

# FUTURE PUBLIC SECTOR LOGISTICS CONSOLIDATION

23 February 2018, London



## AGENDA

| Time          | Item   |
|---------------|--|
| 10:30 – 10:45 | Introduction and purpose of the day  |
| 10:45 – 11:00 | The Department for Transport – Policy context  |
| 11:00 – 11:10 | Transport Systems Catapult Methodology   |
| 11:10 – 12:10 | The Southampton Case Study <ul style="list-style-type: none"><li>a) Southampton County Council and University of Southampton</li><li>b) University Hospital Southampton</li><li>c) Meachers Global Logistics</li></ul> |
| 12:10 – 12:15 | Short break  |
| 12:15 – 12:30 | TSC Research and Results   |
| 12:30 – 13:00 | Lunch  |
| 13:00 – 14:00 | Discussion of results and next steps   |
| 14:00 – 14:30 | Call to action   |

# INTRODUCTION AND PURPOSE OF THE DAY



DR ANDREW TRAILL  
Principal Technologist – Freight & Logistics  
Transport Systems Catapult

**CATAPULT**  
Transport Systems

## INTRODUCTION

- Who are Transport Systems Catapult (TSC)?
  - One of 11 catapults established and overseen by Innovate UK
  - Impartial, not for profit organisation created to drive and promote intelligent mobility
  - Using new emerging technologies to transport people and goods
- Purpose of the day
  - Setting the scene and origins of the project
  - Who is involved and why
  - Project methodology and research
  - Outcome of the project
  - Feedback on results and next steps



Department  
for Transport

# Consolidating Public Sector Logistics Operations

Duncan Price, Head of Freight, Operator Licensing &  
Roadworthiness



# Background

- ▶ The road freight sector is a major contributor to the UK economy, generating £11.9bn annually and employing around 248,000 people.
- ▶ But the sector is also a significant source of UK greenhouse gas and air pollutant emissions.
- ▶ Need to address air quality and climate change commitments:
  - ▶ Short-term challenge on air quality
  - ▶ Ongoing carbon budget obligations and long-term 80% 2050 Climate Change Act target (cf. 1990 levels)

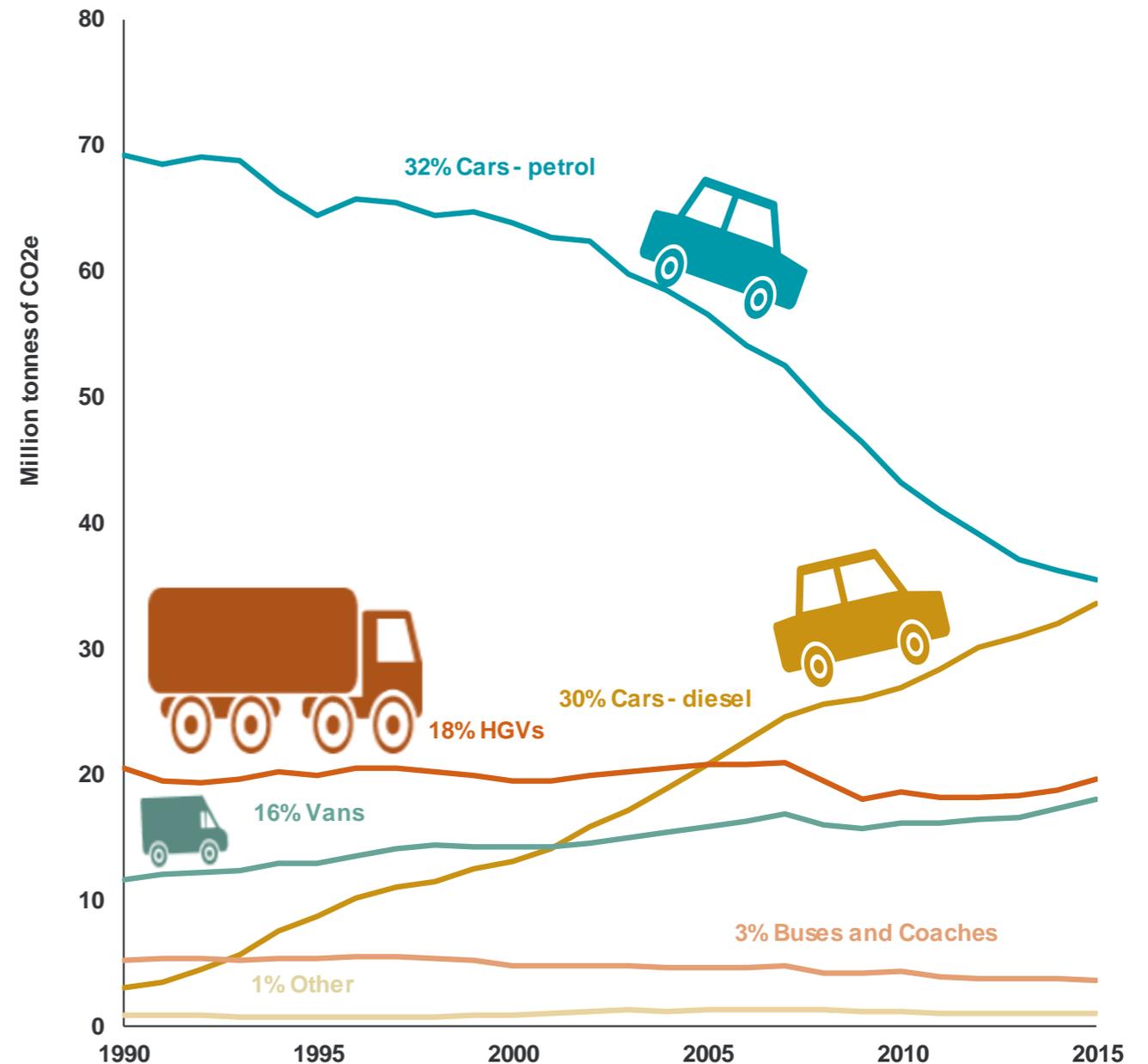




# Greenhouse Gas Emissions

- ▶ In 2016, HGVs accounted for 18% of road transport GHG emissions.
- ▶ HGVs are second largest source of road transport GHG emissions (after passenger cars).
- ▶ In 2016, vans accounted for 17% of UK road transport GHG emissions.
- ▶ Vans are third largest and fastest growing source of road transport GHG emissions.
- ▶ 2017 Clean Growth Strategy notes significant reduction in HGV emissions is needed.
- ▶ CCC strong interest in freight.

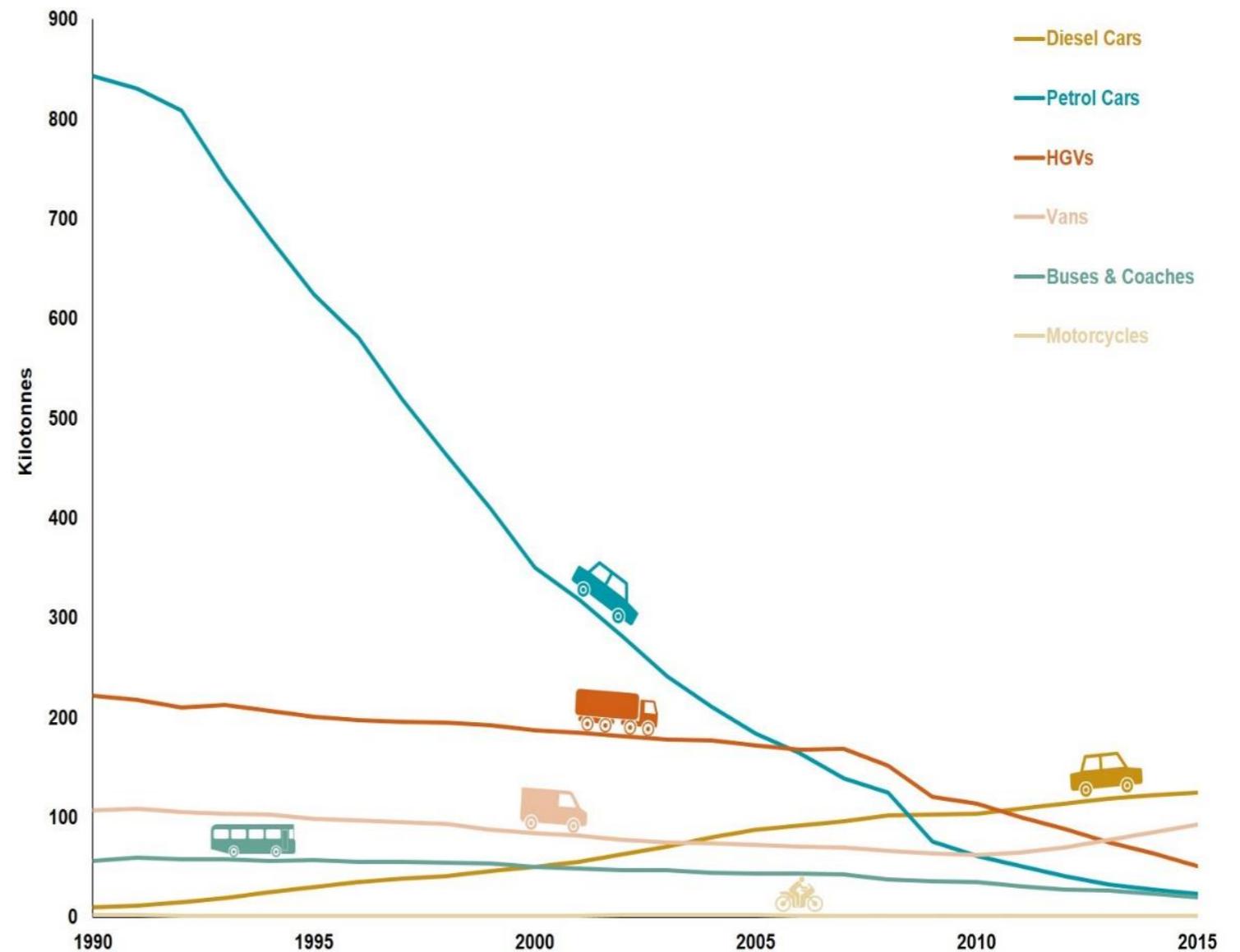
## Road transport greenhouse gas emissions 1990-2015





## Road transport NOx emissions 1990-2015

- ▶ In 2015, HGVs contributed 16% to road transport NOx emissions.
- ▶ Positive downward trend due to success of heavy duty Euro VI standard in tackling NOx.
- ▶ In 2015, vans contributed 30% to road transport NOx emissions.
- ▶ Second highest source (after diesel cars).





