Your Business.
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Project nr. 17565

Somerset Council
Highways Inspections & CO2e reduction

February 2026
- updated from November 2025

BOURTON GROUP

Somerset Council

Highways Inspections – CO2e reduction review

Purpose

As part of **Live Labs 2: Decarbonising Local Roads in the UK,** contribute to the progressive decarbonisation of the road network's maintenance across the whole asset lifecycle.

Objectives

- Have a relevant shared understanding of Reactive Inspections (*Highways Superintendence*, *Street Works*, *Traffic Engineering*) and Planned Inspections
- Identify key opportunity areas for CO2e reductions: optimisations, collaborations & synergies.

Outputs

- Detailed process maps of Reactive and Planned Inspections including waste areas generating CO2e.
- Identification and prioritisation of process waste areas with highest potential for CO2e reduction.
- Sharing of mutual expectations regarding CO2e reductions.

Outcomes

- Managers and Inspectors are aligned on the opportunities and synergies for CO2e reductions

Methodology & Approach

Use of lean methodology and principles to identify and prioritise CO2e reduction opportunities

	1. Scoping, Validation & Preparation	2. As is processes review & Opportunities Identification	3. Opportunities Prioritisation & Deep dives
OBJECTIVE	**Address the right issue, at the right level with the right people**	**Have a shared understanding of Current State, including Challenges & Opportunities**	**Define and align on prioritised of opportunities for CO2e reduction**
ACTIVITIES & TOOLS	• Interviews with Heads of Dept. • Review of available data • Quad of Aims (Project Charter) • High-level process (SIPOC) • Validation with SRO • DMAIC phase(s): Define, Measure	• Training and exercise on Lean principles esp. Value Add. vs Non-Value Add, 8 Wastes • Mapping of Reactive Inspections (3 processes) & Planned Inspections • Identification of process issues and waste & opportunities for CO2e reduction • DMAIC phase(s): Analyse	• Benefits / Ease of Implementation prioritisation of CO2e reduction opportunities • Deep-dive on selected high-benefit opportunities • Implementation plan initiation • DMAIC phase(s): Analyse, Improve
OUTPUTS & OUTCOMES	• Defined and agreed mission and objectives in Quad of Aims • Targeted organisations and participants onboarded • High level approach for CO2e reduction project agreed	• Detailed process maps by organisation • Challenges and roadblocks identified • 8 process wastes review • Root Causes identified	• Prioritised Opportunities for CO2e reduction • Reciprocal expectations defined • Deep dives on 6 opportunities

Step 1 – Scoping, Validation & Preparation

Scoping Interviews - Highways Inspections facts & information

Interview date	Department	Manager(s)	Scope & Mission	People	Vehicles	Travel & Inspections - inc. Planned vs Reactive/Unplanned	Opportunities for Efficiencies / CO2e reductions
15/07/2025	**STREETWORKS**	Jonathan Weeks	- work permits (eg utilities) - excavations for traffic management - regulation / reinstatement	21 people o/w 17 for permits and **4 inspectors**	4 diesel vans	12000 inspections / year Utilities vs. Highways driven (reinstatement)	- Be right at first visit. Can be 2 or 3 visits for Utilities - Repeated visit for repeated patches - Importance of material used - "Lane rental money" to be set aside for Road Improvement
15/07/2025	**BRIDGES & STRUCTURES**	Paul Tucker	- asset maintenance - asset improvement	14 people o/w **2 inspectors,** in Minehead & Wincanton	2 diesel vans	General inspection every 2-2.5 years Principal inspection 6-12 years 30 inspections / week Calls of public, often for minor issues	-Natural grouping of visits, no prescription
22/07/2025	**HIGHWAYS SUPERINTENDENCE**	Neil McWilliams & Jeremy Fry	- 1st on site to assess jobs - Parish Councils meeting - Performance of suitable checks (eg. skip licences)	**20 superintendents** (RBA trained)	20 diesel vans	-Inspections to reactively attend incidents+ reports of defects	- Cross work across other teams: 2023 Efficiency Saving proposals towards Traffic Engineering & Streetworks - Train Inspector and Supervisors on Defects - Benchmark tbc: Oxfordshire CC merger of Highway Teams
25/07/2025	**TRAFFIC ENGINEERING**	Gary Warren	- Events (parties, festivals, carnivals) - Traffic regulations (roadworks) - Traffic engineers (signings, markings) inc Parish / Town Council meetings and New Installations	25 o/w **10-12 Traffic Engineers**	10-12 diesel vans	Importance of frontline service More planned inpections than unplanned 20% of time spent travelling	- Asset Registry (database of Signs / Lines
25/07/2025	**HIGHWAY RISK**	Paul Sweetman	- Health & Safety - Tree surveying - Auditing of contractors - Highways Safety Inspections	13 people o/w 1 H&S Officer, 3 Managers, **9 surveyors**	8 to 10 diesel vans	3 surveyors delivering Safety Inspections drive the network daily	- Collect information for others whilst travelling across the network - Cross work across other teams - Safety training to identify, document and sort defects
29/07/2025	**RIGHTS OF WAY**	Peter Hobley	- Ensure use and ease of use of the Public Rights of Way Network - keep the legal records of public rights of way up-to-date	20 people o/w **6 Area Wardens & 2 Bridge Wardens**	4 allocated vehicles + 2 pool vehicles + use of own vehicles	Planned inspections on 8 years cycle Reactive inspections by Area and Brifge wardens (50% of time on the road)	- Double handling of queries between RoW and Area Highways - Overlap of status in Registers leading to possible duplication of visits (2014 matrix to facilitate decision making)
01/08/2025	**SAFETY, DATA & CONTROL**	Nick Cowling	- Improve Road Safety - Collection and provision of traffic data - Management of Trafic signals	12 people o/w **4 Road Safety, 2 data technicians, 6 traffic control**	1 diesel estate for investigation 1 van for trafic counting	Most of work is planned	-when collecting information, gather data that all can use - as part of effective use of data

Quad of Aims - Highways Inspections & CO2e reduction

Purpose

Planned Highways and associated asset Inspections undertaken using Somerset Council vehicles account for 48.8 tonnes of CO2 emissions per annum across the county. This amounts to circa 25% of transport related carbon emissions attributable to Somerset Council and its staff.

