JumpStart

Evidence Report

Solihull Metropolitan Borough Council

Introduction
Field Dynamics

Field Dynamics

Field Dynamics is a leading net zero data analytics consultancy – helping organisations make the most efficient move to net zero. To us, success is measured by the difference we can make through the carbon reductions we enable our clients to realise.

We perform advanced data science and spatial analysis, as well as creating bespoke modelling solutions. The analytical outputs from these solutions are used by our clients to make a direct, measurable impacts to their business. We're honoured to have had to opportunity to present this work to some of the largest change management consultancies in the world, and they've been fascinated by the huge difference we can make.

Our projects span both the public and private sector covering a range of clients, include leading management, strategy and transport consultancies, Distributed Network Operators (DNO's), Charge Point Operators, government departments and local authorities.

Field Dynamics has a 25-year heritage and pedigree in taking an innovative approach to solving complex operational problems, many of them geospatial in nature. The pioneering nature of our work has recently been recognised through a shortlisting for a National Award for "Data Project of the Year" as well as features in GreenFleet, Fleet News and Smart Transport.

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Report
Contents

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1.1	19/11/2021	Kathryn Spilsbury

Project Overview

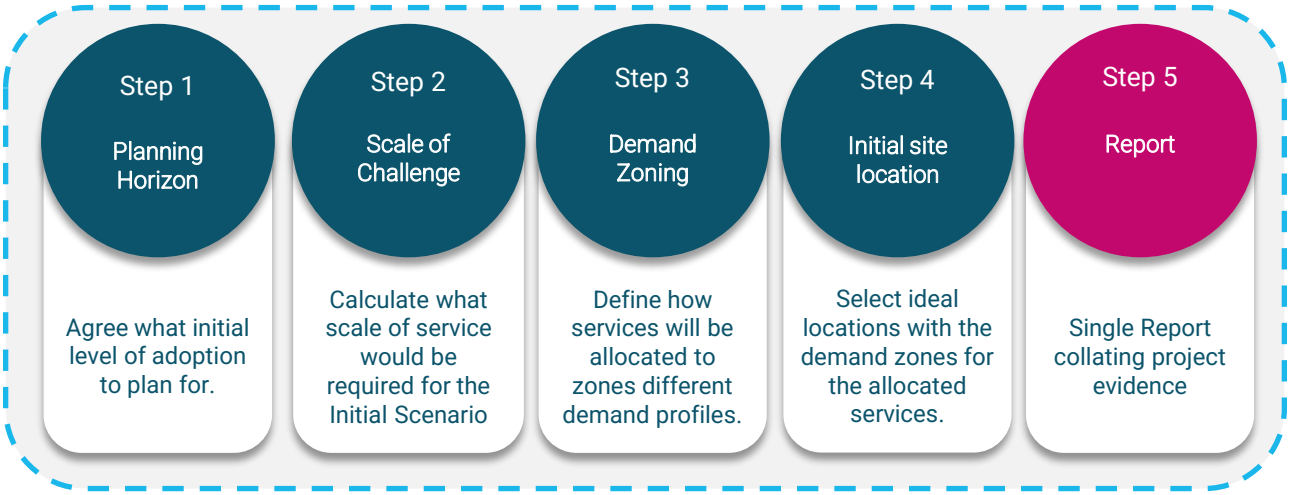
You currently face the very complex challenge of planning and delivering a large and sophisticated Electric Vehicle (EV) charging infrastructure to support the needs of your authority, but without detailed historic data to help plan with an established set of behaviours. This gap means that your strategies and policies will have to adapt rapidly to a fast evolving landscape and will be reliant on a robust evidence foundation to ensure these adaptations are delivered in a consistent and accurate manner.

It is this future proofed evidence foundation that JumpStart delivers. It is your detailed local knowledge and experience that then takes this foundation and defines the ultimate make up of your planning.

About JumpStart

JumpStart is a data driven, structured and proven approach that builds an evidence foundation specific to your needs. It progresses through a number of workshops where key national data sets are adapted around your the needs of your authority. The outputs are then combined and provided back to you in both summary and raw data formats so you can then use them for future analysis.

The programme stages are:



Outputs

The programme has 3 key output types:

1. Raw Data
Jumpstart generates a number of machine-readable data sets that can be used internally to support a wide range of planning requirements.

2. Decision Logs
The new granular insight that JumpStart delivers provides you with the opportunity to make a number of detailed in-flight decisions about how you develop your strategy. These have been recorded and you are able to revisit these to understand how minor changes in these judgments can impact the greater overall scenarios.

3. Interactive Scenarios
Our online service enables you to build scenarios based on the findings and interactively share and adapt these with a wide range of stakeholders.

Project Summary

Planning Horizon

Selected Adoption Curve: Future Energy Scenarios – Consumer Transformation

Planning Horizon:

Assumed current adoption rate	0.58%
Assumed current BEV fleet	1,270

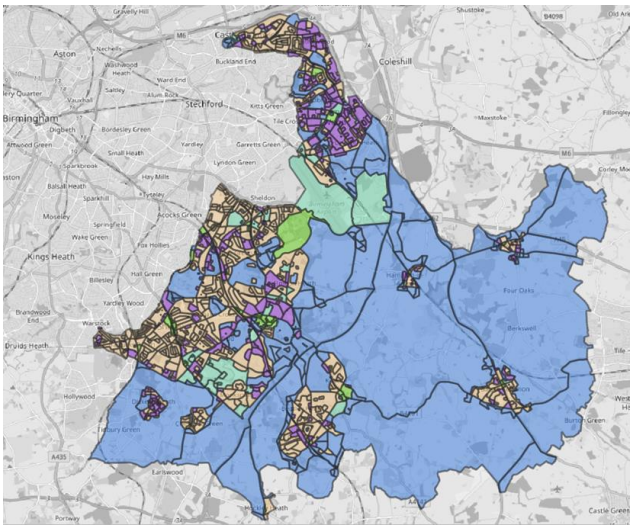
Planning Horizon year	2030
Predicted adoption ratio	37.93%
Predicted BEV fleet	45,164