# Clean Air Zones

- ▶ Air Quality Plan for Tackling NO<sub>2</sub> in urban areas was published in 2017.
- ▶ 28 LAs must submit plans this year setting out how they will meet NOx limits - identifying measures to achieve legal compliance in shortest possible time.
- ▶ One option is to introduce a Clean Air Zone, restricting operation of certain vehicle types.
- ▶ Leeds, Birmingham, Nottingham, Derby and Southampton are expected to implement CAZ by end of 2019.
- ▶ £255m Implementation Fund for LAs to prepare and deliver their plans.
- ▶ Clean Air Fund will provide £220 million for English LAs to support people and businesses to adapt as measures to improve air quality are implemented.





# Key Challenges

- ▶ HGV sector is very diverse: 3.5t - 44t, different duty cycles (e.g. long-haul, urban) and vehicle types (e.g. RCVs and construction).
- ▶ Diversity in fleet sizes – ranging from owner operators to major supermarket fleets.
- ▶ No ‘magic bullet’ – range of measures will be needed.
- ▶ Zero emission options not yet viable for heavy trucks.
- ▶ Forthcoming DfT / OLEV Strategy for reducing tailpipe emissions of greenhouse gases and air pollution from road vehicles.
  - ▶ Will include short, medium and long term measures for HGVs.
  - ▶ Focus on zero emission solutions, including long-term technology options.
  - ▶ Aim to agree voluntary GHG target with industry (including through demand side measures, alternative fuels and new technologies).





## Existing Support

- ▶ Up to £4m OLEV funding for low emission vans and HGVs between 3.5 and 44 tonnes through Plug-in Van Grant.
- ▶ £20m Low Emission Freight and Logistics Trial is supporting trials of new technologies and low and zero emission vehicles in UK fleets.
- ▶ £22m funding for a 'Future Fuels for Flight and Freight'
- ▶ Recent consultation on proposals to seek an EC derogation for Category B driving licence holders to operate alternatively fuelled vehicles up to 4.25 (rather than 3.5) tonnes.
- ▶ Development of Freight Portal with Energy Saving Trust – credible information on fuel efficiency measures.





# Freight Carbon Review

- ▶ Gathered evidence on opportunities for and barriers to road freight decarbonisation.
- ▶ Also focussed on air quality.
- ▶ Looked at medium-term options (2030s – 5<sup>th</sup> Carbon Budget), and also considered longer term options (2050s).
- ▶ Holistic approach – covering vehicle technologies, fuels, driver behaviour and operational efficiency.
- ▶ New research on efficient driving (AECOM) and industry collaboration (TRL).
- ▶ Found scope to improve the efficiency of freight operations and reduce emissions through wider industry collaboration if existing barriers can be addressed.
- ▶ Identified that further work was needed to understand the costs and benefits of available measures to support wider industry collaboration.
- ▶ TSC project is gathering further evidence and attempting to address barriers to freight consolidation.



## Next Steps

- ▶ Today's presentations will provide a detailed overview of the project.
- ▶ Opportunity to test results of the study – outputs from today will feed into the final report.
- ▶ Opportunity to share best practice and challenges - and promote greater awareness of benefits of UCCs.
- ▶ Intend to publish outputs of this work later this year.
- ▶ Further dissemination of project results via future workshops and seminars.
- ▶ Wider discussion will also consider scope for further work and evidence gathering – opportunities to explore further application of approach.



# TRANSPORT SYSTEMS CATAPULT



## Methodology

TOM GADSBY  
Freight & Logistics Specialist  
Transport Systems Catapult

**CATAPULT**  
Transport Systems

## TSC METHODOLOGY

- Literature review to understand why uptake of UCC's is low



**LOCATION**

Support



**CATAPULT**  
Transport Systems

Hypothesis:

Greater visibility of the cost and benefits to all stakeholders, but in particular for the client organisation, would generate greater interest

# CASE STUDY IDENTIFICATION



CASE STUDY IDENTIFICATION



**Welcome to Southampton!**

ROADS SO POLLUTED THEY'LL LEAVE YOU BREATHLESS



primesight

**Clean Air Zone**

Challenges in Southampton

A city of opportunity where everyone thrives



**SOUTHAMPTON**  
CITY COUNCIL

**41,302**  
people who live in the city commute out to work

**28**  
miles of dedicated cycle routes

**370**  
miles of highway

**1.83M**

passengers used Southampton Airport in 2014



**683**  
miles of footways

**32**  
miles of public rights of way

**16.5%**  
journeys to work are on foot



**9.3%**  
of residents travel by bus to work



**58.2%**  
of people drive a car to work



**25%**  
Journeys to work by bike rise by a quarter 2001-2011

**41,891**  
people commute into the city to work from outside

**53,597**  
people both live and work in Southampton

## SOUTHAMPTON TODAY



**124**  
people were Killed or Seriously injured on our roads in 2014

**6.2M**  
JOURNEYS began or ended at Southampton Central station

**18.5M**  
journeys were made on buses, up 4% on the previous year



**70.4%**

of households in the city own at least one car/almost a **third** of households in the city **do not own a car**

**7.1M**  
JOURNEYS went through the city's 8 railway stations, 18% more than in 2007/8



**4TH**  
LARGEST PORT in the UK with 39M tonnes of cargo going through in 2013

**1.7M**  
cruise visitors passed through the Port of Southampton in 2013/14



**245,300**  
Population of Southampton

**3.5M**

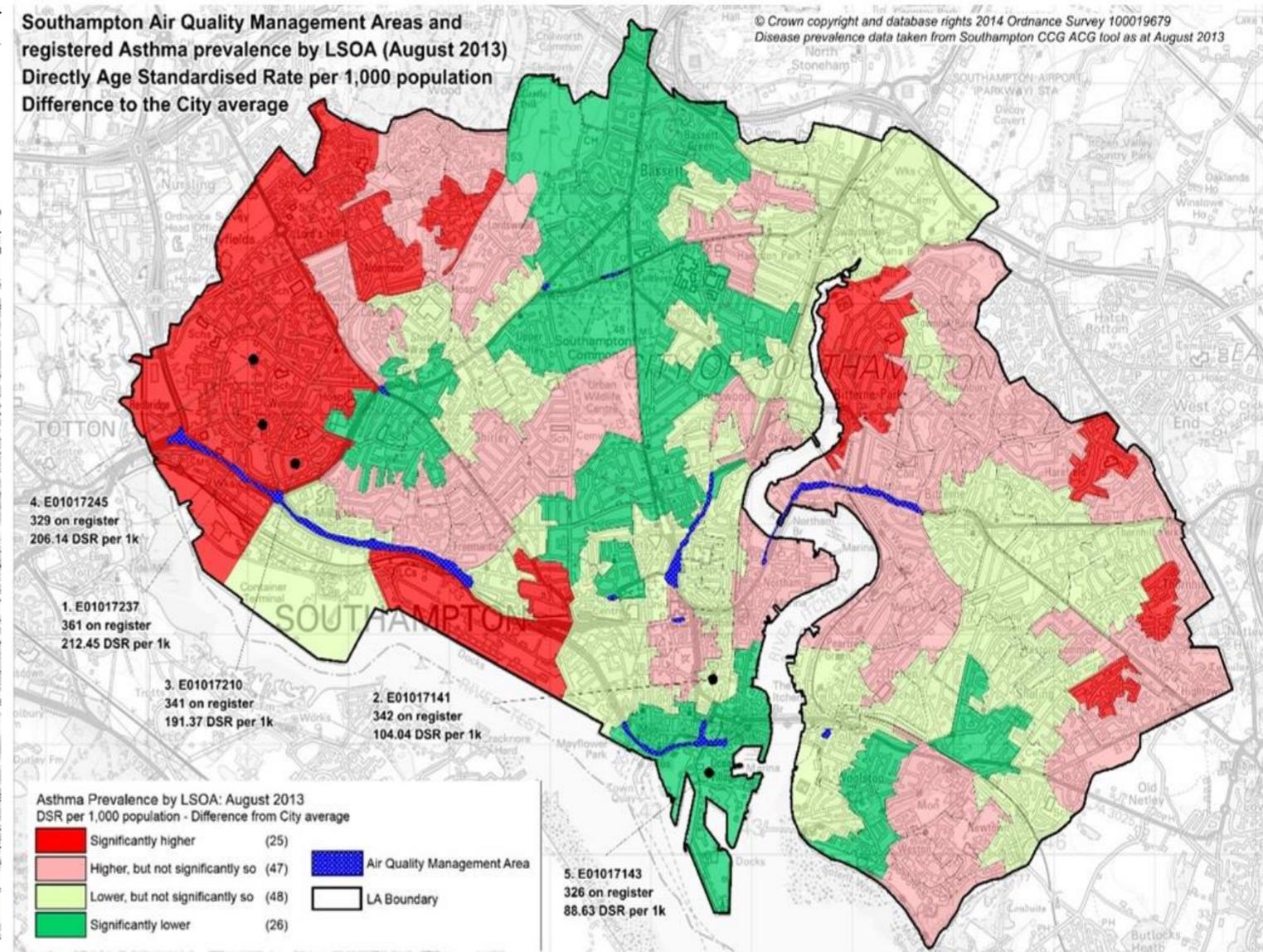
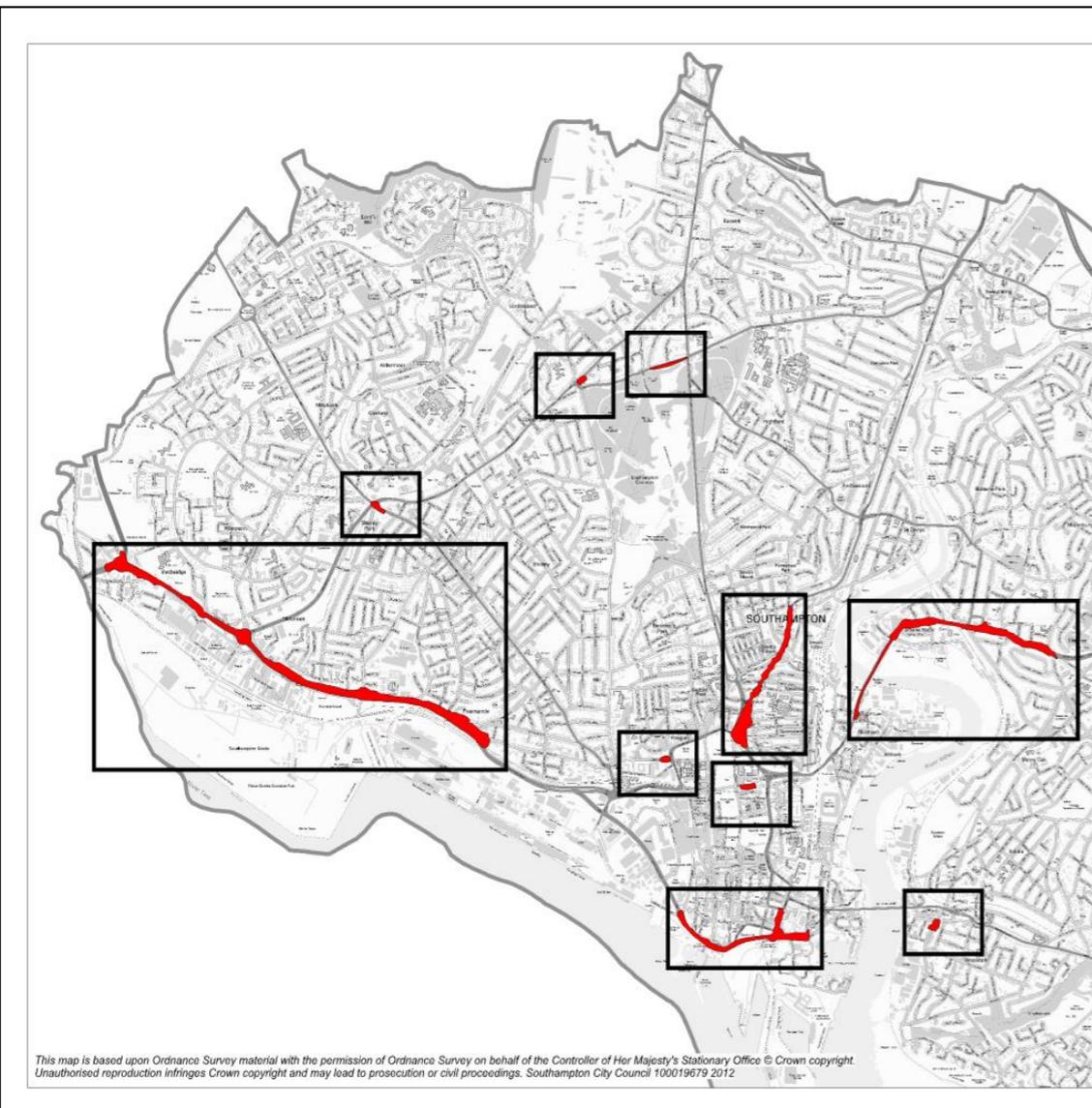
ferry passengers travelled through Southampton on Red Funnel to Isle of Wight and across to Hythe in 2014