A Lean based review will be undertaken to **identify short, medium and long-term process improvements that will reduce CO_2 emissions related to Planned and Reactive Inspections**. The Inspections related scope extends beyond the 3 'Net Zero' Corridors addressed by Somerset Council within Live Labs 2.

Stakeholders & Beneficiaries

- Somerset Council operational units:
  - **Reactive inspections**_ → Highways Superintendents, Street Works, Traffic Engineers.
  - **Planned inspections** → Highways Risk
- Local Authorities: Parish & Town Councils
- Road Users

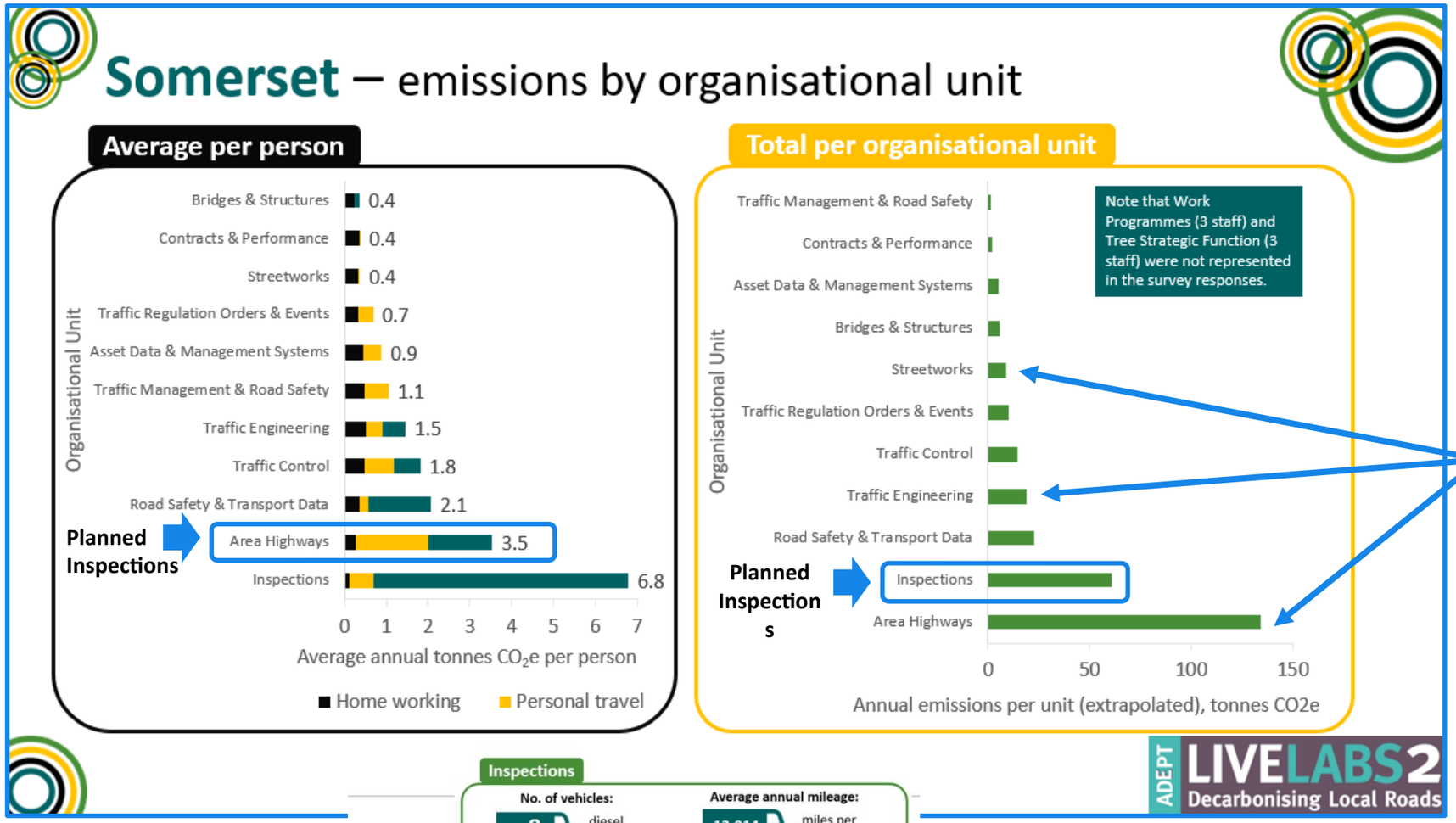
Roadmap / Timelines

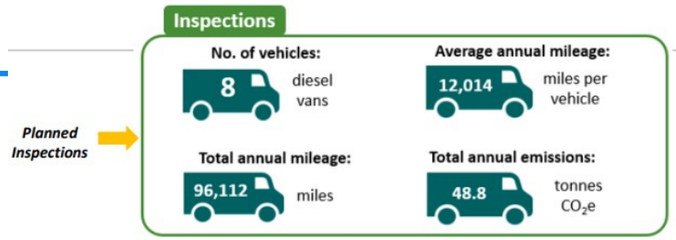
- 10 Sept. 2025 – Project Scope validated by Senior Responsible Owner (SRO)
- 22 Oct. & 12 Nov. 2025 - detailed Inspection baselines and current processes confirmed
- 13 Nov. 2025 - solutions identified and prioritised, To Be processes formalised, Implementation Plan
- 30 Nov. 2025 - Business Case and Implementation Plan validated
- Dec. 2025 – Mar. 2026 – Implementation Plan execution
- Feb 2026 – Mar. 2026 – outcomes of review formalised and ready for transfer.