Scale of Challenge – Predicted number of chargers

Persona Group	Bev Count	Nearby	Primary	Secondary
On-Street Business	1,410	609	6	28
On-Street Non-Business	9,738	333	26	220
Off-Street Business	4,593	0	6	9
Off-Street Non-Business	29,459	0	16	23
TOTALS	**45,199***	**942**	**53**	**280**

*For the sake of modelling input clarity, the modelled BEV count of 49,199 varies slightly from the Planning Horizon BEV count of 45,165

Demand Zoning



Zone Type	No.	On-Streets Households
Public Need	102	15,740
Off-Street	101	2,939
Commercial	15	1,851
Visitor	19	24
Low Density	52	291

Step 1
Planning Horizon

Overview

A Planning Horizon provides the organisation with a point in time and size of Battery Electric Vehicle (BEV) fleet to plan for. It is established by selecting an adoption curve and a date along that curve from which an adoption rate can be read, and expected BEV fleet size predicted.

The Planning Horizon provides the organisations with a number of benefits including:

- A common goal to focus on
- A common forecast for multiple projects
- A substantive research point to aid stakeholder management
- A reference point to compare evolving behaviours

Process

1. Review the currently available BEV adoption curves against a number of criteria and select the curve that best fit the needs and opinions of the organisation.
2. Use the selected curve to define a time horizon that balances being close enough to be relevant and far enough out to guide a broader strategy. This time horizon gives a predicted BEV adoption ratio from the curve.
3. Review the available data on current BEV adoption and select a rate that most made sense for the area.
4. Combine this current BEV fleet size and the Planning Horizon data to derive a Planning Horizon predicted BEV fleet size.

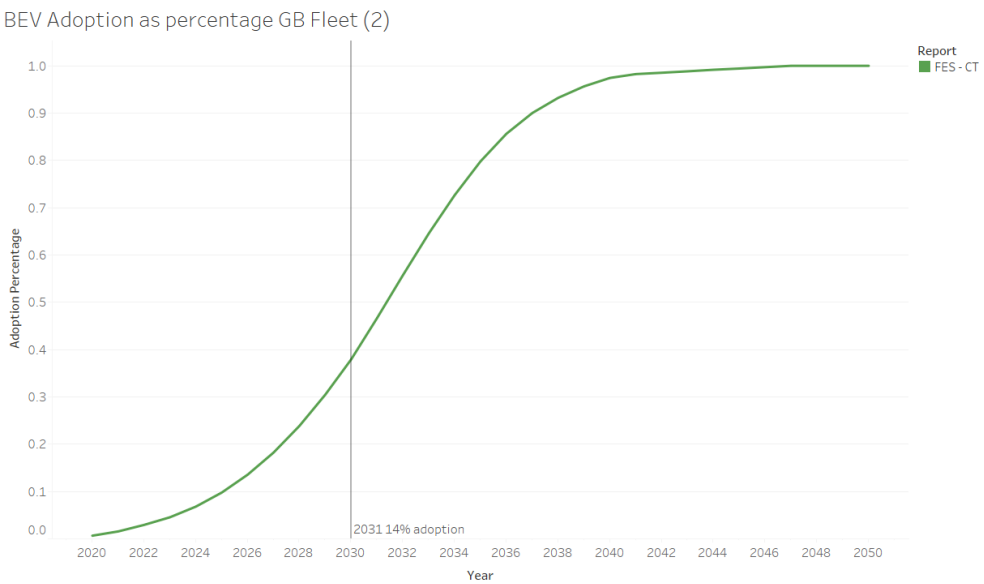
Assumed current adoption rate	0.58%
Assumed current BEV fleet	1,260

Summary Data and Findings

Planning Horizon year	2030
Predicted adoption ratio	37.93%
Predicted BEV fleet	45,164

Selected Adoption Curve:
National Grid: Future Energy Scenarios – Consumer Transformation

The FES – CT curve was chosen by Solihull as the most closely aligned to their proactive EV strategy .
https://www.nationalgrideso.com/document/199871/download



The trend of sum of Adoption Percentage for Year. Color shows details about Report. The view is filtered on Report, which keeps FES - CT.

Step 2
Scale of Challenge

Overview

Having establish a predicted BEV fleet size, the next step in JumpStart is to understand the size of the public charging infrastructure required to support that fleet.

Without mainstream adoption, it is impossible to accurately predict the shape of future infrastructure but it is possible to shape a Scale of Challenge. This Scale of Challenge will provide perspective and context for short to medium term investment decisions.

The Scale of Challenge model is not "Black Box" but you will understand the assumptions in the model, and you will be able to use the model going forward to reshape the forecast as mainstream behaviour becomes more apparent.

Process

1. Create and edit the personas of 8 different future BEV drivers. Review each persona and assume the charging behaviour most appropriate for each persona.

2. With the personas in place assume a percentage adoption against each persona and flex this until the final count of BEVs approximates to the Planning Horizon prediction.

3. Model a total number of connectors by connector type grouped by purpose:

- Nearby – A connector that is in walking distance of the household
- Primary – A connector that is visited for the primary purpose of charging
- Secondary – A connector that is visited for some other primary purpose, charging is a secondary purpose

Summary Data and Findings

Persona Group	Bev Count	Nearby	Primary	Secondary
On-Street Business	1,410	609	6	28
On-Street Non-Business	9,738	333	26	220
Off-Street Business	4,593	0	6	9
Off-Street Non-Business	29,459	0	16	23
TOTALS	**45,199***	**942**	**53**	**280**

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Step 3

Demand Zoning

Overview

Residents that have off-street parking and can install a home charger will be far less reliant on any public chargers than those that cannot. Therefore, it makes sense to zone a region based on need and access. Demand zoning does this and splits the region into 5 types of zone.