**51.8km<sup>2</sup>**  
Size of city



# Air Quality in Southampton



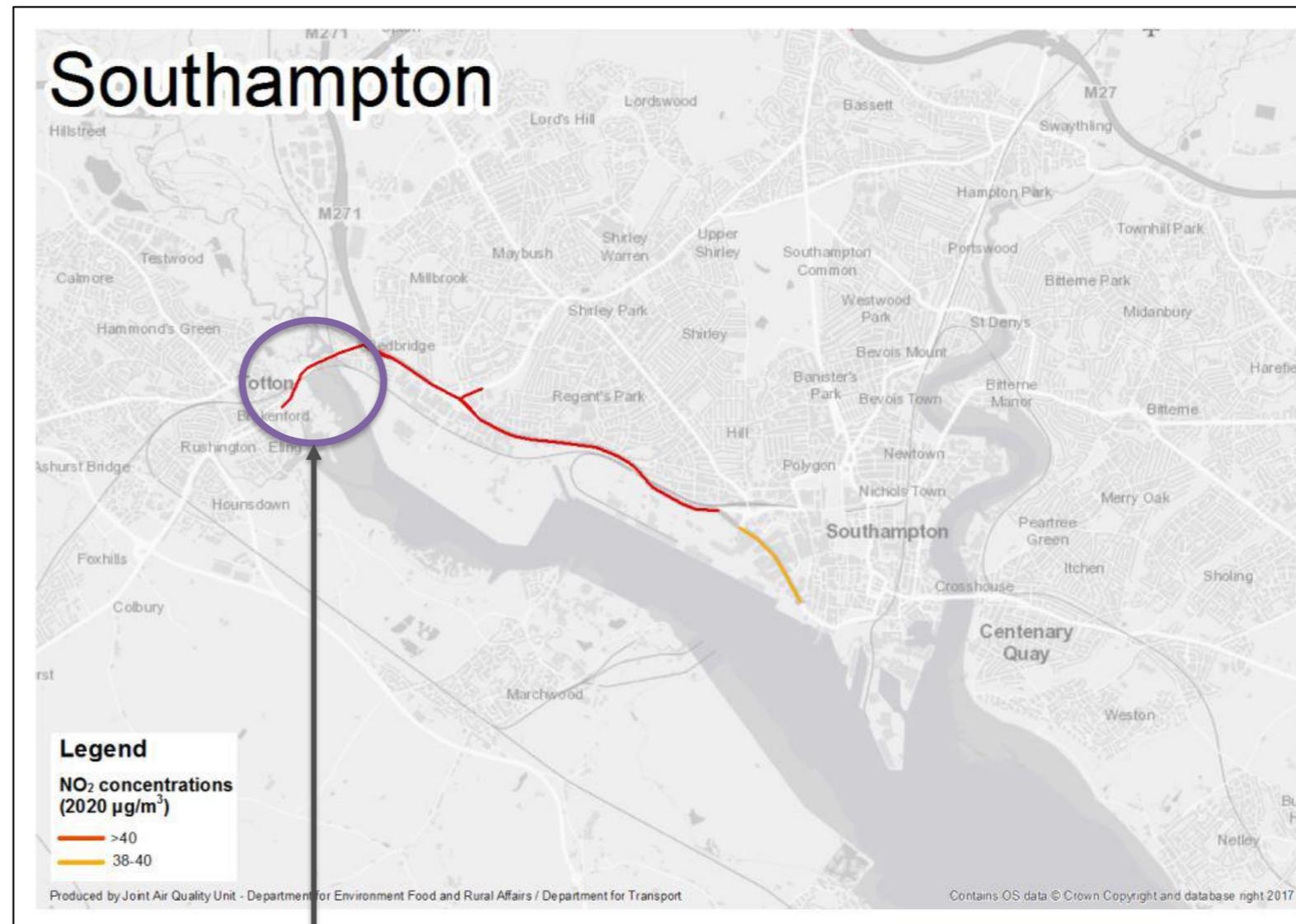
Close correlation between AQMA's and asthma prevalence

# EU Air Quality Directive Exceedance

- Southampton identified in 2015 and 2017 National AQ plan as exceeding annual mean NO<sub>2</sub> objective

