Data-driven fleet planning tools for cost saving and decarbonisation

ZERO | TYRE ANALYTICS | AERO ANALYTICS | PRECISION TRIAL ANALYTICS

Fleet Decarbonisation & Transition to EV's

Agenda:

- Introduction to Dynamon's Planning Software, ZERO:
  Discover how ZERO can help model your fleet's transition to EVs, ensuring optimal vehicle mix and load requirements aligned with grid capacity.
- EV Transition Test:
  Learn about this essential assessment tool and its application in evaluating your fleet's readiness for EV integration.
- Driving Fleet-Related Transition & Decarbonisation Plans:
  Explore various options for councils.
- Collaboration and Best Practices:

What do Local Authorities need to consider ?

How to deliver a environmentally sustainable, efficient, low cost Transport & Fleet solution

- Size and type of fleets – Usually large with a mix of LCV's, HCV's and Components
- Identify which vehicles that are suitable for replacement with alternative fuelled vehicles (EVs) and by when (future 10-year decarbonisation roadmap)
- Formulate a Procurement strategy recognising the ZEV mandate, operational needs, vehicle class lifecycles and whole life costs.
- Install chargepoints at council depots and review the options for optimum EV charging.
- Address local air pollution by reducing Greenhouse gas emissions and realise energy efficient targets

Programme / Project Structure

Fleet Electrification Programme

Key Business Stakeholders

Fleet	Operations	Drivers	Energy	Facilities	IT
					

Scope – time, cost (CAPEX), quality

Business Case Strategy

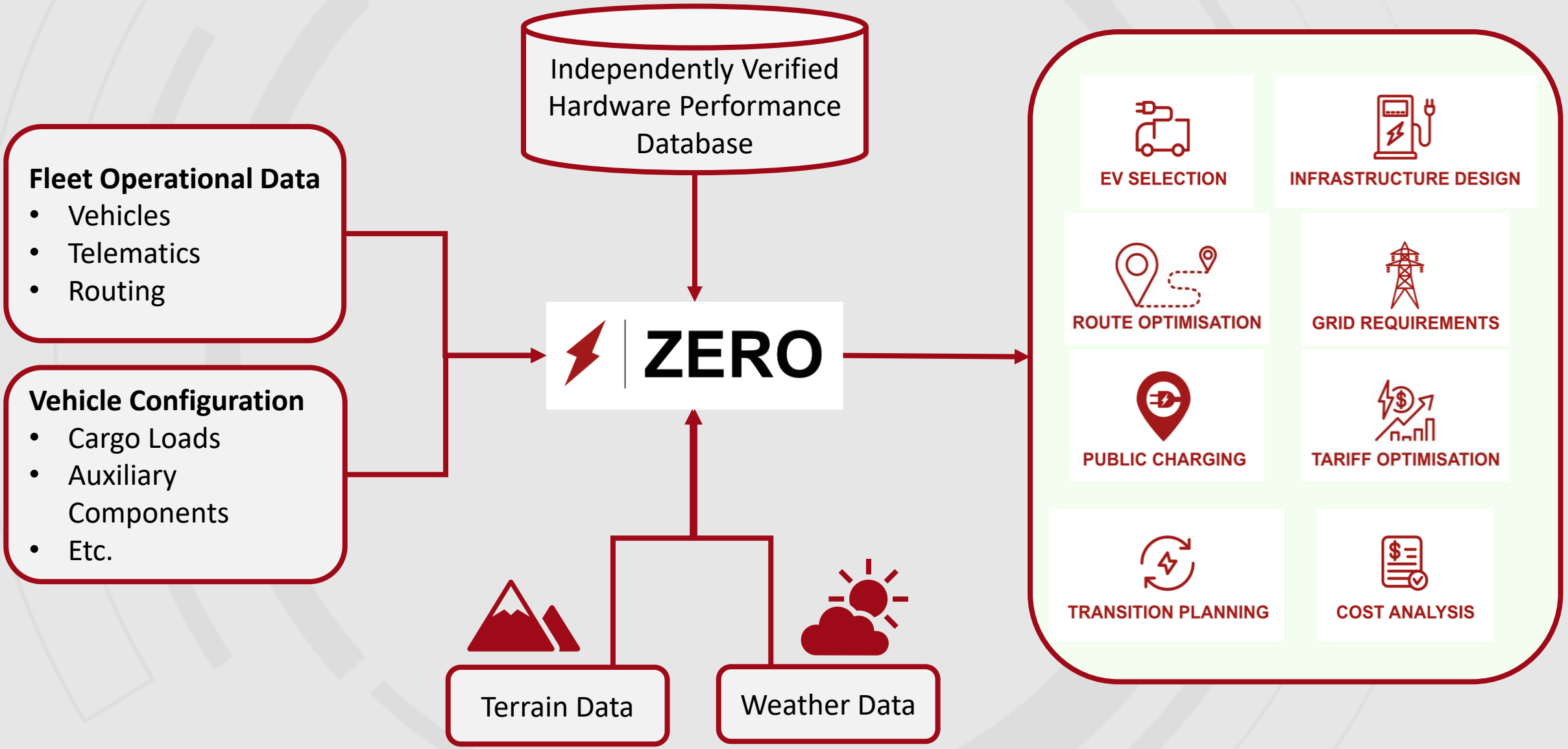
Scope – what, when, how

Introducing **Zero**

- Forecasts performance of Electric Vehicles and charging infrastructure across all fleet departments and depots.
- Provides high-value insights for strategy, planning, procurement and operations.
- Uses advanced simulation, data analytics technology and our proprietary EV performance database.
- Integrates with real-world telematics to make sense of in-life data, enabling better fleet management decision-making.
- Provided as a Software-as-a-Service tool, scaled through Cloud-based infrastructure.

"The transition to electric is very exciting and full of possibilities. But for too many fleets, it also comes with uncertainty. At Dynamon, we create certainty, helping them get it right, first time."
Dr Angus Webb

Introducing **ZERO**



What is simulation?

- Mathematical computer programs that imitate real-world systems or processes.
- Allow users to experiment with different variables and scenarios to see how they might affect the outcome.

Flight Simulators	Vehicle Simulators	Race Simulators
Biological Simulators	Environmental Simulators	Computer Games

Government Projects

eFREIGHT 2030

- As a key member of the eFREIGHT 2030 consortium, Dynamon will collaborate with major industry players to support the deployment of 100 electric HGVs and 32 new charging locations.
- ZERO software will be used for modelling and optimising the integration electric HGVs into fleet operations

ZENFreight

Accelerating Decarbonisation of HGVs

- Dynamon is leading the ZENFreight consortium, spearheading efforts to accelerate the adoption of electric heavy goods vehicles (HGVs).
- The consortium includes leading truck manufacturers, an academic partner, fleet operators and an energy company, working together to decarbonise HGVs

Zemo Partnership

Accelerating Transport to Zero Emissions

- Accelerating Transport to ZERO emissions
- Working across sectors such as Buses & Coaches, Cars, Commercial Vehicles, Energy Infrastructure, Collaborative Interests
- Connects members with access and insights into government policy and technical developments.

Fleet Electrification Programme

How can we support you ?

Zero - Data Loading, Simulation & Analytics

Data Loading

Fleet
Load Vehicles, Locations & Classes

Telematics
Load Driving data, Journeys (or create Synthetics)

Route Classifier
Create Journeys and duty cycles

Simulate

Assign ICE to EV
Model & Battery Options

Energy Model
Calculate Energy Consumption by vehicle

Analytics

Depot Infrastructure
Calculate Depot Charger Config & Grid Requirements

Plan / TCO Model
Calculate the Plan / TCO & Emissions for each Vehicle Type / Class

Delivery Phase – Plan – Time, Cost & Quality

ZERO **Zero Data Analytics**

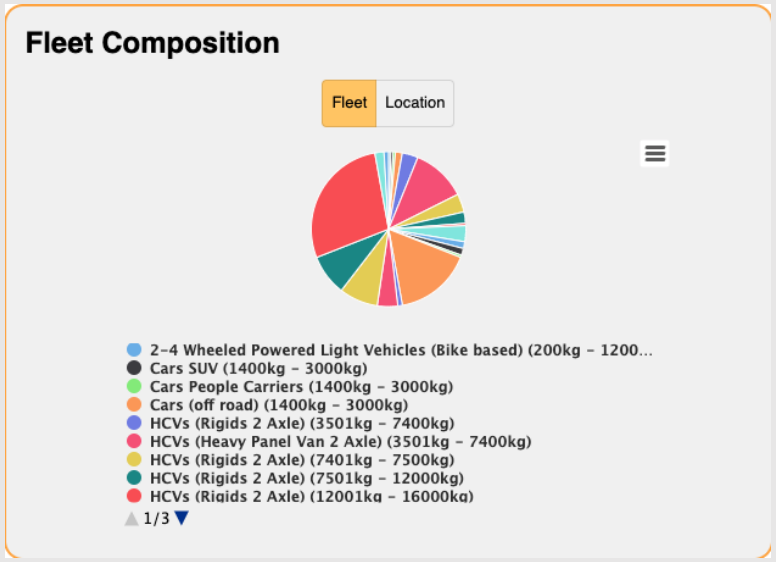
Vehicles	Journeys	Infrastructure	Drivers
Fleet Utilisation, EV Optimisation Review	Ops Journey Duty Cycle Plan	Costs, Charging Infrastructure Software, Plan	Engagement / Awareness
Fleet Decarbonisation Plan (10yr)			
TCO			
Business Intelligence Monitors			
Downtime, Locations, Shifts	EV Duty Cycle Optimisation	Fully Integrated Depot, Home On Road	Training, Behaviour, Payments
EV Procurement, Movements			
By Vehicle Class			
Monitors CAPEX, Opex Co2, NoX, Pm's			

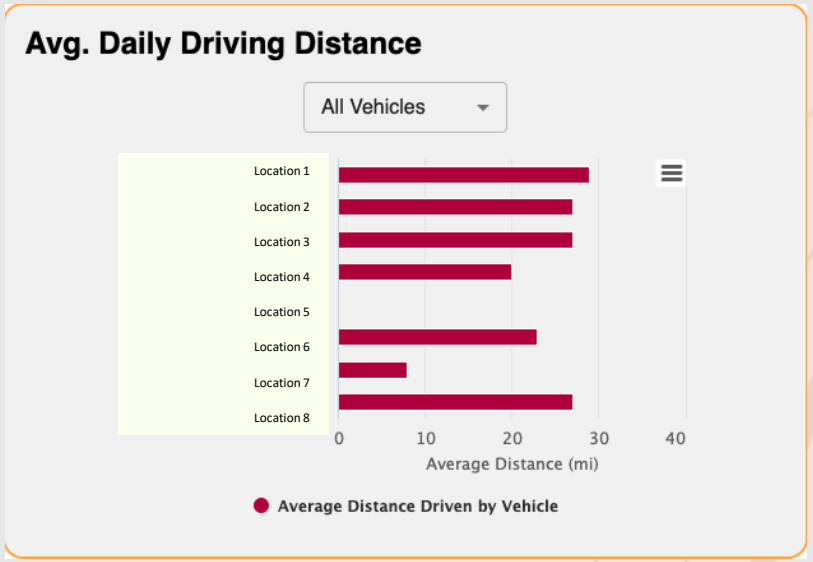
Scope – time, cost, quality **Business Case / Plan** Scope – what, when, how