Evidence based zoning enables the authority to prioritise investment based on clear robust data and evidence those decisions clearly to various stakeholders.

The zoning identifies the location of different demand profiles but acknowledges that supply may be sited outside of these zones.

Process

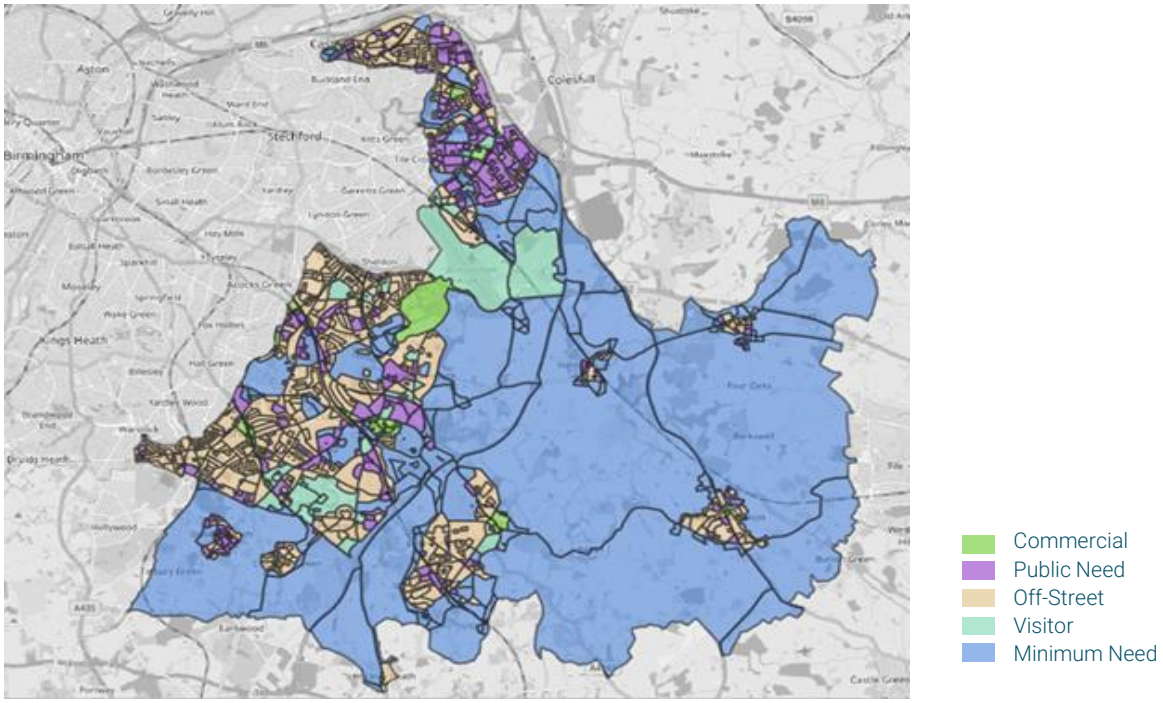
Field Dynamics creates an Initial Iteration of zones based on its unique household dataset. The zones are:

1. Public Need – These zones have a high level of residents who will be reliant on public charging
2. Off-Street – These zones have a high level of residents who will be able to charge at home
3. Commercial – Zones where residents will be able to rely on commercially provided chargers
4. Visitor – Zones where non-residents will make a up a high level of charging
5. Low Density – Zones where there is a minimum need for public charging

Workshop to agree the definitions of the zones in terms of focus and prioritization and use local knowledge to adjust the boundaries so that they match local needs.

This created a new set of boundaries and visualisations that you could then take internally to review and adjust.

Summary Data and Findings



Zone Type	No	# On-Streets
Public Need	102	15,740
Off-Street	101	2,939
Commercial	15	1,851
Visitor	19	24
Low Density	52	291

Step 4

Site Location

Overview

If the ideal location of a charger is known, then the impact of the other factors that influence a location, such as connection cost and street design, that might move the final location away from the ideal can be better understood.

Stages 1-3 have defined how many chargers of what type should serve each zone, what this stage does is create the ideal locations within each zone.

These ideal locations can then be used during the project stage to first direct site location and then understand the location compromises as local and operational factors are understood.

Process

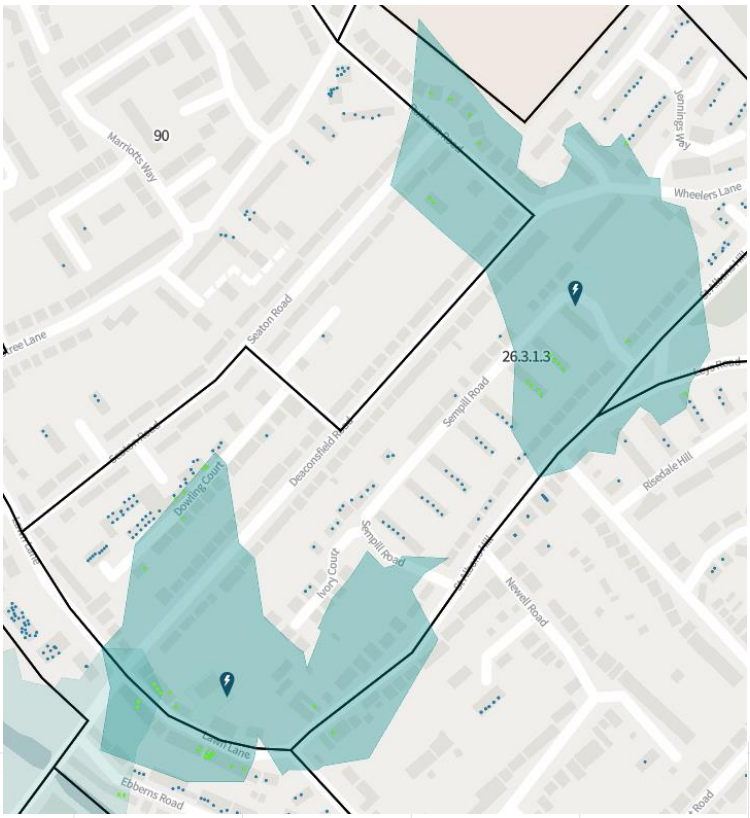
1. Transfer the Zoning data to the CatchmentModeller service to view and understand each zone in detail.

