60,000 lights
Smart lighting control system
5 years of experience

Richard Webster

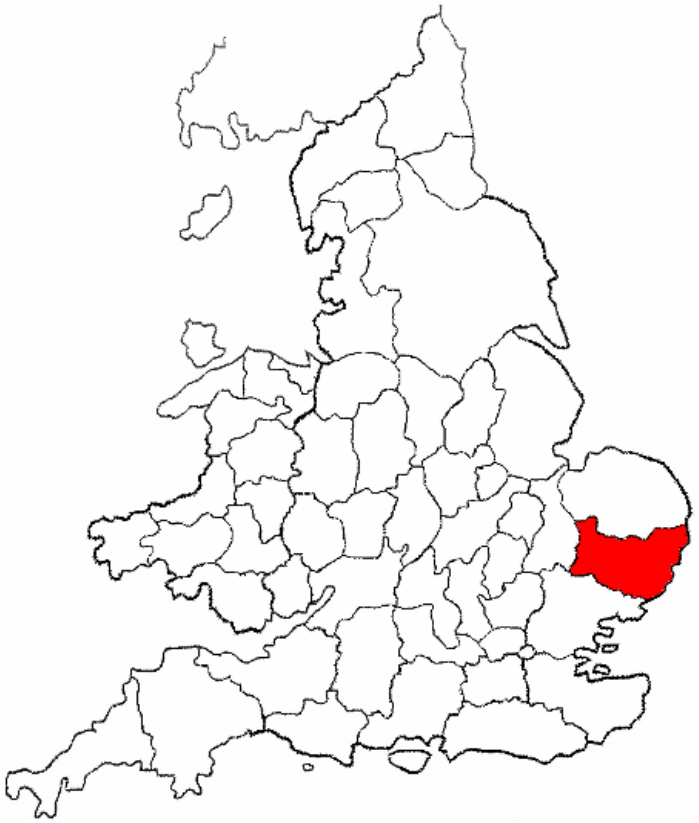
Street Lighting Manager
Suffolk County Council, United Kingdom

Suffolk County Council

Suffolk – An Overview

Suffolk

- 1500 sq miles (30miles x 50)
- Cities, Towns & Rural
- Population – 750,000
- 60,000 lights, mostly HPS
- Smart controls (“CMS”) installed 2011-2012
- LED rollout commenced



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- Greenest County Aspiration
- Invest-to-Save Initiatives

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Procurement of Central Management System

- Initial reasons and drivers for a CMS
- Trials of multiple vendors (and part-night)
- Multi-Vendor solution for CMS /Asset Management System
- CMS Contract
- Budget and ROI

