table, a selection of efficiencies which have significant highways (as opposed to public transport) elements have been used.

The example efficiencies are provided to assist authorities when compiling their own returns. They are not necessarily endorsed by inclusion in this Toolkit.

LA name	Local Transport Savings (including non-roads)	Efficiency Description	Quality Cross Check Used
Hertfordshire County Council	1,647,000	<ul style="list-style-type: none"> Our Integrated Works programme and Hertfordshire Highways contract signified new ways of working. Encouraging users to e-report faults has achieved efficiency gains in faultline calls. All of these savings relates to highways rather than public transport. 	
Northamptonshire County Council	1,360,000	<ul style="list-style-type: none"> Efficiency gains through Highways Procurement Partnering Contract; due to new innovations and techniques the Council has achieved more outputs for the same resource (£816k) 	<ul style="list-style-type: none"> Percentage of road network where structural maintenance should be considered (BV223 & BV224) BVPI 97 and 97 a and b are relevant to this 2003-04 indicators = 9%, 33% and 31% for each element 2004-05 indicators = 8%, 29% and 30% for each element
Kent County Council	155,000	<ul style="list-style-type: none"> Efficiencies built into the Kent Highways partnership agreements Efficiencies gained in the back office finance support function for local transport through BVR and Oracle system implementation 	

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LA name	Local Transport Savings (including non-roads)	Efficiency Description	Quality Cross Check Used
Surrey County Council	992,000	<ul style="list-style-type: none"> • Recycling of waste materials back into highway and footway repairs, so reducing/ eliminating disposal costs, haulage costs and the need to purchase new materials. (£331,000) • The use of 'hot boxes' to store resurfacing materials on-site, rather than collecting from the supplier as required. (£216,000) • Safety inspections - process review leading to improved programming of inspections, resulting in more effective identification of emergency defects and allowing more efficient planning of repair work. Also a staff headcount reduction. (£231,000) • Savings in contractor and sub-contractor costs for road marking materials, grass-cutting, gully emptying, fuel and equipment/ plant hire. (£169,000) • Reduced scheme design costs. (£35,000) • Materials waste taken directly to landfill site, so reducing storage and haulage costs. (£10,000) • It has not been possible on any accurate basis to distinguish between those efficiencies that are capital related and other efficiencies, since for the most part, they cover both areas. • Documentation available: • Detailed calculations and supporting evidence available from contractors. • Documentary evidence of validation undertaken. 	<ul style="list-style-type: none"> • The most appropriate indicator would have been BV223/224, however, given that this is a new indicator for 2005/06, retrospectively gathering consistent data for previous years, would be problematic. Similarly, definitions for BV96, 97a and 97b were amended between the relevant years and so are inappropriate. In consequence, it is proposed to use the transport sub-score that is an element within the environment service assessment, as part of annual CPA. The relevant scores are: <ul style="list-style-type: none"> ○ 2003/04 - 2.65 ○ 2004/05 - 2.85
Lancashire County Council	326,000	<ul style="list-style-type: none"> • Street Lighting - LHP contract savings & review of the frequency of bulk clean/unit replacement (£165k total / £165k cashable) • LHP maintenance budget - contain inflation increase (£43k total / £43k cashable) • April 2004 pay award - 0.5% funded from efficiency savings (£14k total / £14k cashable) 	<ul style="list-style-type: none"> • Secondary Indicators (2003/04 / 2004/05): <ul style="list-style-type: none"> ○ BVPI 180b) - Average street lighting lamp circuit wattage compared with average consumption by LAs in the UK expressed as KWH: 415 / 415 ○ Note - if effects of 2004 leap year & de-trunking are removed 2004/05 result reduces to 406, reflecting the significant investment made by the section to reduce energy consumption. ○ LNSL 098 - % of street lights not working as planned: 0.81% / 0.61%

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LA name	Local Transport Savings (including non-roads)	Efficiency Description	Quality Cross Check Used
Sunderland City Council	783,197	<ul style="list-style-type: none"> • LT1: Improved Highway Inspection Regime: Cashable saving through reduced prices £63,186 • LT2: Back Street Lighting Programme: Non cashable saving of greater outputs for same inputs £95,405 • LT3: Improved Energy Efficiency Through Street Lighting PFI Contract: Non cashable saving of greater outputs for same inputs £92,466 • LT4: Street Lighting and Highway Signs PFI Project: Non cashable saving of proportionately more outputs and improved quality for an increase in resources - full year effect of annualised saving is £208,000 • LT5: Strategic Transport Partnership: Cashable saving of reduced inputs for same outputs: £218,000 • LT6 Strategic Transport Partnership - PTA: Cashable saving of reduced inputs for same outputs: £91,500 • LT7: Reduced Maintenance Costs For Traffic Signals: Cashable saving of greater outputs for less inputs £14,640 	<p>Secondary Cross Checks available:</p> <ul style="list-style-type: none"> • LT1: BVPI100 - Number of days temporary traffic controls or road closure on traffic sensitive roads caused by the authority or utility companies per km of traffic sensitive road • 2003/4:0.00 • 2004/5:0.115 • Quality Cross has actually reduced due to major bridge repair during 2004/5. • LT2: MORI Survey - Satisfaction with street lighting • 2003/4: 77% • 2004/5: 77% • LT3: See LT2 • LT4: See LT2 • LT5, LT6 and LT7: See primary indicator
Wakefield Metropolitan District Council	670,694	<ul style="list-style-type: none"> • Street Lighting PFI - Efficiencies are built into the PFI contract when measured against the Public Sector Comparator. • Efficiency gains from crosscutting initiatives - procurement and productive time. 	<ul style="list-style-type: none"> • Primary cross check - performance of Street Lighting PFI Contractor (AMEY): Average number of days to repair a street light (improving from 4.5 days in 2003/04 to 2.4days in 2004/05). This cross check has been used in the absence of any other comparable measurable data on the approved list between 2003/04 and 2004/05.
Lincolnshire County Council	600,000	<ul style="list-style-type: none"> • (£600,000 estimated) Negotiated New Highways Works Term Contract. Reinvested into additional commissioned work within approved capital schemes which would otherwise remain uncompleted. 	<ul style="list-style-type: none"> • Re: £600,000 New Highways Works Term Contract. Non-approved indicator - 2003/04: 0 compared with 2004/05: 1 (increase). Internal quality cross-checks assuring same work load being completed at same quality.