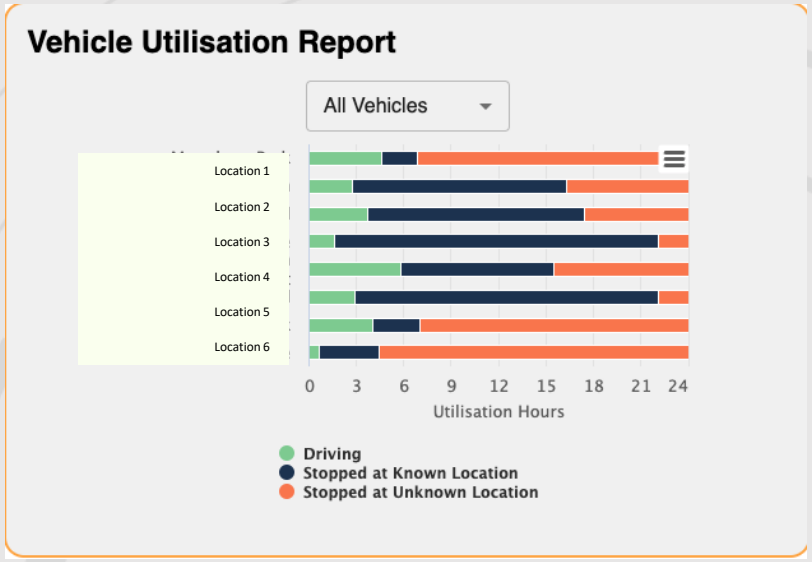
Insights and **Analysis**

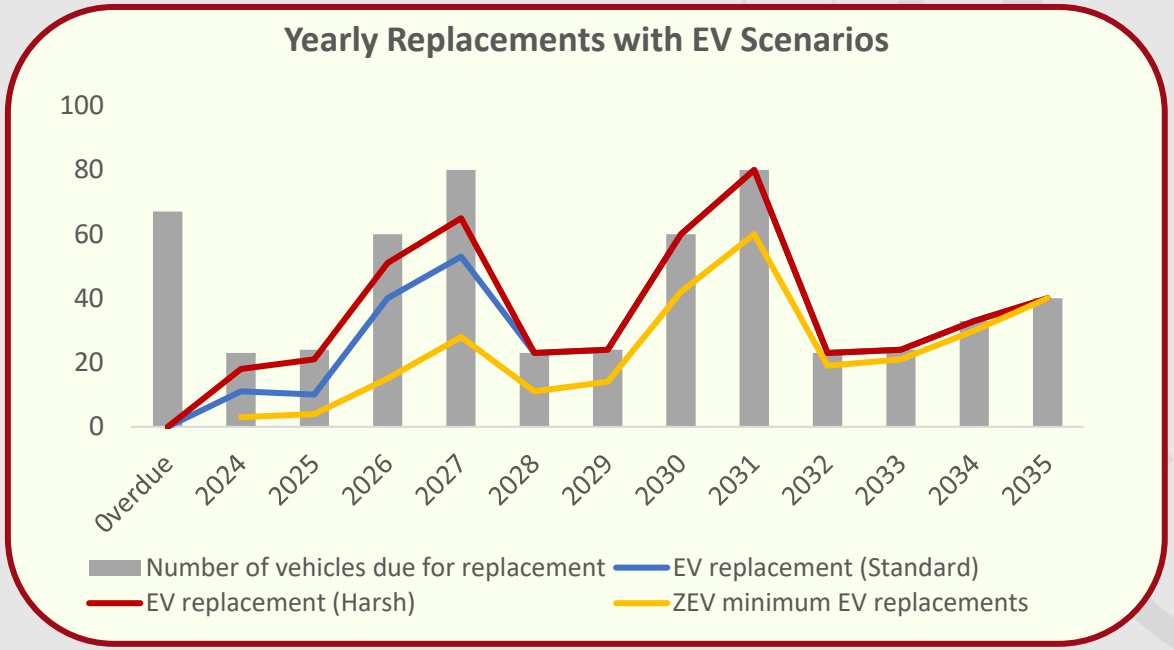
How can Zero help ?

Baselines -Dashboard KPI's "As-Is" & "To-Be" Reporting





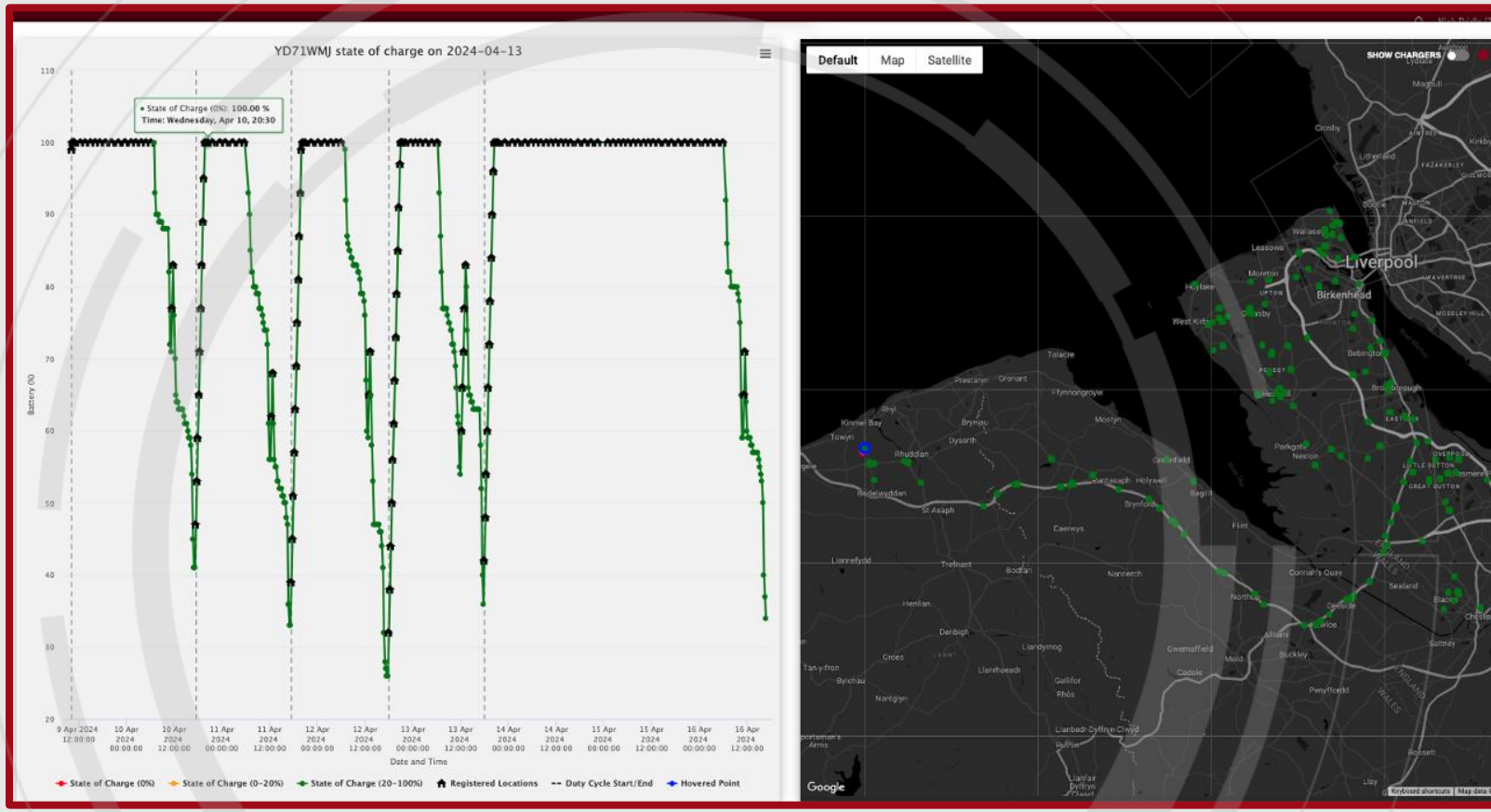




EV Energy Model

Driving data and locations mapped via Telematics

Journeys
Classify routes & create duty cycles with stops and total distance

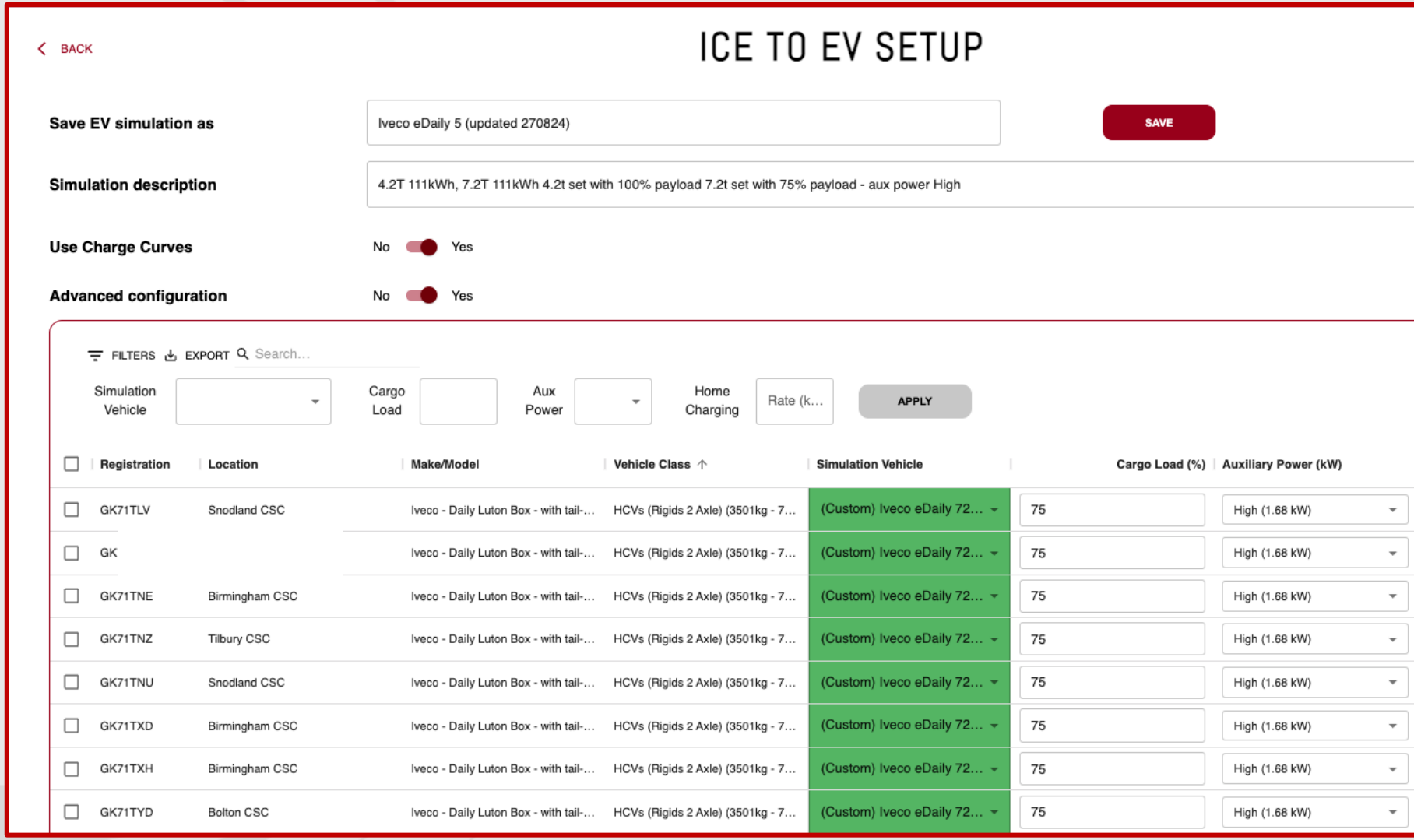


ICE to EV Selection

Use ZERO to **choose the best EVs for your specific operation**. Make sure EVs can do the work required, but don't have overly sized batteries causing unnecessary costs.

