CHARGE

Refuelling Tomorrow's Electrified Transport

ConnectMore User Requirements & Specification

June 2020
EA Technology
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Document Issue Control

Version History

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1.0	27/03/2020	Director (EA Technology), Product Owner (ConnectMore)	DaveA Roberts, Adrian Vinsome	
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Summary

This document describes:

- the stakeholder engagement carried out to gather input for ConnectMore tool user requirements definition,
- how the data gathered has been processed to determine the key user requirements and the high-level functional specifications.

The project proposal states that the scope of this tool covers:

- Users who are looking at installing multiple chargers.
- Connection queries related to charging points that will be used by 'public' (i.e. not fleet and not domestic charging).
- The incorporation of flexible solutions and a transport model (with the help of project partners SGS and PTV).

The *Data Transfer and Processing Plan* document sits alongside this document to provide a base specification for the ConnectMore tool.

Contents

Overview

Stakeholder Workshop 1

- Methodology: User Profile Identification
- Overview of Outputs: Persona

Stakeholder Workshop 2

- Methodology: User Interface Preferences
- Overview of Outputs: User Interface Preferences

Specification development

- Methodology: From User Requirement to Specification
- Outputs: ConnectMore Specification

Next Steps

- UI design: Wireframes
- Heatmaps

Appendices

- User Personas
- Workshop Materials (including survey results)
- Workshop Outputs
- Requirements Matrix

Overview

Overview

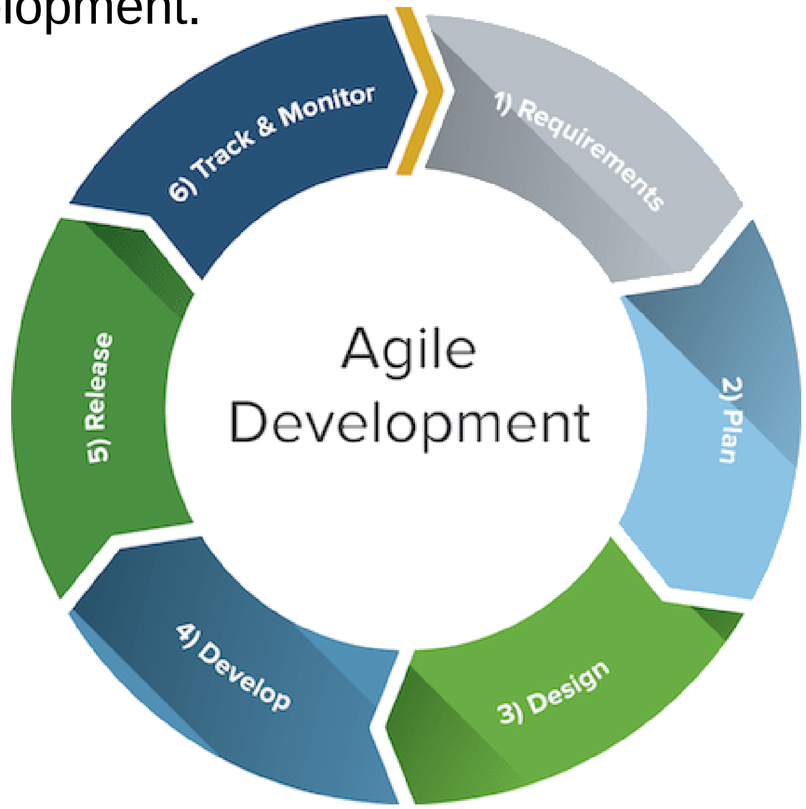
- An intrinsic pillar of the Charge project is that it should be stakeholder led
- Development of the ConnectMore software tool follows the ‘Agile’ methodology, the first stage of which is a ‘discovery’ phase to inform specification development
- The specification of the ConnectMore tool is driven by the requirements of the anticipated future users captured through stakeholder engagement
- Two stakeholder workshops have been held to help identify and define:
  - the user groups, archetypes and personas likely to use the tool,
  - the user interface requirements.

Agile

- Agile software development is based on an incremental, iterative approach.
- Instead of in-depth planning at the beginning of the project (as in the traditional Waterfall method), Agile methodologies are defined by evolving requirements over time and encourage constant feedback from the end users.