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LA name	Local Transport Savings (including non-roads)	Efficiency Description	Quality Cross Check Used
East Riding of Yorkshire Council	569,000	<ul style="list-style-type: none"> • Efficiency savings have been made in working practices that have enabled services to be maintained despite a continual increase in the asset base. • Growth in asset base has increased due to adoption of developments, discovery of lost highways and the high maintenance required for traffic calming measures and the significant Integrated Transport capital investment over the period of the first Local Transport Plan (£483,000 wpOSD7/8). • The revenue impact of capital receipts results in further savings (capital receipts £736,750 - revenue impact £35,000 wpCR1). • Highways total - £518,000 	<ul style="list-style-type: none"> • Quality Cross Check BV223 & BV224 which replaces BVPI 97 used -2003/04 18.1%, 2004/05 18.52%. • BVPI 97(a) shows that the condition of non-principal classified roads improved from 6.7% to 5.74% despite the efficiencies made. • Although BVPI 97 (b) (condition of unclassified roads) did not improve over the period it only fluctuated slightly above the target value of 12% (i.e. increased from 11.4% to 12.78%). This can be attributed entirely to the subjective nature of the indicator and a change in the Council's survey contractor between years. • In both cases the indicators can be described as at the upper threshold of performance as set out in the CPA service assessment framework.
North Somerset District Council	507,000	<ul style="list-style-type: none"> • Improved procurement practices have led to gains in the length of roads being gritted as part of our winter maintenance arrangements. In addition, cashable efficiency gains have been achieved through reduced energy costs for street lighting. 	<ul style="list-style-type: none"> • The length of roads covered by the winter maintenance agreement has increased by 171% from 17% to 29% of the total network for a cost increase of 5%. The existing street lighting contract has achieved gains of 37% compared with the current market price.
Dorset County Council	497,704	<ul style="list-style-type: none"> • All activities relate to roads. Collaborative and partnership working arrangements have been developed with private sector partners in the areas of engineering, design and highways maintenance, which have yielded efficiency savings. Also a variety of other process improvements and recruitment initiatives have generated a mixture of smaller cashable and non-cashable savings. 	<ul style="list-style-type: none"> • The majority of efficiency savings in this area have been generated from collaborative and partnership working with the private sector. The Procurement quality cross checks are therefore used. The Corporate Procurement Strategy was incorporated into the County Council's constitution in 2004/05 and is being reviewed in 2005/06. All NPS milestones were met for 2004. All contracts are let in accordance with our strategy and contract procedure rules

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LA name	Local Transport Savings (including non-roads)	Efficiency Description	Quality Cross Check Used
Cornwall County Council	482,000	<ul style="list-style-type: none"> • £2,000 - Introduction of an electronic database for the logging of faults and repairs. The faults are logged by the call centre and updates to the repair status are entered remotely allowing an up to date status to be accessed. The efficiency gain has been predominantly in the time spent previously by our Divisional Surveyors on the tracking of faults and repairs, however, the service improvement has been the up to date information available to those enquiring about reported faults. This was trialed for a part year in 2004/05 and will therefore provide larger efficiency gains in 2005/06. • £80,000 - The authority began the recycling of road planings in 2004/05 saving approximately £4 per tonne on the cost of transport and tipping. 20,000 tonnes were recycled in 2004/05. In future years the saving per tonne recycled will increase due to new legislation in July that deals with the disposal of this type of waste. The change in legislation will lead to an increased waste disposal cost of approximately £5 per tonne thereby increasing the savings in future years to £9 per tonne. • £400,000 Road maintenance DSO - increase surplus as a result of increased turnover arising from 100% of their work being tendered under open competition. • There is an implicit efficiency that has not been included that comes from having a maintenance DSO that is the difference between the contract bid with which the DSO win and next highest bid that would have been the cost of the contract. Although the value of this runs into several million pounds in the last 5 years, no figure has been included in this statement or the forward as the choice to have a maintenance DSO predates this process. 	<ul style="list-style-type: none"> • Note The primary indicator suggests 2 indicators but the boxes only allow one figure please note also indicators for BV223 & BV224 were introduced from 2005/06 - we have therefore assumed you would require the following; <ul style="list-style-type: none"> ○ BV 96 Halt deterioration of principal roads 2003/04 4.52% 2004/05 24.8% ○ BV 97a Halt deterioration of non principal roads 2003/04 14.25 % 2004/05 12.54% ○ BV97b Halt deterioration of unclassified roads 2003/04 25.79 % 2004/05 16.43% • An indicator will be developed to monitor the level of commercial waste that is recycled compared to the amount that goes to landfill, existing indicators only looks at household waste recycling. There is no comparative information from 2003/04 to 2004/05.
East Sussex County Council	282,000	<ul style="list-style-type: none"> • Rights of way network improvements (Working paper available supported by statistics of number of users compared between years and total investment changes as shown on GL) £176,000 	<ul style="list-style-type: none"> • CPA score for Transport - 2/4 in 03/04 and 3/4 in 04/05. None of listed indicators appropriate for general efficiencies in this area. Secondary indicator: BV 178 % of total length of footpaths and rights of way which were easy to use by the public - 67.9% in 03/04 and 70.2% in 04/05. Selected to support main efficiency gain in this sector.