Analyse the performance of any commercial EV in any fleet operation by accessing a validated database of electric vehicles.

ZERO provides **real-world EV performance insights** considering specific vehicle configurations, modifications, fleet operations, driver behaviour, road conditions, weather, vehicle payloads, and auxiliary power consumption (e.g., refrigeration units and tail lifts).



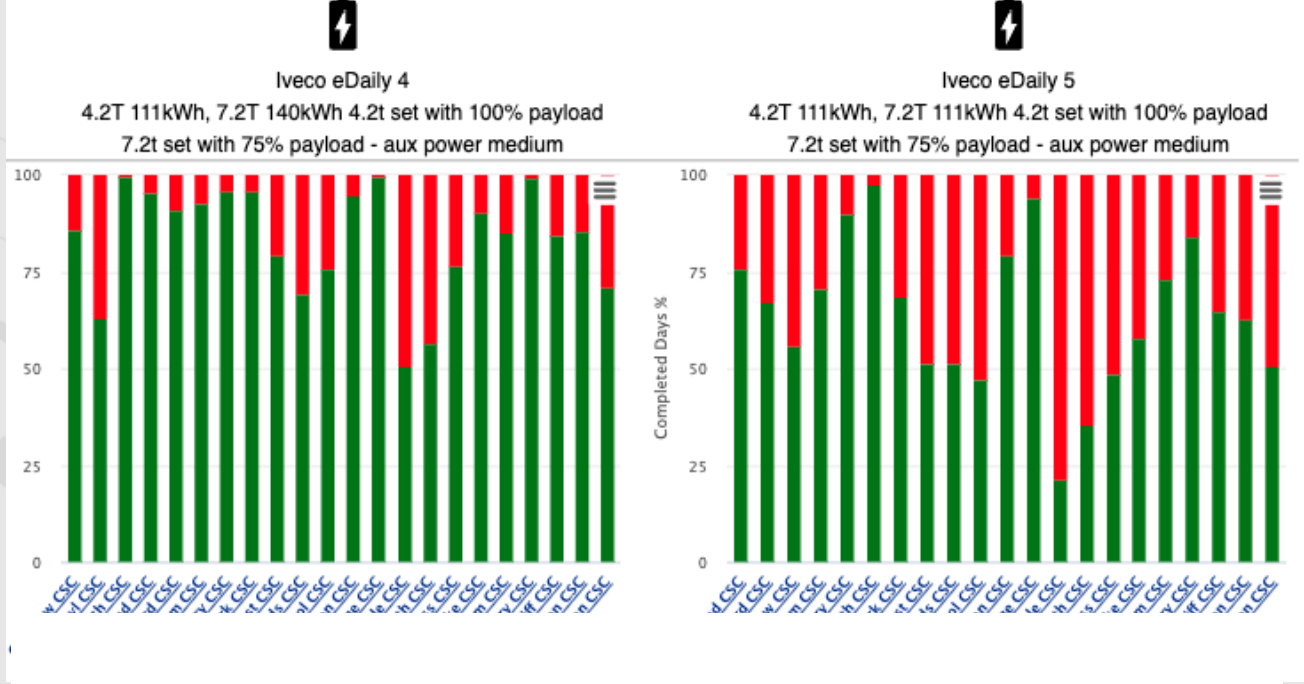
Simulation of Different Battery and Charging scenarios

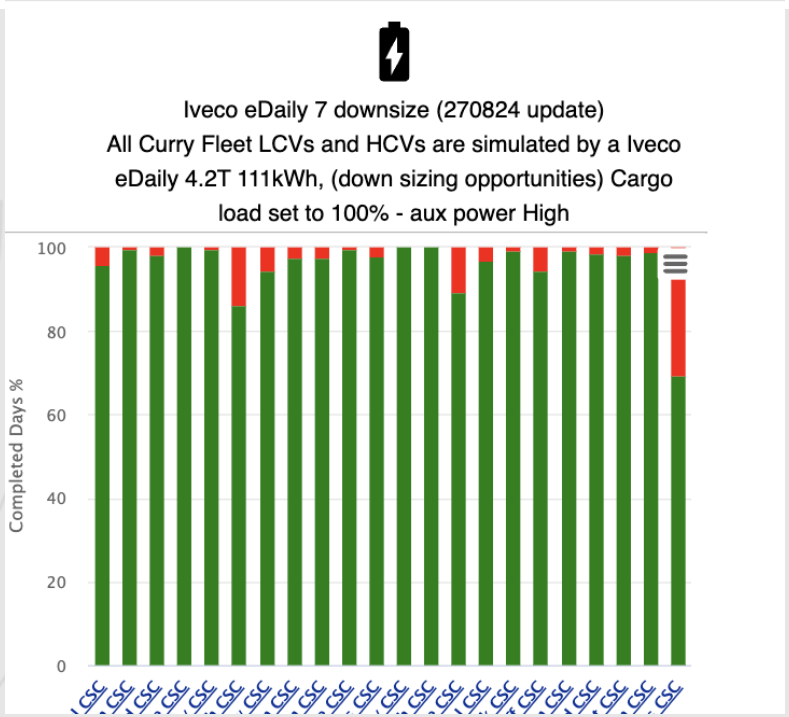
Understand required battery and charger combinations

See which vehicles and routes can be electrified today

Future planning for transition as battery and charging technology improves

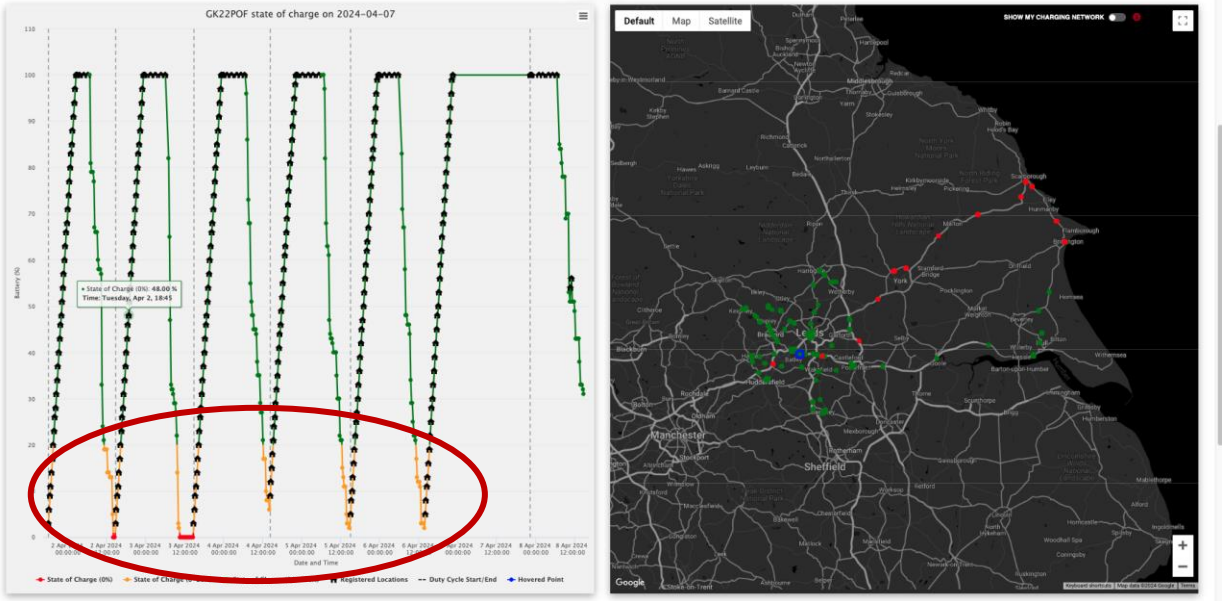
Dowsizing fleet options scenarios



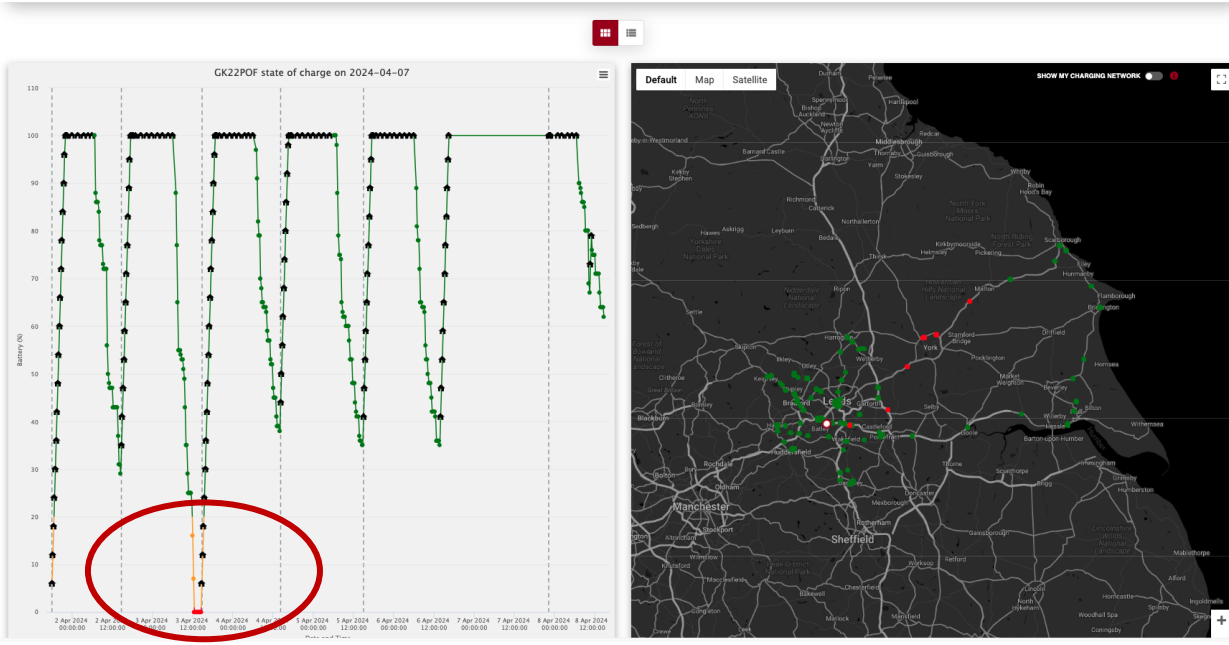


Duty Cycle Analysis

- Average duty cycle distance - 130 miles
- Iveco eDaily 7,2t 74kW battery – Duty cycle incomplete,
- Iveco eDaily 7,2t 111kW battery – Duty cycle almost complete, bigger battery
- Depot charge Power not an issue