Measures of Success

- Achieve aspirational reductions of 25% in the short term, 50% in the medium term and >75% in the long term
- Outcomes of the review transferable to other authorities and organisations
- Approach based on Lean methodology and Doughnut Economics perspective validated for use on other opportunities across Live Labs 2.

Address Planned and Reactive Inspections to identify and deliver on CO2e reduction opportunities



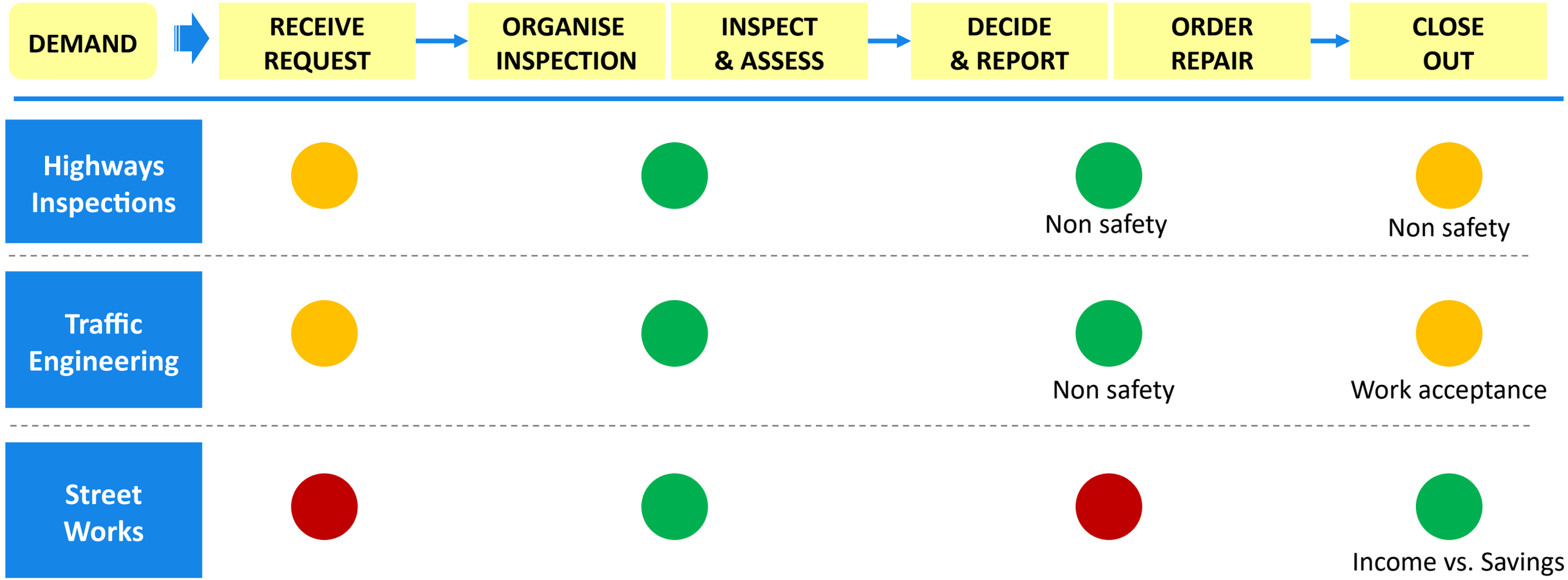


Together with **Planned Inspections, Reactive Inspections** of *Highways Superintendence, Traffic Engineering, & Street Works* to be part of the review.

Source: Somerset Countil / Colas – Feb 2024

Step 2 – As-Is processes review & Opportunities identification

Initial high-level process review suggests focusing on Inspections organisation and execution