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LA name	Local Transport Savings (including non-roads)	Efficiency Description	Quality Cross Check Used
Cambridgeshire County Council	258,000	<ul style="list-style-type: none"> • Use of recycled stone for highways maintenance 100k • Brine used for gritting instead of salt 8k • Highways development control staff savings 20k 	
London Borough of Kingston upon Thames	177,000	<ul style="list-style-type: none"> • Increased investment in planned highway maintenance from Capital and Responsive budgets - saving from Neighbourhood discretionary budgets by reducing the 'hot box' initiative. £95,000 • Used London wide Ukpms survey - saving from not carrying out RBK survey. £4,000 • Invested in Ukpms surveys and inventory gathering to produce more effective bids in future and improved service. £5,000 • Made numerous operational efficiencies within Street Lighting • Replacement and saving of 1fte to undertake other activities £45,000 • Increased Highway Licenses income due to better managed and focused service. £8,000 • Used the Web to provide customer services - saving in administration time and enhanced customer service. £5,000 • Re-let Winter Maintenance contract as part of Street Cleansing contract - efficiency saving from joint contract and shared resources. £10,000 • Invested in Call Centre to relieve technical staff for more effective work. £5,000 	<ul style="list-style-type: none"> • Percentage of road network where structural maintenance should be considered - principal roads (BV96 2004/05 definition) 2003/04: 3.93 2004/05: not yet known - classified non-principal roads (BV97a) 2003/04: 14.1 2003/04: 15.3 - unclassified non-principal roads (BV97b) 2003/04: 11.7 2004/05: 17.99 • Need split between capital and non
Sefton Metropolitan Borough Council	174,900	<ul style="list-style-type: none"> • Efficiencies gained from reduced provision for inflation and unallocated inflation provision 	<ul style="list-style-type: none"> • Figure for APR score for 04/05 is estimated. The 80% is taken from letter from the DFT received December 04

TOOLKIT FOR HIGHWAYS EFFICIENCY GAINS

Appendix B – Cashable Efficiency Examples

Street Lighting (Worcestershire County Council)

Efficiency savings on a street lighting contract through improved item costs in a new contract. A comparison is made using the 04-05 costs on a new contract and the correctly inflated prices/rates for same 04-05 service using the previous contract rates.

Cost based on previous contract	£633,778.77
Actual cost 2004/05	£551,871.39
Efficiency	£ 81,907.38

Quality cross checks available within the County are below. Both demonstrate that service quality is at least the same, and has actually improved.

	2003-04	2004-05
<i>Percentage lights out at any time</i>	0.75%	0.67%
<i>Average Repair Time for a faulty streetlights (days)</i>	3.34	3.09

Withstanding Inflation

An Authority has a revenue budget of £10M for highway works. Service Levels within the whole service have remained the same and it has absorbed inflation. The ROADCON deflator is 4.5% (illustrative value only).

Revenue budget	£10,000,000
Efficiency = Inflation @4.5%	£ 450,000

For a whole service efficiency gain, Authority A has determined that all the Taskforce cross-checks should remain the same or improve:

<i>Cross-checks</i>	<i>2004/05</i>	<i>2005/06</i>	<i>Change</i>
Progress with Local Transport Plan	above average	above average	same
Number of killed or seriously injured road casualties, BV99a	200	196	improved
Temporary Traffic Control, BV 100	2	2	same
Condition of footways, BV187	15%	15%	same
Condition of non principal unclassified roads, BV 224b	25%	25%	same

TOOLKIT FOR HIGHWAYS EFFICIENCY GAINS

Innovation in Resurfacing

An Authority found that five sections of the slow lane amounting to 17,500 sq meters on a major road were showing evidence of wearing course rutting. Conventional treatment would have been to plane out 45mm and replace with 45mm of 14mm size Stone Mastic Asphalt.

It was decided that only 25mm was to be removed and the road repaved with 25mm of 10mm size proprietary surface course. 20mm of material remained in situ and the works were carried out significantly more quickly with fewer possessions.

Cost of traditional treatment	£331,400
Cost of new treatment	£224,400
Efficiency	£107,000

Quality cross check:

Previous trials have shown that the proprietary surfacing performs better in resistance to rutting than the traditional method, and that the whole life performance of road is improved.

Note: This is only a one-off efficiency. It can be included in the appropriate years efficiency claim but cannot be counted in cumulative savings. The process is repeatable at other locations and the example is therefore useful in this context.

TOOLKIT FOR HIGHWAYS EFFICIENCY GAINS

Increasing Highway Inspection to Reduce Unjustified 3rd Party Claims

An Authority increases its inspection and support to undertake a locally enhanced inspection regime. It improves the recording of defects and claims handling and reduces sums paid out on unjustified claims.

Systems were modified and strengthened to improve the Authorities ability to repudiate unjustified claims and to contest others where necessary. A rigorous review of claims received is undertaken which provides evidence to support claims handling.

The efficiency gain is calculated as the difference between the cost of the service without the efficiency measure and with the cost of activities undertaken. The reduction of claim costs occurs over a short period and will then be maintained at the lower level.

The efficiency gains are claimed in the AES for the appropriate year.

	Year 1	Year 2	Year 3	Year 4
Cost of additional Inspection	£60,000	£60,000	£60,000	£60,000
New reductions in 3rd Party Claims	£165,000	£90,000	£80,000	£0
New efficiency gains	£105,000	£30,000	£20,000	£0
Efficiency Gain	£105,000	£135,000	£155,000	£155,000

TOOLKIT FOR HIGHWAYS EFFICIENCY GAINS

Capital Investment in a Programme of Carriageway and Footway Strengthening

An Authority adopts a capital programme of renewals rather than annual localised patching to provide performance and safety improvements and reductions in future revenue maintenance expenditure.

Roads that have a high annual maintenance requirement are targeted so that future annual maintenance will be reduced. This will include roads where high traffic disruption is caused by patching works. A 'one-off' capital programme is developed for strengthening of targeted roads. The efficiency gain is calculated as the difference between the cost of the service without the efficiency measure and with the cost of activities normally undertaken.

