OS Highways for Waste Management

Stuart Henshaw - Integrated Skills

Integrated Skills

Specialists in Waste Management and Route Optimisation

Business Partnerships:-

RouteSmart TECHNOLOGIES

Ordnance Survey

esri

Offices in Northern Ireland, Southampton, Leeds, Leicester, Guernsey

RouteSmart TECHNOLOGIES

OS Highways Webinar Integrated Skills outline

- Who are Integrated Skills?
- What is Route Optimisation for Waste Management?
- What data layers are needed?
  - Streets (OS Highways – previously ITN)
  - Service Locations – service addresses – from LLPG
  - Facilities – location of depots and waste facilities
- Elements of a project
- Typical Project Outcomes
- Our customer-ready importer for OS Highways data
- New tool for merging pathways data
- Questions

RouteSmart TECHNOLOGIES

RouteSmart Technologies & Integrated Skills

RouteSmart Inc

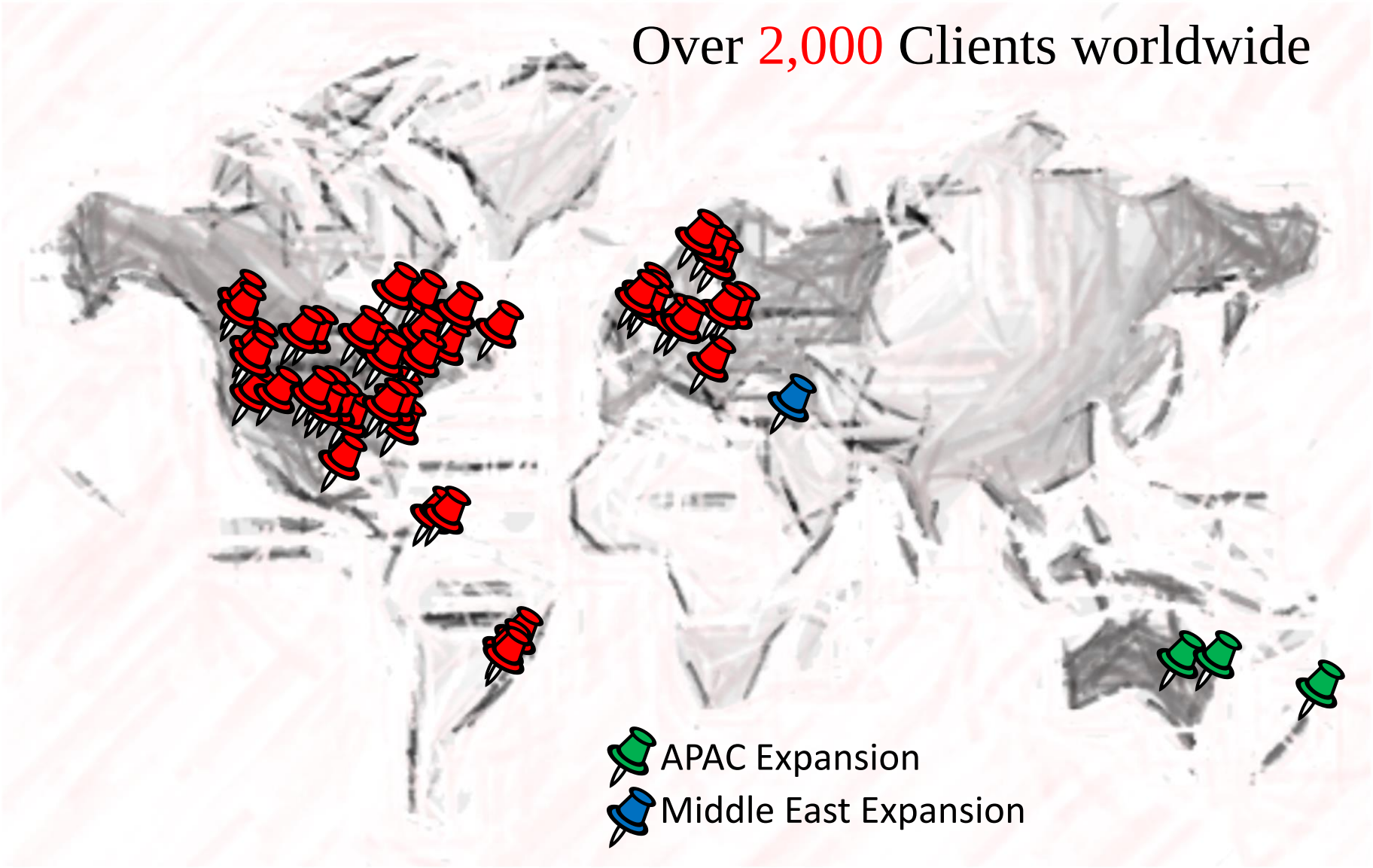
- Developers of RouteSmart
- World's best-selling high density routing software
- 30 year track record
- Re-seller of Navigator & Fusion

Integrated Skills

- Re-seller of RouteSmart
- "Most successful partner company"
- Developers of Navigator & Fusion
- Over 100 UK LA clients

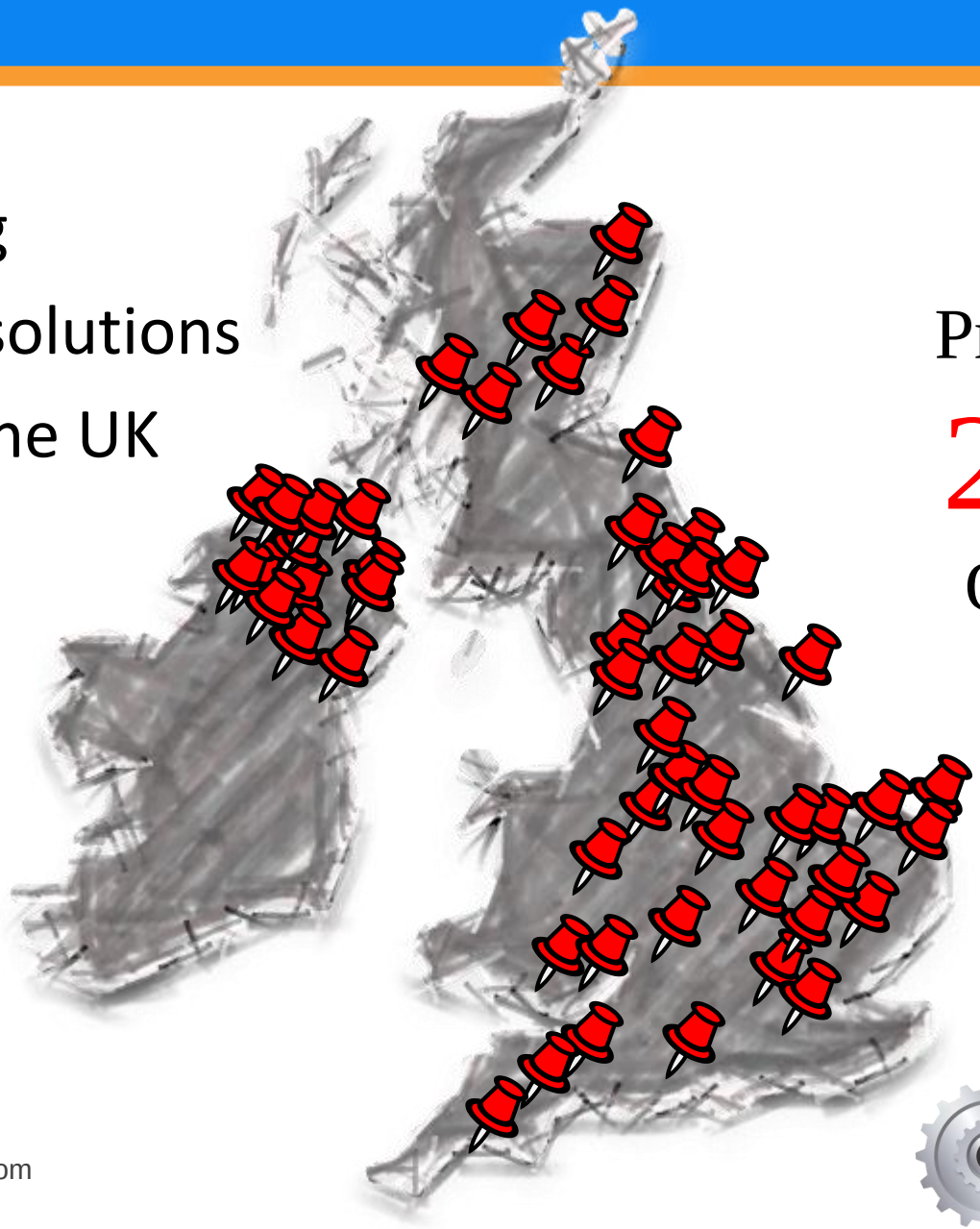
RouteSmart TECHNOLOGIES

RouteSmart World's Best-selling High Density Routing Software



Over 100 local authority clients

Providing
Routing solutions
around the UK



Provided over
200 Route
Optimisation
projects

RouteSmart TECHNOLOGIES

Over 100 local authority clients …

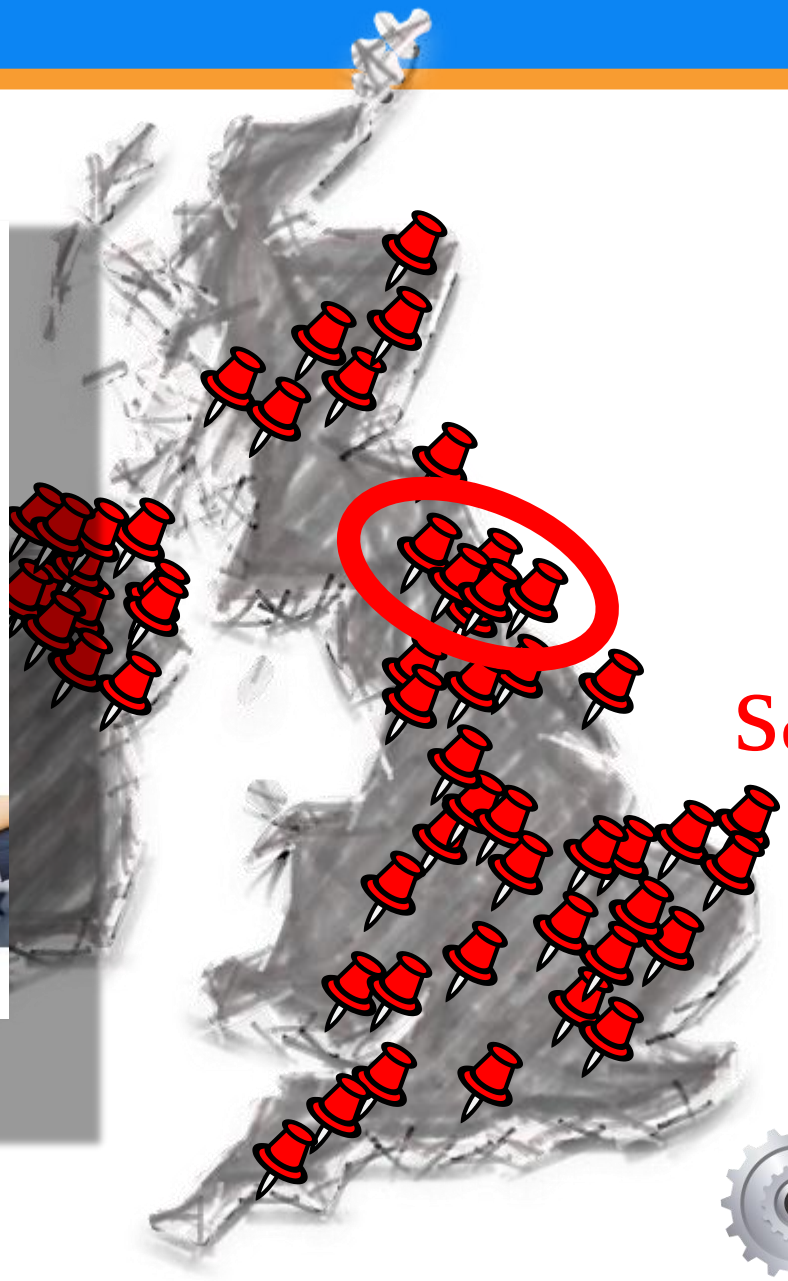
Providing the

largest

Route Optimisation partnership project in Europe.