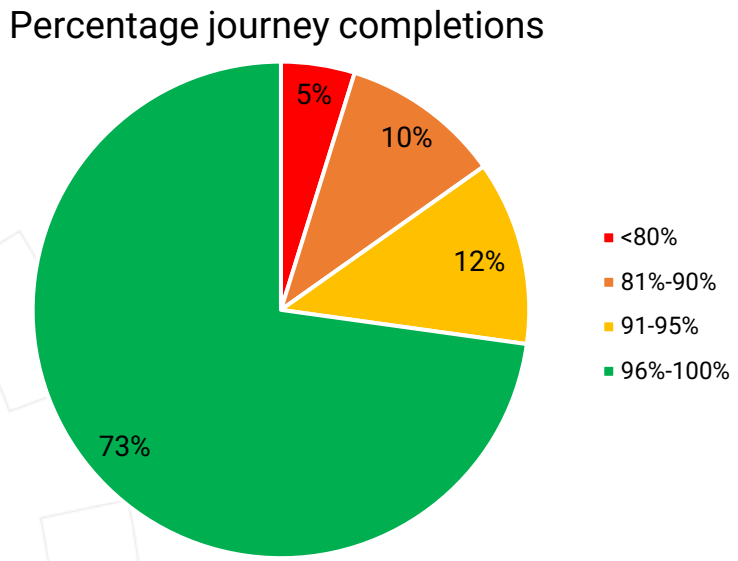
7.2t box van 74kW Battery



7.2t box van 111kW Battery

Custom Reports

- ✓ All data and outputs in Zero can be downloaded and viewed / analysed in Excel
- ✓ Allows further interrogation of data
- ✓ Ability to design and create extra graphs and tables



Vehicle Type / Journey Completion %	Average Mean Daily Driving Distance (mi)	Average Mean Duty Cycle Driving Distance (mi)	ZERO Estimated Range (mi)	Manufacturer Provided Range (mi)
Heavy Panel Van (LCV)	55	72	237	221
<80%	91	114	179	221
81%-90%	90	105	205	221
91-95%	85	115	198	221
96%-100%	46	61	248	221
Car	38	49	196	324
<80%	75	146	201	270
81%-90%	57	71	140	333
91-95%	42	52	179	331
96%-100%	33	41	211	323
Medium Panel Van	34	45	164	205
<80%	82	122	118	205
81%-90%	61	78	156	205
91-95%	37	48	145	205
96%-100%	24	32	172	205
Grand Total	43	55	199	249

Custom Reports - Depot Simulation results by Vehicle Class

22 locations 500 Fleet Vehicles (internal)	Total vehicles	No of vehicles 3.5t	No. of vehicles 7.2t	Av Daily mileage driven 3.5t	Av Daily mileage driven 7.2t	Charger Power	Iveco eDaily 1 3.5T 37kWh, 7.2T 74kWh	Iveco eDaily 2 3.5T 74kWh, 7.2T 111kWh	Iveco eDaily 3 4.2T 111kWh, 7.2T 111kWh	Iveco eDaily 3 Depot Transition Challenge
Location 1										**9.4**
All vehicles	22					7kwh	54.02%	85.57%	87.54%	
Heavy Panel Van(LCV)		2		**111**			13.64%	66.67%	93.94%	
Heavy Vehicle Small (HCV)			20		**93**		56.24%	86.61%	87.19%	
Bolton (all vehicles)	22					22kWh	54.73%	87.54%	88.49%	
Bolton (Heavy Panel Van(LCV)		2		**111**			24.24%	87.88%	**96.97%**	
Bolton (Heavy Vehicle Small (HCV)			20		**93**		56.41%	87.52%	**88.02%**	
Bolton (all vehicles)	22					75kWh	55.21%	87.85%	88.56%	
Bolton (Heavy Panel Van(LCV)		2		**111**			27.27%	93.24%	98.48%	
Bolton (Heavy Vehicle Small (HCV)			20		**93**		56.74%	87.52%	88.02%	

Customer Reports - Depot Simulation results by Vehicle Class

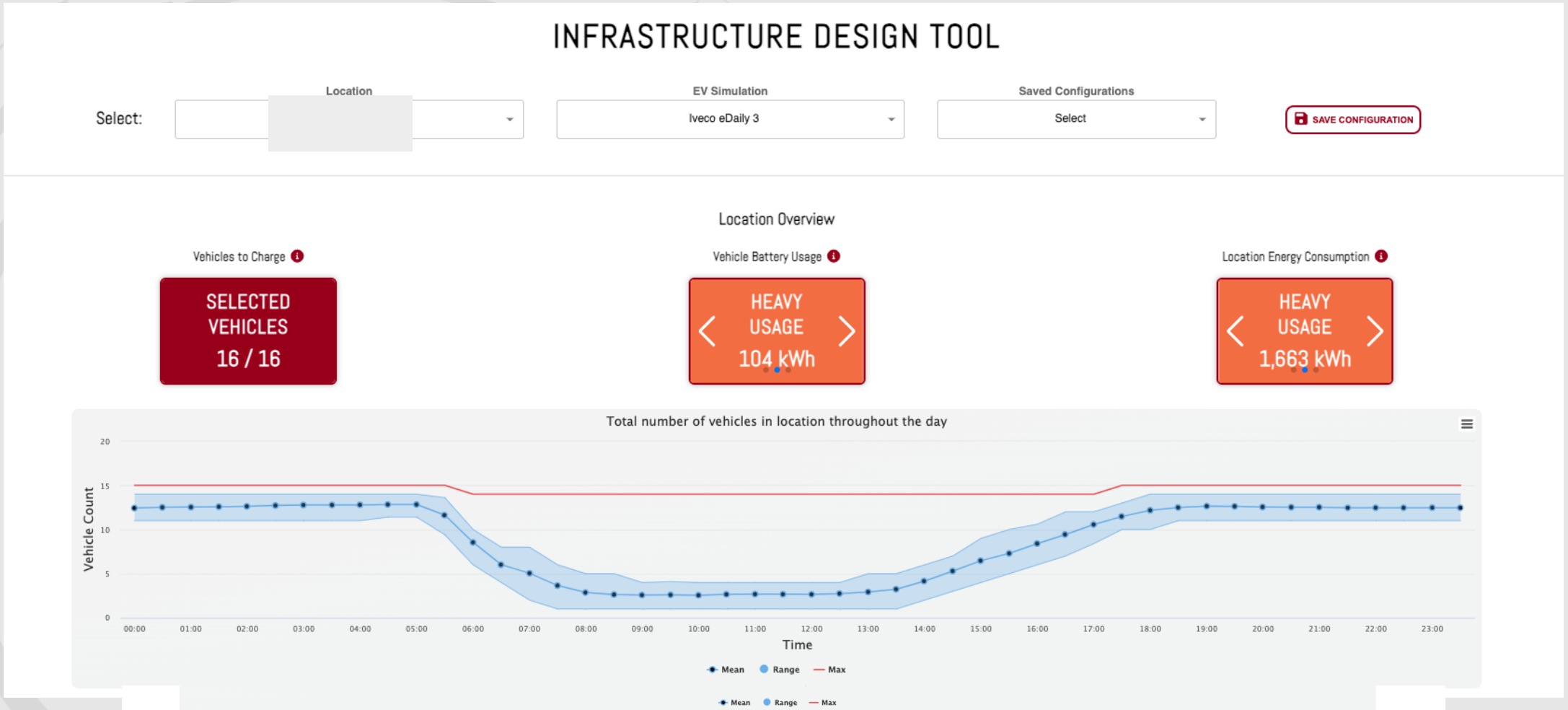
Vehicle Simulation –

- Vehicle Class, Model & Battery size
- Charger Power

	Spec 1 = Iveco eDaily 3.5t = 37kW battery & 7.2t= 74kWh battery			Spec 2 = Iveco eDaily 3.5t = 74kW battery & 7.2t= 111kWh battery			Spec 3 = Iveco eDaily 3.5t =111kW battery & 7.2t= 111kWh battery			
	Iveco eDaily 1 - 22kw	Iveco eDaily 1 - 7 kW	Iveco eDaily 1 - 75kw	Iveco eDaily 2 - 22kw	Iveco eDaily 2 - 7 kW	Iveco eDaily 2 - 75kw	Iveco eDaily 3 - 22kw	Iveco eDaily 3 - 7 kW	Iveco eDaily 3 - 75kw	Grand Total
Vehicle 1	55.68	54.55	55.68	92.05	92.05	92.05	92.05	92.05	92.05	79.80
Vehicle 2	50.00	50.00	50.00	91.67	88.89	91.67	91.67	88.89	91.67	77.16
Vehicle 3	64.52	64.52	64.52	91.94	91.94	91.94	93.55	93.55	93.55	83.33
Vehicle 4	67.47	67.47	67.47	93.98	93.98	93.98	95.18	95.18	95.18	85.54
Vehicle 5	64.77	63.64	64.77	96.59	95.46	96.59	96.59	95.46	96.59	85.61
Vehicle 6	63.51	63.51	63.51	90.54	90.54	90.54	91.89	91.89	91.89	81.98
Vehicle 7	37.50	37.50	38.75	77.50	77.50	77.50	77.50	77.50	77.50	64.31
Vehicle 8	42.05	42.05	42.05	71.59	71.59	71.59	71.59	71.59	71.59	61.74
Vehicle 9	71.95	71.95	73.17	90.24	89.02	90.24	92.68	91.46	92.68	84.82
Vehicle 10	76.09	76.09	76.09	95.65	95.65	95.65	97.83	97.83	97.83	89.86
Vehicle 11	46.75	46.75	48.05	81.82	77.92	81.82	81.82	79.22	81.82	69.55
Vehicle 12	61.18	61.18	62.35	92.94	90.59	92.94	92.94	90.59	92.94	81.96
Vehicle 13	51.92	51.92	51.92	92.31	92.31	92.31	92.31	92.31	92.31	78.85
Vehicle 14	50.00	50.00	50.00	68.18	68.18	68.18	68.18	68.18	68.18	62.12
Vehicle 15	57.45	57.45	57.45	91.49	90.43	91.49	91.49	90.43	91.49	79.91
Vehicle 16	47.13	47.13	47.13	79.31	78.16	79.31	79.31	78.16	79.31	68.33
Vehicle 17	24.24	13.64	27.27	87.88	66.67	93.94	96.97	93.94	98.49	67.00
Vehicle 18	**54.84**	**54.08**	**55.30**	**87.39**	**85.34**	**87.75**	**88.44**	**87.54**	**88.53**	**76.58**