Additionally there may be improvements to:

Percentage of road network where structural maintenance should be considered (BV223 & BV224)

Percentage of temporary control measures (BV100)

Condition of footways (BV187)

Number of people killed or injured in road traffic collisions (BV 99)

	Year 1	Year 2	Year 3	Year 4, etc
Capital Works with a 20 year life	£403,800			
Annualised cost				
(Cost of capital)	£21,199	£21,199	£21,199	£21,199
Alternative revenue maintenance	£27,690	£27,690	£27,690	£27,690
Efficiency per annum	£6,490	£6,490	£6,490	£6,490

TOOLKIT FOR HIGHWAYS EFFICIENCY GAINS

Capital Investment in Upgrading Traffic Signal Heads

An Authority invests capital in a programme of new LED Traffic Signal Heads. This will reduce energy requirements and lamp replacement costs. Existing lamps are around 50 watts and LEDs are around 15watts - approximately 300kwh/year reduction. Existing lamps have to be replaced every 6 months whereas the LEDs are assumed to last for 10 years. (LEDs have substantial life which is yet to be established but railway LED signals are known to have remained operational for 15 years). The efficiency gain is calculated as the difference between the cost of the service without the efficiency measure and with the cost of activities undertaken. The efficiency gains are also likely to enhance the image of the Authority by reducing energy requirements and improving signal performance.

	Year 1	Year 2	Year 3	Year 4, etc
Capital Works with a 10 year life	£39,500			
Annualised Cost (cost of capital)	£4,148	£4,148	£4,148	£4,148
Alternative revenue maintenance	£5,782	£5,782	£5,782	£5,782
Efficiency per annum	£1,636	£1,636	£1,636	£1,636

TOOLKIT FOR HIGHWAYS EFFICIENCY GAINS

Appendix C

Non-cashable Efficiency

See notes below for calculation details and rules.

Service Objective	Indicator	Base Indicator (Score) (see notes)	Current Indicator (Score)	Change in score + or –	Local Weighting (High/Med/Low) (optional)	Weighted % Change (optional) + or –
Overall	Local Transport Plan					
Safety	Cat 1 defects repaired within 24 hours					
Serviceability	BV 100					
	BV 165					
	BV178					
	BV 187					
	BV 215*					
	BV 223*					
	BV 224a*					
	BV 224b					
All published Local Indicators (%'s only) (Optional)						
Average Change in Value (P)						

[*BV 223, 224a and 215 not used in 2005/06 due to new indicators. BV 97b figures can be used for previous BV 224b. BV 99 not used since this is a cross service gain.]

TOOLKIT FOR HIGHWAYS EFFICIENCY GAINS

Efficiency Gain (£) = (P x B) - (C – B)

..

P = Net change in Value

B = 2004/05 expenditure inflated using Roadcon index (£)

C = 2005/06 Revenue and Capital expenditure (£)

Note: To avoid double-counting, if element (C–B) is negative, the element is not included in this calculation as cashable efficiency will have been claimed elsewhere.

Expenditure

Revenue (from Local Authority General Fund Revenue Account Out-turn RO2 submission)

Line 11: Highway maintenance planning policy and strategy

Line 20: Construction

Line 31: Structural maintenance – Principal Roads

Line 32: Structural maintenance - other roads

Line 33: Structural maintenance – bridges

Line 41: Environmental, safety and routine maintenance - Principal Roads

Line 44: Environmental, safety and routine maintenance - other roads

Line 48: Winter maintenance

Line 49: Street Lighting

Line 54: Safe routes (incl. school crossing patrols)

Line 58: Road safety education and other traffic management

Capital (roads, bridges, lighting)

LTP maintenance spend

LTP Integrated Transport (except public transport related)

Locally funded maintenance (e.g. prudential, receipts, etc)

Exclude major schemes

TOOLKIT FOR HIGHWAYS EFFICIENCY GAINS

Score: Indicators all need to be expressed such improvement is a positive percentage change. Conversions to be applied are:

Indicator	Description	Conversion to Score															
Local Transport Plan	APR assessment : <table style="margin-left: 20px; border: none;"> <tr> <td style="text-align: center;"><u>2005</u></td> <td style="text-align: center;"><u>2004</u></td> <td></td> </tr> <tr> <td>Excellent</td> <td>Well above average</td> <td>100 %</td> </tr> <tr> <td>Good</td> <td>Above average</td> <td>95%</td> </tr> <tr> <td>Average</td> <td>Average</td> <td>90%</td> </tr> <tr> <td>Weak</td> <td>Weak</td> <td>85%</td> </tr> </table>	<u>2005</u>	<u>2004</u>		Excellent	Well above average	100 %	Good	Above average	95%	Average	Average	90%	Weak	Weak	85%	
<u>2005</u>	<u>2004</u>																
Excellent	Well above average	100 %															
Good	Above average	95%															
Average	Average	90%															
Weak	Weak	85%															
Cat 1 defects	% of Cat 1 defects repaired within 24 hours	No conversion															
BV 100	Days of temporary traffic control	100 - (current days x100, divided by 4.8) *															
BV 165	% pedestrian crossings with facilities for disabled	No conversion															
BV 178	% Rights of Way that are easy to use	No conversion															
BV187	% Cat 1 Footway for maintenance	Invert															
BV 215	Days to repair lighting faults	n/a for 2005 since no results for 2004 available															
BV 223	% Primary roads for maintenance	Invert															
BV 224a	% Non-primary classified roads for maintenance	Invert															
BV 224b	% Unclassified roads for maintenance	Invert															
Local indicators	From BVPP (see below)	Either none or invert to make improvement positive															

[*4.8 is the upper limit, using the top 95th percentile of all LAs in 2003/04,(ref HA Methodology in AppD)]

Local Priorities

Local indicators - Authorities can opt to supplement the indicators in the calculation by adding all their local highways related indicators, as published in their Best Value Performance Plan (BVPP). However, given the variability of local indicators, conversion rules are difficult to establish and **only** local indicators which are expressed as percentages may be used.