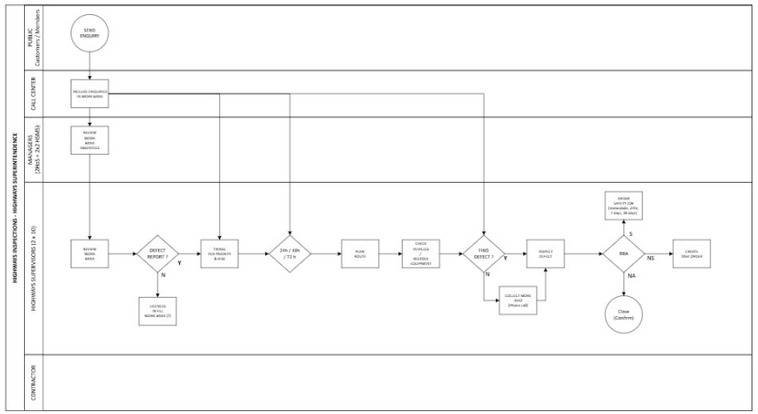


Expectation for CO2e reduction opportunities: *High* *Medium* *Low*

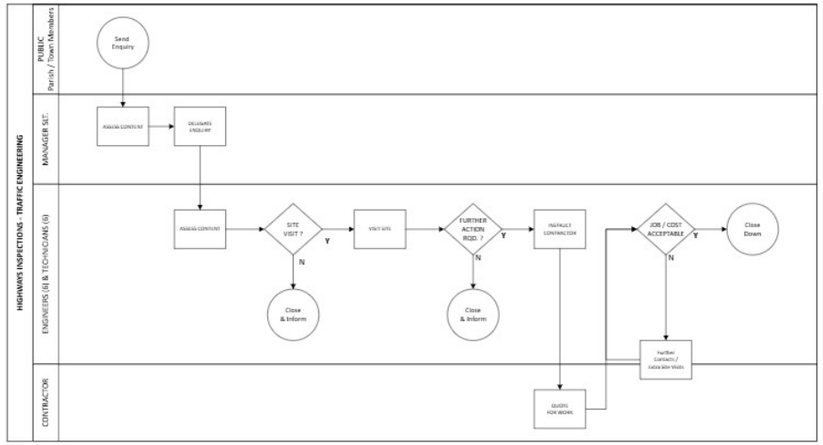
Detailed mapping highlighted commonalities and specificities of Highways Inspections processes