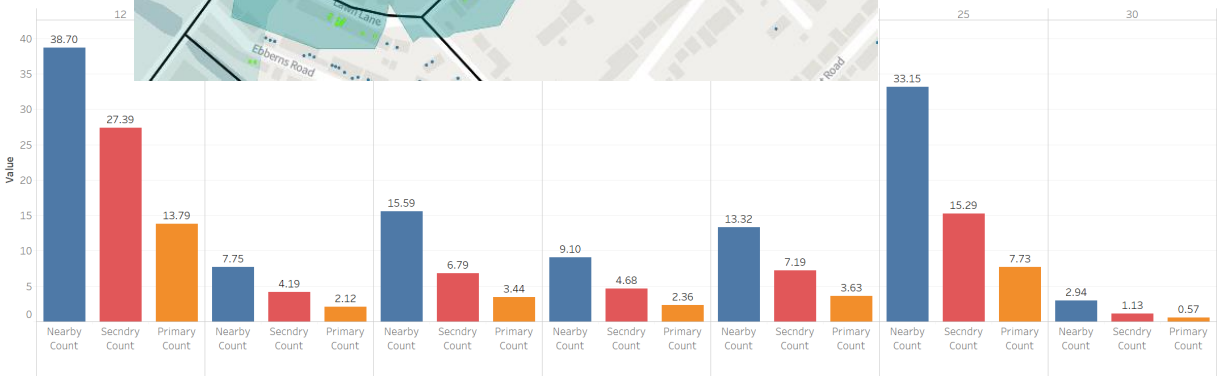
2. Work zone by zone to create multiple scenarios of charger placements to create an Initial Charging Scenario Iteration.

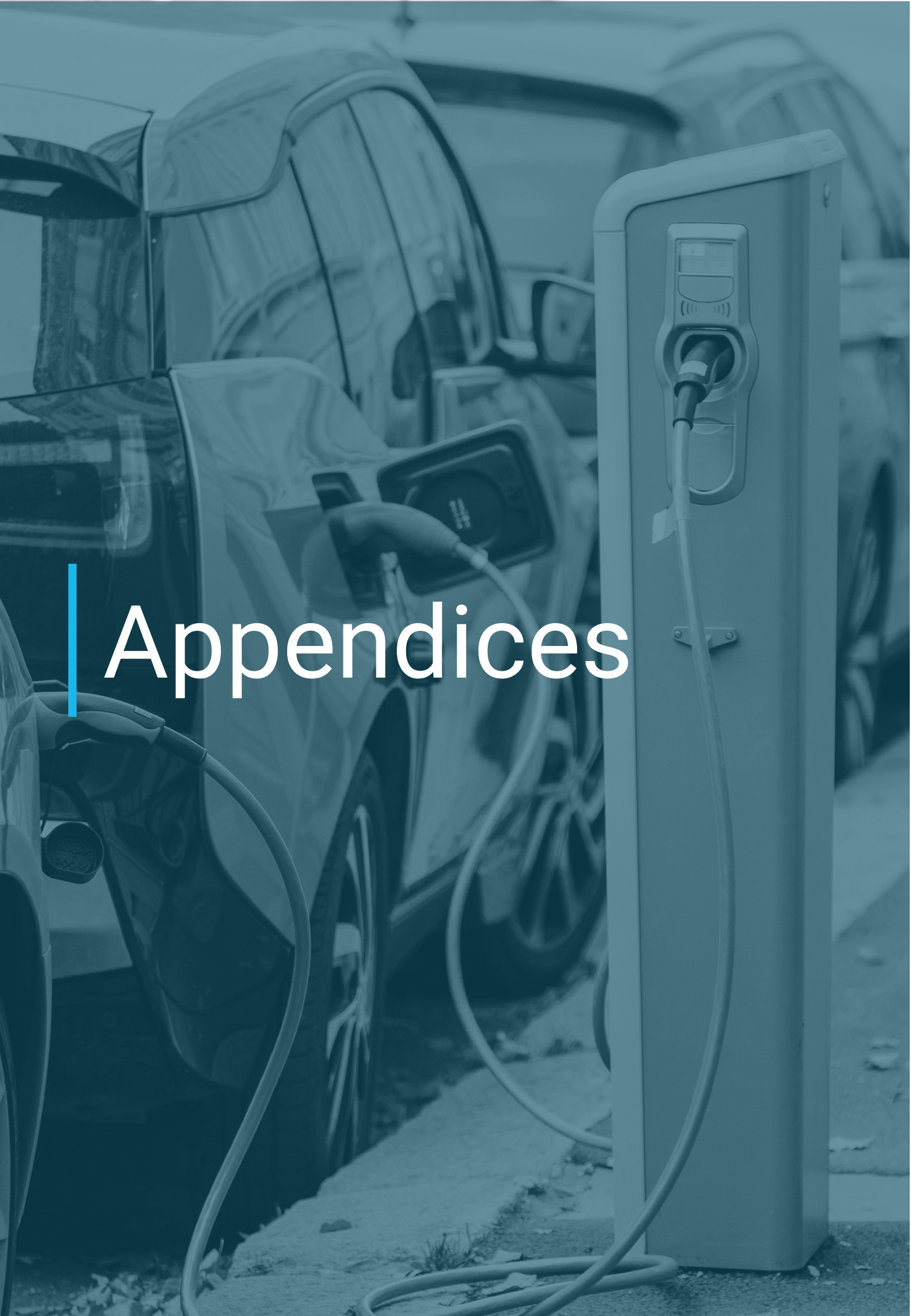
3. Share these scenarios with different stakeholders and edit as appropriate taking into account stakeholder needs using your account for CatchmentModeller to create a finalised set of scenarios.