- 1 of 5 worst performing cities in the UK

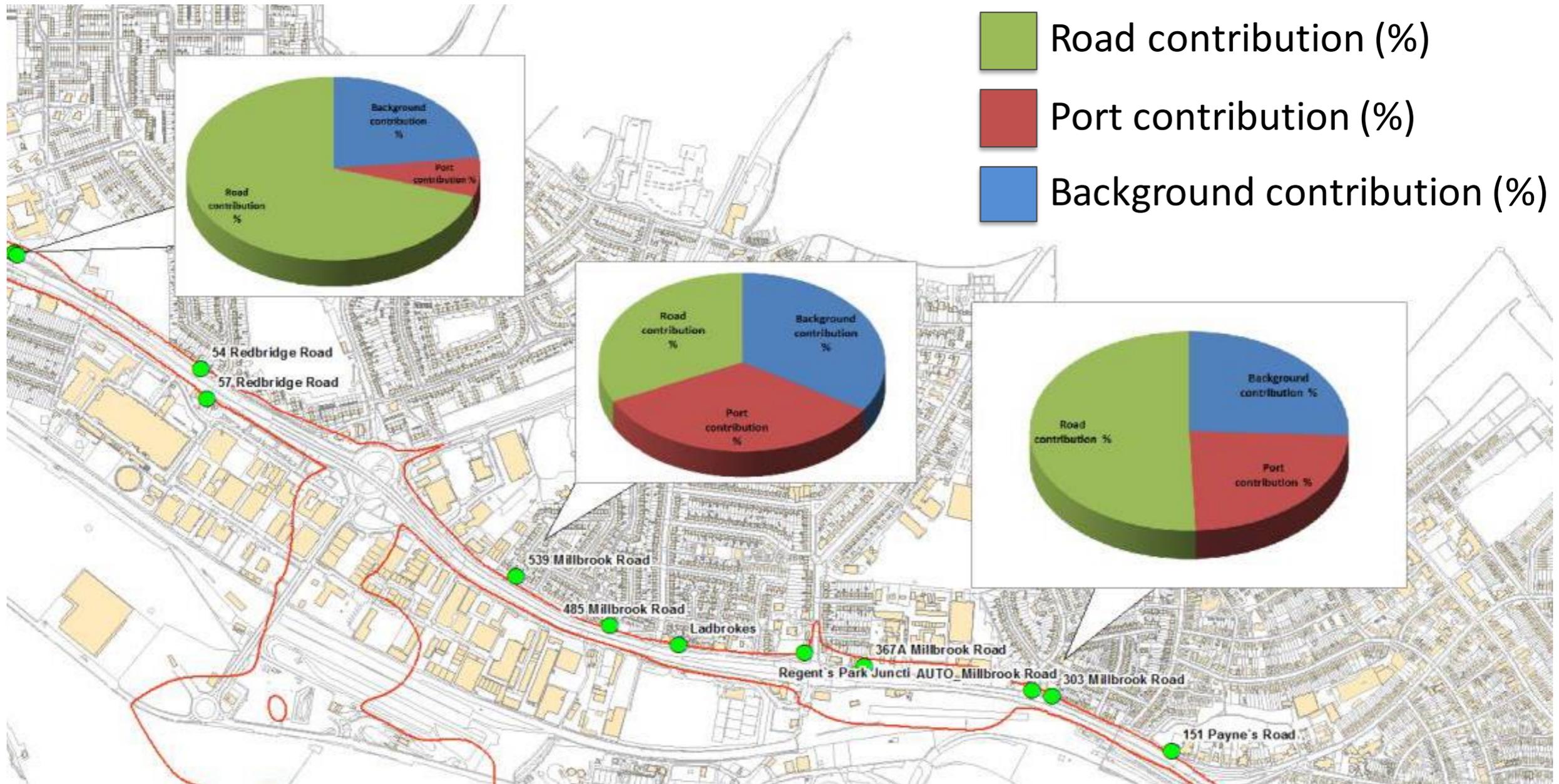
- 2017 Revised National AQ Plan identified an extension of the exceedance into NFDC.



Highest point of exceedance

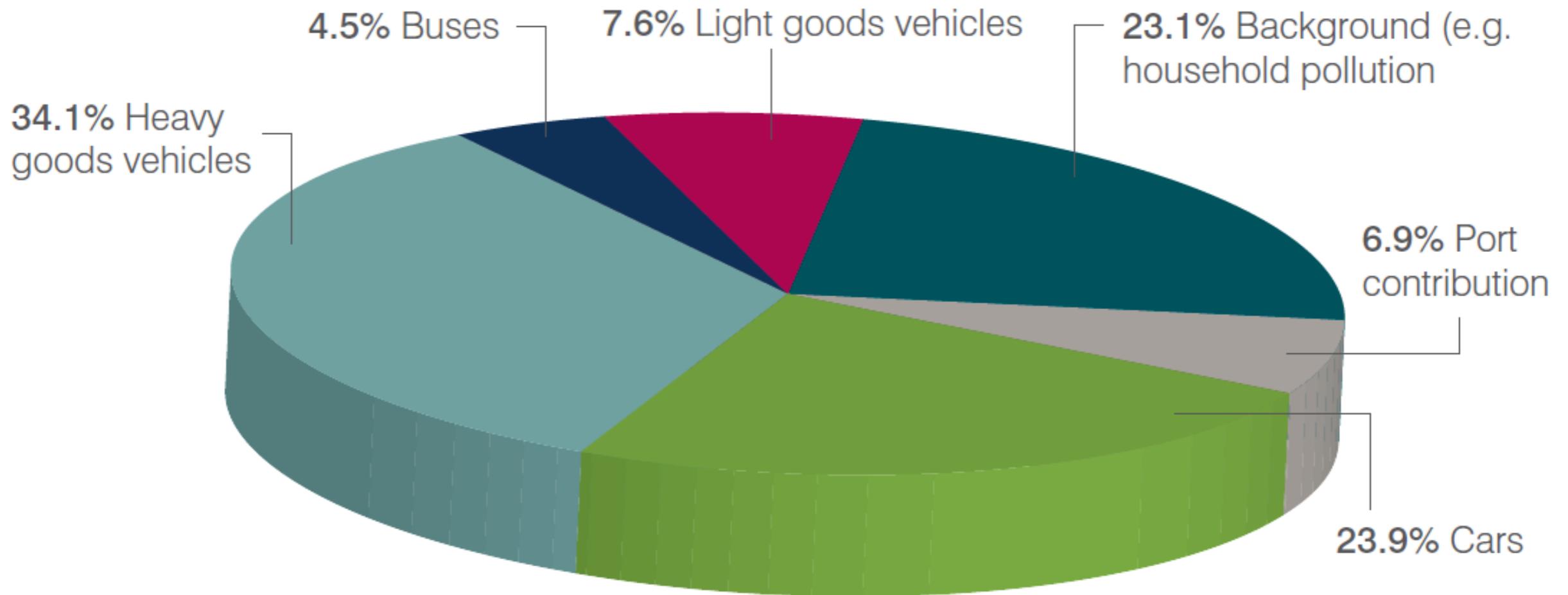
# Source Apportionment

Western Approach (% of Modelled NO<sub>x</sub>) (Western Approach AQ Assessment 2014)