RouteSmart TECHNOLOGIES

Over 100 local authority clients …



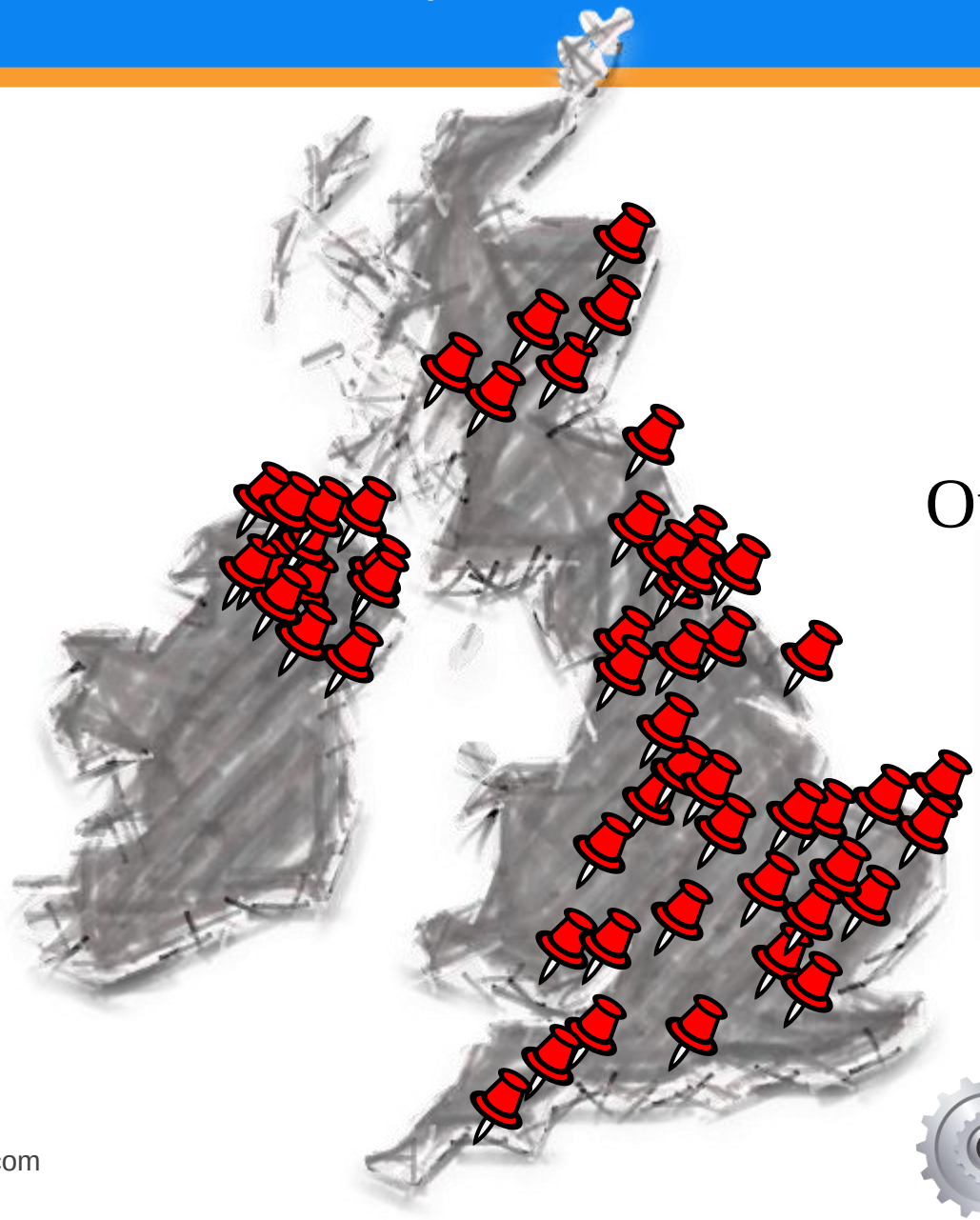
Project "realising £9M savings per year"

Local Partnerships

www.integrated-skills.com

RouteSmart TECHNOLOGIES

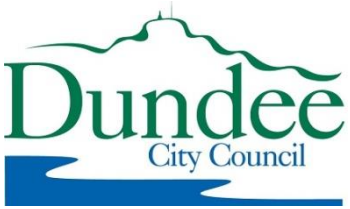
Over 100 local authority clients …



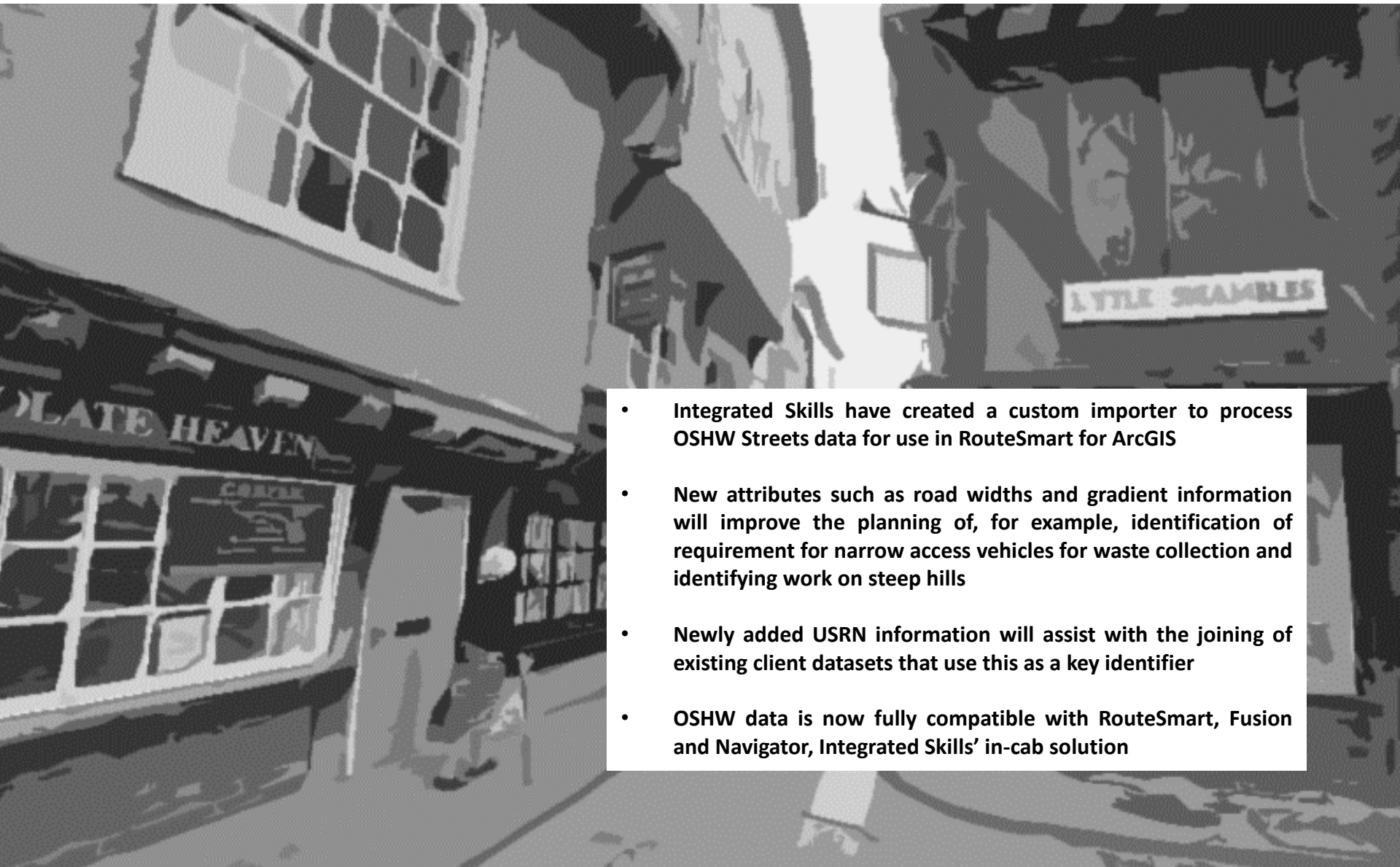
Providing Route Optimisation to

of UK streets

Including major UK cities…

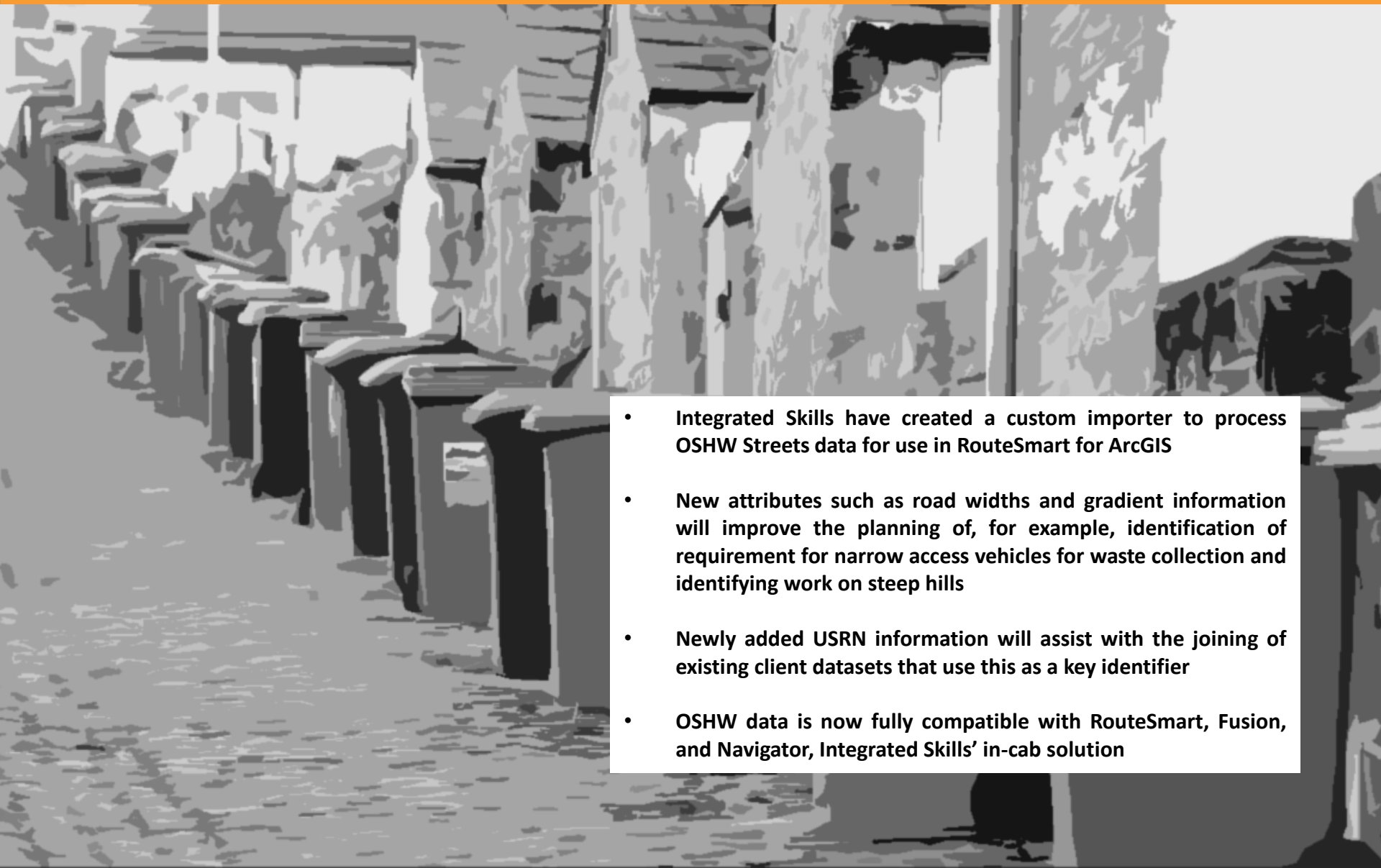


OS Highways Data



- **Integrated Skills have created a custom importer to process OSHW Streets data for use in RouteSmart for ArcGIS**
- **New attributes such as road widths and gradient information will improve the planning of, for example, identification of requirement for narrow access vehicles for waste collection and identifying work on steep hills**
- **Newly added USRN information will assist with the joining of existing client datasets that use this as a key identifier**
- **OSHW data is now fully compatible with RouteSmart, Fusion and Navigator, Integrated Skills' in-cab solution**