4. Download these scenarios in GIS, image and CSV file so that you can use them for your operational projects.

Summary Data and Findings

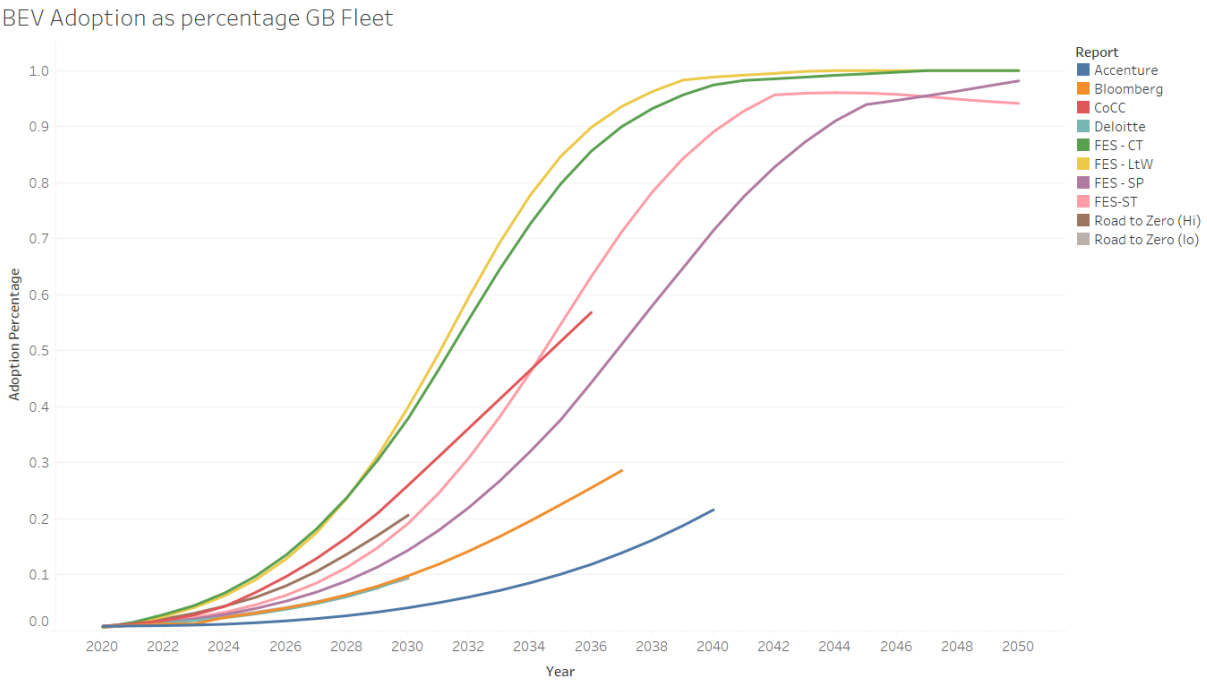






Appendices

Appendix 1
Potential Adoption Curves



The trend of sum of Adoption Percentage for Year. Color shows details about Report. The view is filtered on Report, which keeps 10 of 10 members.

Appendix 2
Adoption Curve Descriptions

Below is a summary of the publicly available adoption curves.

Publisher	Period	Region	Drivetrain	Vehicle Types	Review
Deloitte	2020-2030	Europe	PHEV and BEV	Car and Van	Occasional
Accenture	2019-2040	UK	BEV	Cars	Occasional
BloomberNEF	2020-2040	Europe	PHEV and BEV	Cars	Recurrent
CoCC	2020-2035	UK	BEV	Cars	Occasional Recurrent
DfT Road to Zero	2018-2030	UK	ULEV	Cars	One-off
National Grid Future Energy Scenarios	2020-2050	UK	BEV	Cars and Vans	Recurrent

The national Grid Future Energy Scenarios (FES) include 4 scenarios

Leading the Way	Consumer Transformation	System Transformation	Steady Progress
• Fastest credible decarbonisation • Significant lifestyle change • Mixture of hydrogen and electrification for heating	• Electrified heating • Consumers willing to change behaviour • High energy efficiency • Demand side flexibility	• Hydrogen for heating • Consumers less inclined to change behaviour • Lower energy efficiency • Supply side flexibility	• Slowest credible decarbonisation • Minimal behaviour change • Decarbonisation in power and transport but not heat

Appendix 3
Personas and Profiles

Profile	Descriptions
On Street Business Miles #1	A sales person who travels a lot outside of the area but returns home at the same time
On Street Business Miles #2	A local trades person with a van, who carries out many miles within the area
On Street Personal Miles #1	A driver who charges primarily at a nearby charger
On Street Personal Miles #2	A driver who charges primarily at a secondary detination
Off Street Business Miles #1	A sales person who travels a lot outside of the area but returns home at the same time
Off Street Business Miles #2	A local trades person with a van, who carries out many miles within the area
Off Street Personal Miles#1	An office worker who commutes out of the area, with no work based charging
Off Street Personal Miles #2	A retiree who goes to different locations or a parent who goes to multiple events

	On-Street Parking				Off-Street Parking			
	Business Miles		Personal Miles		Business Miles		Personal Miles	
	Persona 1	Persona 2	Persona 1	Persona 2	Persona 1	Persona 2	Persona 1	Persona 2
What percentage of this group do they make up?	50%	50%	33%	67%	50%	50%	50%	50%
NEARBY								
How many overnight charging sessions do they do per **week**?	3	3						
How many charging sessions do they do a **month**?			4.00	0.50				
What percentage of Business focussed connectors can be used?			50%	95%				
DESTINATION								
How many Primary destination charging sessions will they complete per **month**?	1.00	0.50	0.50	0.50	0.25	0.25	0.10	0.10
How many Secondary destination charging sessions will they complete per **month**?	1.00	4.00	0.50	4.00	0.25	0.25	0.10	0.10