# Source apportionment

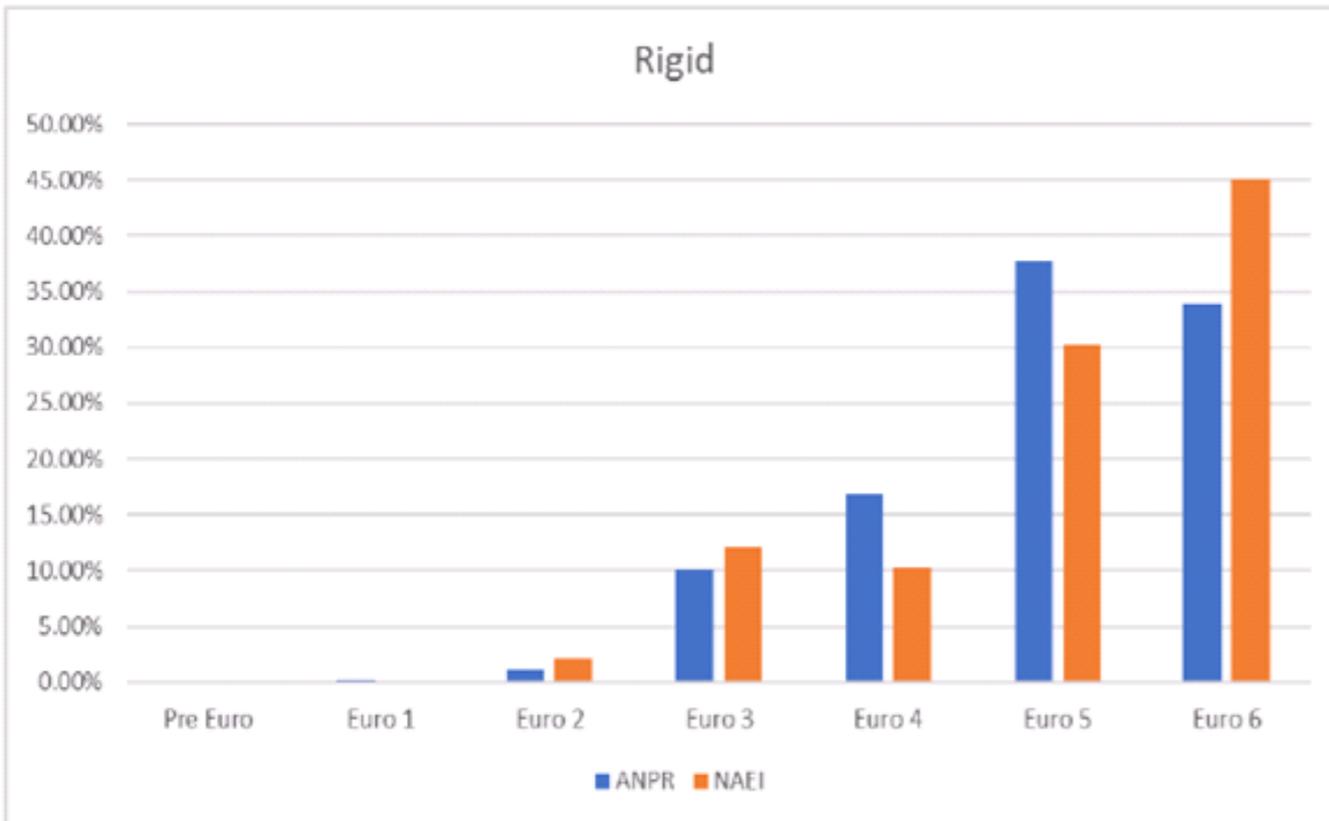
## Causes of pollution in Southampton



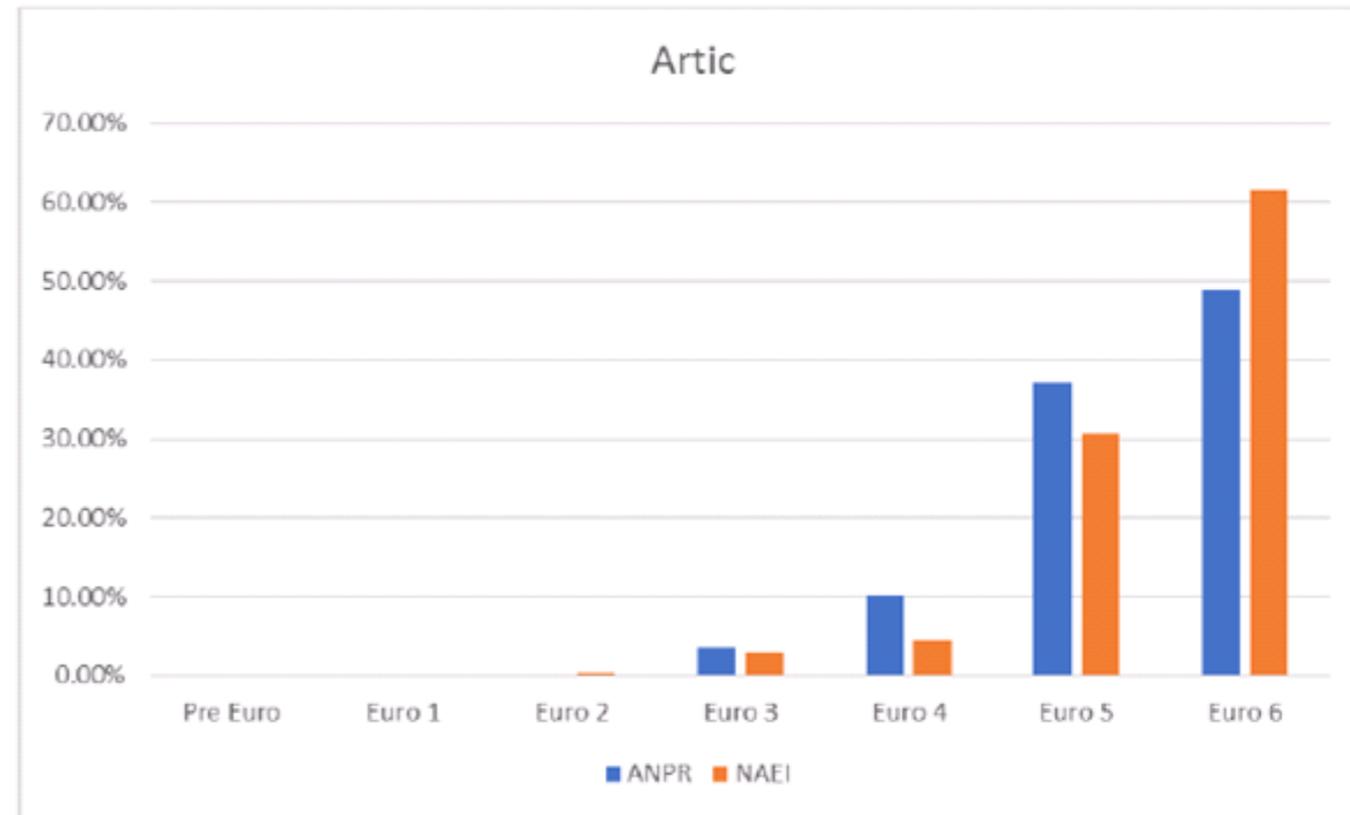
Source apportionment (% of modelled nitrogen dioxide) at M271 and A33 junction, Redbridge

# HGV's visiting Southampton

Rigid HGV Euro Classification distribution



Artic HGV Euro Classification



# Clean Air Zone

## Penalty Charging Classes

| Clean Air Zone class | Vehicles included  |
|----------------------|--|
| <b>A</b>             | Buses, coaches and taxis (including private hire)            |
| <b>B</b>             | <i>Buses, coaches, taxis and heavy goods vehicles (HGVs)</i> |
| <b>C</b>             | Buses, coaches, taxis, HGVs and light goods vehicles (LGVs)  |
| <b>D</b>             | Buses, coaches, taxis, HGVs, LGVs and cars                   |

## Clean Air Zone emission standards

| Vehicle type                        | NOx emissions limit             |
|-------------------------------------|---------------------------------|
| Bus/coaches                         | Euro VI                         |
| HGV                                 | Euro VI                         |
| Car/light commercial (up to 1305kg) | Euro 6 (diesel) Euro 4 (petrol) |

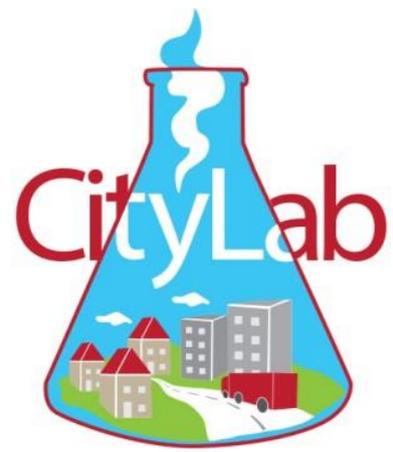
# Local Plan Objectives

## Primary Objective

“The overall spending objective of the local plan is to deliver a scheme that leads to compliance with NO<sub>2</sub> concentration limits in the shortest possible time.” – *JAQU Options Appraisal Guidance*

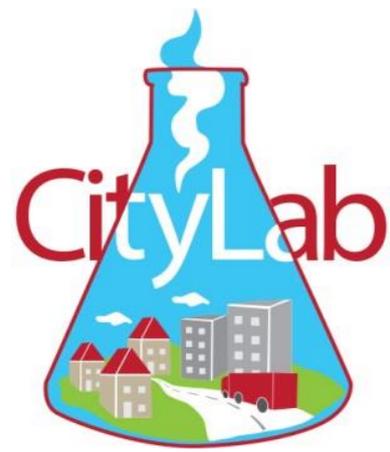
## Proposed Secondary Objectives

- Ongoing improvements to public health
- Likelihood of compliance with LAQM (i.e. AQMAs revoked)
- Addressing exceedances beyond boundary
- Supporting existing measures and sustainable travel communications
- Supporting transformation to low emission economy
- Affordability



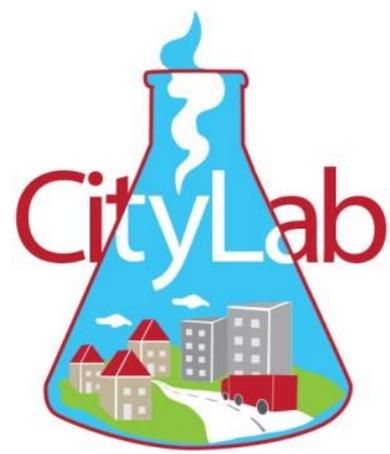
CITYLAB -  
*City Logistics in Living Laboratories*

Tom Cherrett  
University of Southampton



# CITYLAB

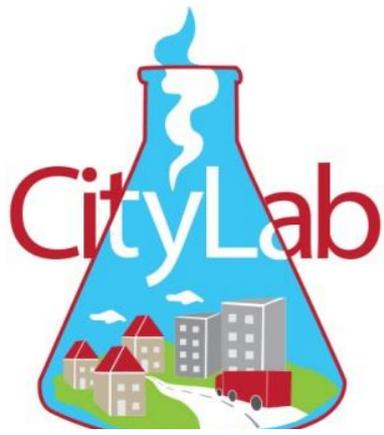
- Horizon 2020, Mobility for Growth
- Topic MG-5.2-2014 *Reducing impacts and costs of freight and service trips in urban areas*
- Budget 4 Mill Euro
- 1 May 2015 – 30 Apr 2018
- 25 partners, 7 countries



# Objectives

- Improve **knowledge and understanding** about the impacts of freight distribution and service trips in urban areas;
- Implement and test **7 innovative solutions** that **reduce the negative impacts** of freight vehicles whilst **enhancing business profitability**
- Provide a platform to aid the **replication and roll out** of the solutions in other cities

*Emission free city logistics in urban centres by 2030*



# The living labs

**LONDON:** New distribution hub concepts and clean vehicles

**ROME:** Integration of direct and reverse logistics

**BRUSSELS:** Increasing load factors by utilizing free van capacity

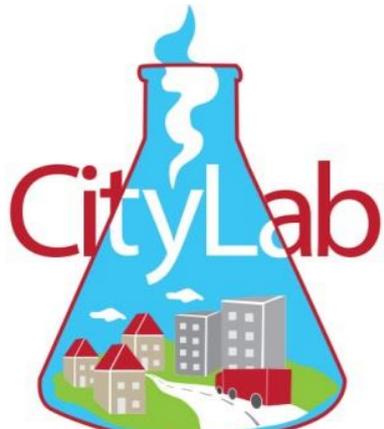
**ROTTERDAM:** Floating depot

**PARIS:** Logistics hotel

**OSLO:** Common logistics functions for shopping centres

**SOUTHAMPTON:** Joint procurement and consolidation for large public institutions





# Southampton – consolidation for large public institutions

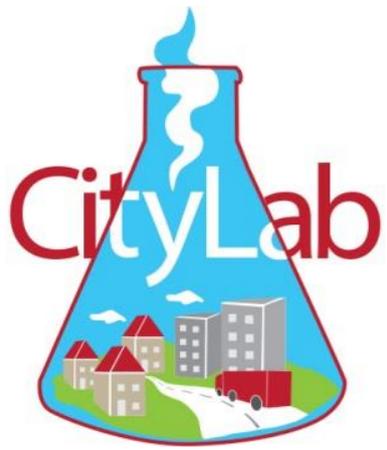


© Alamy



© Alamy





# University hall post consolidation

- 162 UK HEIs
- 1.75m UGs
- 385,000 UGs in halls



- Cities with  $>1$  HEI might have  $> 8000$  UGs in halls
- Consolidation estimate £17.88/yr/student