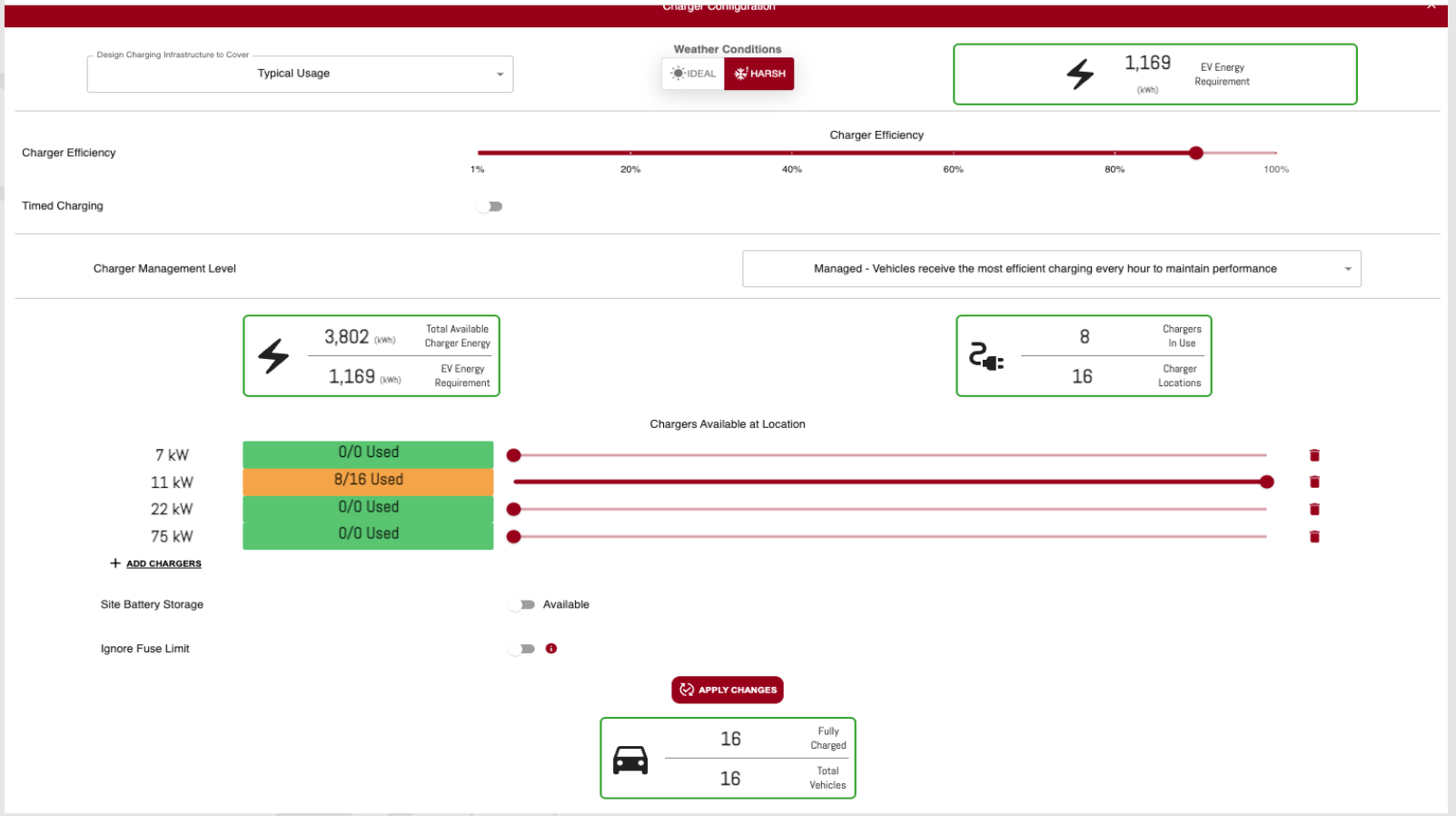
Infrastructure Design

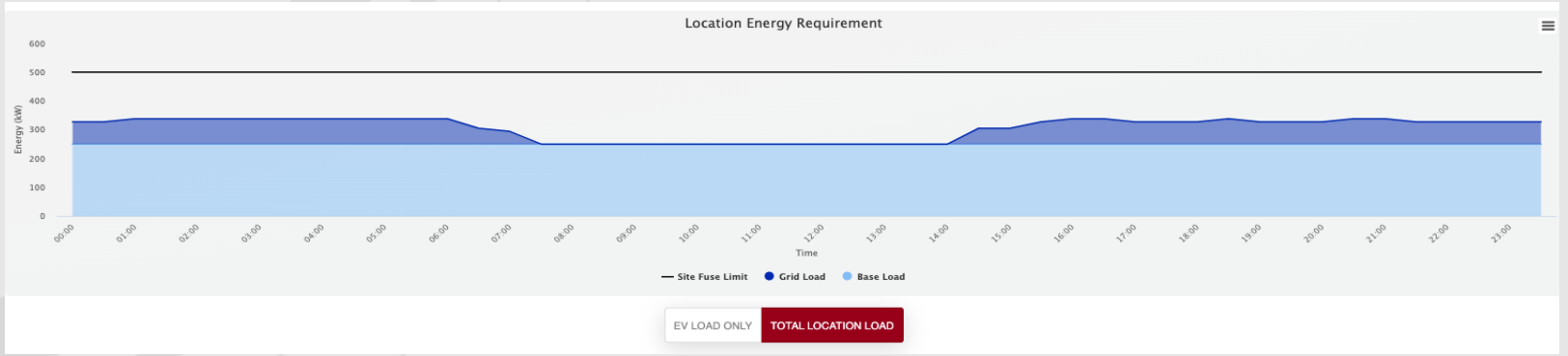
Infrastructure Design – Depot Charging



Infrastructure Design – Operational Assessment

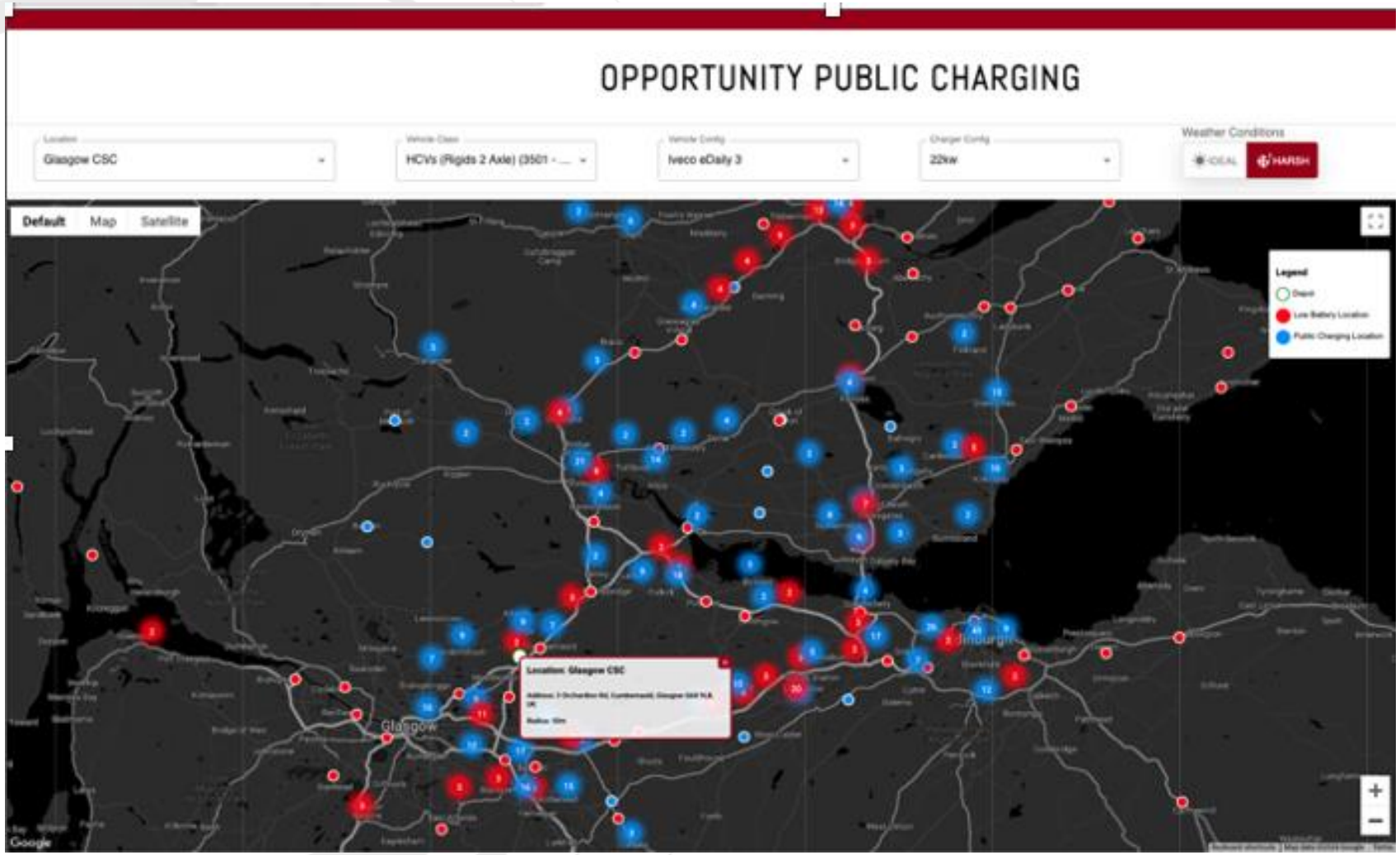
- ✓ Design infrastructure to support charging requirements
- ✓ Analyse projected electrical load throughout the day
- ✓ Find the optimum tariff for your unique charging profile



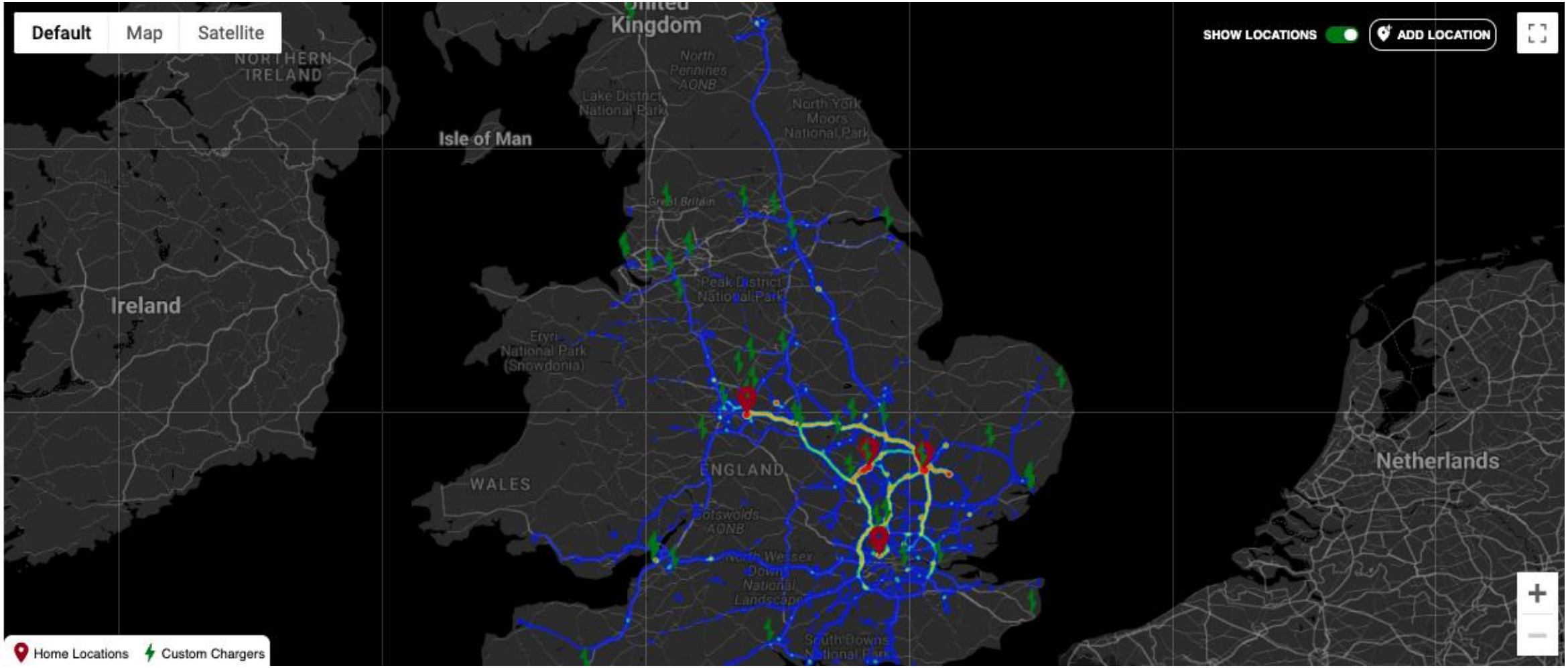


Opportunity Public Charging

Detailed analysis of nearby public charging points for when electric vehicles require top-up and identify hot spots where future infrastructure could be deployed.