OS Highways Data



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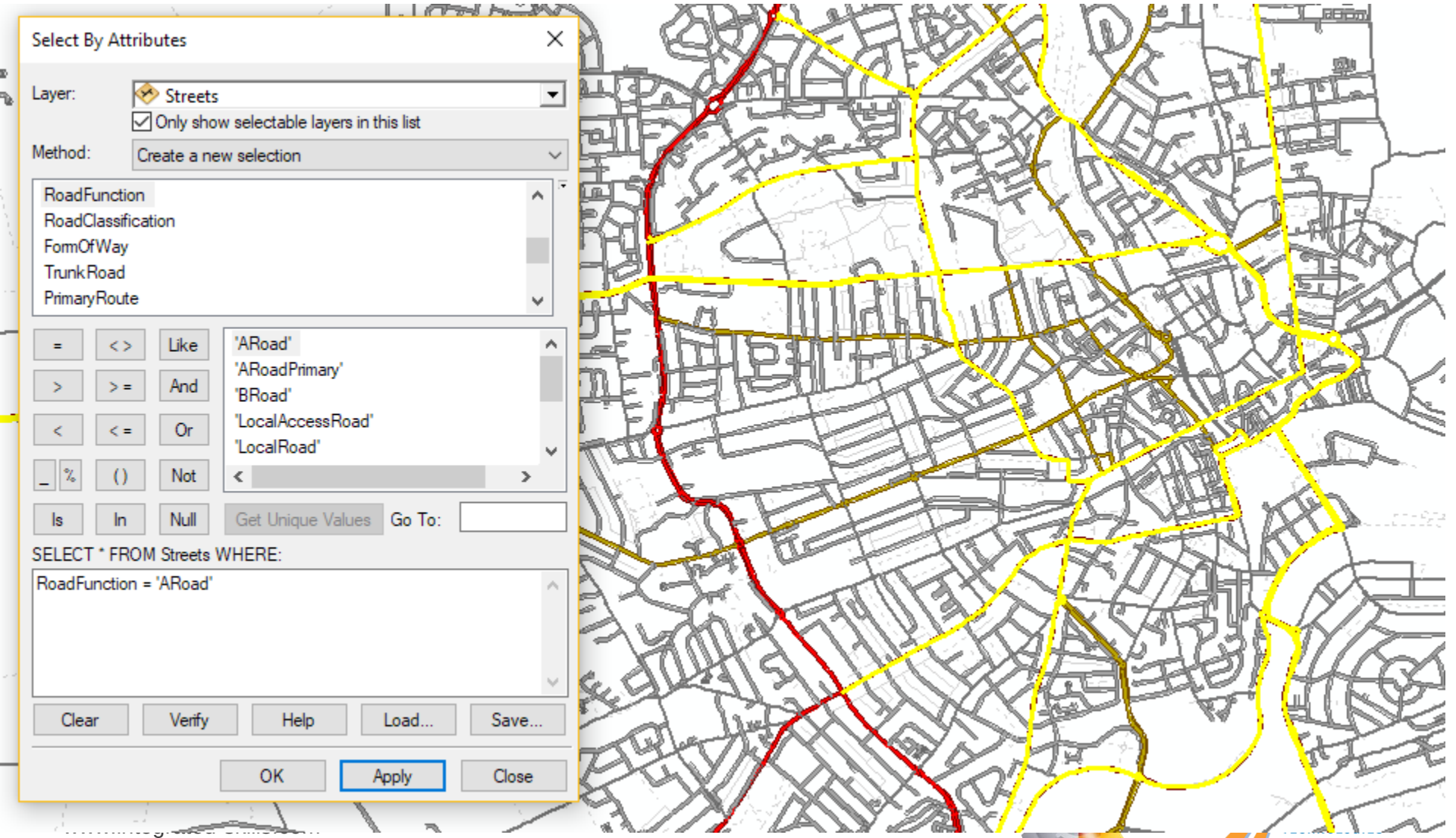
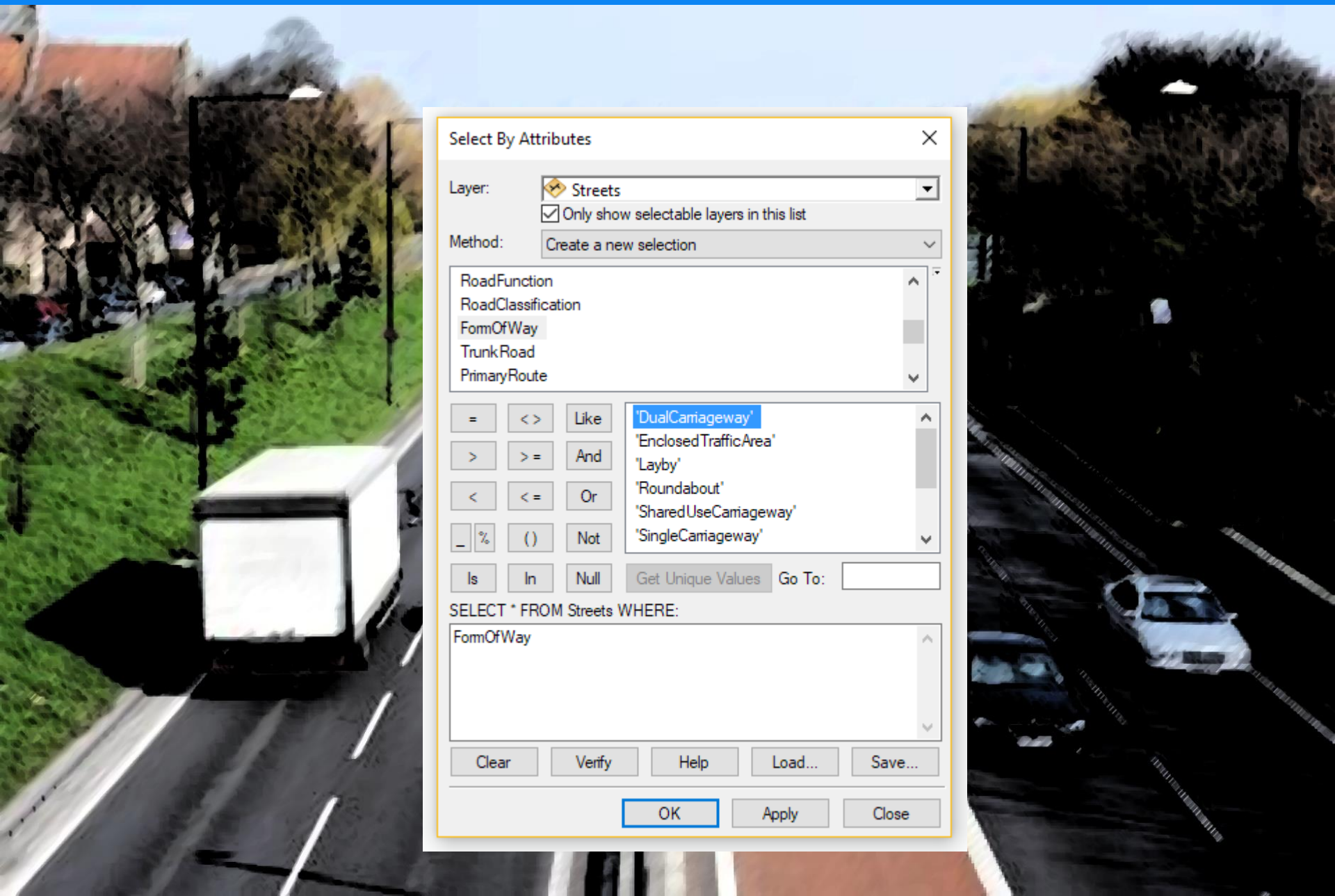
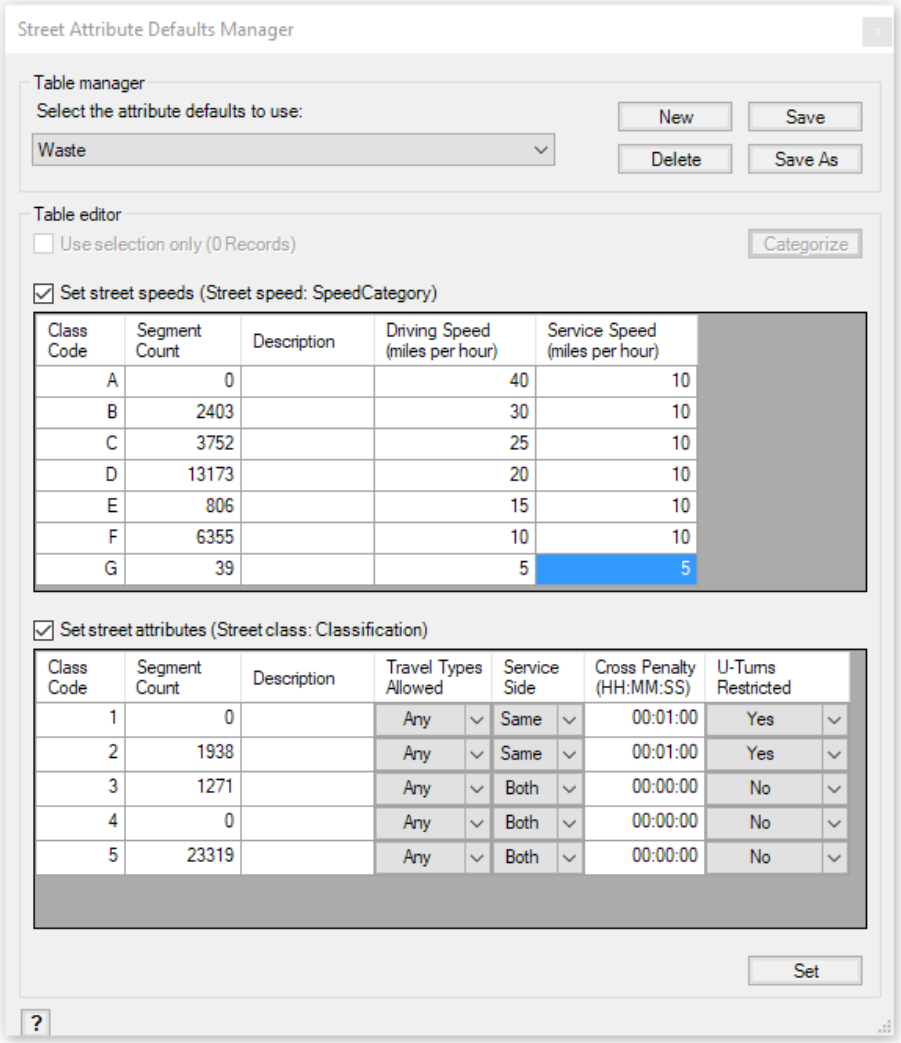
Importing the new Highways Data



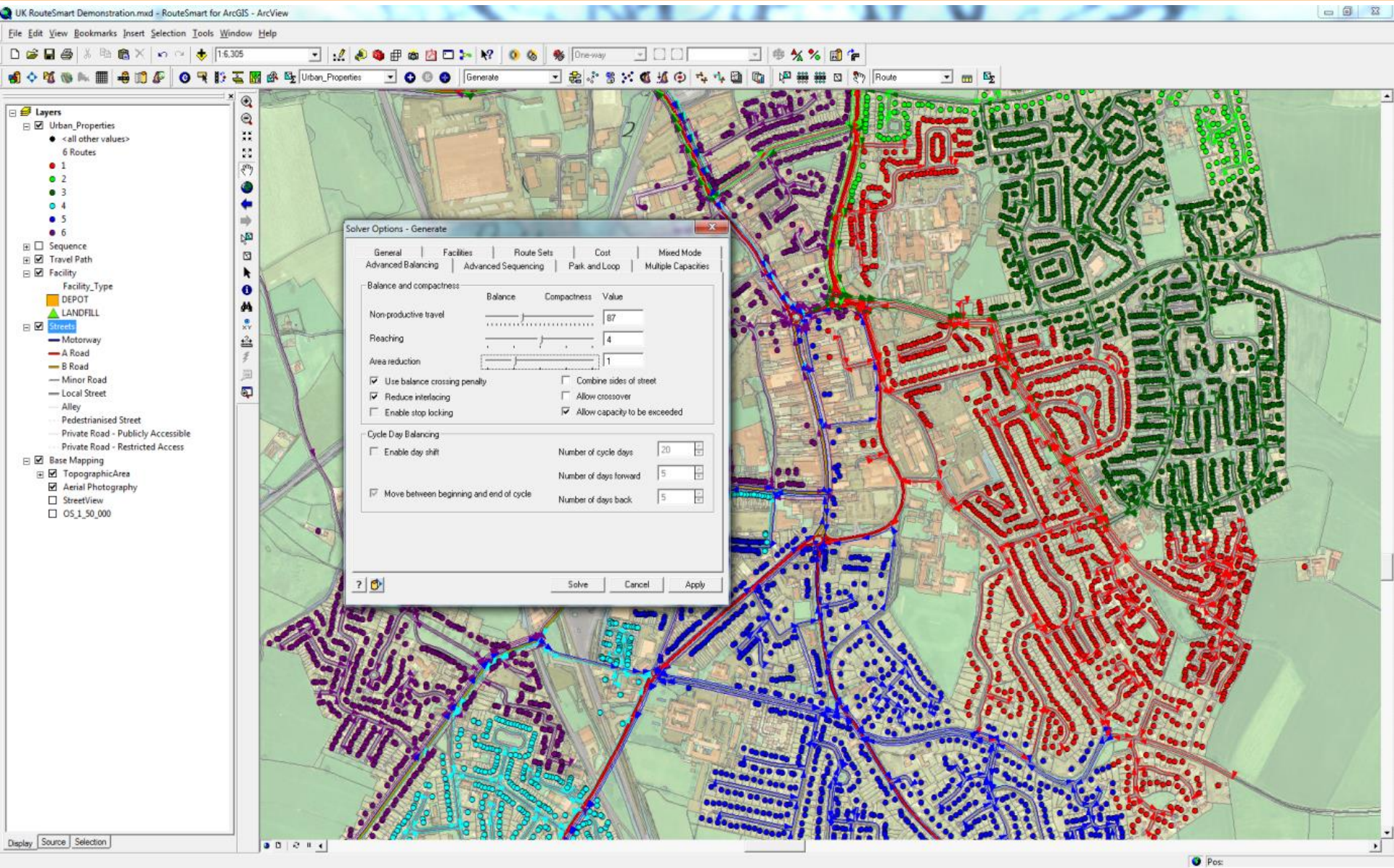

Select By Attributes
Layer:
Streets
Only show selectable layers in this list
Method:
Create a new selection
RoadFunction
RoadClassification
FormOfWay
TrunkRoad
PrimaryRoute
=
< >
Like
>
> =
And
<
< =
Or
_
%
( )
Not
Is
In
Null
Get Unique Values
Go To:
'DualCarriageway'
'EnclosedTrafficArea'
'Layby'
'Roundabout'
'SharedUseCarriageway'
'SingleCarriageway'
SELECT * FROM Streets WHERE:
FormOfWay
Clear
Verify
Help
Load...
Save...
OK
Apply
Close