# Hospital delivery consolidation

- St Mary's Isle of Wight
- Planned use of SSDC



- Southampton General Hospital
- Using SSDC



# Experiences from University Hospital Southampton

**Chris Meayers-Norkett**

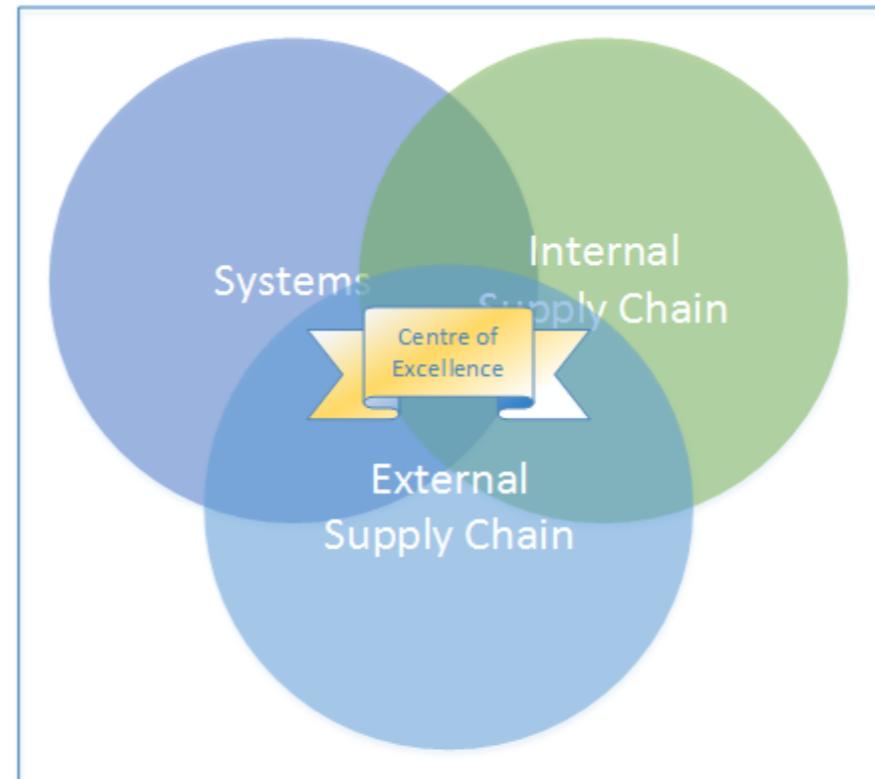
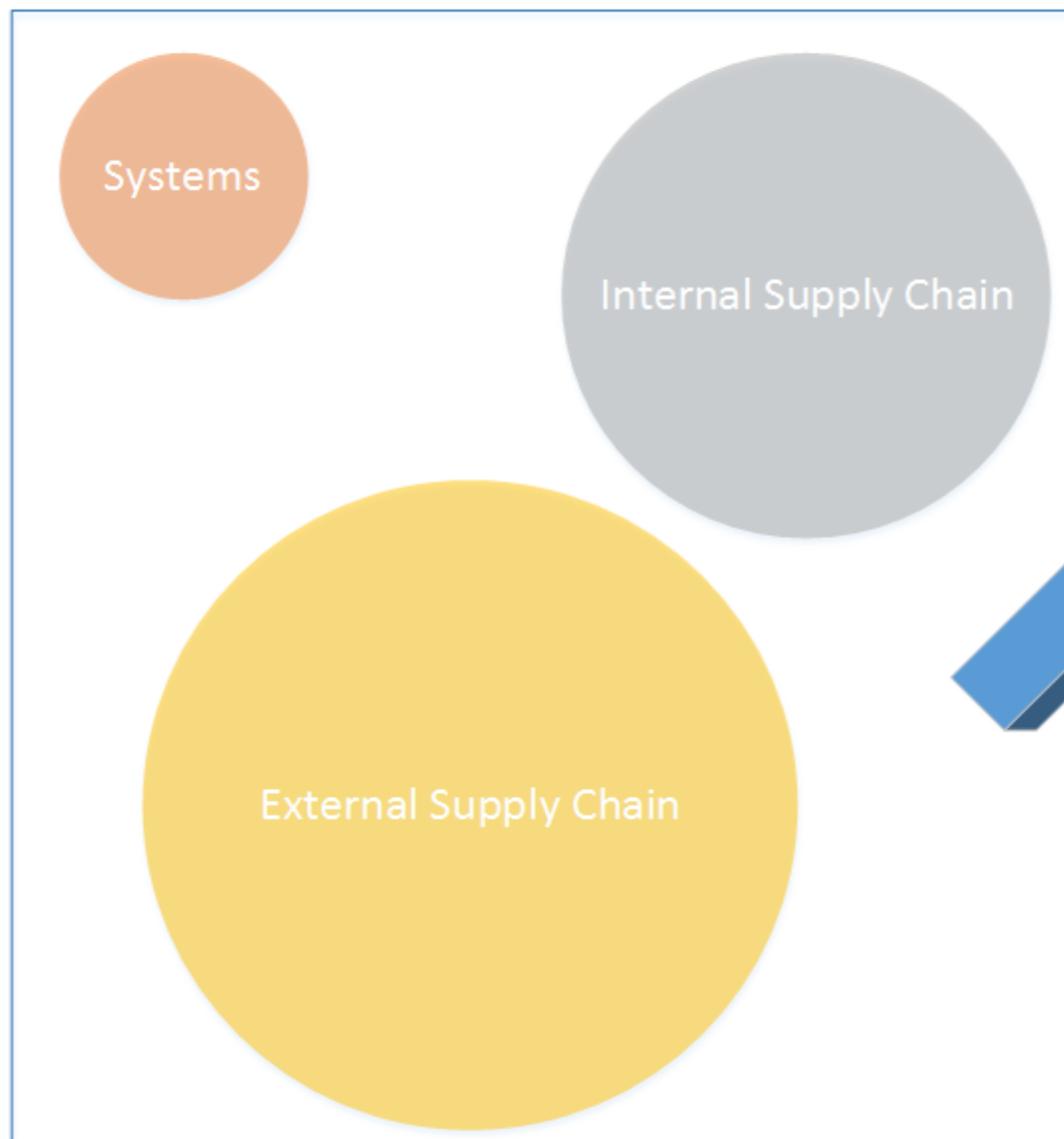
University Hospital  
Southampton



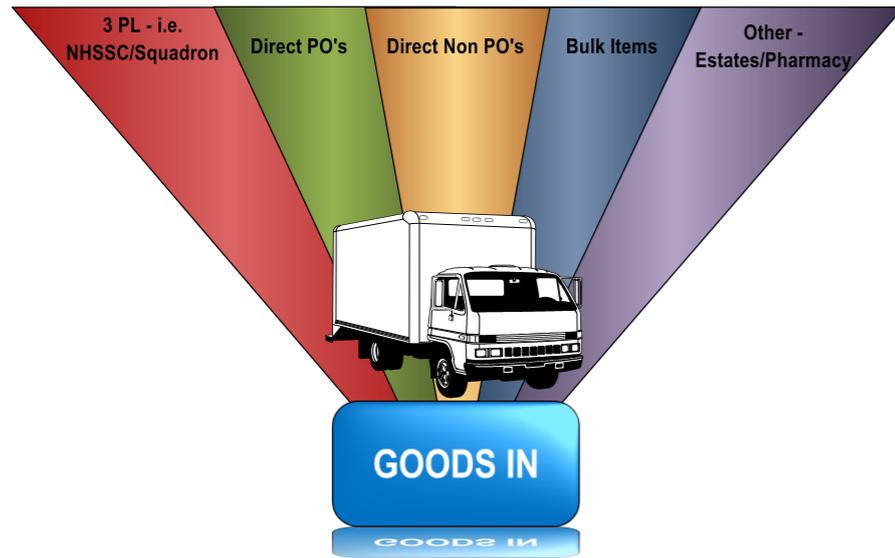
The views expressed in this presentation are those of the Author and not necessarily those of the University Hospital of Southampton Foundation Trust



# What do we need to do?



# Consolidation – External Factors



## 900 vehicles a week to 4 Yards:

Catering  
Clinical Materials (Supplies, Drugs, Equipment)  
Facilities and Estates  
Food Retail  
Waste  
Pathology  
Etc.

## Challenges we face:

- Clean Air Zone 2019
- Site Safety
- Patient & Staff experience
- Growth and service expansion
- Local infrastructure - internal and external
- Impact on environment and local residents
- Oversight & competing priorities – DoH FOM, NHS E – ZCM , NHS I - Carter, STP, Acute Alliance

# Consolidation? – Internal Factors

## Receipt and Distribute (per day):

Over 900 direct items (couriers etc)

70 roll cages

To 600+ internal Deliver to Locations

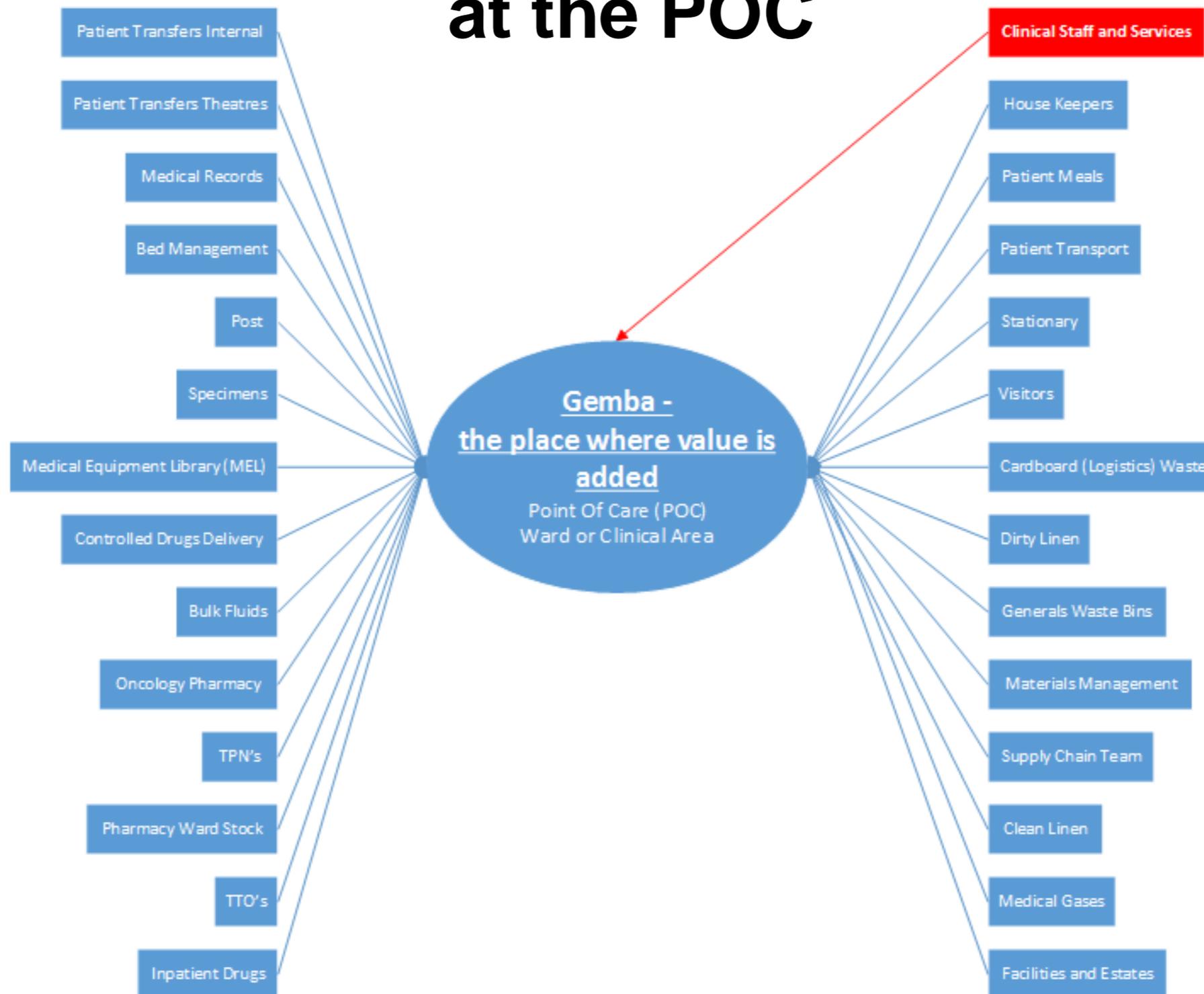
Distribution Operatives walking on average 18 miles a day