Heat Map Analysis (eFREIGHT 2030)



Fleet Transition Decarbonisation Planning – inc. TCO

Fleet Transition / Decarbonisation Plan Strategy

Fleet related transition & decarbonisation plans options

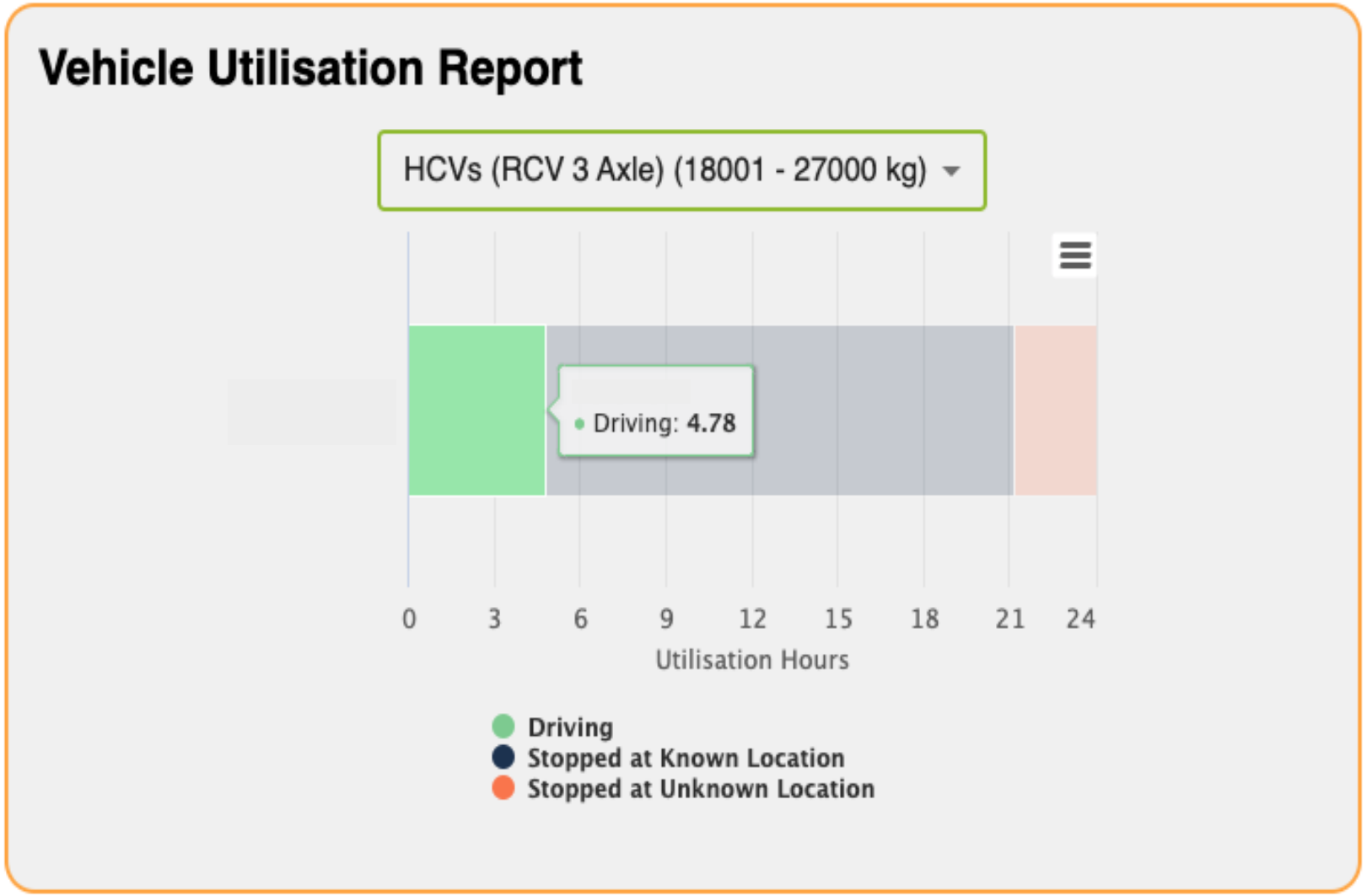
- Baseline ICE replacement plan 10 years *(Do nothing)*
  - What does your current ICE replacement plan look like ?
  - Peaks and troughs based on lifecycles and CAPEX shortages ?
  - CAPEX & CO_2 impacts by year

- ZEV Mandate Overlay (Car & Commerical Vehicles)
  - What does your baseline replacement plan (do nothing) look like with a ZEV mandate overlay to 2030 ?
  - CAPEX & CO_2 impacts by year

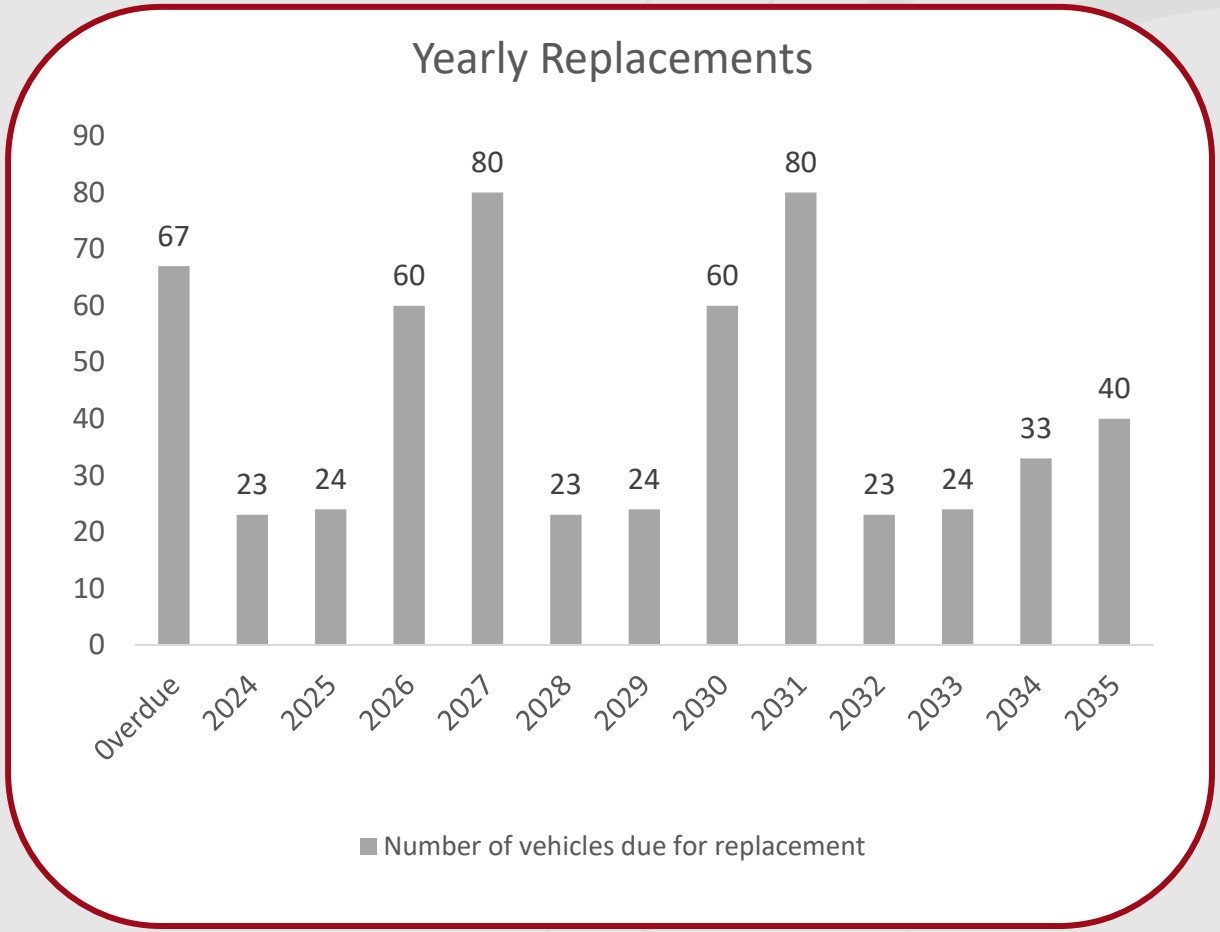
- ZERO transitions option overlayed on Decarbonisation plan
  - Offer the board 3 decarbonisation plans as part of the programme
  - Take into account overdue Asset impacts
  - Plan for stranded assets
  - Depot charging insights, chargers required with power impacts
  - CAPEX & CO_2 impacts by year

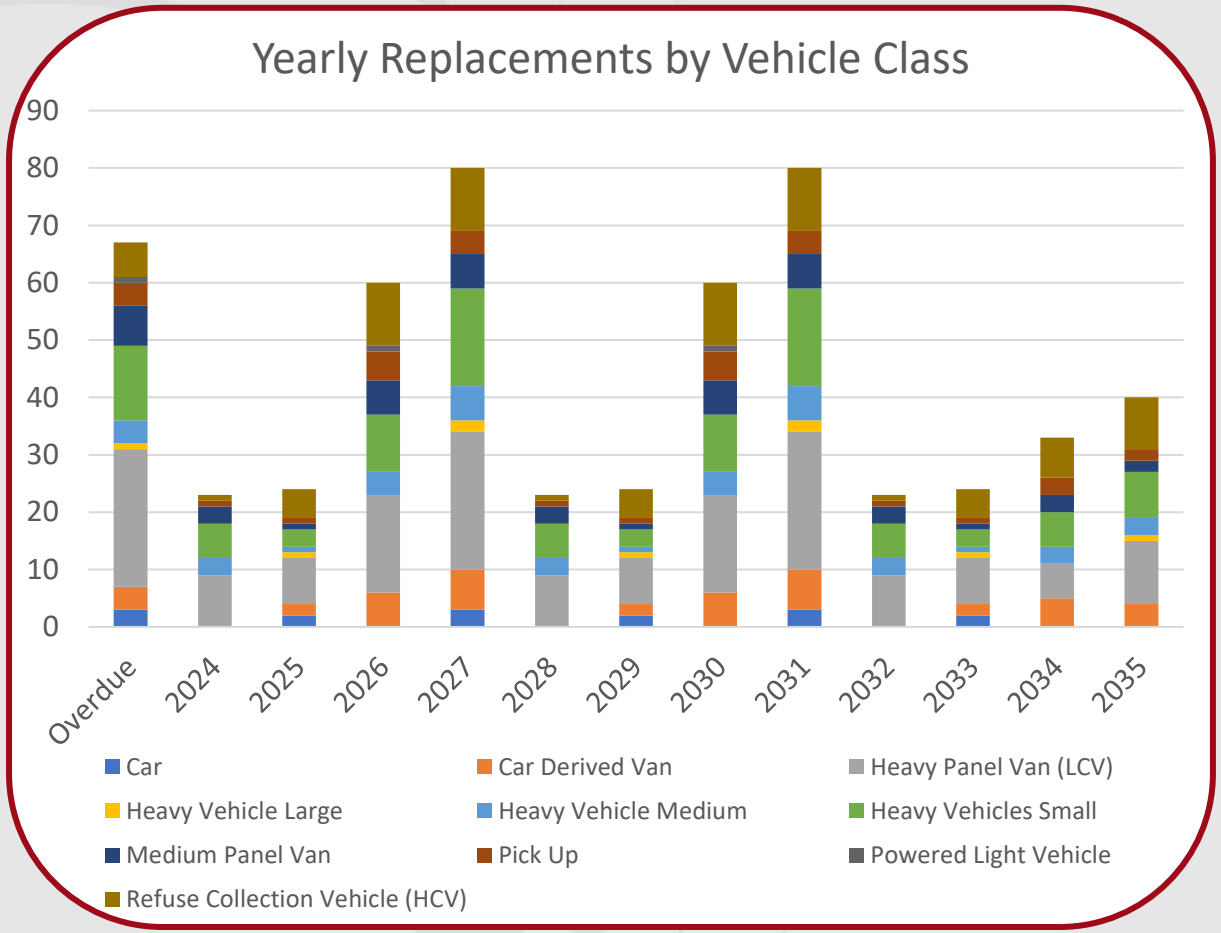
Vehicle Utilisation – Operational Baseline