Local weighting – Authorities can opt to weight changes in scores to reflect local policy priorities. The number of High weightings must be the same as the number of Low weightings. Weighting must be the same year on year, or the efficiency based on previous weighting shown as well.

Adjustments:	High	- increase a positive percentage change by 5% (e.g. 5% to 5.25%) or decrease a negative percentage change (e.g. -5% to -4.75%)
	Medium- none	
	Low	- decrease positive percentage change by 5% (e.g. 5% to 4.75%), or increase a negative percentage change by 5% (e.g. -5% to -5.25%)

TOOLKIT FOR HIGHWAYS EFFICIENCY GAINS

Example Authority A

Service Objective	Indicator	Base Indicator (Score) (see notes)	Current Indicator (Score)	Change in score + or –	Local Weighting (High/Med/Low) (Optional)	Weighted % Change (Optional) + or –
Overall	Local Transport Plan	Average (90)	Good (95)	5.00%	High	5.25%
Safety	% of Cat 1 defects repaired with 24 hours.	92.3%	98.3%	6.00%	High	6.30%
Serviceability	BV100	1.1 (77.1%)*	0.9 (81.3%)*	4.2%		4.2%
	BV165	82%	88%	6.00%		6.00%
	BV178	68%	65%	-3.00%	Low	-3.15%
	BV187	18%	19%	-1.00%		-1.00%
	BV215*	n/a				
	BV223*	n/a				
	BV224a*	n/a				
	BV224b	20%	21.5%	-1.50%	Low	-1.58%
All published Local Indicators (% ages) (Optional)						
Average Change in Value (P)						2.29 %

*see conversion rules

TOOLKIT FOR HIGHWAYS EFFICIENCY GAINS

Base Year Spend (adjusted for inflation using Roadcon index) (**B**) = £20,919,000

Current Year Spend (**C**) = £21,219,100

Change in value (**P**) = 2.29%

Non cashable Efficiency Gain (£) = (P x B) - (C - B) [so long as C-B is positive]

$$= (2.29\% \times 20,919,000) - (21,219,100 - 20,919,000)$$

$$= (479,045) - (300,100)$$

$$= £ 178,945$$

Appendix D Highways Agency Methods of Measurement for Road Procurement Efficiency Gains - Maintenance Contracts

This Highways Agency paper is included to provide information on maintenance efficiency targets, its general approach to measuring achievement of these targets, and issues relating to the measurement and reporting of efficiencies.

The version included is '2006_05_03 HA Maintenance Efficiency Method 21 April 06 V4Rev.doc'.

The paper can be read in conjunction with the API Handbook Issue 04 dated 28 February 2005 – a separate document to this Toolkit.

Highways Agency Roads Procurement Efficiency Gains

Method of Measurement for Maintenance Contracts

This version is '2006_05_05 HA Maintenance Efficiency Method V5.doc

1. Purpose

The Highways Agency operates, improves and maintains the trunk road and motorway network in England, the strategic road network, on behalf of the Secretary of State for Transport.

The Gershon efficiency review of government spending, published in July 2004, identified targets for savings across the public sector, including savings from greater efficiencies in roads procurement. The Department for Transport requires the Highways Agency to contribute towards those savings.

This paper provides information on the Highways Agency's overall efficiency targets, its general approach to measuring performance for its maintenance contracts, and issues relating to the measurement and reporting of efficiencies.

The Agency's methods are under continuous review and could change in the future.

2. The Agency's Efficiency Targets

As part of the Government Spending Review 2004 (SR04) settlement, the Agency is expected to deliver the following efficiency gains:

	04/05	05/06	06/07	07/08
Total savings	£18m	£66m	£132m	£200m

The savings are to be delivered from the Agency's total spend on the strategic road network, of which the costs of maintenance contracts are a part.

3. Delivery Mechanisms for Maintenance

For operational reasons the Agency's road network is divided into 15 geographic areas (Areas 1 – 14 and Dartford Crossing). Each Area's operations are managed by a Highways Agency team of around 20 people. These teams manage the delivery of network and customer services through two types of contract with the private sector:

1. Managing Agent and Term Maintenance Contractor (MA+ TMC) - (2 separate contracts)
2. Managing Agent Contractor (MAC) - (single contract combining the MA and TMC roles)

The services provided by the maintenance contractors include: data and inventory management; scheme identification and development; delivery of schemes costing up to a threshold (£250k for MA/TMC and £500k for MAC); all routine and cyclic maintenance; and customer services including attendance at incidents.

4. General Approach to Measuring Efficiency

A method for measuring efficiency gains is required which includes both cashable and non-cashable efficiencies and can take into account proportional changes in performance relative to cost.

A simple and effective method for measuring efficiency gains is to adopt a cost-effectiveness approach. This identifies an indicator of service improvement and expresses the improvement as a percentage increase from the previous provision of that service. If it is assumed that an output is at least equal to the input required to make it, a value can be placed on the improvement achieved. Thus, if the cost of provision in the base year is £100,000 and service as measured by an indicator (for example, street lighting outages within a given area) improves by 4%, then this improvement is worth £4,000 in base year terms. However, this example assumes that spend on the service remains constant from the base year to the measurement year.

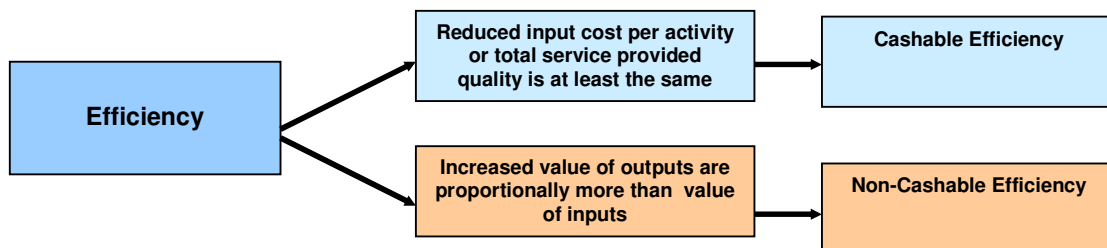
5. The Agency’s Approach to Measuring Efficiency

The approach used by the Agency to measure efficiency is based on determining the relationship between inputs and outputs over a period of time. This general principle has been used to develop a specific measurement model that fits the Agency’s maintenance and renewals delivery mechanisms. This method is applicable to both cashable and non-cashable efficiencies.