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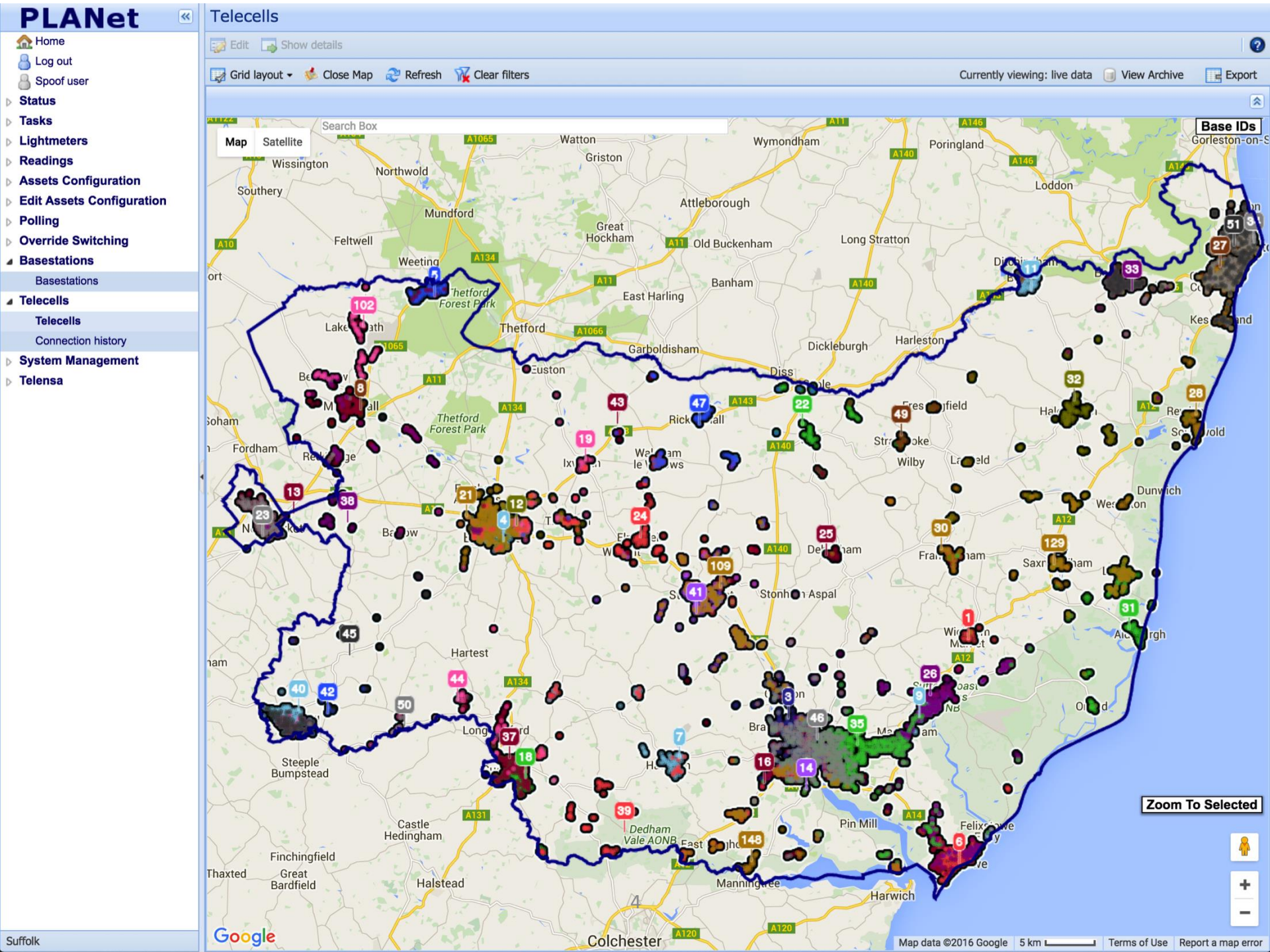
PLANet
Telecells
Edit
Show details
Grid layout
Close Map
Refresh
Clear filters
Currently viewing: live data
View Archive
Export
Home
Log out
Spoof user
Status
Tasks
Lightmeters
Readings
Assets Configuration
Edit Assets Configuration
Polling
Override Switching
Basestations
Basestations
Telecells
Telecells
Connection history
System Management
Telensa
Search Box
Map
Satellite
Base IDs
Zoom To Selected
Google
Map data ©2016 Google
5 km
Terms of Use
Report a map error
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Pre-Start Works

- 1500 sq miles –> 75 Base Stations estimate
- Field Trials -> 44 Base Stations with only small reduction in resilience
- Programme of works over two phases:
  1) PNL savings (residential only)
  2) Arterial routes
- Operative training – PDAs and Barcode Scanners
- Batch order to start
  - Central System
  - Base Stations
  - Multiple node types
    Functional 94.7%,
    Decorative 5.3%.

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Installation Process & Unintended Consequences

- Mapping already in AMS, so simple node scanning to selected fixture in AMS hand-held device
- Node self-commissions
- Inventory Update - Carried out at same time
    - Lamp type, control gear type (9no. Fields)
- Import from AMS to CMS after working hours (30mins)
- Unintended Consequences(!)
    - Small number of nodes installed but not communicating (Re-visit, fixture wiring)
    - Small number of nodes not assigned but communicating (set to ‘Dayburn’ to identify)
- Errors due to Operative shortcuts!!