Street Attributes



RouteSmart TECHNOLOGIES

RouteSmart Route Optimisation software



RouteSmart

RouteSmart

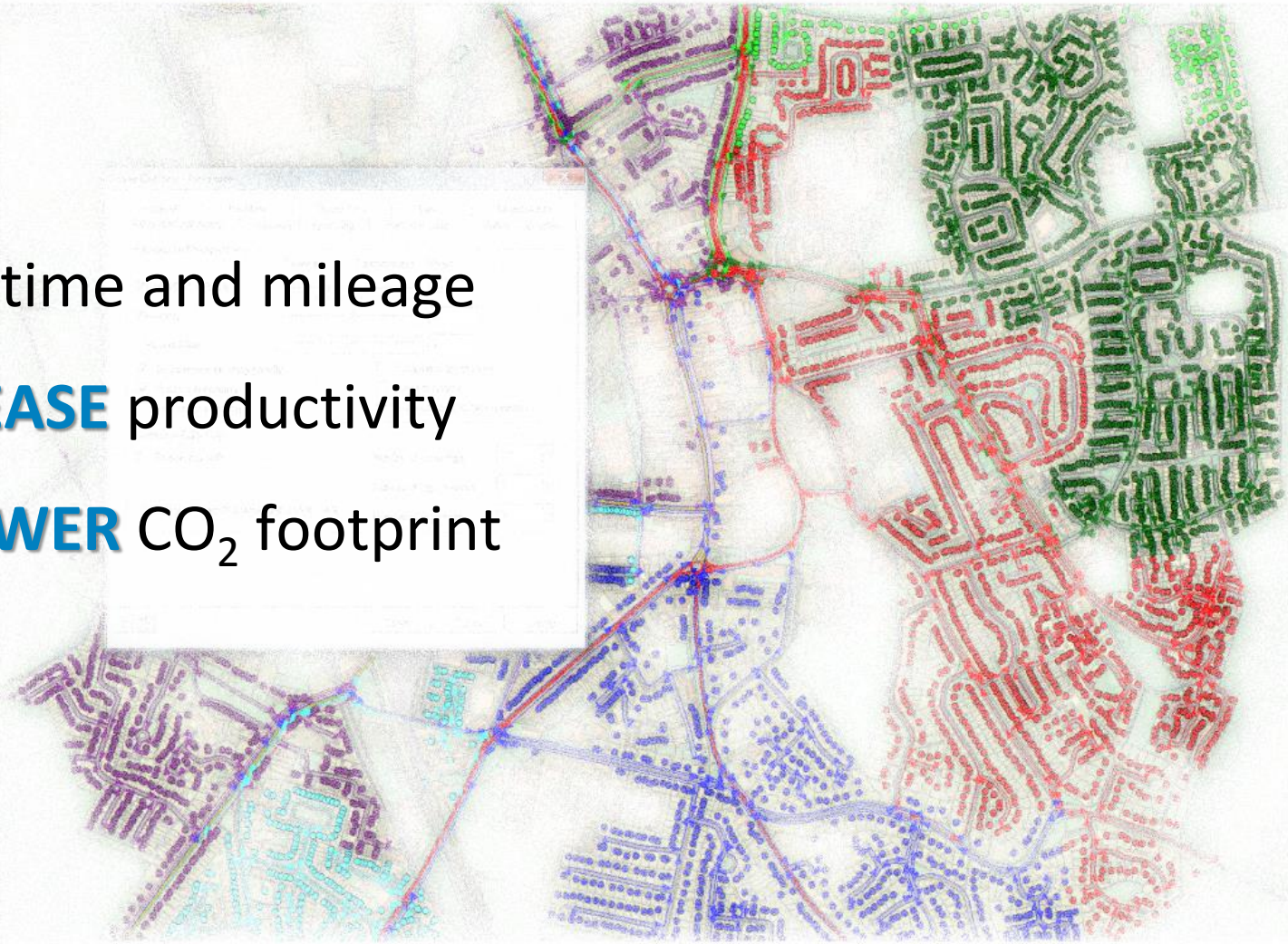
- **REDUCE** time and mileage

RouteSmart

- **REDUCE** time and mileage
  - **INCREASE** productivity

RouteSmart

- **REDUCE** time and mileage
  - **INCREASE** productivity
    - **LOWER** CO_2 footprint



RouteSmart

- **BALANCE** workloads

RouteSmart

- **BALANCE** workloads
- **MODEL** new scenarios

Fast & Accurate Modelling of Options

Route Summary

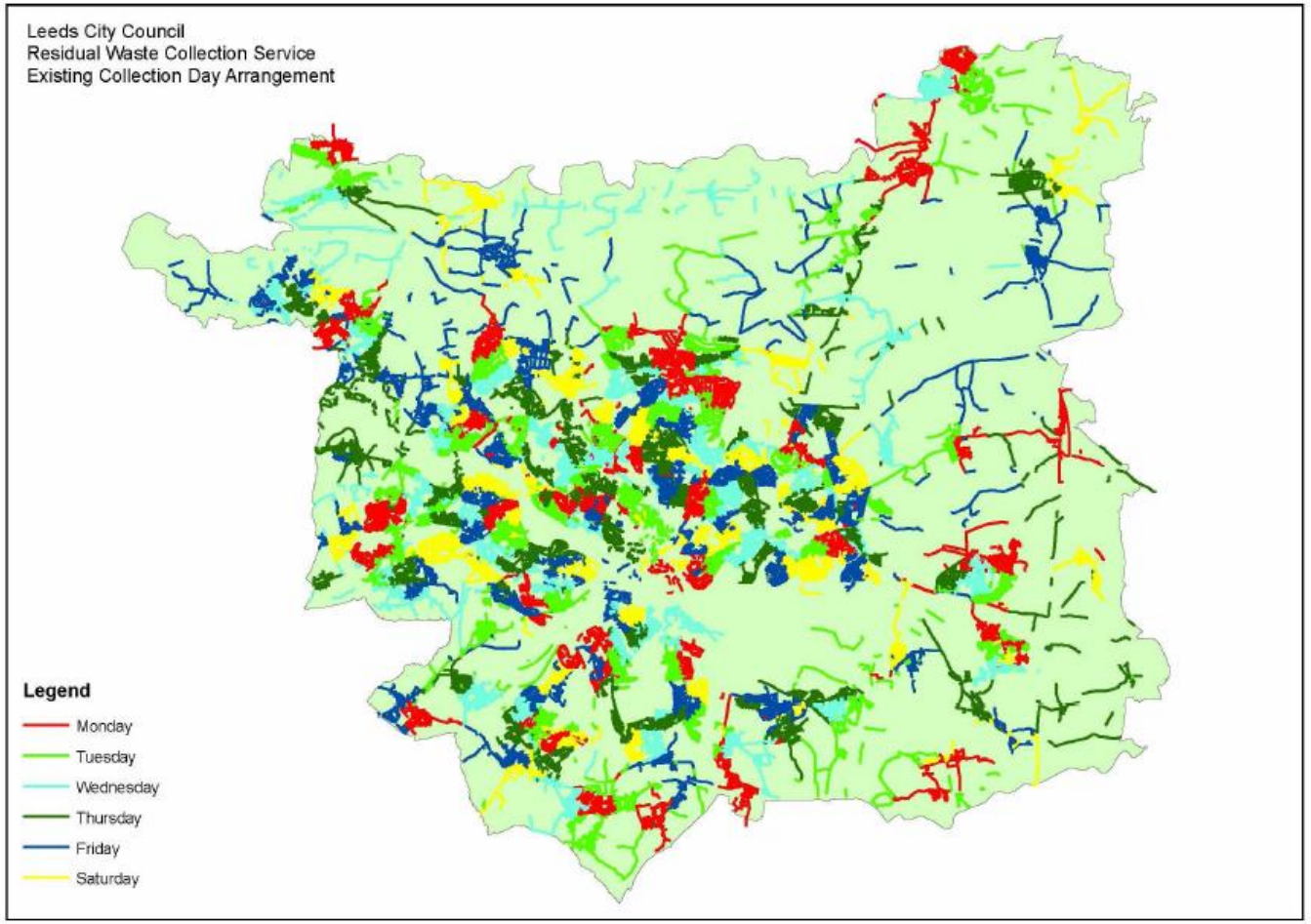
Solution Name: Demo Solution
Solution Label:
Report Date: 04/06/2014
Report Time: 10:49 AM

Route ID	Time Span Start	Time Span End	Travel Time	Service Time	Facility Time	Break Time	Total Time	Distance (miles)	Location Count
1	7:00	16:03	0:49	5:55	1:39	0:40	9:03	30.5	1,314
2	7:00	16:31	1:06	6:06	1:39	0:40	9:31	36.4	1,366
3	7:00	16:29	1:20	5:50	1:39	0:40	9:29	43.8	1,263
4	7:00	16:41	1:14	6:07	1:39	0:40	9:41	43.2	1,503
5	7:00	16:11	1:08	5:44	1:39	0:40	9:11	39.7	1,515
6	7:00	16:03	0:57	5:46	1:39	0:40	9:03	34.6	1,478
7	7:00	16:52	1:29	5:40	2:02	0:40	9:52	45.6	1,302
8	7:00	15:56	1:06	5:31	1:39	0:40	8:56	39.2	1,400
9	7:00	16:29	1:23	5:46	1:39	0:40	9:29	47.8	1,455
10	7:00	16:25	1:08	5:57	1:39	0:40	9:25	38.2	1,488
11	7:00	16:40	1:16	6:04	1:39	0:40	9:40	42.9	1,475
12	7:00	16:48	1:22	6:06	1:39	0:40	9:48	43.2	1,594
13	7:00	16:29	1:07	6:02	1:39	0:40	9:29	39.2	1,430
14	7:00	16:27	1:15	5:53	1:39	0:40	9:27	42.2	1,304
14			16:41	82:26	23:29	9:20	132:04	566.6	19,887

All service locations have been sequenced.