Cashable efficiency savings are those where the Agency is able to deliver the same outputs for physically less inputs (money). Thus a cashable efficiency saving of 3% will result in the Agency being able to provide the same output for 3% less input, provided that the value of service remains constant.

A non-cashable efficiency occurs where the Agency is able to deliver increased outputs for the same inputs. In this instance the Agency does not reduce expenditure and is able to make an efficiency gain by providing more service or a better quality of service.

An efficiency gain can contain both a cashable and non-cashable element. For example, reduced input costs can occur alongside an improvement in the value of outputs. However, an inefficiency (negative efficiency) in one element can result in a negative overall efficiency even if the other element is a positive efficiency.



The Agency has developed methods of measuring inputs and outputs for two different types of activities covered under ‘maintenance’. These two activities are:

- (i) General maintenance – network management, programme management, customer services, engineering services (design etc) and routine work such as gully cleaning. [These are the subject of this document].
- (ii) Small Schemes (Renewals and improvement schemes) – identification, design and management of discrete projects that alleviate congestion or improve safety such as the replacement of a worn surface or installing a new set of safety barriers.) [These are not included in this document].

6. General Maintenance

In using a cost-effectiveness approach it is vital to focus on the overall objective of measuring efficiency. The Highways Agency has chosen Area Performance Indicators (API) to be used which are based on outcomes that are significant for the service that the Agency provides. The Agency has adopted a formula approach to defining efficiency gains in terms of value and cost, which measures both cashable and non cashable efficiencies.

The Agency has built into its maintenance contracts a requirement for the contractor, or service provider, to measure and report against 14 APIs. Each API is broken down into a number of sub-measures designed to capture a range of variables that are relevant as a particular subset of performance. API measures contribute to outcomes that are of value to the public as a whole – these are reflected in the Highways Agency’s aims and objectives. Although the suite of APIs was originally developed as a tool to drive continuous improvement at an Area level, they are being used as a proxy for the measurement of the value of service levels because they measure a broad spectrum of services and contribute to customer outcomes. The API Handbook gives further details.

Changes in indicators are combined in an equally weighted sum to minimise local fluctuations and simplify the approach. Efficiency is then measured as the relevant change in the quality (value) of the service being provided and the change in spend.

The Highways Agency’s method of measurement for efficiency gains is set out in a “Gershon Scorecard”.

An efficiency is measured as described below. An equation for efficiency and some worked examples are given in Annex A and B.

$$\begin{array}{c} \text{Multiplication of ‘\% change in performance’ and base year spend (allowing for inflation)} \\ + \\ \text{Difference between current year and base year spend (allowing for inflation)} \end{array}$$

In other words, this equation can roughly be equated to:

$$\begin{array}{c} \text{The change in Value} \\ + \\ \text{The change in Cost} \end{array}$$

The efficiency gain can then be categorised as cashable, non-cashable or both, if desired.

The Agency considers that the most appropriate input is the total cost of the work carried out. For general maintenance, this is taken as the total yearly spend, which includes both a fixed lump sum and a time charge. It is assumed that the value of inputs at base year is an efficient amount in order to deliver the outputs achieved in that year. Inputs relating to the Agency's running costs (staff numbers and salaries) and assets (office accommodation, depots etc), after inflation related adjustments, are assumed to remain constant during the SR04 period if outputs remain unchanged.

Different efficiency scenarios are shown in the Table below which illustrates the relationship between value and cost in determining whether an efficiency is realised, as well as the type of efficiency.

Cashable Efficiency

Scenario 1 No change Value and ↓ Cost Cashable efficiency reported.

Non-cashable Efficiency

Scenario 2 ↑ Value and no change Cost Non-cashable efficiency reported.

Scenario 3 ↑ Value > ↑ Cost Non-cashable efficiency reported.

Cashable and Non-cashable Efficiency

Scenario 4 ↑ Value and ↓ Cost Cashable and non-cashable efficiencies reported.

No Efficiency

Scenario 5 ↑ Value < ↑ Cost No efficiency.

Scenario 6 ↑ Value = ↑ Cost No efficiency since the changes cancel each other out.

7. Summary of Indicators Used

The Table below shows how the inputs and outputs relating to the general maintenance, renewals and minor improvement schemes activities of a Highways Agency maintenance contract are aligned to service delivery. However, only the inputs and outputs of the general maintenance activities are considered within this document.

Input measure/network activity (Costs)	Output measure (Area Performance Indicators)
<p><u>General Maintenance</u> [<i>Current Maintenance</i></p> <p><i>Technology Maintenance</i></p> <p><i>Grants and Compensations</i></p> <p><i>Third Party Receipts.</i>]</p>	<p>API 1 – Response to emergency incidents</p> <p>API 2 – Response to Category 1 defects</p> <p>API 3 – Customer satisfaction</p> <p>API 4 – Environmental Amenity Index</p> <p>API 8 – Predictability of Resource (Accruals Forecasting) – [Not used in this document]</p> <p>API 9 – Winter maintenance</p> <p>API 11 – Road Traffic Accidents at roadworks</p> <p>API 12 – Street light outages</p> <p>API 13 – Network availability</p> <p>API 14 – Third party claims – [Not used in this document]</p>
<p><u>Small Schemes</u></p> <p>Renewal of Infrastructure [<i>Renewal of roads</i></p> <p><i>Renewal of structures</i></p> <p><i>Renewal of Technology</i></p> <p><i>Winter Maintenance (Assets)]</i></p> <p>Improvement schemes</p>	<p>API 5 – Site (Workplace) Safety</p> <p>API 6 – Predictability of Discrete Schemes – Time</p> <p>API 7 – Predictability of Discrete Schemes – Cost</p> <p>API 10 – Defect Free Work</p>

8. Conclusion and Further Information

The Highways Agency is using total annual spend and change in service performance measured by contractual Area Performance Indicators of service quality to measure cashable and non-cashable efficiencies.