  E.g. Scan nodes at depot,

  Multiple scanning

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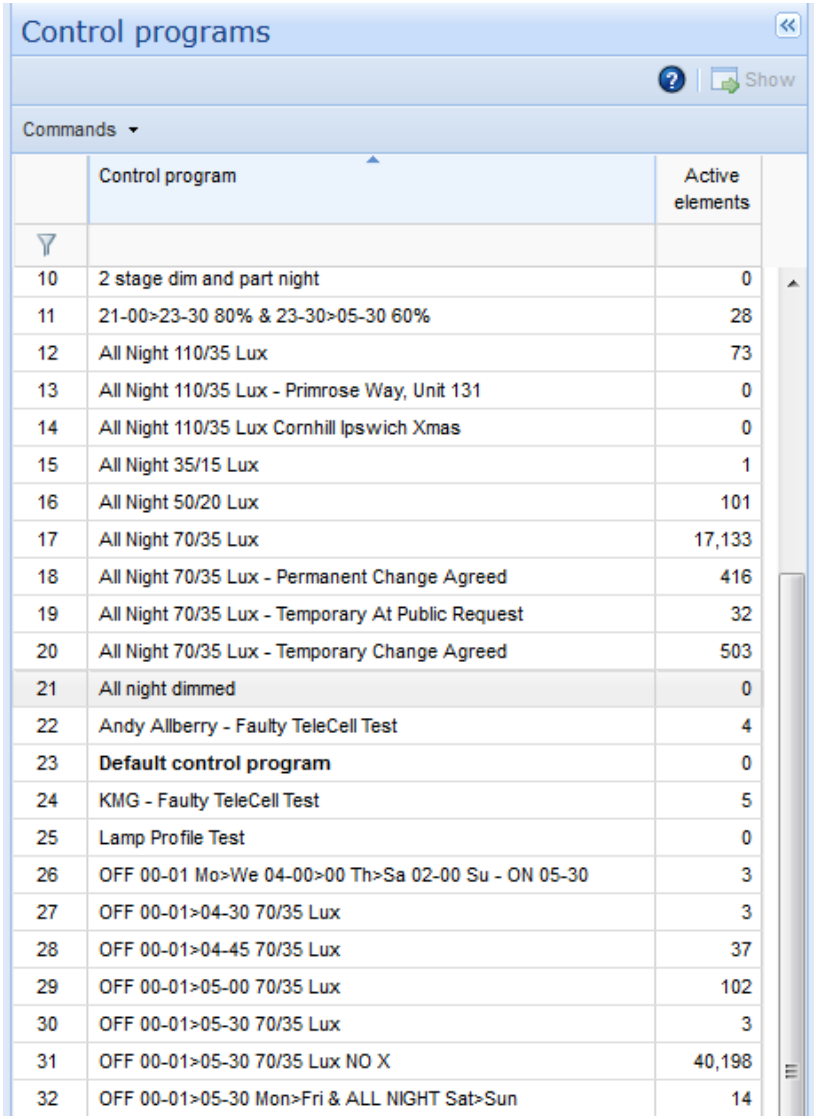
CMS Experience

- 60,000 nodes + 47 base-stations + 1 server hosted by vendor
- Installation completed on time & on budget
- Less than 0.1% node failures
- Close to ZERO day burners
- No significant service or operational issues
- Provides all functionality we need



Control programs

Show

Commands

	Control program	Active elements
10	2 stage dim and part night	0
11	21-00>23-30 80% & 23-30>05-30 60%	28
12	All Night 110/35 Lux	73
13	All Night 110/35 Lux - Primrose Way, Unit 131	0
14	All Night 110/35 Lux Cornhill Ipswich Xmas	0
15	All Night 35/15 Lux	1
16	All Night 50/20 Lux	101
17	All Night 70/35 Lux	17,133
18	All Night 70/35 Lux - Permanent Change Agreed	416
19	All Night 70/35 Lux - Temporary At Public Request	32
20	All Night 70/35 Lux - Temporary Change Agreed	503
21	All night dimmed	0
22	Andy Allberry - Faulty TeleCell Test	4
23	**Default control program**	0
24	KMG - Faulty TeleCell Test	5
25	Lamp Profile Test	0
26	OFF 00-01 Mo>We 04-00>00 Th>Sa 02-00 Su - ON 05-30	3
27	OFF 00-01>04-30 70/35 Lux	3
28	OFF 00-01>04-45 70/35 Lux	37
29	OFF 00-01>05-00 70/35 Lux	102
30	OFF 00-01>05-30 70/35 Lux	3
31	OFF 00-01>05-30 70/35 Lux NO X	40,198
32	OFF 00-01>05-30 Mon>Fri & ALL NIGHT Sat>Sun	14

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Integral to how we operate

- vendor monitors network
- SCC check system every morning
- integrated to AMS (fault ticketing)
- used for automated billing
- Adjust lights for special events

Street Lighting Term Maintenance Contract With Increased Efficiencies

- Daily Faults identified by CMS & Automatically Raised in AMS.