REACTIVE INSPECTIONS

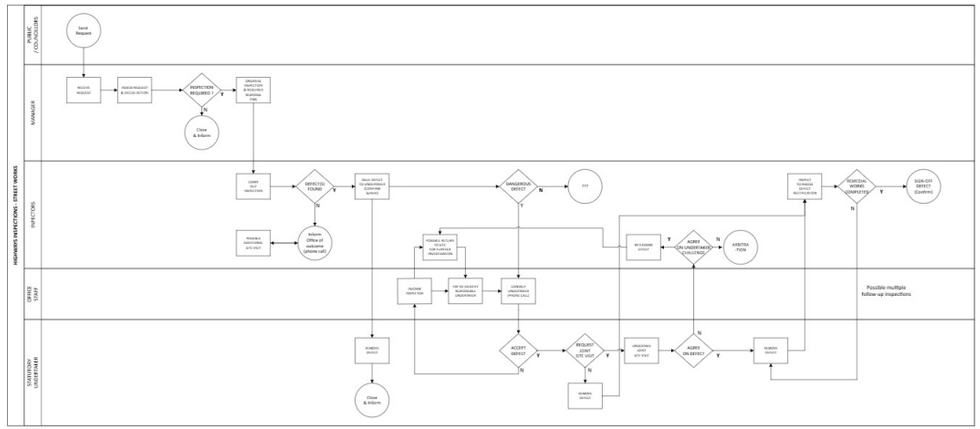
HIGHWAYS SUPERINTENDENCE



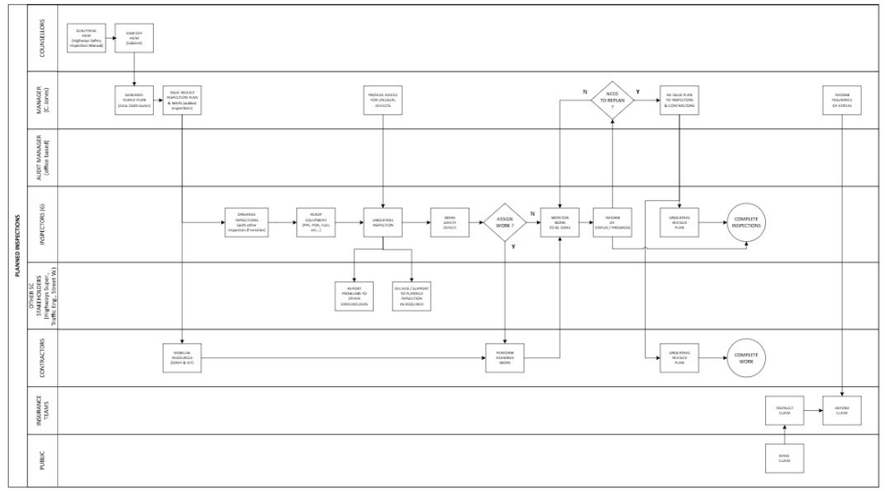
TRAFFIC ENGINEERING



STREET WORKS



PLANNED INSPECTIONS



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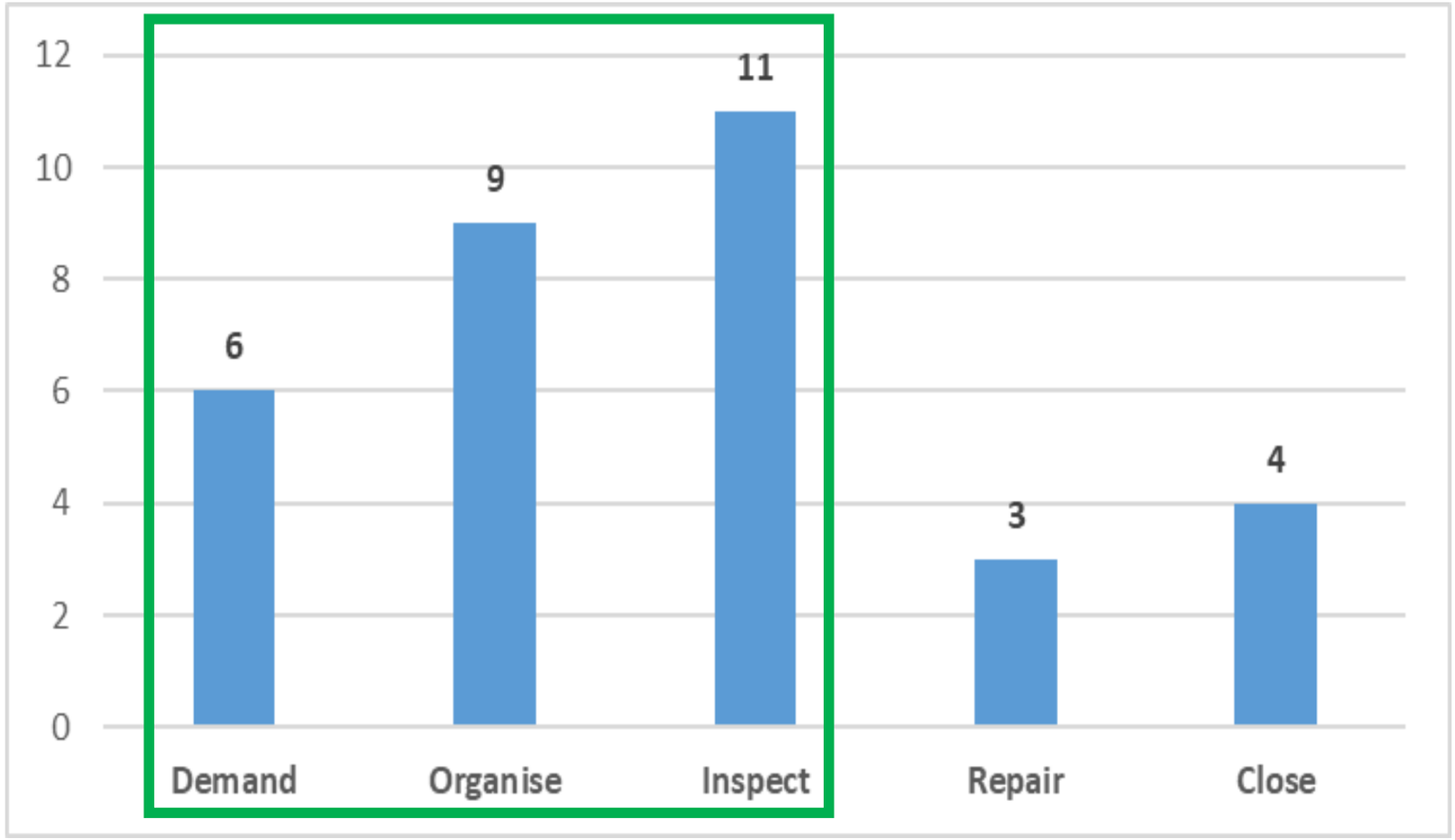
Detailed analysis also highlighted ‘Demand management’ as a focus area for CO2e reduction

79%

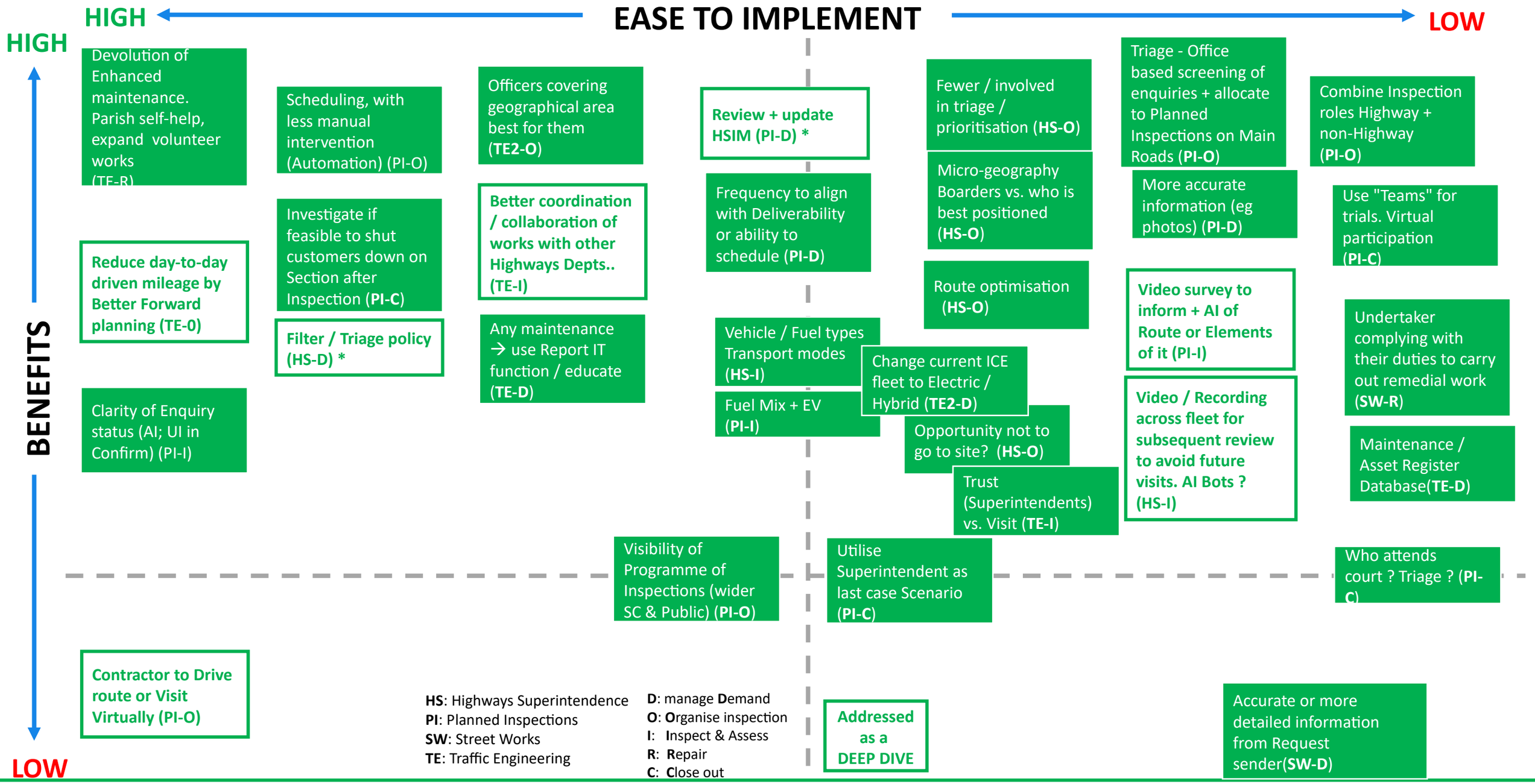
of CO2e reduction identified opportunities are in the upstream phases of *Manage Demand*, *Organise inspections* and *Inspect & Assess.*