	Agile	Waterfall
Sequential		✓
Flexible	✓	
Accommodates change	✓	
Defined requirements		✓
Deliver quality products	✓	✓
Continually evolving	✓	
Rigid process		✓

- The Agile method has been chosen due to the complex nature of this project – cross-disciplinary and with multiple strands of development.

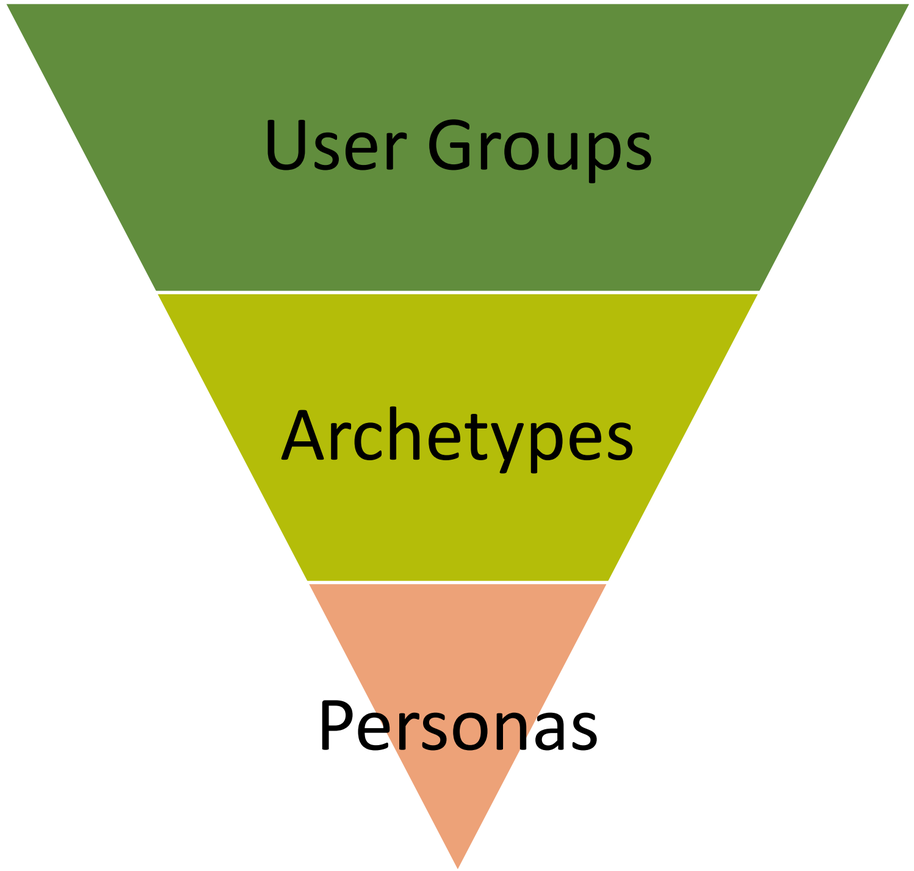


Source: https://www.smartsheet.com/agile-vs-scrum-vs-waterfall-vs-kanban

Discovery Phase

- The discovery phase aims to gain a detailed understanding of stakeholders and the end customer in order to produce a better performing product.

- The first step is identifying the user groups which are typically job roles.
- An archetype shows the common characteristics of a given user group (or a job).
- The persona is a specific individual, one instance of the user group created by personifying the archetype.



User Profile Workshop

Methodology: User Profile Workshop

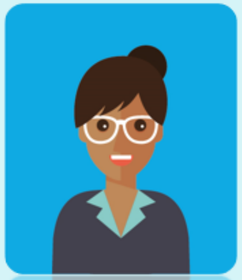
- The first stakeholder workshop was held in Chester, in July 2019.
- It was attended by a cross-section of stakeholders including:
  - Local Authority transport and strategic planners from across the SP-Manweb licence area (Merseyside, Cheshire, North Wales and Shropshire),
  - Chargepoint installers,
  - Community organisations,
  - Consultancies,
  - All project partners (logos top right of this page) were also represented.