  ***Increased*(!) repair times = Better service**

  - Fewer Lights Out
  - Zero Day Burning Units
  - Monitored Power Factor
  - Reduced Power Bands with LED
- Exceeding KPI – 98.5% units in lighting
- Ceased Night Scouting
- Targeted Cyclical Maintenance

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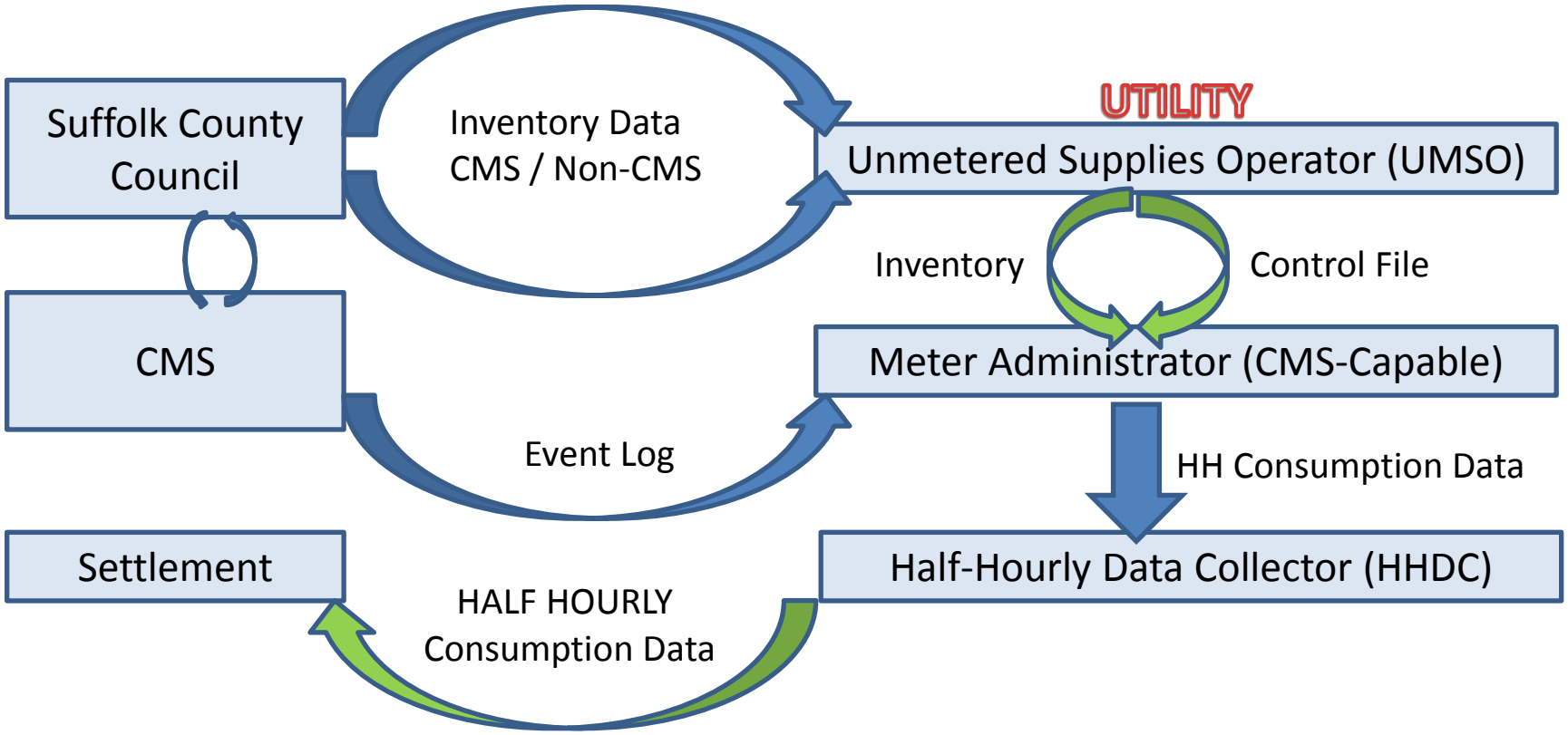
Billing Process



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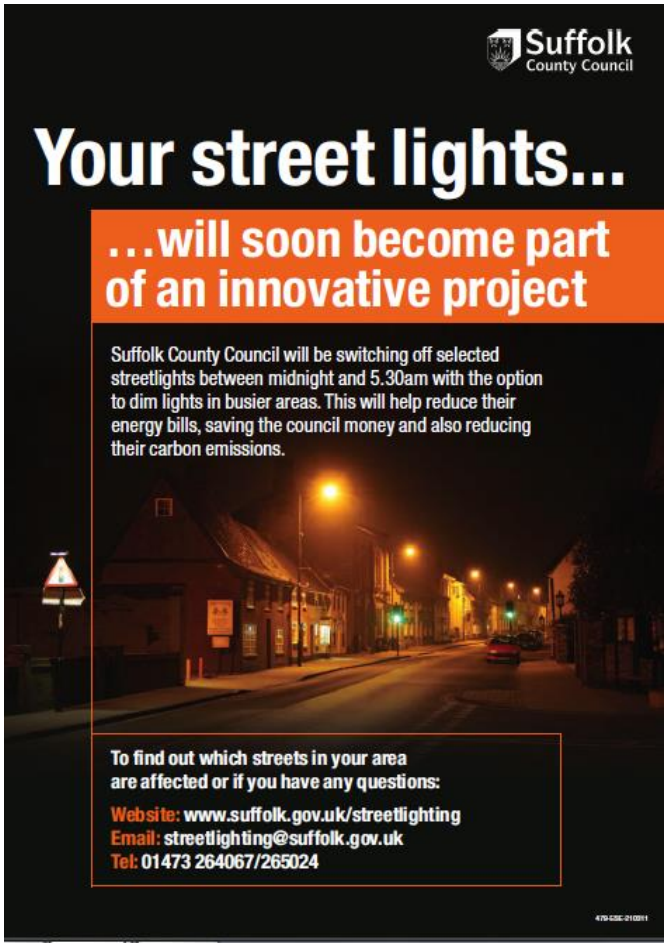
Suffolk CC's PNL Project