The method described has been approved by the Office of Government Commerce and general discussion on methods for measuring efficiency gains is continuing with OGC. The National Audit Office has undertaken a high level review; this has identified a number of improvements which are being considered.

In addition to reporting efficiency, the Highways Agency is also using the information gathered for management purposes. This will help it to monitor current and future efficiency projections and identify areas that need to be looked at for improvement.

The Highways Agency aims to review its methods and continue to improve them. It is recognised that measures of performance in particular can be improved. The Agency would also like to learn from highways clients in local government and is taking steps to do this through the Highways Efficiency Liaison Group.

Annex A - Gershon Scorecard - Step-by-step API score conversion

1 Calculation

The Agency demonstrates efficiency gains through showing that it has provided additional outputs (extra service, productivity, safety etc) for the same inputs. This will be achieved through a comparison of the current year spend as the input and the API score change as the output. The formula for assessing this is set out below.

$$\text{Efficiency Gains (£)} = (P \times B) + (B - C)$$

Where:

P = Overall API Score change from 2003/04 (performance base year) expressed as a percentage

B = 2004/05 (cost base year) budget inflated to current year (£)

C = Current year spend (£) (eg 2005/06)

2 Glossary

“Result” - the actual API sub-measure result for a particular month

“Score” - the mark out of 100 achieved by an Area for a particular API sub-measure in a particular month, i.e. after any conversion method applied.

3 Conversion of API results into % score change

Not all APIs are % results, some are expressed as the number of days taken to achieve a certain output, the number of incidences of a particular observation or a variance from expectation. Therefore, it is necessary to convert such results in some way.

In addition, for some APIs a lower result means improved performance. In order to achieve a set of scores that may be aggregated it is necessary to invert such results so that all resultant scores for the Gershon Scorecard are in the form that higher is better.

4 APIs included in Gershon Scorecard, type of result and score conversion method applied:

API	Sub-measure	Included?	Type of result	Method of conversion
API 1 Emergency Incidents	REI01	No	n/a	n/a
	REI02	Yes	%, higher better	None
	REI03	Yes	%, higher better	None
	REI04	Yes	%, lower better	Inversion
API 2 Cat 1 Defects	IR01	Yes	%, higher better	None
	IR02	Yes	%, higher better	None
	IR03	Yes	%, higher better	None
	IR04	Yes	Number of days	Inversion of incident number
API 3 Customer Satisfaction	CS01	No	n/a	n/a
	CS02	No	n/a	n/a
	CS03	Yes	%, lower better	Inversion
	CS04	Yes	%, higher better	None
API 4 Environmental Amenity Index	EAI01	Yes	%, higher better	None
API 9 Winter Maintenance	WM01	No	n/a	n/a
	WM02	Yes	Number – Lower the better	Inversion of incident number
API 11	RTA01	No	n/a	n/a

RTAs at roadworks	RTA02	Yes	Number – Lower the better	Inversion of incident number
API 12 Street Lighting outages	SL01	Yes	%, lower better	Inversion
	SL02	Yes	%, higher better	None
API 13 Network Availability	NA01	Yes	%, higher better	None
	NA02	Yes	%, higher better	None
	NA03	Yes	%, higher better	None

5 Methods of conversion

5.1 Inversion

When a result is expressed as a percentage but with a lower scores being preferable (e.g. percentage of street lights out) the method of conversion is to merely subtract the result from 100:

$$\text{Gershon API Score} = 100 - \text{API Result}$$

5.2 Inversion of incident number

All the API sub-measures that record the number of incidences (eg RTAs at roadworks and complaints) are first converted into a percentage. This is done by taking the number of incidences recorded and dividing it by the upper limit of the expected observation range. This observation range is taken from the API Handbook (version 4.0). The resultant percentage is then subtracted from 100 to achieve inversion.

As an example, if an Area recorded zero complaints, this would result in a score of 0% when divided by the upper limit of expected observations; this is then subtracted from 100 so that an Area recording zero complaints would achieve a Gershon score of 100. For three complaints and an upper limit of 30, the result would be a score of 90.

$$\text{Gershon API Score} = 100 - (\text{API Result}/\text{Upper limit of expected observation range})$$

6 Baseline

The 03/04 baseline is the average of the Gershon scores for each sub-measure over the 12 months to March 2004. For APIs that reflect 12 month rolling results just the score from March 2004 would be taken as the baseline.

For General Maintenance, there are no 12 month rolling APIs included in the aggregation so this is not an issue.

7 Exclusions

If the baseline in 03/04 is 100 any further achievement of 100 is removed from the aggregation as an Area would otherwise have its average improvement dragged down by measures that cannot be improved upon.

8 Aggregation

For each API, once the sub-measure results have been converted into scores, the scores are compared with the baseline for each API sub-measure to flag any outlying results. The API score is then determined as the average of all the ‘included’ sub-measure scores.

This ensures that an API that has four sub-measures does not have a greater impact on the total than an API with just one sub-measure.

The score for each API is then aggregated to calculate an average score for an Area for the whole month. The percentage improvement from the baseline is then calculated.