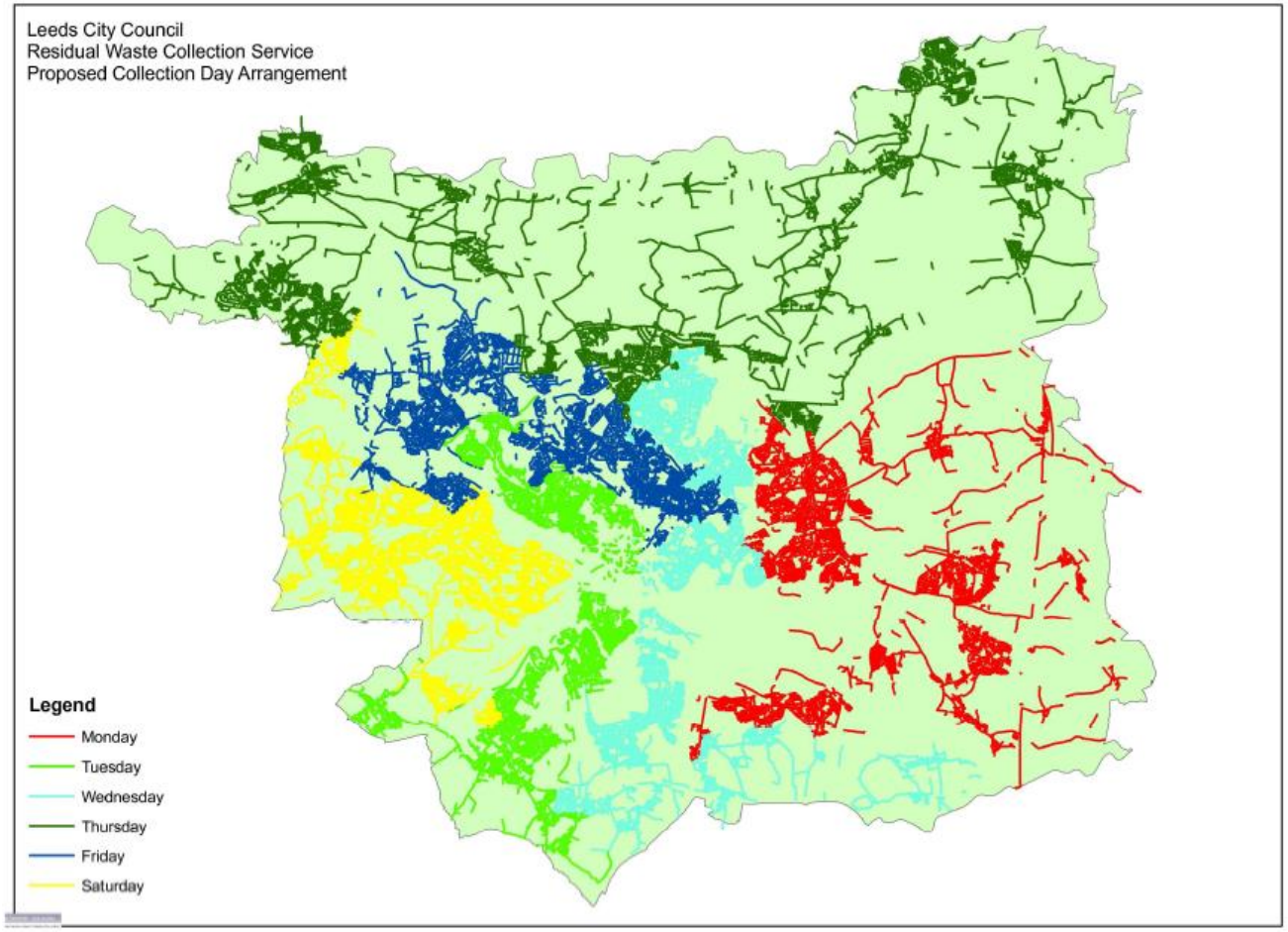
RouteSmart TECHNOLOGIES

Options: Crew Territory Collections



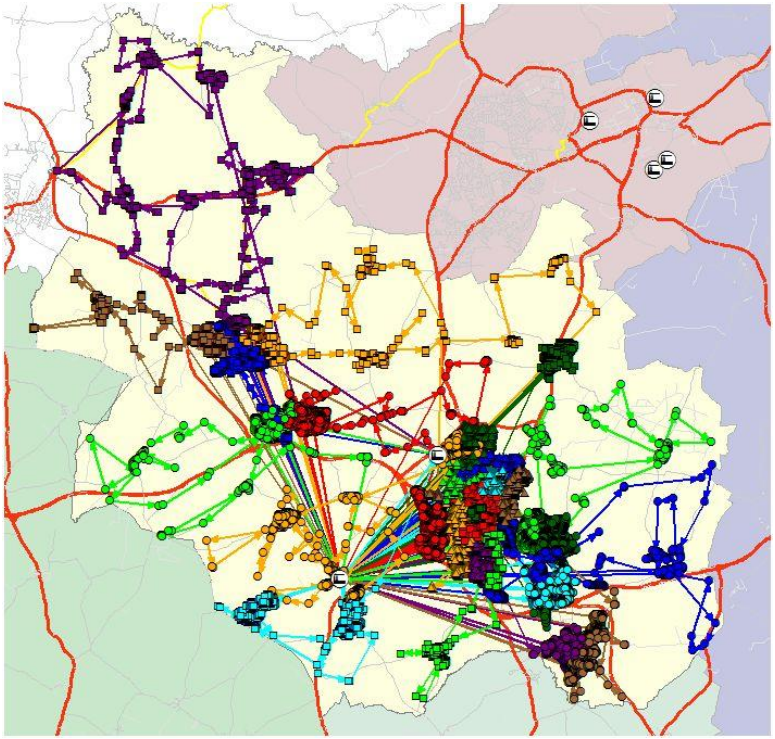
RouteSmart TECHNOLOGIES

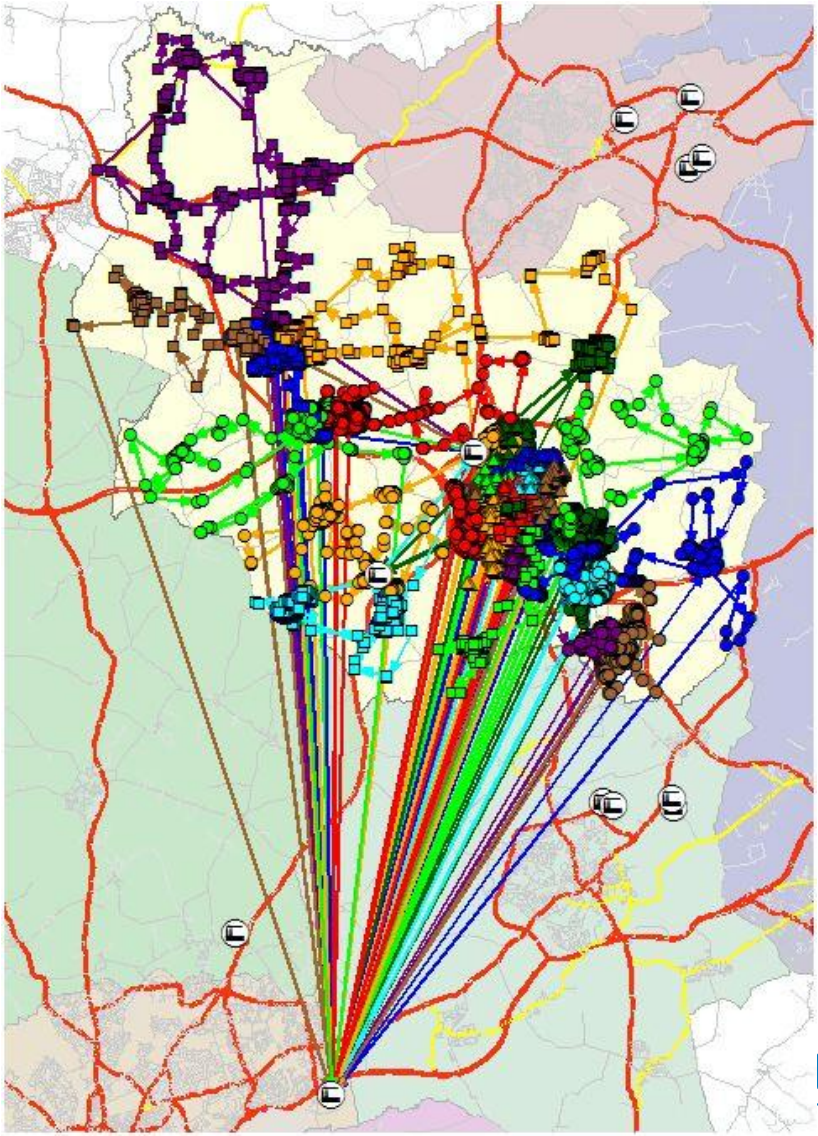
Options: Zonal Collections



RouteSmart TECHNOLOGIES

Baseline Disposal Sites v Proposed Sites



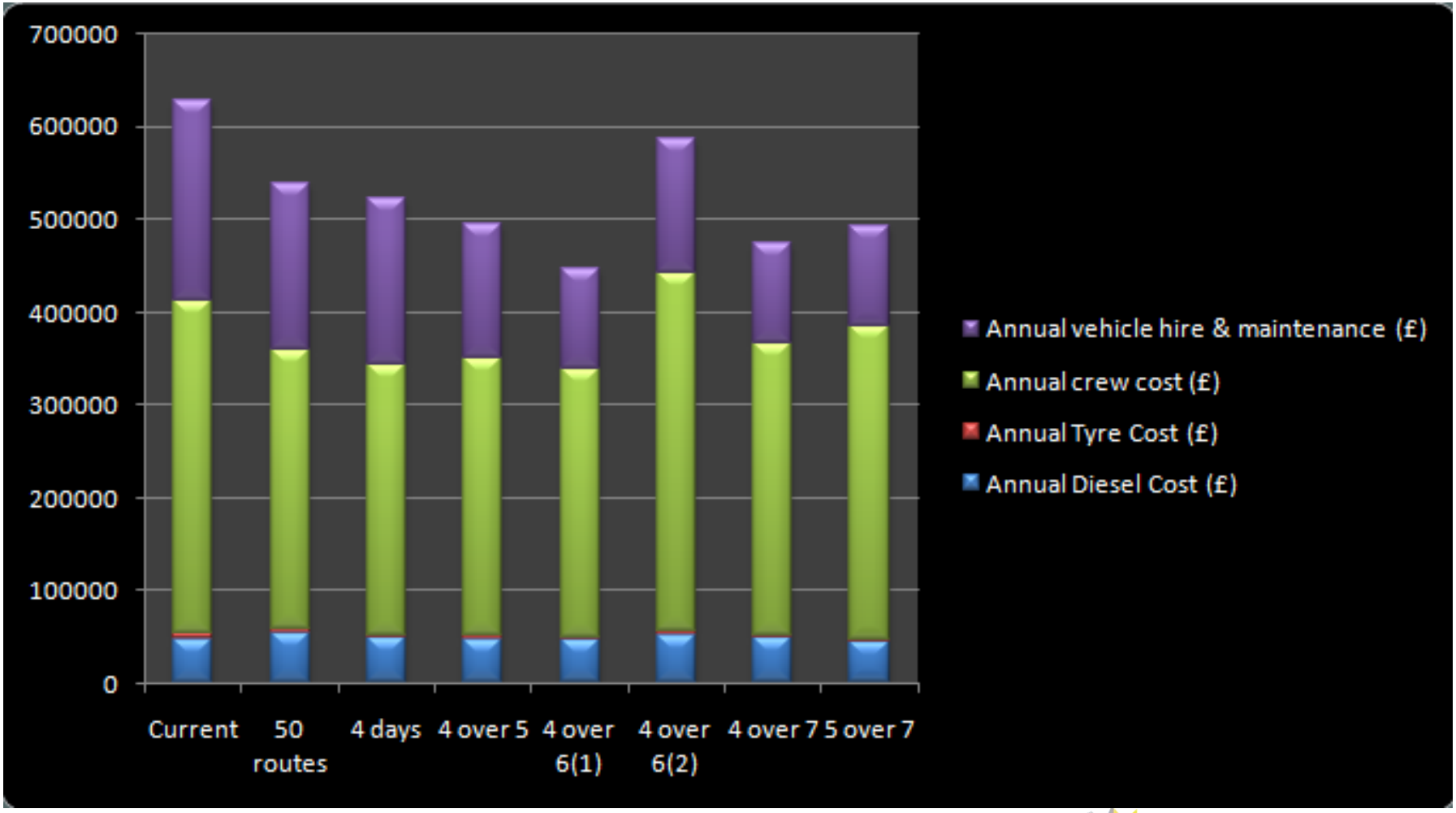


Modelling Shift Patterns

	Current	50 route	4 days	4 over 5	4 over 6(1)	4 over 6(2)	4 over 7	5 over 7
Number of Vehicles	6	5	5	4	3	4	3	4
Number of routes	60	50	40	40	36	48	42	56
Average productive working hours	5.9	7	8.7	8.6	9.3	7.25	8.2	6.5
Mileage	1725	1975	1767	1700.92	1678	1885	1756	2009
Annual Diesel Cost (£)	47534	54423	48691	46870	46239	51943	48388	55360
Annual Tyre Cost (£)	5397.6	4498	3598	3598	3238	3238	3778	3778.3
Annual crew cost (£)	360042	306730	291390	303384	271038	361384	314538	338184
FTE	18	15	15	12	9	12	9	12
FTE/WK	90	75	60	60	54	72	63	84
Annual vehicle hire & maintenance (£)	216000	180000	180000	144000	108000	144000	108000	108000
Total Cost (£)	629081.6	545741	523679	497924	428578	560649	474776	505418
Annual Saving over Current (£)		83340.6	105403	131157.6	200503.6	68432.6	154305.6	123663

RouteSmart TECHNOLOGIES

Modelling Shift Patterns

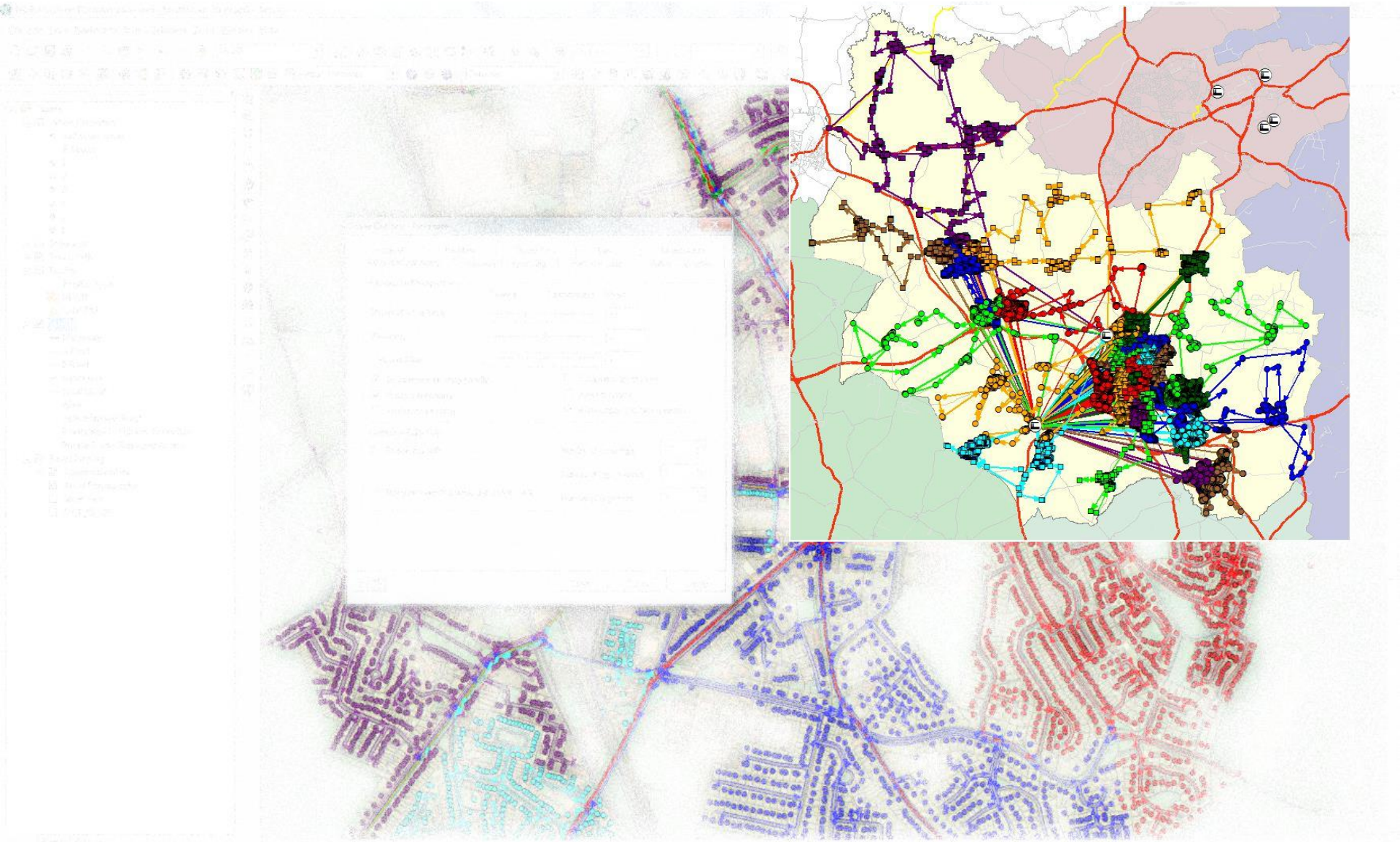


RouteSmart TECHNOLOGIES

RouteSmart

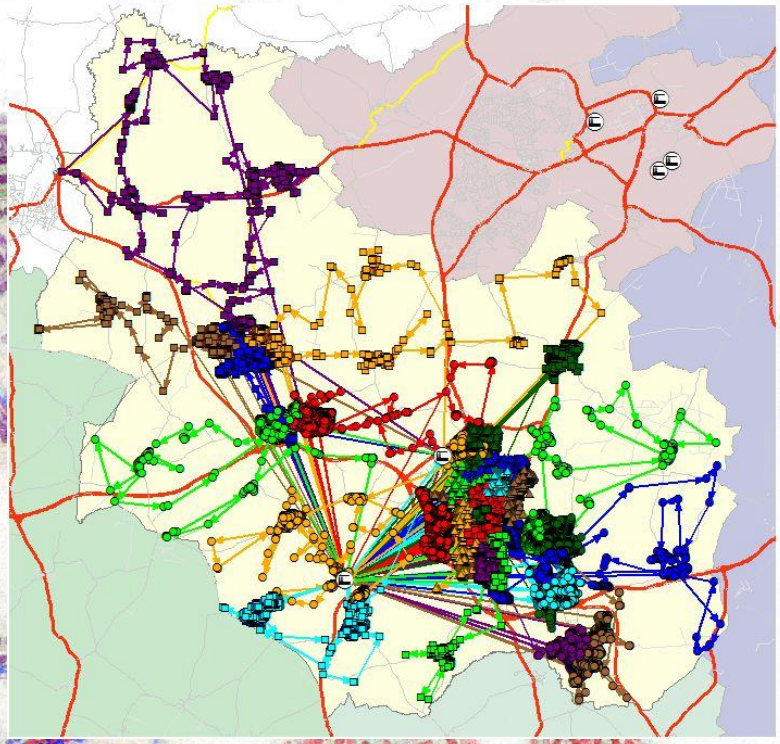
- **BALANCE** workloads
- **MODEL** new scenarios
- **OPTIMISE** resources