- Scrutiny Committee
- Cabinet Approval
- Part Night Policy (PNL)



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Crime

Initial Concerns

- Fear of increased Crime & Burglaries

Used flexibility of CMS to adjust and monitor

- Out-of-Hours instantaneous override (“ON”) facility
- Examined Crime Figures (Limitations)
- Targeted trials e.g. ‘Lights on’ routes

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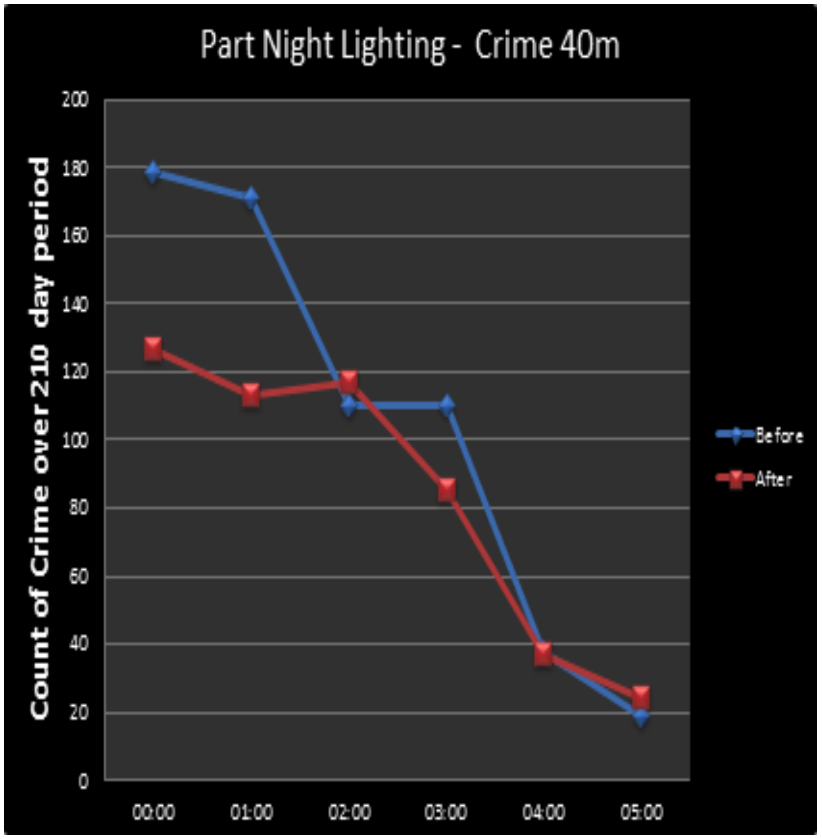
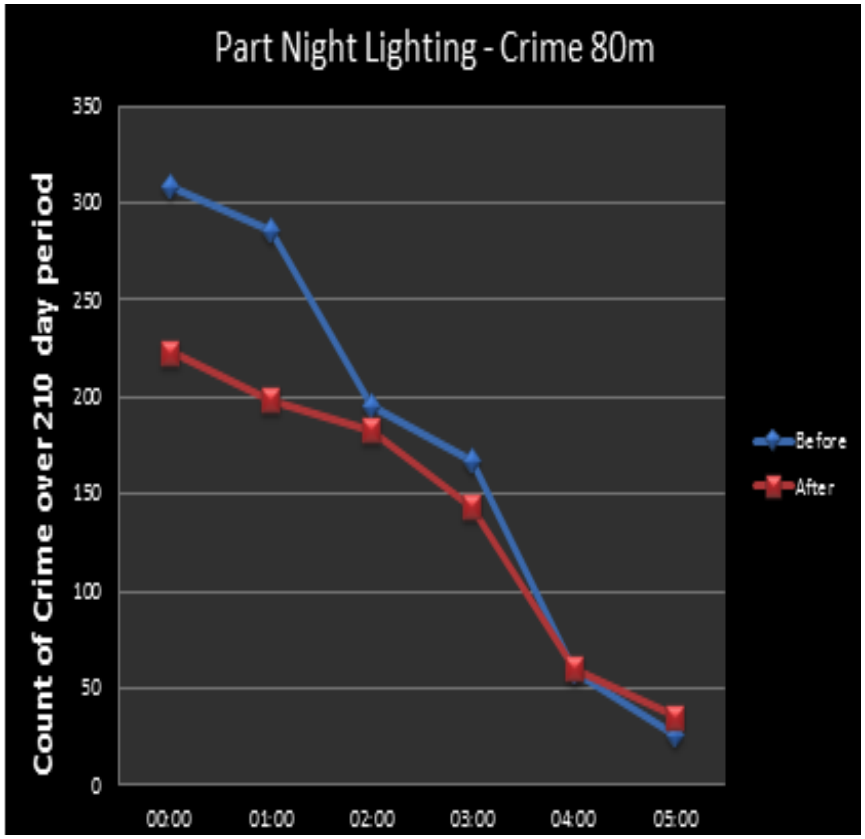
Crime Figures (related to distance from fixture) in Part Night areas