Populations and Adoption Rates	
Adoption Horizon number of EVs	Modelled number of Evs
45,165	45,199
Assumed Adoption ratios by Persona	
On-Street business driver #1	30%
On-Street business driver #2	30%
On-Street non-business driver #1	34%
On-Street non-business driver #2	34%
Off-street business driver #1	38%
Off-street business driver #2	38%
Off-Street non-business driver #1	40%
Off-Street non-business driver #2	40%

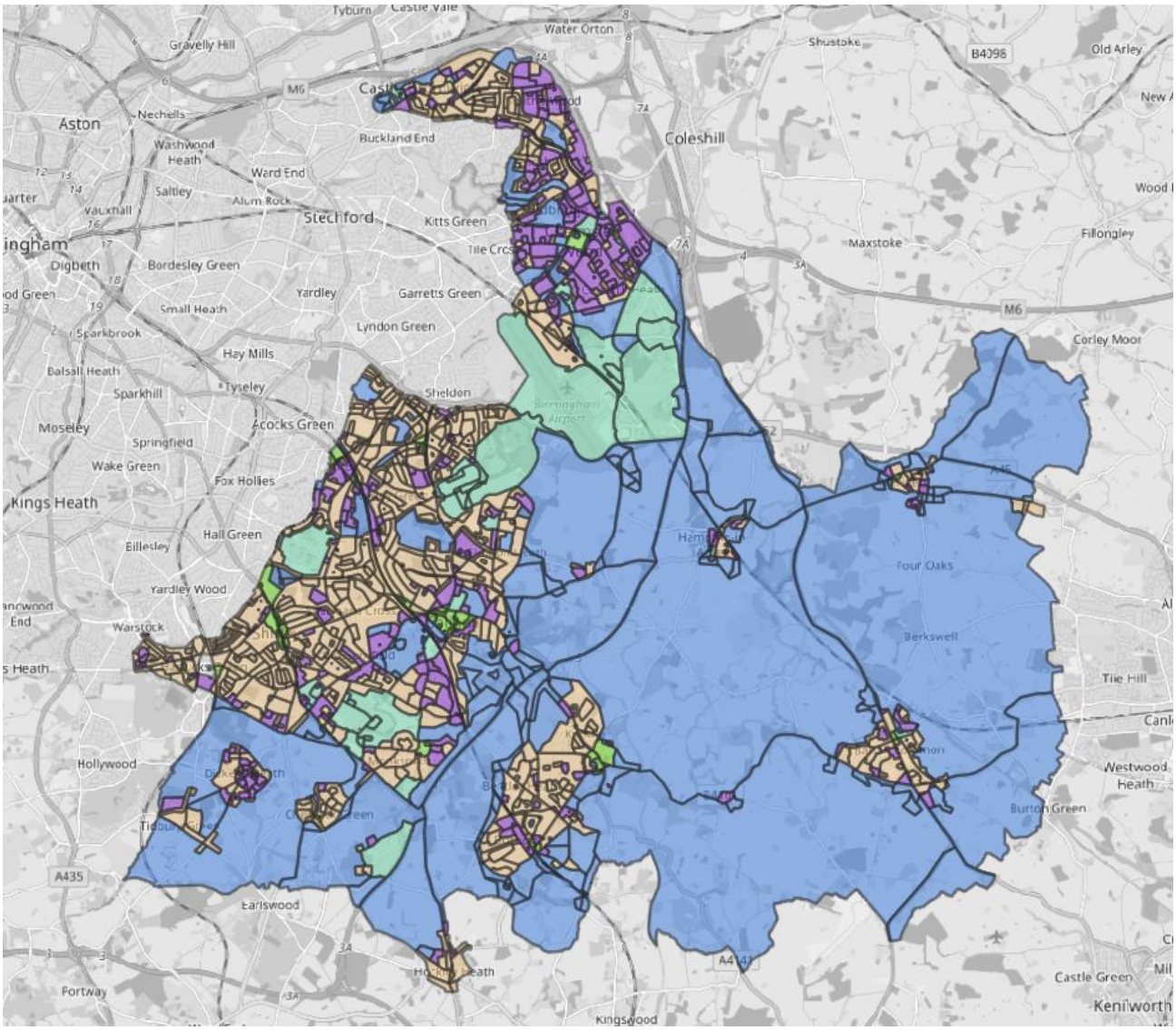
Appendix 4
Adoption Ratios and Connector Counts

Adopted EV Counts	
On-Street business driver	1,410
On-Street non-business driver	9,738
Off-street business driver	4,593
Off-Street non-business driver	29,459
TOTAL	45,199