- Professional event moderators, *Explain Market Research*, ensured conversations remained focused and covered all necessary topics. The views of all participants were gathered and discussions were accurately recorded.
  - Participants were provided with background information about the Charge project, its aims and principal deliverables.
  - Round table discussions were used to help identify user personas which are expected to use the ConnectMore tool and then identify working practices and pain points that the tool could address for the identified personas.
- The professional event moderators provided transcripts of the workshop discussions and a summary of the findings.

Overview of User Profile Workshop Outputs

Example persona (the workshops produced 12 personas representing 12 key user groups likely to benefit from the tool):

Laura Khan – Motorway service stations



Profile

- Laura is a 36 year old female, who works in planning for the motorway service station
- Laura has a degree in Planning and experience in strategical infrastructure planning
- Laura has a general awareness of EV and understands that charging points are needed in service stations

Goals & needs

Laura needs…

- A tool that will clearly identify capacity for connection
- The ability to forecast EV uptake to understand impact on future demand at motorway services
- A tool that can outline the options and impact for number and type of charge points
- A tool that can help her understand the 'bigger picture' of EVs and chargers, including smart solutions
- Outputs that can be exported and printed

Motivation

Laura would like…

- To be able to look at different scenarios within one interaction
- To have an understanding of the costs relating to these different scenarios

This is because as a motorway service station planner, Laura needs to be able to look at scenarios and costs to inform business decisions

Pain points

Laura's current pain points are…

- Understanding the implications of different scenarios and factors
- Complex language and information
- Understand how the process works as a whole

Use scenario

Laura would usually be…

- Trying out different scenarios to understand how many charge points may be needed and what type
- Assessing from the office desktop computer

Key quotes about ConnectMore

"I need the knowledge to build a business case"

"I'm not an electrician"

"What are my options here?"

Methodology: User Interface Workshop

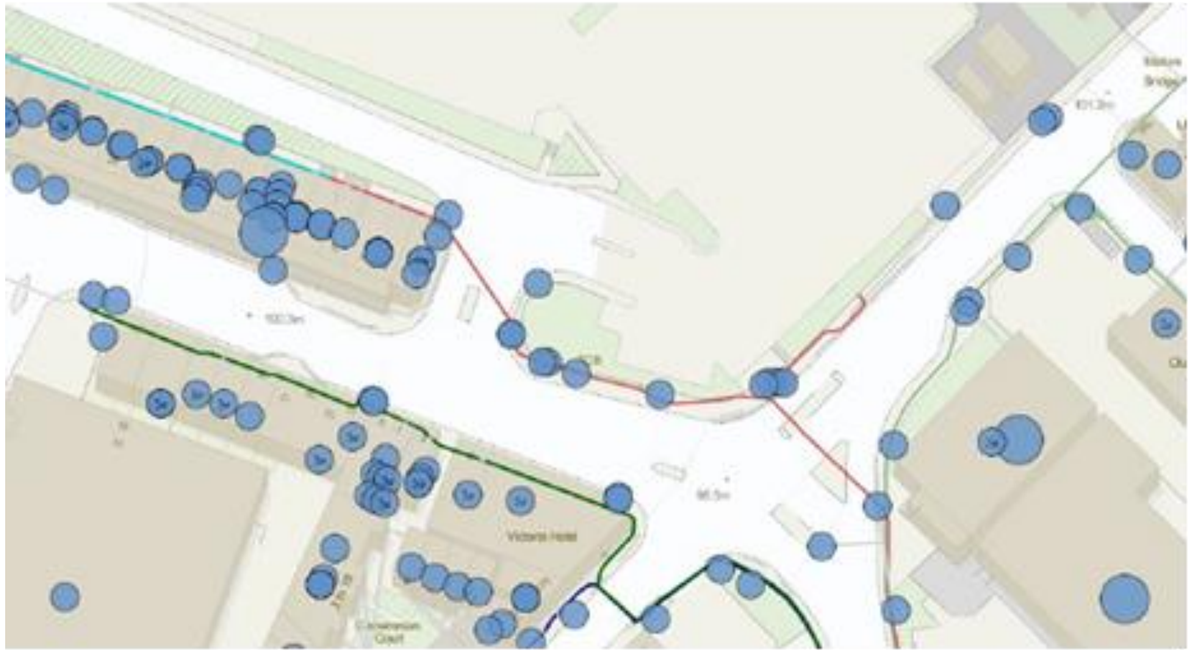
- The second stakeholder workshop was held in Chester, in December 2019.
- Many attendees had attended the previous workshop held in July 2019, the groups attending including:
  - Local Authority transport and strategic planners,
  - Charge point installers,
  - Community organisations,
  - Consultancies,
  - All project partners (logos top right of this page) were represented.