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Savings

- Financial: $1.2m ACT v $1.1m Target
- CO2: 3600Tonnes
  - CMS: 3400Tonnes
  - Contractor: 200Tonnes
- Contractual: $250k / yr

Changing Public Attitudes

- Festivities requiring different lighting periods
- Shift to complaints about lights being ON(!)
- Public concern if Day Burning Lights

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Future of Lighting In Suffolk

- Highway Magazine Excellence Award
- LED Rollout – 16,000
- Dimming modules
- Adaptive Lighting based upon traffic flow
- Lighting-centric sensor deployment
- Workforce diversity
- What we want!

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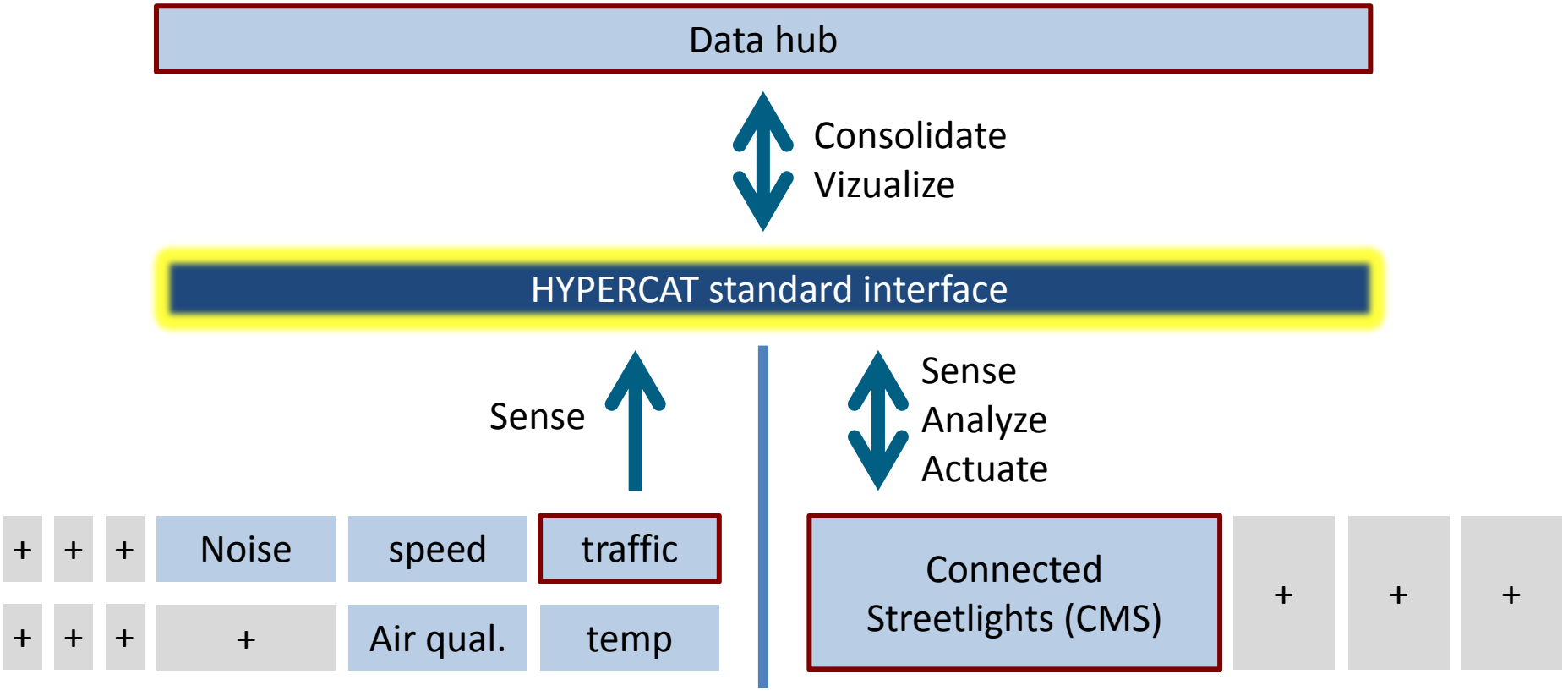
Traffic-adaptive lighting pilot