Households	
On-Street	11,148
Off Street 1	4,593
Off Street 2	29,459
TOTAL	45,199

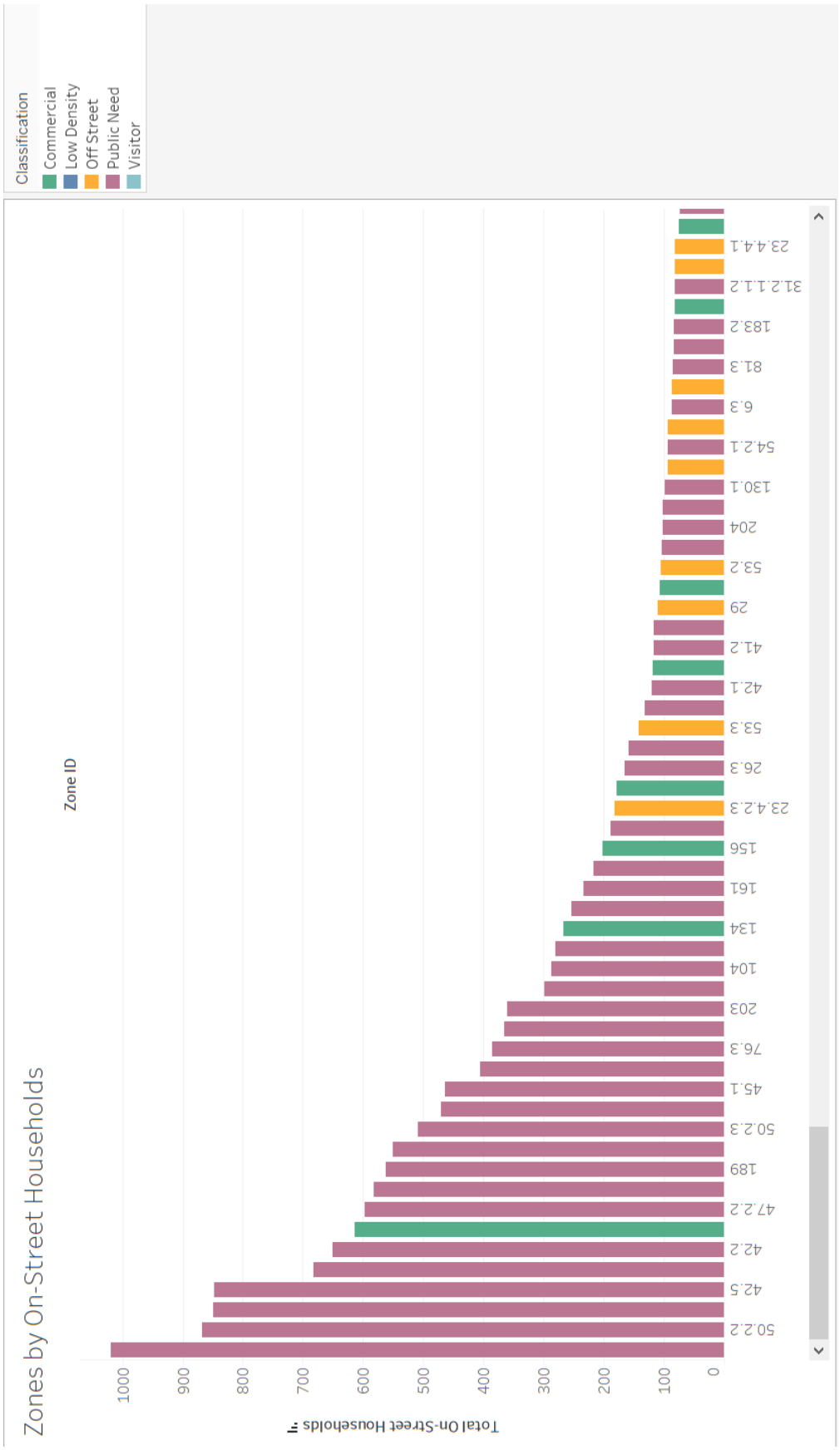
Connector Count Summary			
	Nearby	1ry Destination	2nry Destination
On-Street business driver	609	6	28
On-Street non-business driver	333	26	220
Off-Street non-business driver	0	6	9
Off-street business driver	0	16	23
TOTAL	942	53	280