Breakdown of CO2e reduction opportunities by Inspection phase



Step 3 – Opportunities & Review

High potential CO2e reduction opportunities



Deep Dive: Policy + HSIM Review

Planned Inspections – Manage Demand

Description

- Review existing HSIM to reflect national legislation
- Guidance
- LHA appetite for risk
- Risk based decision making

Impact / Benefits

- Scope that we currently maybe visiting too much and too often → fewer / better scheduled trips
- Be more efficient in delivery

Risks

- Insurance premiums increase ?
- Public perception / reputation
- Right for the Asset ?
- Contractual change (THC) ?

Work required

6 months

- Review & Benchmarking with other LHAs
- Virtual team: Risk Team, Traffic, Legal, Area Teams, Asset, Safety / Comms
- Redefine / redraft
- Potential trials ?

6 months after trials

- Scrutiny then Cabinet

Investment

- Staff time
- Low outlay unless utilising consultn
- LHA appetite for risk
- Risk based decision making

Deep Dive: Filter (+ Policy &Triage)

Highways Superintendence – Manage Demand

Description

- Review and amend HSIM / Other Policy (If So)
- Automation: review online report IT Structure + Routing (Hazard on Highway) (XXX)
- Avoid duplication and/or identifying duplicates

Impact / Benefits

- Reduced Safety Reactive assessments for Non-Highway / Traffic work types
- Better coordination
- Reduced Site Visits

Risks

- Insurance premiums increase
- Public perception / reputation

Work required

Quick Win

- IT Service / Partner / PM

3 months

- Map / Remap Online reporting Assessment

6 months+

- Reconfiguration of Platforms
- Comms (Members)

Investment

- Internal resources - £ ?
- External Support PM ? £ 50k

Deep Dive: Reduce mileage by better work planning

Traffic Engineering – Organise Inspections

Description

- Better use of Software to make use of existing (& new) information to influence / determining routes for carrying out work.

Impact / Benefits

- Creating a more agile workforce
- Reduction in miles being driven
- Increased consistency in how work is prioritised
- Flexibility in Officer unavailability

Risks

- Once a day / start of day process
- Admin burden
- Allocating to ‘offline’ Superintendent
- Road closures / diversions / limits (route planning)

Work required

3 months

- Initial ‘Priority’ for enquiry & how this is determined (SC IT involvement)

6 months + (tbc)

- Determining which enquiry is sent to which Superintendent(not Parish)
- Integrating absence, illness, other work tasks into (re-)allocating
- How to visually display the route to the Superintendent ?

Investment

- New planning Software ?
- New ‘Confirm’ functionality
- Training

Deep Dive: Transfer / Delegate work to Contractor (Kier)

Planned Inspections – Organise Inspections

Description

- Non-safety task ordering without staff travelling to site where issue can be dealt with in isolation

Impact / Benefits

- Time saving for individual issue

Risks

- Reliance on information provided
- Contractor buy-in ?
- Com & Risks information
- Current, small range of applicable tasks
- Proactive work, missing other issues close by
- Increase of Insurance Claims

Work required

Quick win

- Volunteer / Parish work ?
- Identify applicable low risk activities this could be applied

3 months

- Contractor requirements review for com. process
- Training / Education

Investment

- In House SC / Kier

Deep Dive: Better coordination / collaboration of works

Traffic Engineering – Inspect & Assess

Description

- Identifying the need for an Inspection
- Identifying is closest regardless of geographical area
- Identifying capability, what is required
- Reduce number of Inspections required

Impact / Benefits

- Reduced travel, officer time savec
- Reduced CO2, time savings

Risks

- General or Technical task

Work required

Quick win

- Office based filtering-triage

6 months +

- Phone call or map based tracking to see who is closest (pilot)
- Cross-service training, buy-in, collaboration (pilot)

Investment

- Buy in from officers (staff time)
- Cultural change: we all work for one organisation
- Cost of Map based systems. (filtering)

Deep Dive: Use of video / information analysis

Planned Inspections & Highways Superintendence – Inspect & Assess

Description

- Image capture
- Dash cam / body cam
- Use of other image sources (Google etc.)
- Tool to identify defect remotely

Impact / Benefits

- Better knowledge of Asset condition
- Proactive identification of potential defects