## Challenges we face:

- Systems enablement
- Corridors and lift capacity
- Internal Storage – point of care only
- Patient Experience
- Internal Culture, awareness and competing priorities
- Site Safety



# Illustration of Non Clinical Support Services at the POC



# Benefits and Potential

- Creation of a Pull system for the supply chain – optimised sequencing
- Significant reduction in Goods Vehicles on site
- Significant reduction on environmental impact and impact to local residents
- Improved patient experience
- Control over the last mile enabling out of hours put away for non inpatient areas
- Consolidated deliveries (Supplies, Pharmacy, EBME,) – making every journey count
- Consolidated deliveries (Supplies, Pharmacy, EBME,) – ensuring optimised utilisation

# Benefits and Potential.... continued

- Enhanced service performance and site safety
- Reduction in waste on site
- Enabling for future growth plans – release of space
- Expansion beyond Supply Chain
- Scalability for collaboration
- Sustainability and Commercialisation?

# **Meachers Global Logistics**

**Running a successful Consolidation  
Centre**

**Gary Whittle – Commercial Director**



# Introduction

- Who are Meachers Global Logistics?
    - Transport, Warehousing and Freight Forwarding
    - Employ 200 people
    - Turn over 26mill
    - Been located in Southampton since 1958
  - What is a Sustainable Distribution Centre?
    - Freight Consolidation
    - Storage – Long term and Short term
    - Reworking and Ancillaries
- 'Freight consolidation involves grouping individual consignments or part-loads that are destined for the same locality so that a smaller number of full loads are transported to their destination'***
- What qualifies us to run a SDC?
    - Shared Warehouse space
    - Locality
    - Fleet of appropriate vehicles
    - Warehouse Management System



## Why did Meachers get involved?

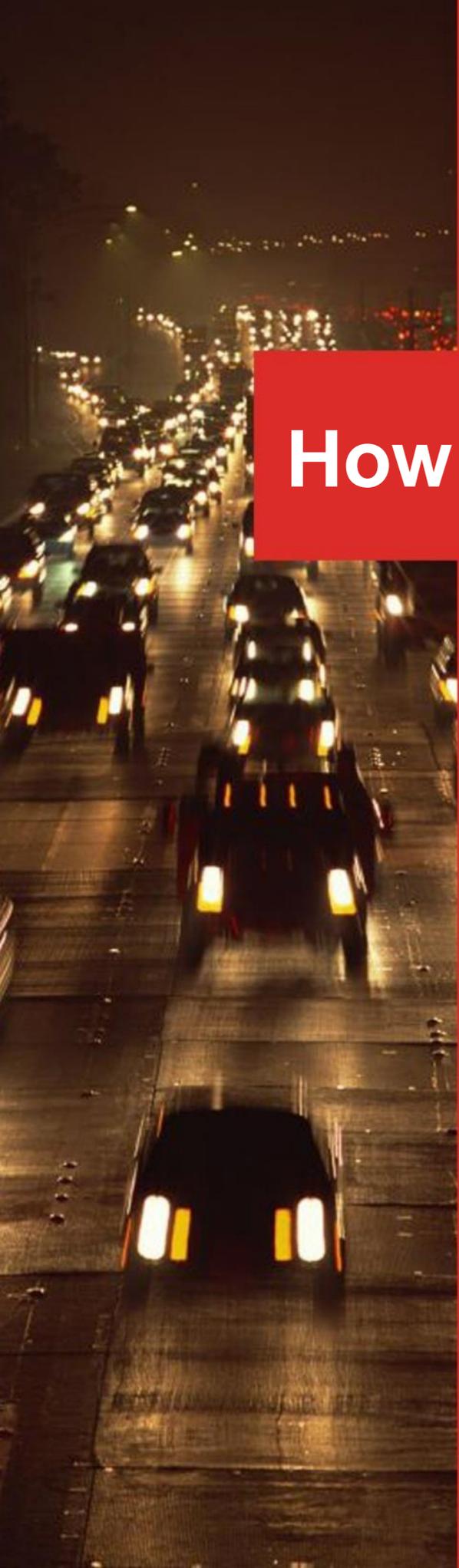
- Recognition of ongoing issues in the following areas:
  - Congestion:
    - In 2007, it was predicted that the level of traffic on the Southampton road network would increase by up to 40% by 2026.
  - Pollution/ Air Quality – Running a full Euro VI Fleet
  - Commercial Opportunity within Meachers
  - Geographically and operationally appropriate

# How does the current SDC operate?

- Freight Consolidation:
  - Inbound Shipments
  - Outbound Groupage
  - Scheduled Collections/ Deliveries - Timed
  - Last mile Logistics/ Pre Solent Logistics
- Sustainability:
  - Reduction in Movements/ Congestion.
  - Reduction in Pollution
  - Out of Hours Utilisation
  - Consolidated Deliveries
- Storage Requirements:
  - Short/ Medium/ Long Term
  - Rework/ Out of Gauge/ Inventory Management
  - Shared user/Multi Functional

# Particular benefits for public sector?

- Time saved through framework agreement as procurement already taken place for any public body in a 20 mile radius of the SDC
- Opportunity for savings through joint procurement (bulk buying)
- Potential savings through variable rates (only pay for what you use on a weekly basis)
- Factory Gate Pricing becomes possible
- By reducing the need for council properties
- Demonstrate that you are trying to improve economy and environment at the same time



## How successful has it been so far?

- **83,000** vehicle movements off the roads per year
- **33,424,930g/km** emissions total annual saving
- **£701,116** Operational cost savings for suppliers
- **£5,255,030** potential saving in clean air zone penalty fees when introduced

\* Internal and Independent Research completed by Catapult Transport Systems



## So why has it worked so well in Southampton?

- Multi User:
  - The SDC is now being used by:
    - Southampton City Council Corporate
    - Records Management
    - Southampton Hospital
    - Solent GO
    - New Forest District Council
    - Solent University
    - Southampton University
    - Range of Private companies
- Range of services
- Political Support – Early adopters
- Specific Geographic issues
- High Public Sector density

A photograph showing a worker in a red cap, blue shirt, and high-visibility vest operating a grey and orange forklift in a warehouse. The forklift has 'LOCATORS' written vertically on its mast and 'STILL EX70-30' on the seat area. The background shows blurred warehouse shelves.

## Future projection based on current evidence

- The SDC is currently reducing the number of HGV travelling into Southampton City Centre by a minimum of 83,000 vehicle movements per annum (based on the current data) – We hope to increase this
- The SDC will reduce Southampton's Carbon footprint by up to 75% and decrease the output of other harmful gases caused by HGVs – totaling 33,424,930g/km omissions per annum (based on current data)
- The SDC will also reduce general congestion in and around the city especially the port area



## Challenges faced and lessons learned

- Public sector lead times and existing contracts
- Clear and concise procurement message
- Identifying triggers for end user
- Public and Private sector commercial activity
- Flexible business model

# TSC RESEARCH AND RESULTS



MANUEL MARTINEZ  
Transport Economist  
Transport Systems Catapult

**CATAPULT**  
Transport Systems



## DATA IDENTIFICATION & COLLECTION

The Freight Economic model was calibrated for the UHS case study using mainly the following datasets:

### Additional Costs

- Meachers' Fleet & Admin Operating Costs data

### Operating Savings & Opportunity Cost

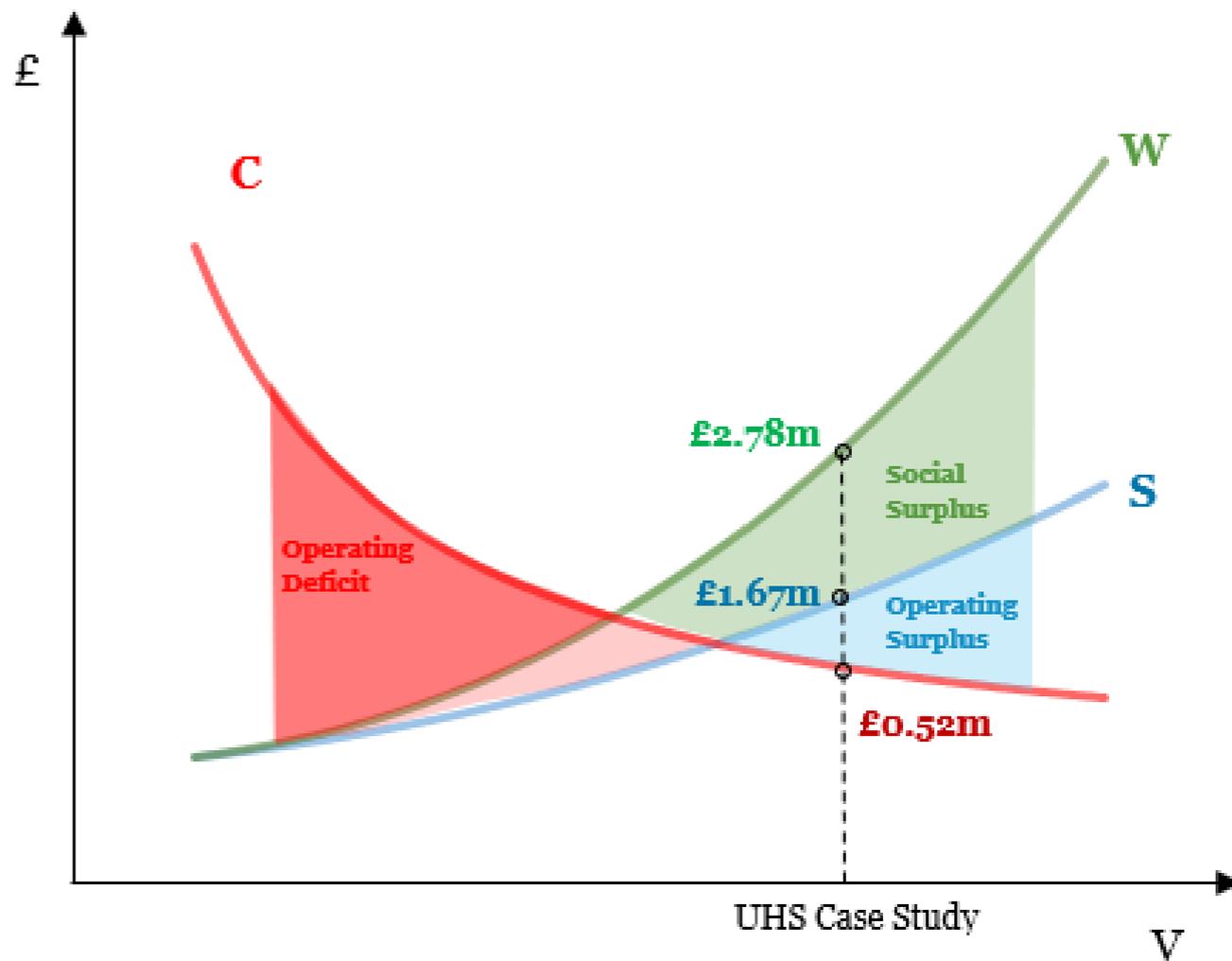
- RHA Freight Costs
- UHS Delivery and Servicing Plan (DSP) data
- Automatic Number Plate Recognition (ANPR) Traffic Data
- UHS Business as usual internal operations

### Wider Benefits

- Sub-Regional Transport Model (SRTM)

# PROVISIONAL RESULTS – BASE YEAR

| Total Present Values (£ p/a) |   |   | Low         |
|------------------------------|---|---|-------------|
| Additional Costs             |    | Freight Operator (Running Consolidation Model)                  | -£ 468      |
| Operating Savings            |    | Freight Industry (Operating Costs)                              | £ 157       |
|                              |    | Freight Industry (Penalty Fees)                                 | £ 79        |
|                              |   | University Hospital Southampton (Opportunity Cost)              | £ 458       |
| Wider Benefits               |  | Improved Journey Times - Decongestion Benefits (*)              | £ 221,001   |
|                              |  | Environmental Benefits (**)                                     | £ 2,792     |
|                              |  | Accidents reduction (*)   | £ 2,247,781 |
|                              |  | Other 'Soft' Social Benefits (Reduction Sick days incl. stress) | £ 37,341    |



UHS Case Study

(\*) Southampton Wide Area covered by Sub Regional Transport Model (SRTM)  
 (\*\*) Include CO2, NOx and Noise quantification



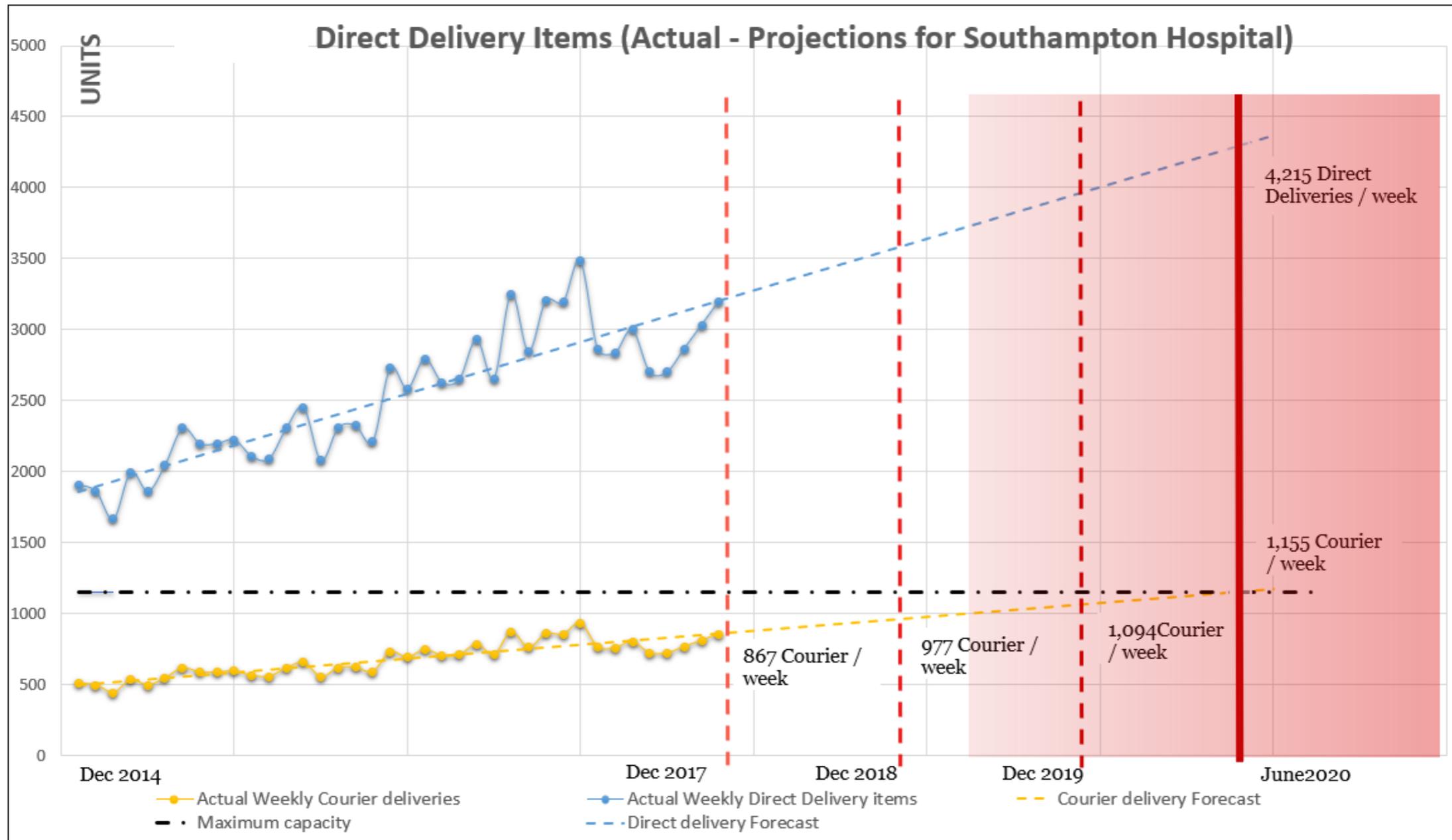
# PROVISIONAL RESULTS - FORECAST (2017 - 2030)

| Total Present Values (£ p/a) |   |   | 2017               | 2030               |
|------------------------------|---|---|--------------------|--------------------|
| Additional Costs             |    | Freight Operator (Running Consolidation Model)                  | <b>-£ 520,967</b>  | <b>-£ 946,677</b>  |
| Operating Savings            |    | Freight Industry (Operating Costs)                              | <b>£ 175,220</b>   | <b>£ 503,960</b>   |
|                              |    | Freight Industry (Penalty Fees)                                 | <b>£ 988,840</b>   | <b>£ 19,662</b>    |
|                              |   | University Hospital Southampton (Opportunity Cost)              | <b>£ 509,548</b>   | <b>£ 958,074</b>   |
| Wider Benefits               |  | Improved Journey Times - Decongestion Benefits (*)              | <b>£ 245,327</b>   | <b>£ 201,354</b>   |
|                              |  | Environmental Benefits (**)                                     | <b>£ 5,017</b>     | <b>£ 6,239</b>     |
|                              |  | Accidents reduction (*)   | <b>£ 2,497,534</b> | <b>£ 1,400,328</b> |
|                              |  | Other 'Soft' Social Benefits (Reduction Sick days incl. stress) | <b>£ 41,490</b>    | <b>£ 69,103</b>    |

(\*) Southampton Wide Area covered by Sub Regional Transport Model (SRTM)

(\*\*) Include CO<sub>2</sub>, NO<sub>x</sub> and Noise quantification

# ECONOMIC FORECAST – UHS CAPACITY CONSTRAINTS



# RESULTS DISCUSSION



DR ANDREW TRAILL  
Principal Technologist – Freight & Logistics  
Transport Systems Catapult

**CATAPULT**  
Transport Systems

## DISCUSSION

1. Feedback on methodology
2. Feedback on results
3. Potential next steps:
  - Carry out more case studies to test model further on different organisations and in different locations?
  - Provide organisations with economic modelling tool along with user guide so they can undertake analysis themselves?
  - Further research to look at collaborative procurement and the use of this model within collaborative procurement?