9 Worked example

The API results are actual Nov 2005 results taken from a HA Area:

9.1 API 1

Measure	Description	Result (A)	Conversion required	Conversion	Upper observation limit (B)	Score	03/04 baseline	% change from baseline	Include?
REI02	Percentage of emergency incidents identified by Providers' ISU teams	65	None	n/a	n/a	65	32.25	101.55	Yes
REI03	% of reactive ISU call-outs achieved within contract response time	86	None	n/a	n/a	86	84.75	1.47	Yes
REI04	Average response time achieved for reactive call-outs as % of contract response time	75	Inversion	100 – A	n/a	25	30.42	-17.82	Yes
Average						58.67	49.14	19.39	

9.2 API 2

Measure	Description	Result (A)	Conversion required	Conversion	Upper observation limit (B)	Score	03/04 baseline	% change from baseline	Include?
IR01	% of Cat1 defects made safe/repared within 24 hour response time	100	None	n/a	n/a	100	90.24	10.82	Yes
IR02	% of Cat1 defects made safe/repared within 7 day response time	100	None	n/a	n/a	100	88.39	13.13	Yes
IR03	% of Cat1 defects made safe/repared within 28 day response time	100	None	n/a	n/a	100	92.85	7.70	Yes
IR04	Average time (days) to repair 7 day Cat1 defects	3.29	Inversion of incident number	100 – A/B * 100	25	86.84	83.13	4.46	Yes
Average						96.71	88.65	9.03	

9.3 API 3

Measure	Description	Result (A)	Conversion required	Conversion	Upper observation limit (B)	Score	03/04 baseline	% change from baseline	Include?
CS03	% of complaints received	0	Inversion	100 – A	n/a	100	83.17	20.24	Yes

	requiring corrective action								
CS04	% of complaints requiring corrective action closed within 10 days	100	None	n/a	n/a	100	90.83	10.10	Yes
Average						100.00	87.00	15.17	

9.4 API 4

Measure	Description	Result (A)	Conversion required	Conversion	Upper observation limit (B)	Score	03/04 baseline	% change from baseline	Include?
EAI01	Environmental Amenity Index	83.1	None	n/a	n/a	83.1	67.78	22.60	Yes
Average						83.10	67.78	22.60	

9.5 API 9

Measure	Description	Result (A)	Conversion required	Conversion	Upper observation limit (B)	Score	03/04 baseline	% change from baseline	Include?
WM02	Number of confirmed instances of ice on network	0	Inversion of incident number	100 – A/B * 100	200	100	99	1.01	Yes
Average						100.00	99.00	1.01	

9.6 API 11

Measure	Description	Result (A)	Conversion required	Conversion	Upper observation limit (B)	Score	03/04 baseline	% change from baseline	Include?
RTA02	Number of RTAs at roadworks where criticism of TM received	0	Inversion of incident number	100 – A/B * 100	100	100	100	0.00	No. 100% achieved in base year, no improvement possible
Average						n/a	n/a	n/a	

9.7 API 12

Measure	Description	Result (A)	Conversion required	Conversion	Upper observation limit (B)	Score	03/04 baseline	% change from baseline	Include?
SL01	% of street light outages	4.6	Inversion	100 – A	n/a	95.4	93.37	2.17	Yes
SL02	% of Cat2 street light outages repaired on time	100	None	n/a	n/a	100	64.24	55.67	Yes
Average						97.70	78.81	28.92	

9.8 API 13

Measure	Description	Result (A)	Conversion required	Conversion	Upper observation limit (B)	Score	03/04 baseline	% change from baseline	Include?
NA01	% of network available at peak times	99.9	None	n/a	n/a	99.9	95.07	5.08	Yes

NA02	% of network available at off-peak times	99.7	None	n/a	n/a	99.7	94.74	5.24	Yes
NA03	% of network available at night	99.5	None	n/a	n/a	99.5	94.89	4.86	Yes
Average						99.70	94.90	5.06	

10 Aggregation of API Gershon efficiency scores

Average scores for each API (the final row in each of the tables above) are then averaged again to assess percentage improvement in outputs for Gershon purposes.

API	Average Nov 05 Score	03/04 Baseline score	% improvement (from API tables above)
1	58.67	49.14	19.39
2	96.71	88.65	9.03
3	100.00	87.00	15.17
4	83.10	67.78	22.60
9	100.00	99.00	1.01
11	n/a	n/a	n/a
12	97.70	78.81	28.92
13	99.70	94.90	5.06
Gershon score	90.84	80.75	12.50

The table above shows that, for General Maintenance, this Area has demonstrated a 12.50% improvement in outputs from the baseline of 03/04.

Annex B – Worked Examples**General Maintenance**

Worked examples are provided below. The data used is all hypothetical and not reflective of a particular organisation. The value of the Road Construction (Roadcon) index is illustrative only.

Base Year Spend in 2004/05 = £11,621,237

Inflated to 2005/06 using Roadcon index @ 4.5% pa = £12,144,192

Scenario 2 from Table A

P = 12.50%

Current Year Spend = £12,144,192

2005/06 Efficiency Gains = $(12.50/100) \times 12,144,192 + (12,144,192 - 12,144,192)$
= £1,518,024 + 0
= £1,518,024 i.e. a non-cashable gain.

Scenario 3 from Table A

P = 12.50%

Current Year Spend = £13,000,000

2005/06 Efficiency Gains = $(12.50/100) \times 12,144,192 + (12,144,192 - 13,000,000)$
= £1,518,024 - £855,808
= £662,216 i.e. a non-cashable gain.

Scenario 4 from Table A

P = 12.50%

Current Year Spend = £10,000,000

2005/06 Efficiency Gains = $(12.50/100) \times 12,144,192 + (12,144,192 - 10,000,000)$
= £1,518,024 + £2,144,192
= £3,662,216 i.e. both a non-cashable and cashable gain.

Scenario 5 from Table A

P = 12.50%

Current Year Spend = £14,000,000

2005/06 Efficiency Gains = $(12.50/100) \times 12,144,192 + (12,144,192 - 14,000,000)$
= £1,518,024 - £1,855,808
= -£337,784 i.e. no efficiency.