- ✓ Identify asset utilisation percentage at each location
- ✓ Visualisation of low utilisation assets for review
- ✓ Optimise the number of assets required for operational performance

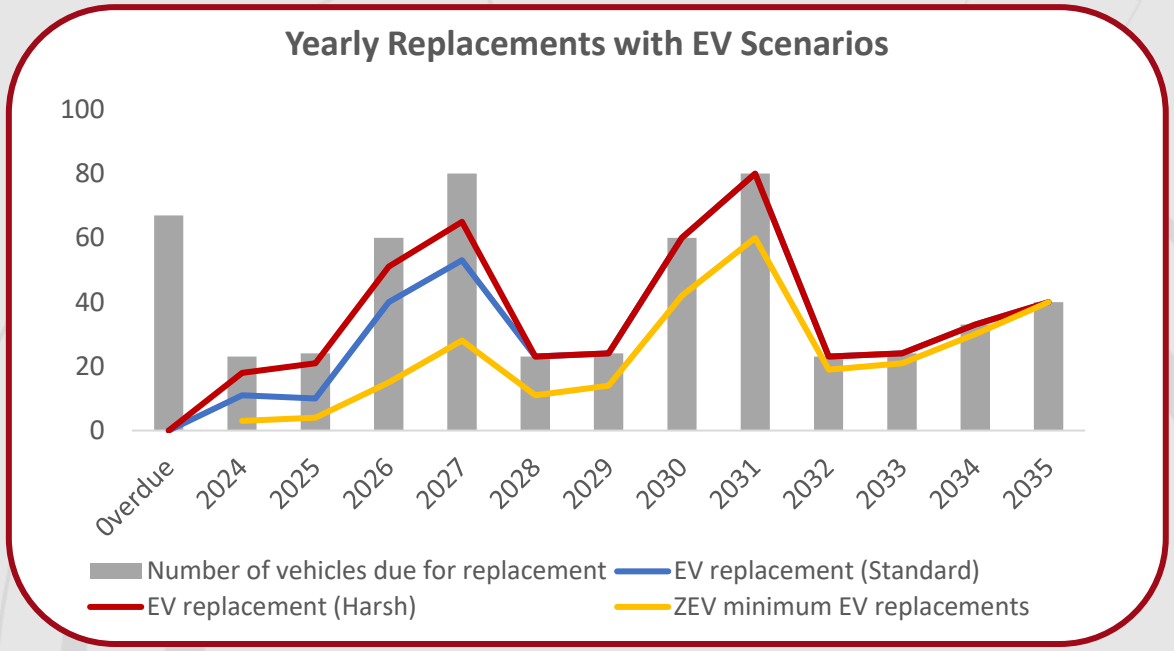


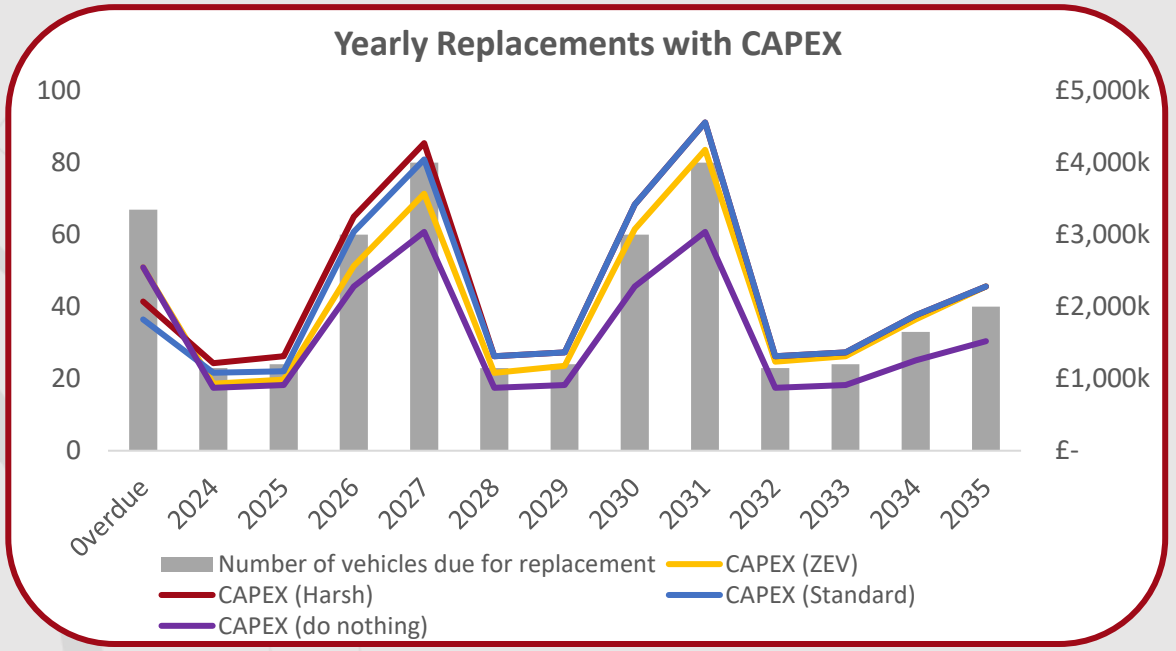
Fleet Transition / Decarbonisation Plan Strategy





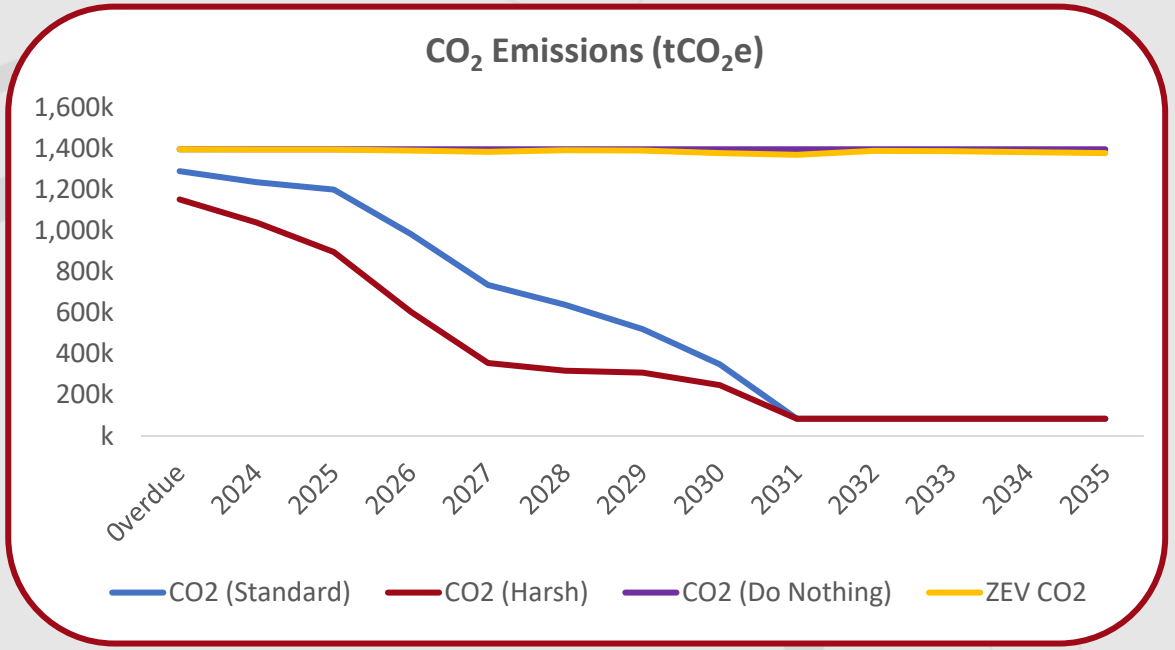
Fleet Replacement Planning Roadmap





CAPEX Scenario	Overdue	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
Replacements	67	23	24	60	80	23	24	60	80	23	24	33	40	
Standard	£1,824,000	£1,083,000	£1,102,000	£3,040,000	£4,047,000	£1,311,000	£1,368,000	£3,420,000	£4,560,000	£1,311,000	£1,368,000	£1,881,000	£2,280,000	£28,595,000
Harsh	£2,071,000	£1,216,000	£1,311,000	£3,249,000	£4,275,000	£1,311,000	£1,368,000	£3,420,000	£4,560,000	£1,311,000	£1,368,000	£1,881,000	£2,280,000	£29,621,000
Do nothing	£2,546,000	£874,000	£912,000	£2,280,000	£3,040,000	£874,000	£912,000	£2,280,000	£3,040,000	£874,000	£912,000	£1,254,000	£1,520,000	£21,318,000
ZEV	£2,546,000	£931,000	£988,000	£2,565,000	£3,572,000	£1,083,000	£1,178,000	£3,078,000	£4,180,000	£1,235,000	£1,311,000	£1,824,000	£2,280,000	£26,771,000

Fleet Replacement Planning



CO_2 Scenario	Overdue	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
Replacements	67	23	24	60	80	23	24	60	80	23	24	33	40	
Standard	1,289,763	1,236,172	1,200,317	983,271	735,203	639,432	521,289	349,588	84,154	84,154	84,154	84,154	84,154	7,375,805
Harsh	1,152,135	1,038,898	895,559	605,336	354,876	318,752	308,094	247,570	84,154	84,154	84,154	84,154	84,154	5,341,993
Do nothing	1,396,421	1,396,421	1,396,421	1,396,421	1,396,421	1,396,421	1,396,421	1,396,421	1,396,421	1,396,421	1,396,421	1,396,421	1,396,421	18,153,476
ZEV	1,396,421	1,395,071	1,394,621	1,389,671	1,383,821	1,391,471	1,390,121	1,377,520	1,369,420	1,387,871	1,386,971	1,382,921	1,378,420	18,024,320

Fleet Decarbonisation Plan – CAPEX Cost Baseline by Vehicle & Type

- ✓ Identify asset replacement dates by year
- ✓ Visualisation of assets for review
- ✓ Capex reflects new Alternative Fuelled vehicle costs