RouteSmart



RouteSmart

- **Evaluate impact of new/different *depots and facilities***



RouteSmart

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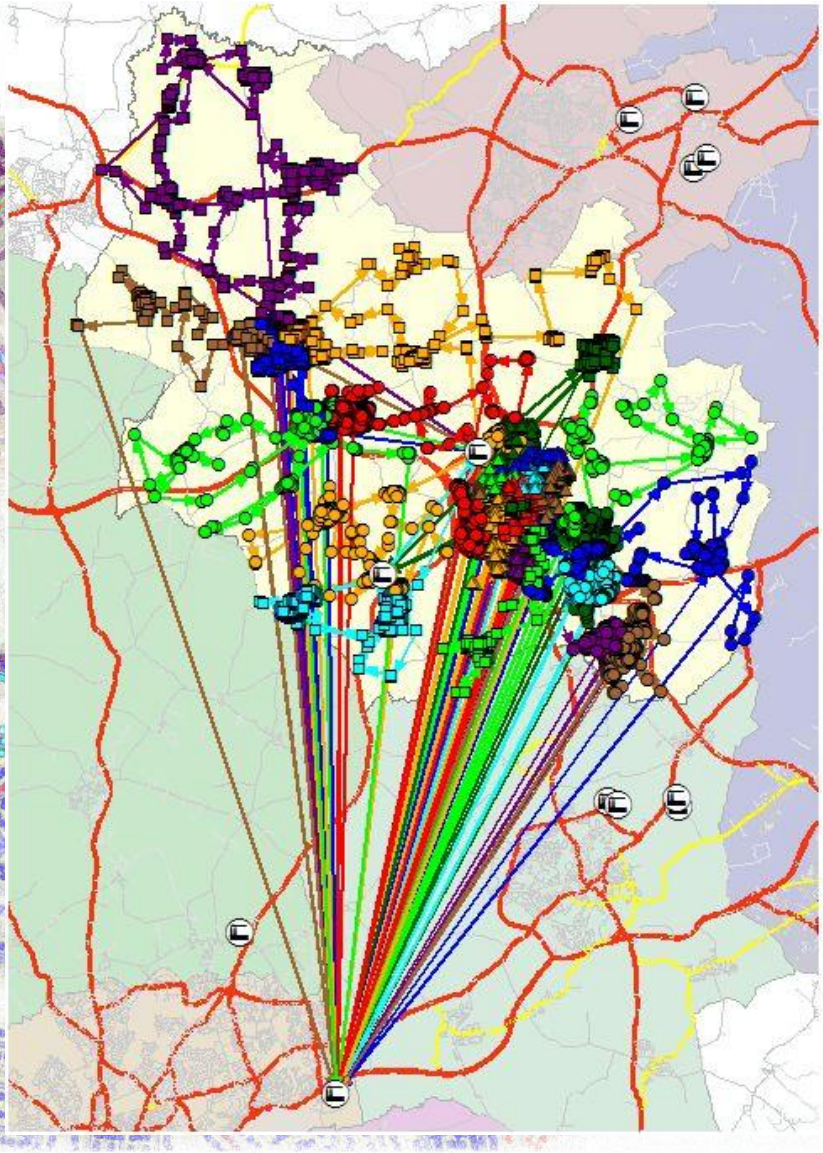

RouteSmart

- Evaluate impact of new/different *depots and facilities*
- **Model *property growth***

RouteSmart

- Evaluate impact of new/different *depots and facilities*
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- **Compare different *operational methodologies***

RouteSmart

- Evaluate impact of new/different *depots and facilities*
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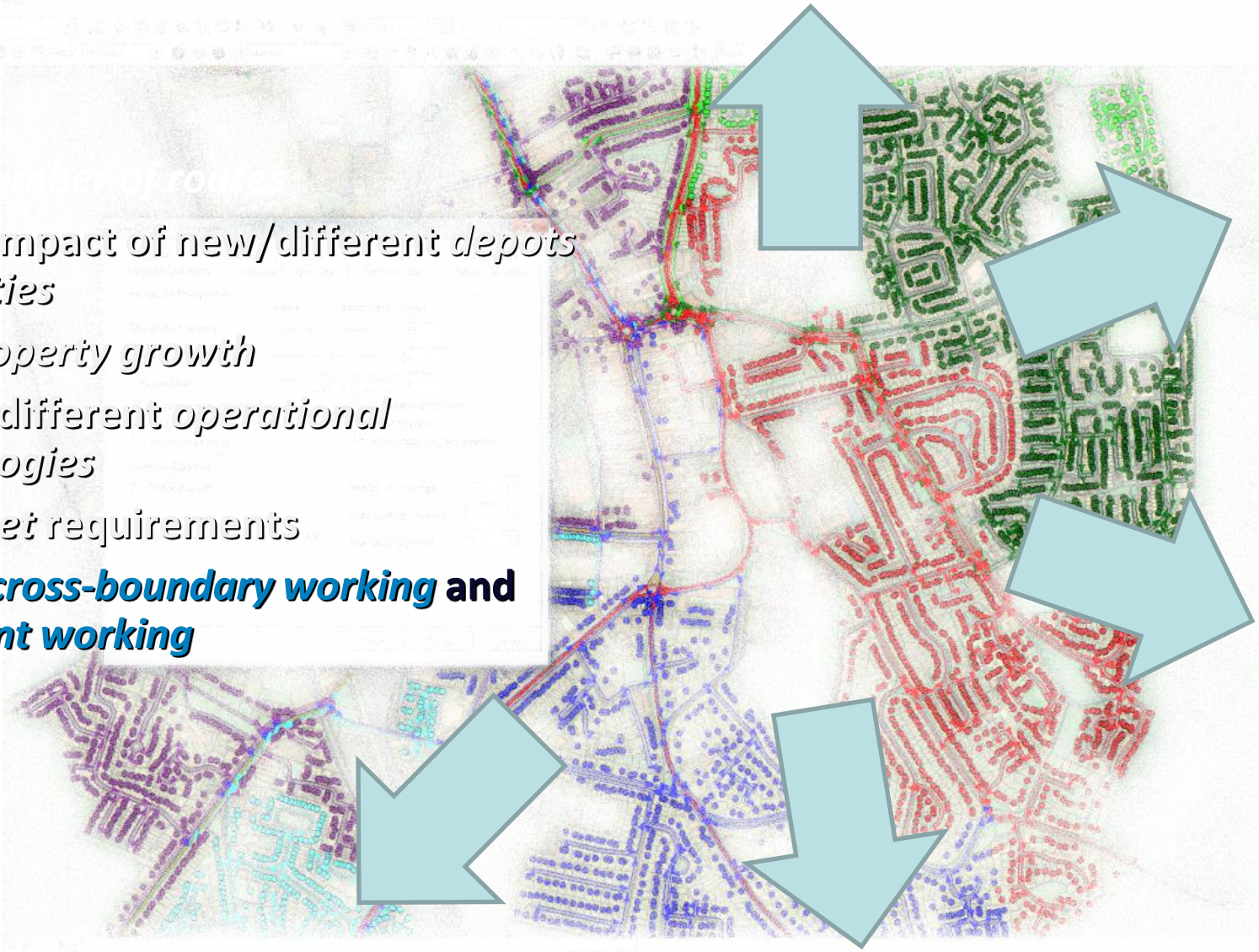
- **Define *fleet requirements***

RouteSmart

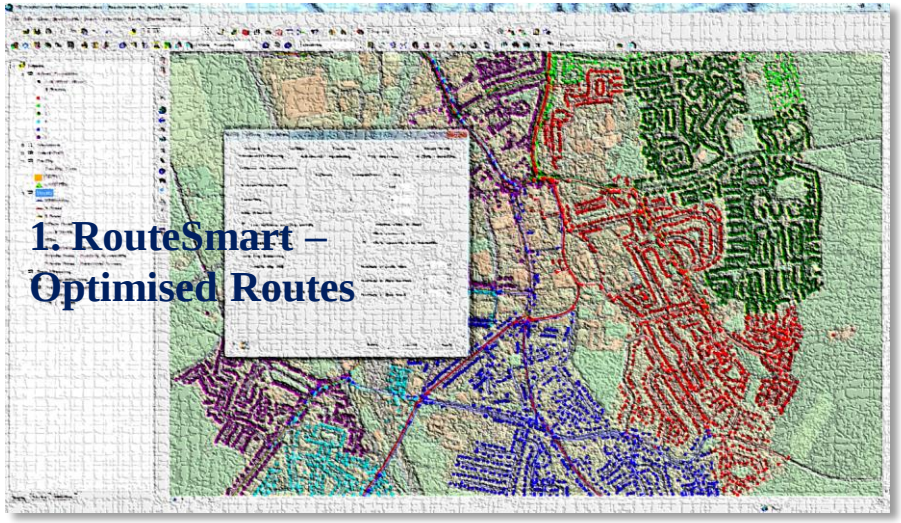
- Evaluate impact of new/different *depots and facilities*
- Model *property growth*
- Compare different *operational methodologies*
- Define *fleet* requirements
- **Evaluate *cross-boundary working* and model *joint working***



RouteSmart

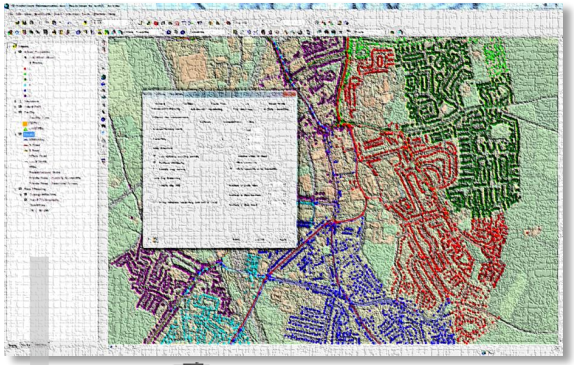
- Evaluate impact of new/different *depots and facilities*
- Model *property growth*
- Compare different *operational methodologies*
- Define *fleet* requirements
- Evaluate *cross-boundary working* and model *joint working*
- **Take account of *H&S issues***

The Integrated RouteSmart Solution

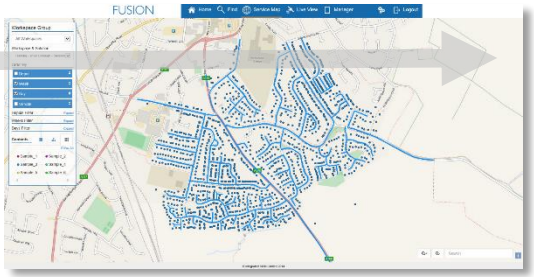


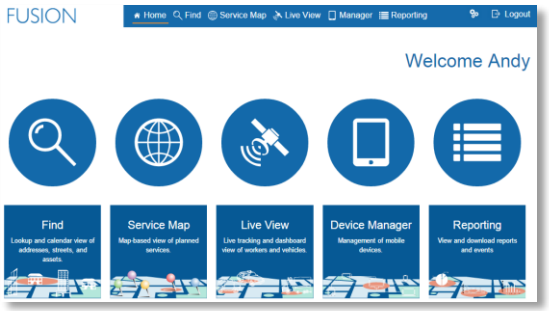
The RouteSmart Solution

RouteSmart Optimised Routes Designed



Routes previewed/ published to FUSION web-viewer, address look-up – unlimited internal use