- As for the July workshop, it was managed by professional event moderators, *Explain Market Research*.
  - Delegates were provided with an update on project progress and a recap of the previous workshop.
  - Attendees reviewed the user personas created in the previous workshop and were asked which one they most closely identified with themselves.
  - Discussions were held to identify what the represented personas would want or need from the ConnectMore tool, and following a demonstration of different interface examples the interface preferences of each persona was also captured.

User Interface Workshop

Overview of User Interface Workshop

Delegates were provided with demonstrations of software interface examples developed by EA Technology and PTV Group



Screenshot from an EA Technology connections tool

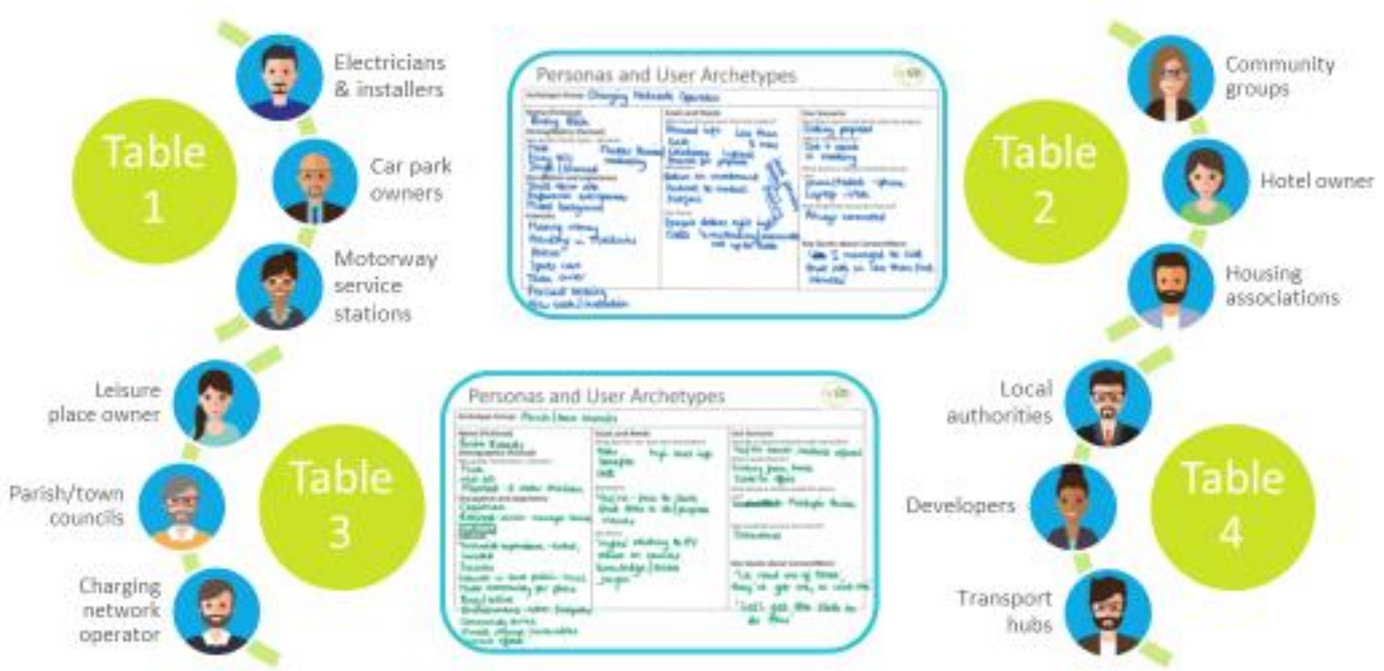
Screenshot from PTV Group's Visum tool

Overview of User Profile Workshop Outputs

- Delegates were presented with a starting selection of potential ConnectMore user groups.
- The first exercise was to determine if this list was complete or if further user groups should be added.