Risks

- Large amount of data storage required → associated Carbon usage of Cloud storage)
- Legal risk of holding information not assessed / actioned
- GDPR Risk

Work required

3-6 months

- Identifying systems that are suitable
- Talking to other authorities
- Host or access data
- Trials

Investment

- Dash cam / body cam costs
- Data storage costs
- System costs
- Resource costs for investigations

Initialisation of a phased Implementation Plan

QUICKWINS

- Office based filtering-triage
- Review IT Service / Partner / PM for filter-triage
- Volunteer / Parish work: identify low risk activities where it could be applied

3 TO 6 MONTHS

- Map / remap Online reporting Assessment
- Initial ‘Priority’ for enquiry & how this is determined (w/ IT involvement)
- Contractor requirements review for com. Process
- Identify suitable Video Systems

6 MONTHS →

- Review & benchmarking HSIM with other LHAs
- Phone call or map-based tracking to see who is closest (pilot)
- How to visually display the routes to the Superintendent ?

To reduce CO2 emissions, we would like from you …

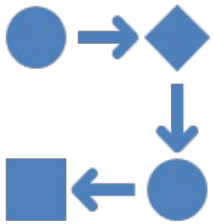
	Highways Superintendent	Traffic Engineering	Street Works	Others
Highways Superintendent	Flexibility of areas Collabo -ration	Undertake RUK-based training Utilise PDA functionality (non-safety)	Utilise PDA functionality to order immediate Su. Safety response Undertake risk-based training	LCN Promotion of SC Enhanced Maintenance / Volunteer Group offerings Awareness of Planned Inspections plan
Traffic Engineering	On-site information (accurate / descriptive) Collabo -ration	Assessment of one network HSPR/PIP Consistent Ways of Working Promote use of Report IT Be dynamic Diverge / help other workstreams Not helped with hybrid working. Never happened in the past Improve website information.	Coordination and programming of works / future works programme Feedback From Street Works Re. permit approvals	
Street Works	Accurate Information Photos / Description	Accurate Information Photos / Description		Call centre - Ask for accurate information. If possible, obtain photo. Accurate information from Planned Inspections (photos)

Retrospective:
Key Learnings & Way Forward

Project delivery was based on the Lean DMAICT methodology

Define

- Define the problem you wish to solve – what does the customer want?



Measure

- Measure how big the problem is today – how well are we meeting the customer's requirements?

Analyse

- Analyse the process to determine the root cause(s) of the problem

Improve

- Improve performance with solutions that tackle the root causes

Control

- Control the new level of performance

Transfer

- Transfer your knowledge to other parts of the Firm

Time and budget enabled to go through the *Define*, *Measure*, *Analyse* and *Improve* phases

Implementation will be driven by Somerset Council

Key outcomes of using the Lean Methodology

DEFINE

- Ensured the team addressed the right problem (travel-driven CO_2 emissions).
- Established inspection travel as ~25% of transport-related Council emissions.
- Aligned multiple departments under a single CO_2 reduction mission.
- Created formal governance framework.

MEASURE

- Quantified the scale of the emissions problem.
- Established inspection travel and duplication as measurable waste.
- Provided evidence base to support behavioural and structural change.
- Created shared understanding of where CO_2 emissions originate in the process.

ANALYSE

- Shifted mindset from fleet electrification alone → systemic demand reduction.
- Identified behavioural and governance drivers of emissions.
- Created prioritised list of high-impact initiatives.
- Structured selection of deep dives based on benefit/feasibility

IMPROVE

- Converted analysis into structured, actionable workstreams.
- Balanced:
  - Policy reform (HSIM review)
  - Behavioural change
  - Technology enablement
- Ensured improvements addressed:
  - Demand reduction
  - Travel reduction
  - Smarter scheduling
  - Remote assessment

Define Phase: approach & tools

Scoping Interviews with Heads of Department

- Conducted structured interviews across *Highways Superintendence, Street Works, Traffic Engineering, Highways Risk, Rights of Way, Bridges & Structures, and Safety/Data teams*.
- Gathered factual data on:
  - Inspection volumes
  - Fleet usage (diesel vans)
  - Travel patterns
  - Planned vs Reactive inspections
  - Existing inefficiencies
- Established baseline understanding of operational realities and CO_2 drivers

Quad of Aims (Project Charter)

- Defined:
  - Purpose (reduce 48.8 tonnes CO_2 from inspections)
  - Stakeholders (operational units, parish councils, road users)
  - Measures of success (25% short-term, 50% medium-term, >75% long-term reduction)
  - Roadmap and governance milestones
- Ensured alignment with Live Labs 2 and decarbonisation strategy.

High-Level Process Mapping (SIPOC)

- Mapped the end-to-end inspection flow:
  - → Receive request → Organise inspection → Inspect & assess → Decide/report → Order repair → Close out
- Clarified scope boundaries across Reactive and Planned inspections

Validation with Senior Responsible Owner (SRO)

- Confirmed scope and objectives.
- Ensured leadership alignment before progressing.

Measure Phase: approach & tools

Baseline CO_2 Quantification*

- Identified 48.8 tonnes CO_2 annually from planned inspections.
- Identified inspection-related transport as a major emission contributor.

** Data provided by Somerset Council & Colas*

Inspection Volume & Fleet Data Collection

- Captured:
  - Number of inspections per year
  - Inspection cycles (2–2.5 yrs, 6–12 yrs, etc.)
  - Vehicle types (diesel vans predominately)
  - % of time spent travelling (e.g., 20% in Traffic Engineering)

High-Level Process Mapping (SIPOC)

- Mapped the end-to-end inspection flow:
  -->Receive request
  → Organise inspection
  → Inspect & assess
  → Decide/report
  → Order repair
  → Close out
- Clarified scope boundaries across Reactive and Planned inspections

Lean Awareness Training

- Training on:
  - Value Add vs Non-Value Add
  - 8 Wastes (transport, motion, duplication, over-processing, etc.)