- Traffic camera and CMS are not connected and use different networks
- HYPERCAT provides standard interface to smart city platforms

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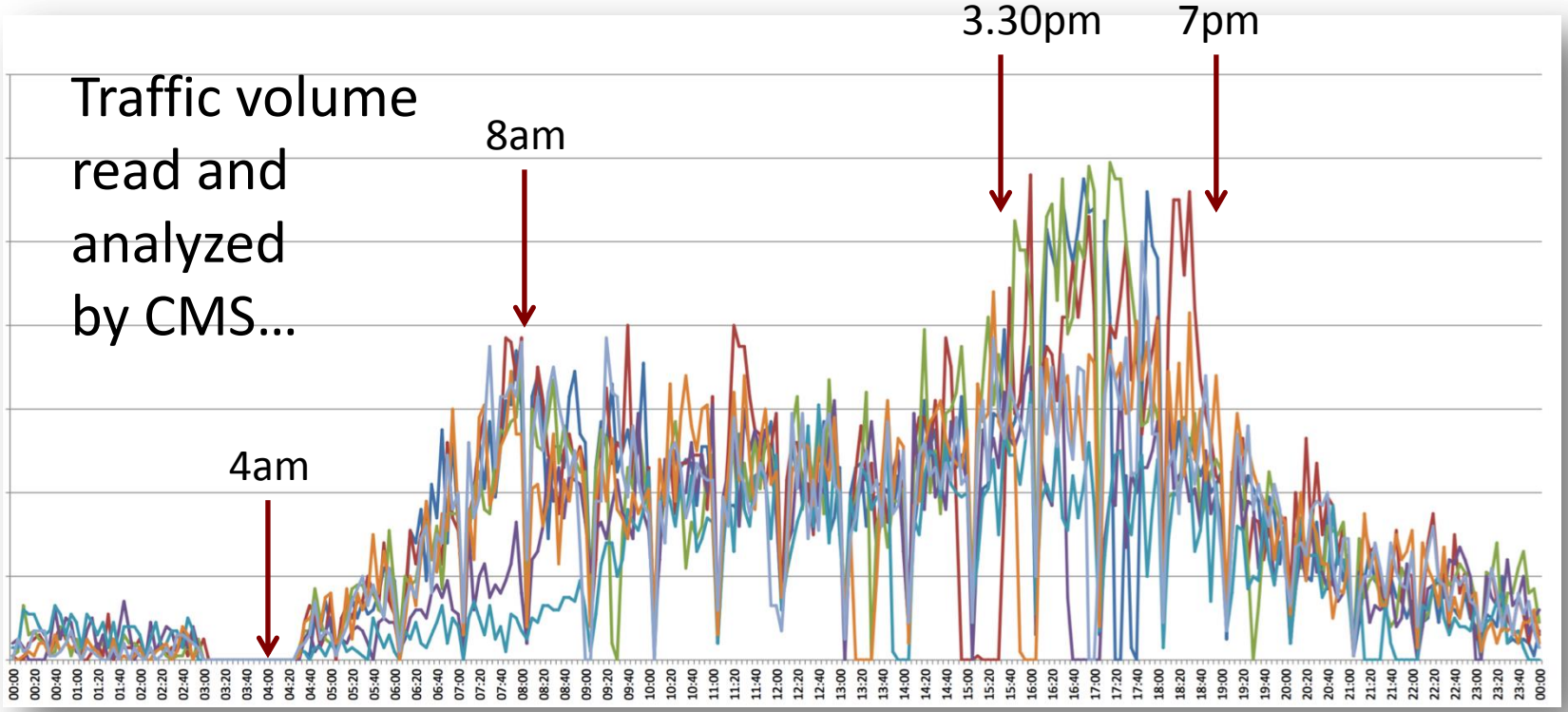
Traffic-adaptive lighting pilot - Data