Overview of User Profile Workshop Outputs

- Participants were separated onto four tables so that each workshop table comprised of delegates from a variety of professional backgrounds.
- Each group then worked with the templates provided to develop the personas.



Overview of User Interface Workshop Outputs

- Delegates were asked to self-assign themselves to one of the user personas developed at the previous workshop.
- Through this process seven personas were represented.

Overview of User Interface Workshop Outputs

PERSONA – Chris James – Electrician & installer

Goals and Needs

Chris needs...
- A tool with a simple and clear interface across devices
- A tool that provides an instant yes/no indication for his customer
- A tool that provides accurate indicative costs
- A tool that allows him to input and search based on precise technical details, such as postcode and MPAN

Pain points

Chris' current pain points are...
- Not having access to accurate and up to date information for his customer
- Barriers to him providing speedy customer service

Inputs and Outputs

- What inputs are needed?
  - How could they be entered?
- What outputs are necessary?
  - How could these be displayed?

User Story

Card

As a .....

I want/need.....

So that.....

Conversation

.....

Confirmation

Can I.....

Can it.....

- Delegates expanded the definitions of the persona that they identified with on template activity sheets.
- These were subsequently supplemented and expanded using transcripts of the workshop activities.
- The resultant seven definitions corresponding to the represented personas are included in the appendices (an example of which is shown on the next page).

Overview of User Interface Workshop Outputs

Example requirements by persona

Dan Sprake – Car park owner

Goals and Needs

Dan needs...

- A tool that is simple, with a toolbox format
- A tool that can provide budget estimations
- A tool that will educate on the connections process – with a clear guide and checklist
- A tool with images and videos to help understanding
- A tool that generates a quick response

Pain points

Dan's current pain points are...

- Local authority targets and quotas on the percentage of charge points needed
- The use of jargon
- Knowing where to find this tool

Inputs and Outputs

What inputs are needed?

— Postcode

— How many chargers

— Type of charge needed

How could they be entered?

— Keyboard

— Drop down menu

What outputs are necessary?

— Is it possible?

— Cost and benefits (carbon and financial)

How could these be displayed?