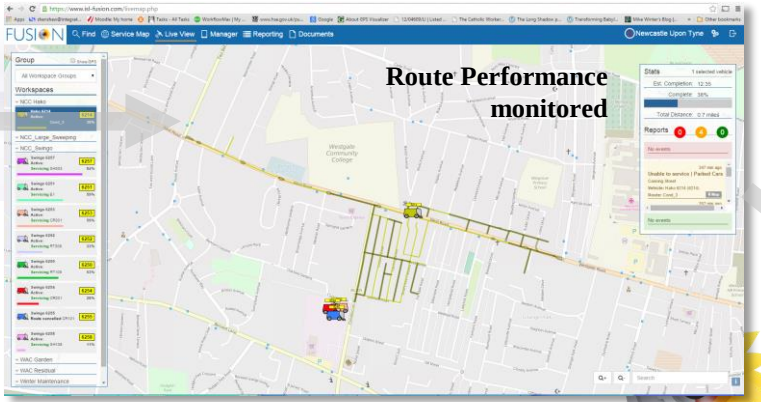


Routes exported to in-cab NAVIGATOR

- **Leads driver through the route**
- **Driver Reports**

"Bin not presented"
"Contaminated Waste"
(edit-able reports)

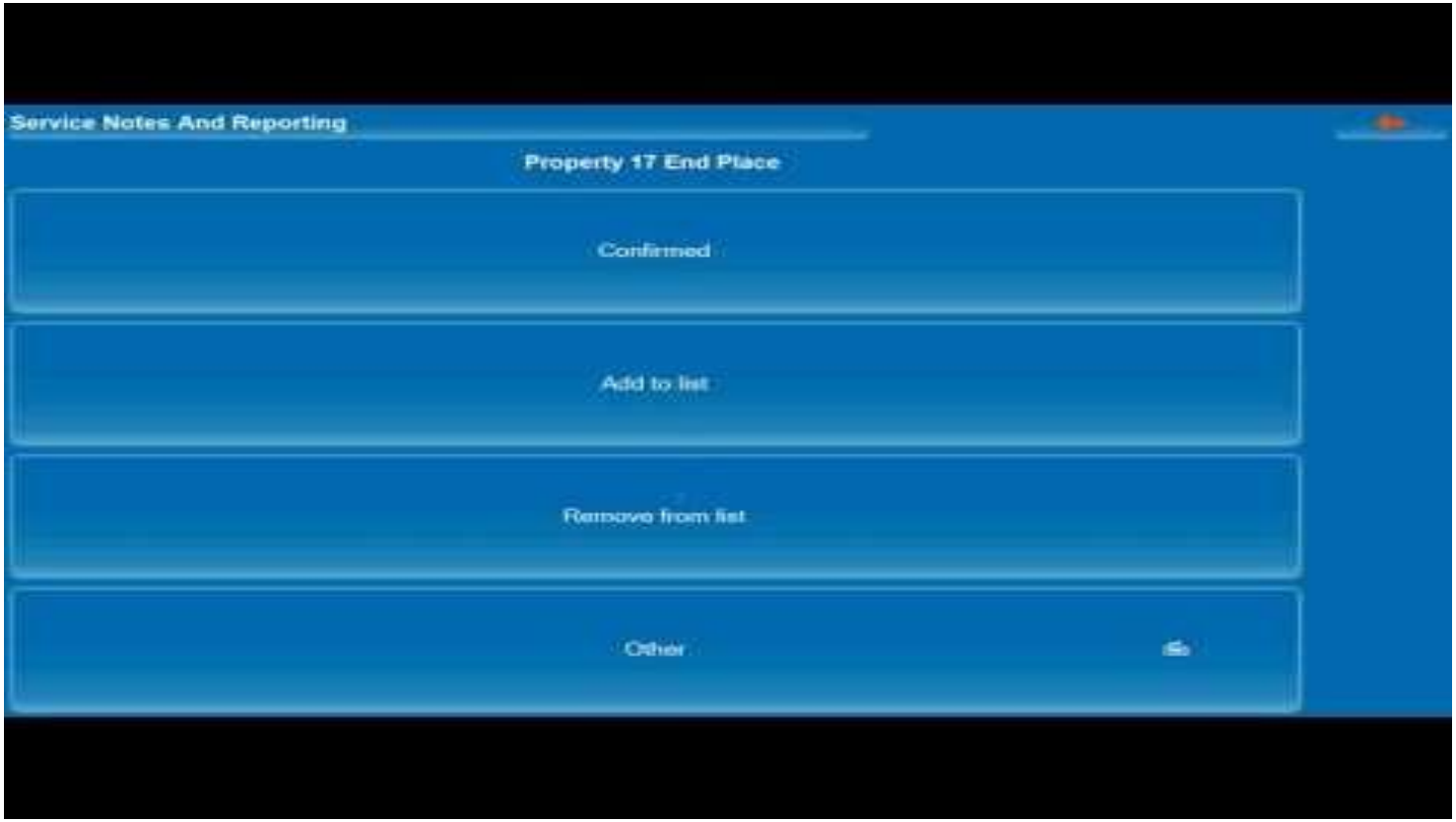
Public Access to Service Calendar via website or smartphone app



Route Performance monitored

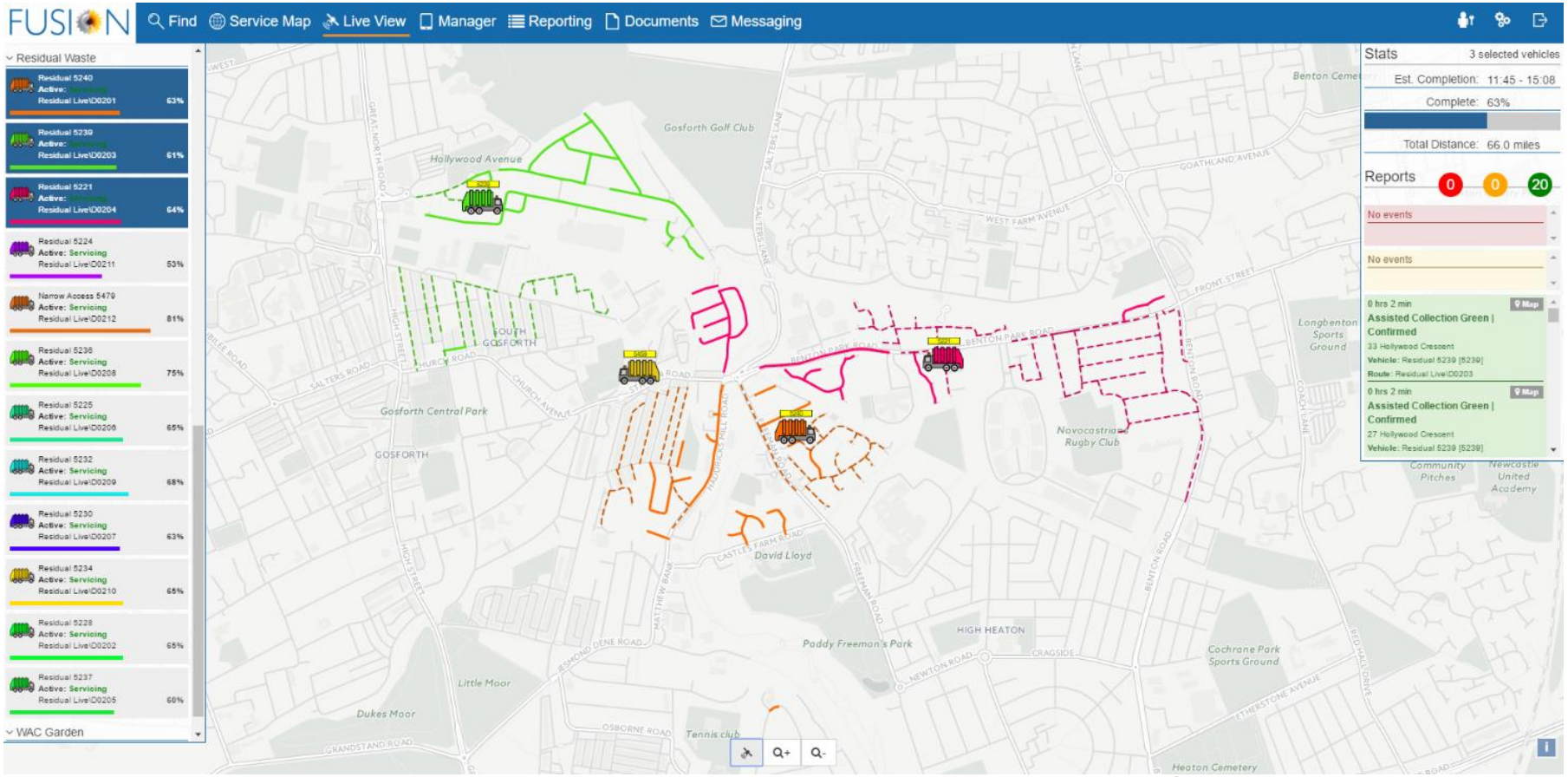
- **Reports and vehicle tracking to dashboard**
- **Managing by exception**
- **Locate missed collections**
- **Percentage completion**
- **Tracking data**

Driver reports visible to Call Centre via our API



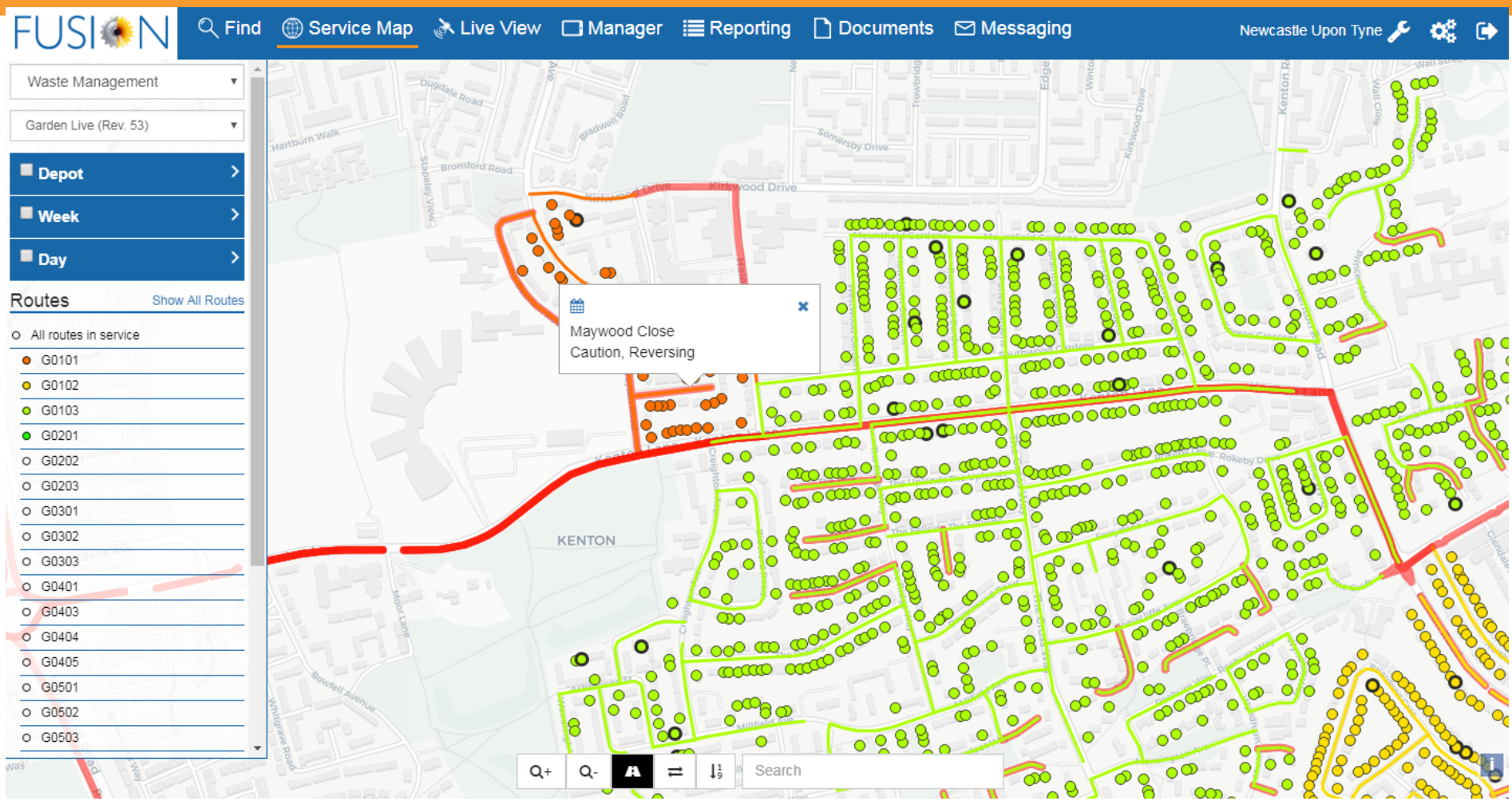
RouteSmart TECHNOLOGIES

FUSION: Live View



RouteSmart TECHNOLOGIES

FUSION: Service Map



RouteSmart TECHNOLOGIES

LEISURE | GOVERNMENT & BUSINESS

Ordnance Survey | GOVERNMENT & BUSINESS | BUSINESS PRODUCTS | Innovation | Resources | Log in

OS MASTERMAP HIGHWAYS NETWORK

Paths

OS MasterMap® Highways Network – Paths is the most complete, detailed, accurate and authoritative path network dataset for Great Britain. It reveals all the footpaths through towns and cities, and shows who's responsible for them.

Sample data | Support docs | Get data

OS MasterMap Highways Network – Paths gives you a better understanding of the connectivity to the citizen to the towns and cities around them. This will help to better understand the true time it takes for the citizen to access existing services and the new services they need in the community.

With OS MasterMap Highways Network – Paths data in your logistics business, you'll be able to make amore informed decision about which mode of transport would be best to deliver your package. It may not always be sensible to do this by road as the paths will give a better understanding of the whole navigable network and whether you can squeeze more deliveries into your day.