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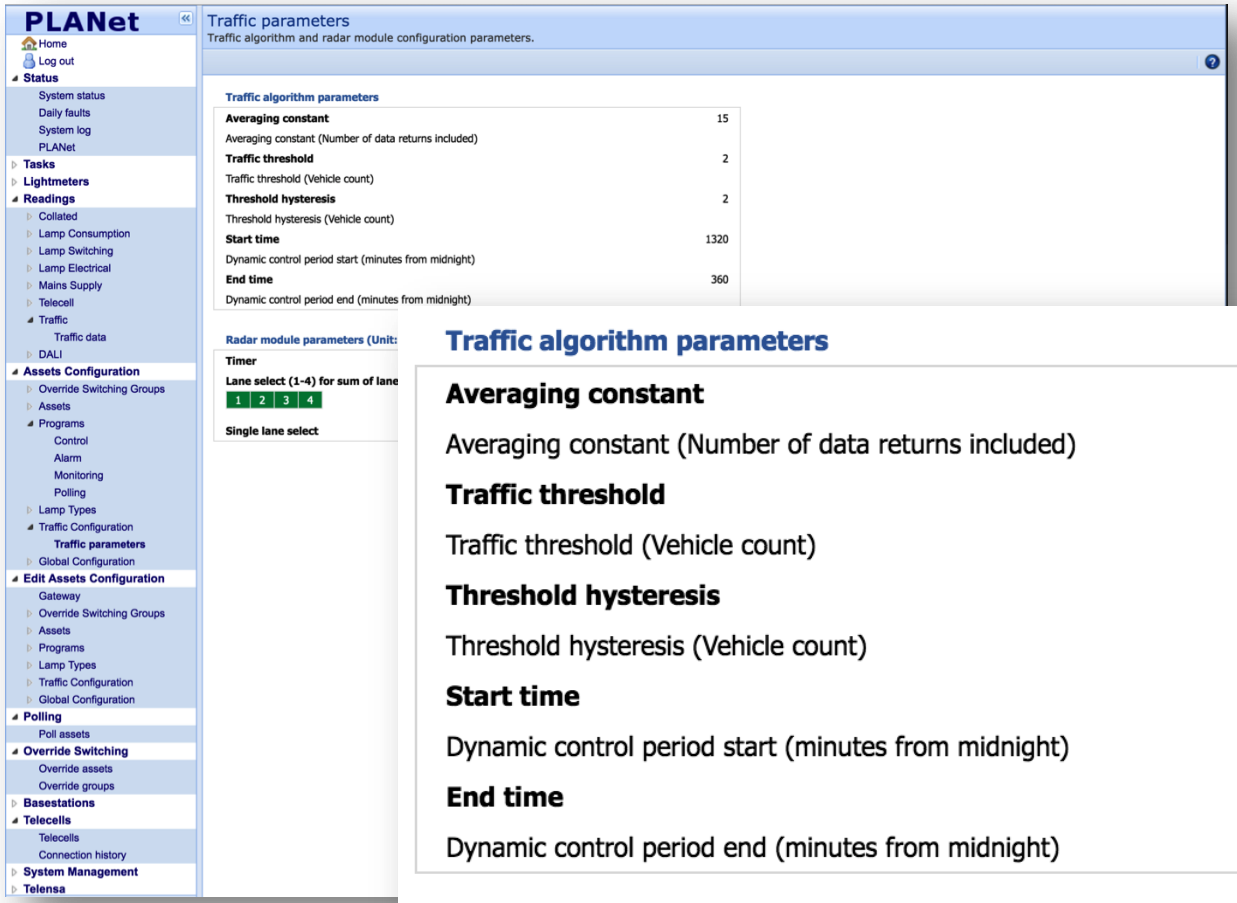

…selects dimming program based on traffic algorithm

Traffic algorithm parameters

Averaging constant	15
Averaging constant (Number of data returns included)	
Traffic threshold	2
Traffic threshold (Vehicle count)	
Threshold hysteresis	2
Threshold hysteresis (Vehicle count)	
Start time	1320
Dynamic control period start (minutes from midnight)	
End time	360
Dynamic control period end (minutes from midnight)	

Radar module parameters (Unit: 1234)

Timer	3.0 mins
Lane select (1-4) for sum of lane counter	
1 2 3 4	
Single lane select	Lane 1

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Thank you for your time

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