Appendix 6
First Edit Map



- Commercial
- Public Need
- Off-Street
- Visitor
- Minimum Need

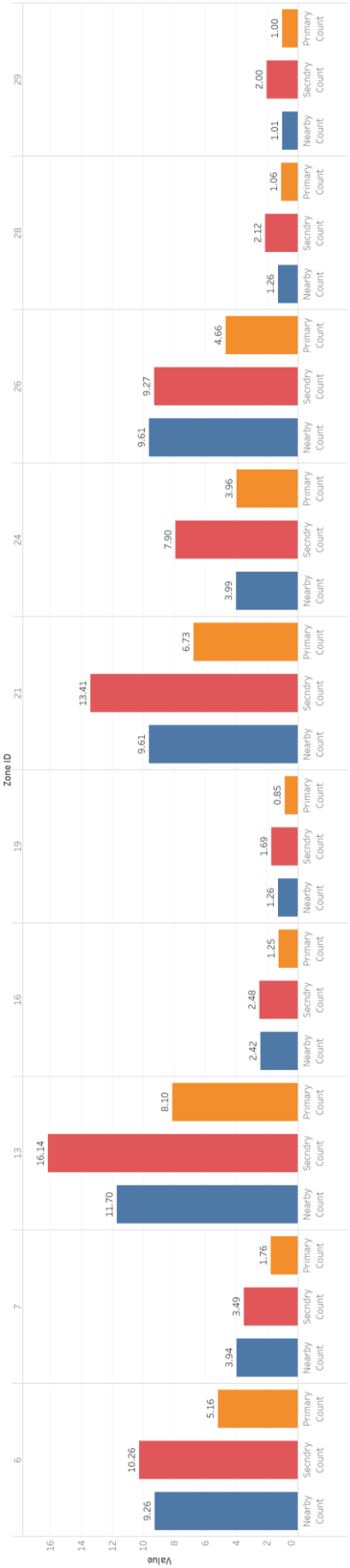
Appendix 7
Zones by On-Street Household



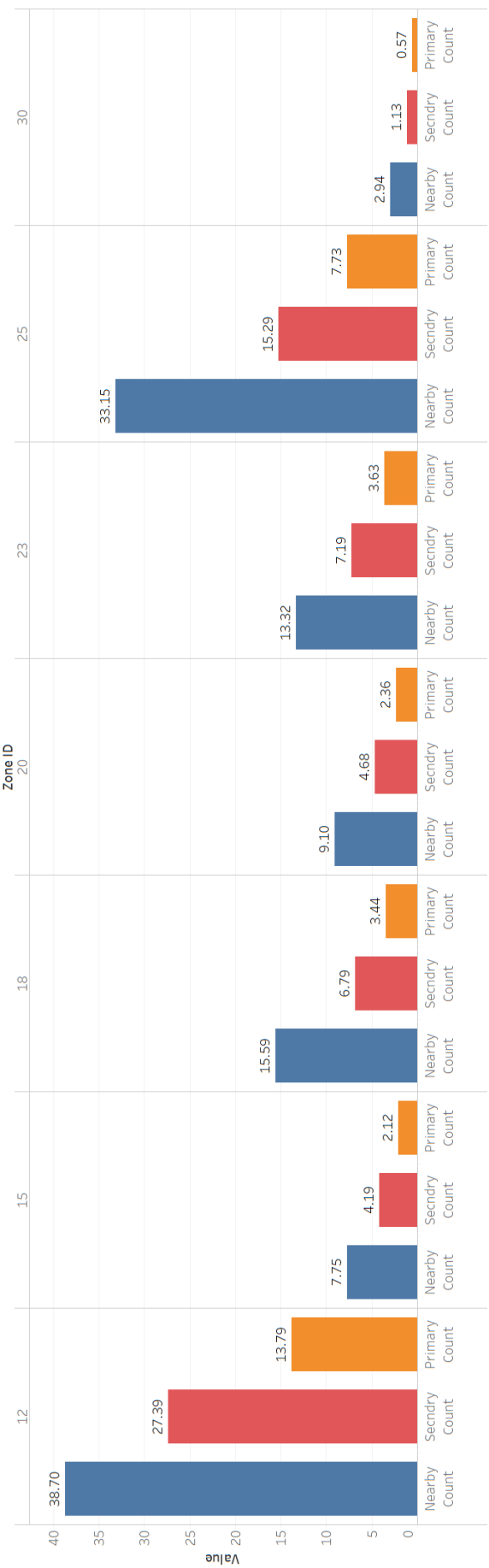
Zones by On-Street Household

Appendix 11
Connectors by Zone – Public Need and Off Street

Off-Street

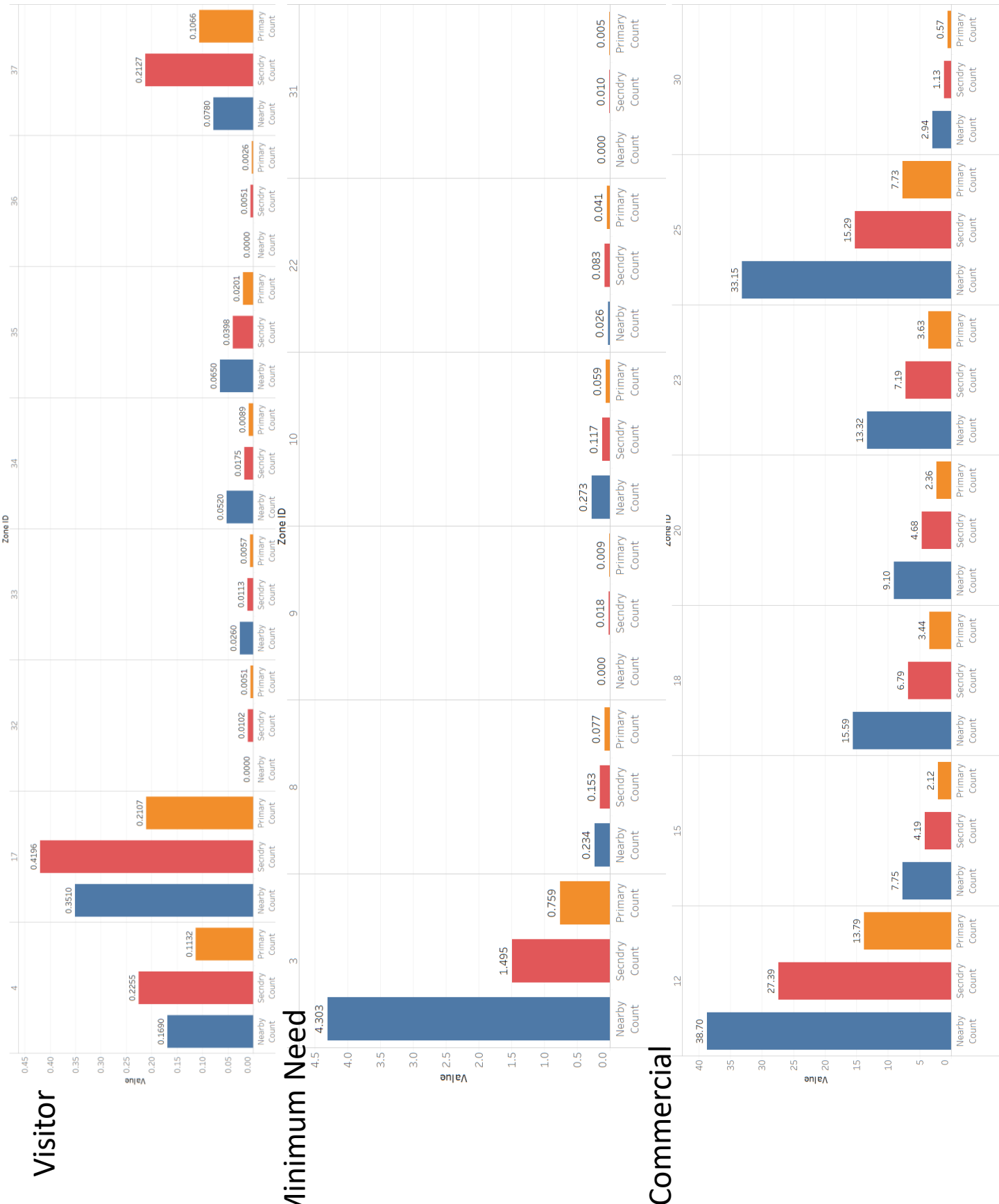


Public Need



Appendix 12

Connectors by Zone – Commercial, Visitor and Minimum Need



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