Built a shared language for waste identification.

Analyse Phase: approach & tools

Detailed Process Waste Analysis

- Reviewed processes against Lean 8 Wastes.
- Identified:
  - Excess travel
  - Duplication of visits
  - Poor information quality
  - Manual scheduling inefficiencies

Demand Management Analysis

- Found 79% of CO_2 opportunities were upstream:
  - Manage demand
  - Organise inspections
  - Inspect & assess
- Shifted focus from “repair efficiency” to “visit avoidance”.

Root Cause Identification

- Policy drivers (HSIM rigidity)
- Risk aversion behaviour
- Poor enquiry information (no photos, vague locations)
- Lack of triage
- Manual routing
- Siloed departmental behaviours

Solutions Matrix (Benefit vs Ease of Implementation)

- Visual prioritisation tool.
- Categorised opportunities by:
  - Benefit (CO_2 impact)
  - Ease of implementation
- Highlighted high-potential deep dives.

Improve Phase: approach & tools

Deep Dive Workshops (6 priority areas)

HSIM policy review (risk-based inspection frequency)

- Filter/triage system for enquiries
- Route optimisation & better planning
- Delegation of low-risk tasks to contractor
- Cross-department coordination pilots
- Use of video/dashcam for remote assessment

Pilot & Trial-Based Thinking

Identification of

- Map-based tracking pilot.
- Office-based triage pilot.
- Video system trials.

Quick Wins vs 3–6 Month vs. 6+ Month Phasing

- Structured phased implementation roadmap.
- Enabled early momentum while longer-term policy changes developed.

Business Case Development (high level)

Framed CO_2 reduction alongside:

- Efficiency savings
- Time savings
- Cultural collaboration improvements

Key Learnings:
main blockers to CO2e reduction opportunities

Policy & Governance

- **Outdated or unclear HSIM** (Highways Safety Inspection Manual) and other policy frameworks that drive unnecessary or excessive inspections.
- **Appetite for risk-based decision making varies** across services — meaning some teams default to "visit just in case."
- Concern that reducing inspection frequency may **increase insurance claims and public perception risk**.

Demand Management

- **No robust triage/filtering** exists yet to avoid unnecessary visits.
- Volume of avoidable enquiries from public & internal stakeholders remains high.
- Teams **often respond reactively** instead of challenging or filtering demand

Data & Information Quality

- **Poor initial information** (lack of photos, vague location, unclear description) from public, members, or internal staff → generating unnecessary reactive visits. (e.g. Street Works, Planned Inspections, Highways Superintendence all list this blocker.)
- **Duplicated enquiries** due to inconsistent registers (e.g. Rights of Way matrix outdated).
- **Lack of accurate asset data** to enable remote assessment.

Operations

- **Manual scheduling** potentially leading to excess mileage.
- **Geographical boundaries causing inefficient routing** - "micro geography" issues.
- **Absence/illness reallocations are ad hoc** and often lead to duplication or inefficiency.
- **Limited contractor scope** for taking on low risk inspections (requires new agreements or trust).

Technology & Systems

- Existing systems (e.g. Confirm, Report IT) don't support automated triage or route optimisation without reconfiguration.
- **Lack of integrated map-based tracking**, planning tools, or shared dash cam/image capture infrastructure.
- Large data storage requirements and GDPR concerns limit widespread use of body cams/dash cams and video based remote inspections.

Key Learnings: behavioural change areas for consideration

- **COLLABORATION**
  - "**Cultural change: we all work for one organisation**" is listed as required to enable cross-service collaboration →current siloed behaviour blocks opportunities
  - Levels of trust between teams could or should improve (e.g., Traffic Engineering trusting Superintendent assessments rather than visiting themselves).
  - "Not helped with **hybrid working**. Never happened in the past" → reduced face-to-face collaboration affects coordination.
  - Frontline staff highly value independence and may resist centralised triage or routing.
- **RISK AVERSION**
  - Reluctance to adopt **risk-based** decisions: teams prefer to "go and check" to avoid complaints or claims.
  - Concerns about reputation or insurance claims drive behaviour that increases site visits.
- **HABITS & LEGACY BEHAVIOURS**
  - Longstanding norms about *"how inspections are done"* make it hard to shift towards a different way of working: remote assessment, fewer visits, shared visits across departments, delegation to contractors or volunteers
- **INFORMATION QUALITY**
  - Staff and public not consistently providing accurate information (photos, descriptions), which is mostly a behavioural rather than a technical issue.
  - Call centre staff may not challenge callers for better information.

The way forward

KEY LEARNINGS

- Suitability of lean approach to drive the analysis and prioritise improvement actions
- Critical impact of quantitative & qualitative Demand Management
- High value of cross-department collaboration for the planning and execution of inspections
- Importance of combining policy changes and shorter-term operational improvements
- CO2e reduction opportunities will also improve efficiencies and effectiveness

NEXT STEPS

- Nominate a Project Manager and keep momentum with the core implementation team
- Structure the project workstreams and ensure the progress
- Build and defend the high-level and specific Business Cases
- Prepare and deliver the Change and Communications plan
- Share the progress and learnings within the Wessex Partnership

Thank you

To find out more about how we can

help your business please get in touch…

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