Roads aren't the only place you can bury your assets. OS MasterMap Highways Network – Paths give you another aspect to consider with information about the authoritative nature of a path and the obstruction you might encounter along the route. This data gives you another dimension to consider when deciding where to place your asset.

RouteSmart TECHNOLOGIES

Incorporating footpaths into Service routes

RouteSmart TECHNOLOGIES

Incorporating footpaths into Service routes

RouteSmart TECHNOLOGIES

Merging OSHW Streets & Pathways Data

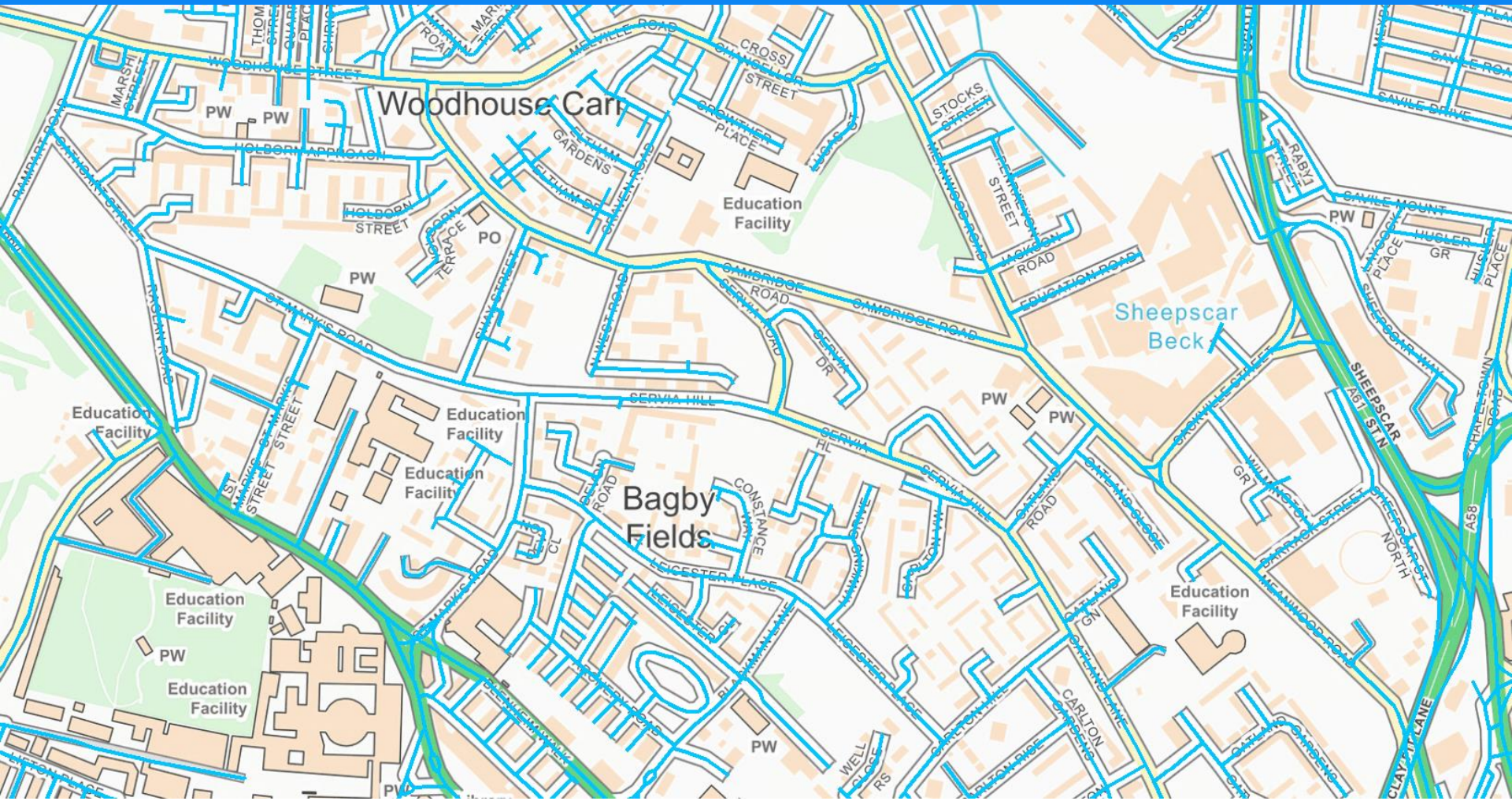
- Integrated Skills have created a custom dataset merging OSHW Streets and Pathways data into one single layer for the purpose of routing using RouteSmart for ArcGIS

- This will bring a new level of accuracy to the planning of services such as street sweeping, litter bin collections, weed spraying and postal services

- Previously clients have created custom pathways datasets to extend the coverage of ITN data but these were:
  - Very time consuming to digitise
  - Inaccurate
  - Not possible to update

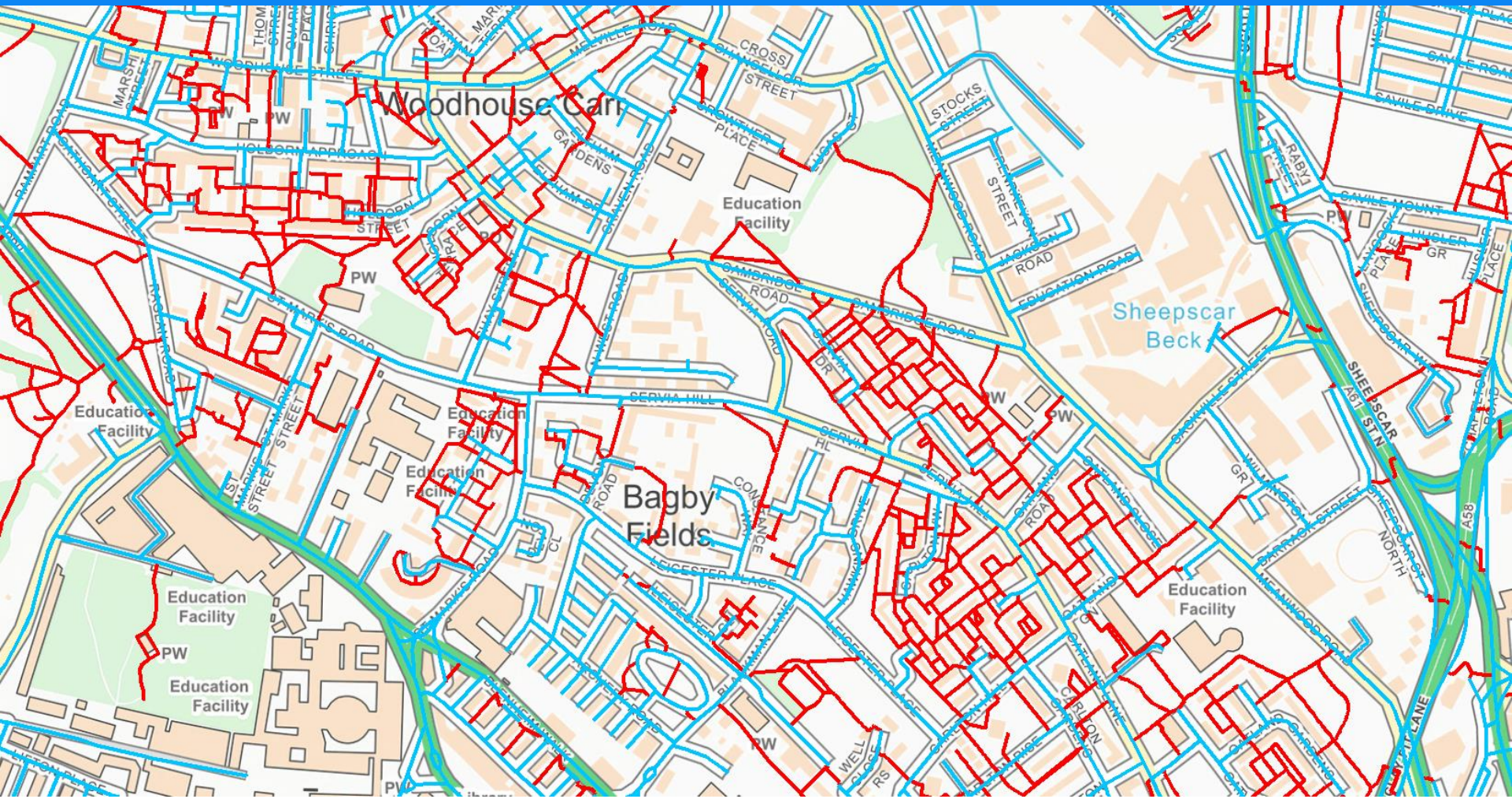
RouteSmart TECHNOLOGIES

OSHW Streets Data (only)



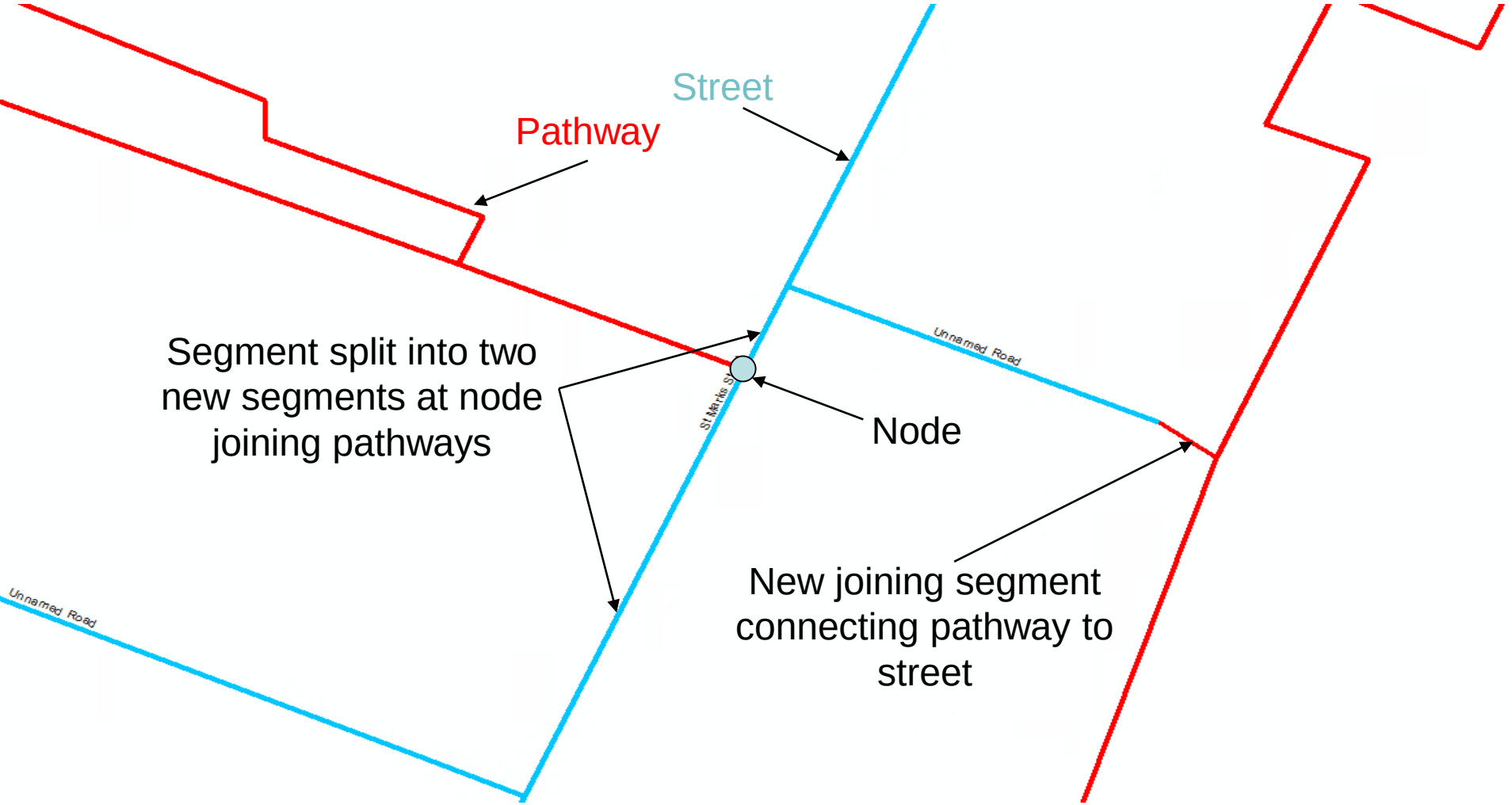
RouteSmart TECHNOLOGIES

Merged OSHW Streets and Pathways Data



RouteSmart TECHNOLOGIES

Splitting of Streets to linking to Pathways



RouteSmart TECHNOLOGIES

Technical Considerations

- Where streets were split to connect these to pathways, the two new streets created have been given unique IDs and updated geometries
    - The new streets also have an attribute linking them back to the original OS ID
- Built in network attributes (e.g. one-ways) have been maintained and accompanying turn exceptions data has been modified to take account of changes

RouteSmart TECHNOLOGIES

Conclusion

- OS Highways bring new data to waste management services
  - Road widths
  - Gradient to identify steep hills
  - Links to USRNs

- Integrated Skills has:
  - created an importer for this data for its software RouteSmart, Fusion and Navigator – adding value for our Clients
  - Created a bespoke merged network of highways and paths for use in many environmental services functions

RouteSmart TECHNOLOGIES

- Thank you

RouteSmart TECHNOLOGIES