Vehicle Type / Year	Overdue	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Car	£114,000	£0	£76,000	£0	£171,000	£0	£114,000	£0	£171,000	£0	£114,000	£0	£0
Car Derived Van	£146,500	£0	£114,000	£227,875	£260,375	£0	£48,750	£146,250	£170,625	£0	£48,750	£121,875	£97,500
Heavy Panel Van (LCV)	£1,136,112	£484,014	£427,014	£756,245	£1,067,315	£378,189	£336,168	£729,336	£1,023,483	£378,189	£336,168	£267,105	£477,210
Heavy Vehicle Large	£57,473	£0	£57,473	£0	£172,473	£0	£115,000	£0	£230,000	£0	£115,000	£0	£115,000
Heavy Vehicle Medium	£206,786	£124,484	£79,333	£283,150	£527,146	£229,968	£158,666	£460,816	£729,054	£229,968	£158,666	£374,332	£403,816
Heavy Vehicles Small	£562,146	£273,210	£129,726	£646,662	£1,151,808	£518,904	£259,452	£864,840	£1,470,228	£518,904	£259,452	£518,904	£691,872
Medium Panel Van	£347,882	£119,882	£57,000	£197,469	£47,056	£26,469	£8,823	£52,938	£52,938	£26,469	£8,823	£26,469	£17,646
Pick Up	£119,882	£38,000	£38,000	£228,000	£160,823	£57,000	£57,000	£285,000	£131,646	£57,000	£57,000	£171,000	£65,823
Powered Light Vehicle	£38,000	£0	£0	£57,000	£0	£0	£0	£57,000	£0	£0	£0	£0	£0
Refuse Collection Vehicle (HCV)	£900,000	£150,000	£750,000	£2,850,000	£2,175,000	£450,000	£2,250,000	£4,950,000	£4,750,000	£450,000	£2,250,000	£3,150,000	£3,850,000
Total	£3,514,781	£1,189,590	£1,652,546	£5,246,401	£5,561,996	£1,660,530	£3,233,859	£7,546,180	£8,557,974	£1,660,530	£3,233,859	£4,629,685	£5,718,867

Fleet Decarbonisation Plan - overdue assets

- ✓ Identify overdue asset replacements
- ✓ Visualisation of 'low hanging fruit'
- ✓ Replace 'easy to transition' vehicles as a priority

Vehicle Id	Ice Vehicle Class	Cheaper as EV	EoE Score	Replace with EV?
246	Heavy Vehicles Small	FALSE	1	No
254	Medium Panel Van	TRUE	1	Yes
255	Heavy Vehicles Small	FALSE	1	No
259	Medium Panel Van	TRUE	1	Yes
266	Heavy Panel Van (LCV)	TRUE	1	Yes
276	Heavy Vehicles Small	FALSE	1	No
284	Heavy Panel Van (LCV)	TRUE	1	Yes
285	Car	FALSE	1	No
294	Heavy Vehicles Small	FALSE	1	No
295	Pick Up	TRUE	2	No
298	Heavy Panel Van (LCV)	TRUE	2	No
305	Heavy Vehicles Small	FALSE	1	No
307	Pick Up	FALSE	1	No
308	Heavy Panel Van (LCV)	TRUE	1	Yes
311	Heavy Panel Van (LCV)	TRUE	1	Yes
313	Heavy Vehicles Small	FALSE	1	No

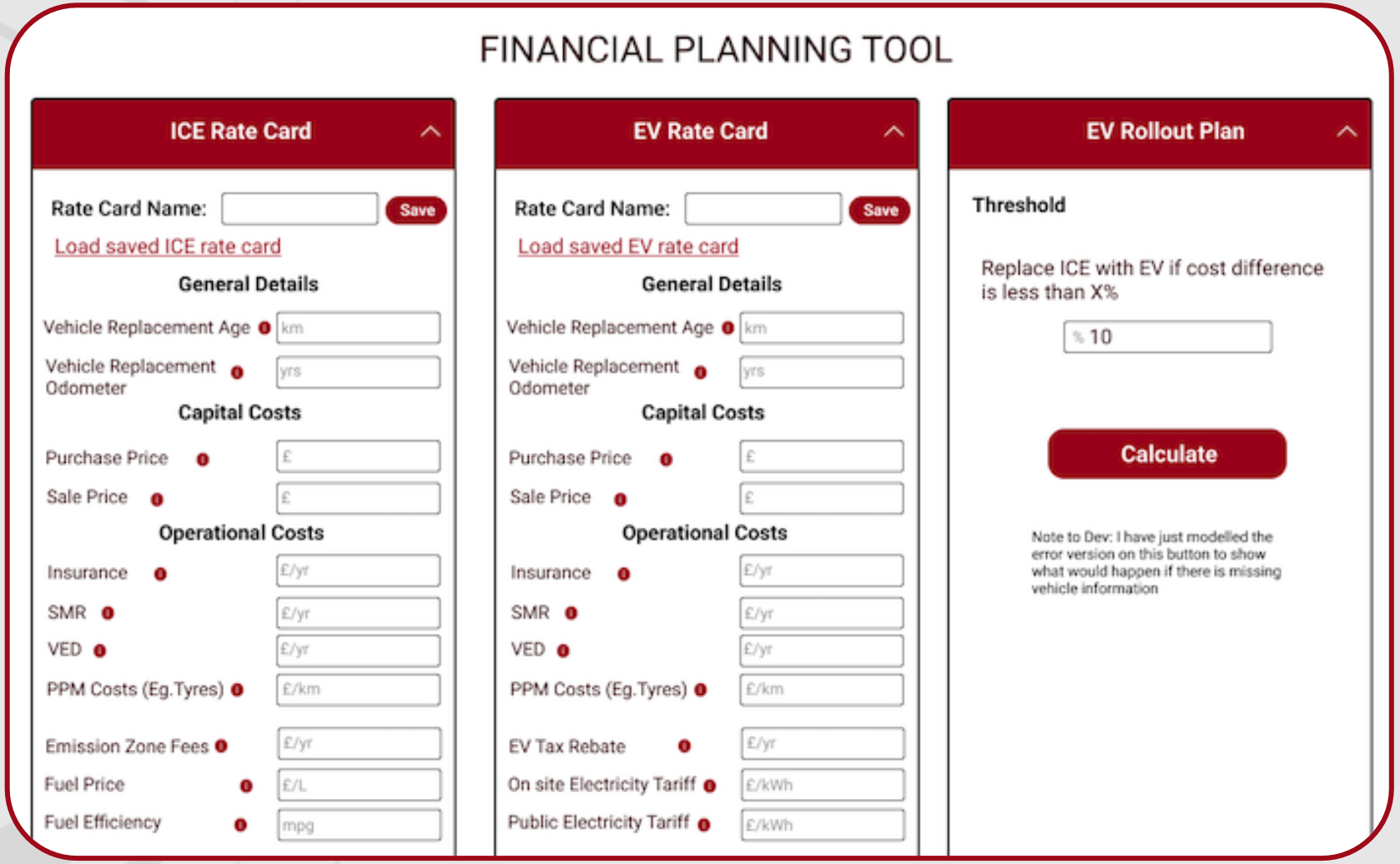
Fleet Financial Planning Tool

TCO Cost Analysis

Total Cost of Ownership (TCO)

(Rate Cards ICE vs BEV)

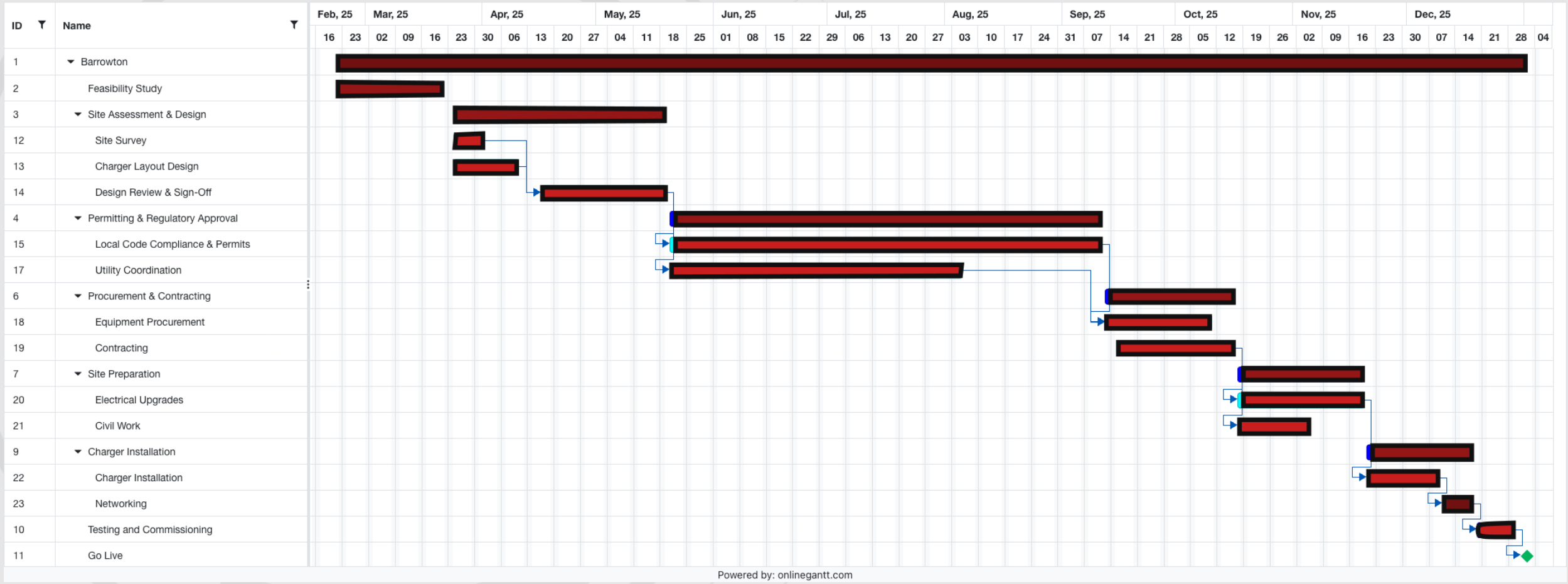
Could use APSE Categories



Infrastructure Roll out Strategy

Plan & TCO Considerations

Infrastructure Roll Out Strategy



Depot Infrastructure Capex & TCO

DNO Connection	
DNO	Northern Powergrid
Site Capacity Requirement Upgrade	73 kW
Upgrade Size Category	Medium
Low Estimate	£16,000
High Estimate	£110,000

LV Infrastructure	
Low Estimate	£20,000
High Estimate	£35,000

Charge Point Infrastructure	
Project Management and Planning Overheads	£2,170
Charge Point Cost	£12,436
Civil Costs and Installation	£3,769
Electric Materials Costs	£7,860
Cost of Set-up, Transport and Plant	£3,775
Testing and Commissioning	£472
Total	**£26,482**

Total Cost Estimation	
Low Estimate	**£62,842**
High Estimate	**£171,482**

In Summary

What do we need from you ?

Zero - Data, Simulation & Analytics

Data Loading

Fleet
Load Vehicles,
Locations & Classes

Telematics
Load Driving data,
Journeys
(or create Synthetics)

Route Classifier
Create Journeys and
duty cycles

Simulate

Assign ICE to EV
Model & Battery
Options

Energy Model
Calculate Energy
Consumption by
vehicle

Analytics

Depot Infrastructure
Calculate Depot
Charger Config & Grid
Requirements

Plan / TCO Model
Calculate the Plan /
TCO & Emissions for
each Vehicle Type /
Class

Questions

Contact

If you would like to connect, learn more about our software tools and discuss your requirements please contact:

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