— Forecast risk metric updated regularly

— What to do next? £6 contractors would pay for leads, handover to contractors

User Story

Card

As a car park owner

I want/need to know if I can fit EV chargers and how much it will cost

So that I will know if it's worth fitting them

Conversation

Keep it simple

Confirmation

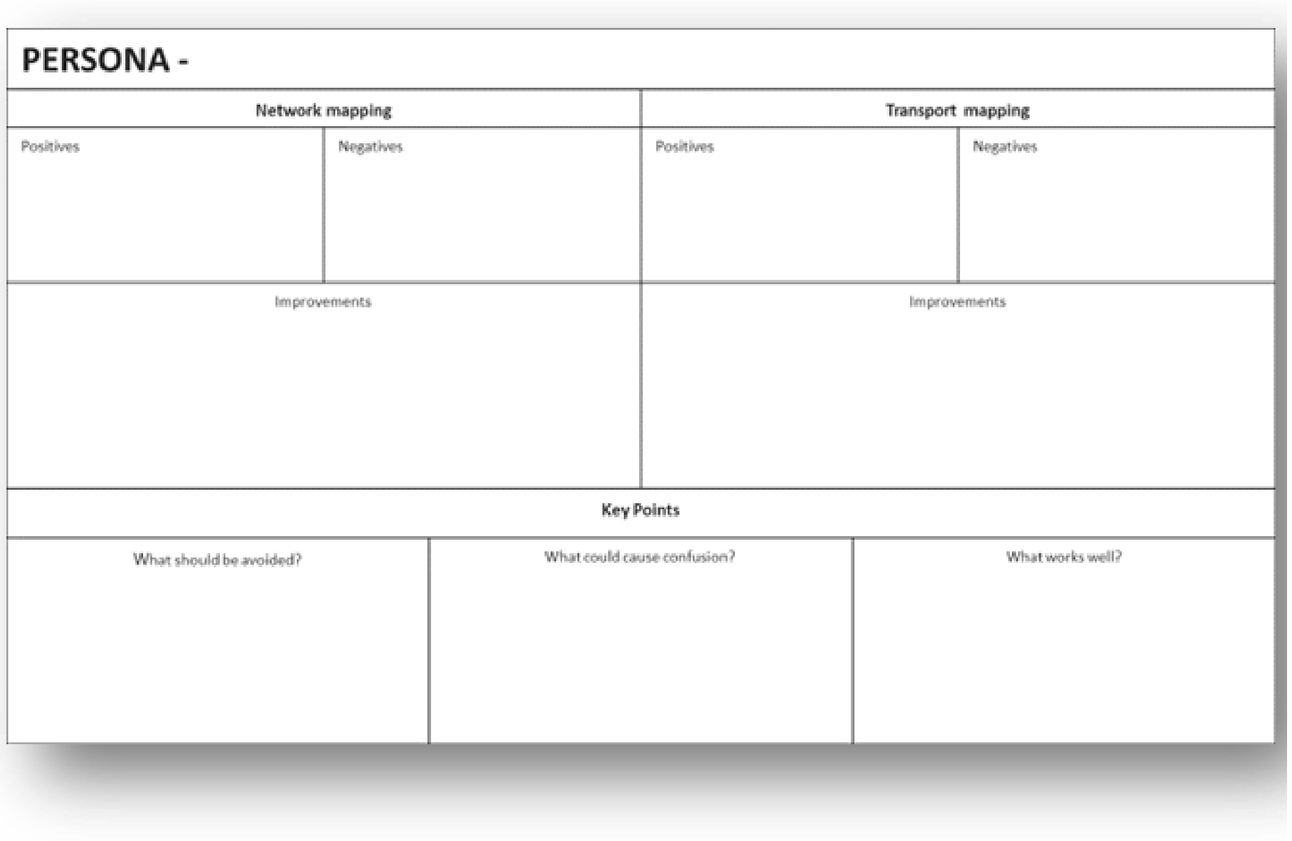
Can I see how many people have them installed (from previous users of the system to prove tool)

Can it...

Overview of User Interface Workshop Outputs

- Each person was also asked to review the transport and electricity network mapping software demonstrated, reflecting on positives, negatives, and possible improvements to the interface.
- Reflecting on the ConnectMore tool each group considered:
  - key points to avoid
  - what could cause confusion
  - what should be included

  from the perspective of their persona.
- The 12 activity sheets, again supplemented with transcripts of the group's discussions, are included in the supporting documentation



PERSONA -			
Network mapping		Transport mapping	
Positives	Negatives	Positives	Negatives
Improvements		Improvements	
Key Points			
What should be avoided?	What could cause confusion?	What works well?	

Overview of User Interface Workshop Outputs

- Example Output

Sian Evans – Development Surveyor

Network mapping

Positives

- Lots of detail
- Understand where can be developed for planning

Negatives

- Have to keep digging – want an indication earlier on
- Does it take into account future developments already planned
- Almost too much detail

Transport mapping

Positives

- Compare different sites
- More relevant for brownfield sites

Negatives

- Less relevant to persona – go where client site dictates
- Does it let you see enough detail?

Improvements

- Quicker being able to interpret the data (narrowing it down to what is relevant to you)
- Quicker visual of feasibility
- An app for a 'quick look' at options
- Option for 'quick response' or detailed response
- Note: better for small users

Improvements

- Look at impact of developing new sites on EV flow
- Sensitivity studies for the future
- Does it include lorries and busses?
- Are vehicle to grid (v2g) taken into account?
- Can you see how closely post 'future' scenarios
- Ability to plot indicated sites
- Indication of time spent at locations during travel

Key Points

What should be avoided?

- Too much information –more than a lot of users need
- People will lose trust if it is not accurate/doesn't work

What could cause confusion?

- Need a level of technical expertise to work
- Concern over accuracy of predictions – does it include all load types?
- Long term future is very important for this audience

What works well?

- Need right balance of data detail
- Zooming/scrolling
- User friendly, interactive
- Good to be able to draw a plot and then view lots of different scenarios at a click (trends over

User Requirements to Specification

Methodology: User Requirements to User Specifications

In order to determine the full set of requirements:

1. All workshop material including transcripts was reviewed itemised.
2. The itemised list was turned into a matrix showing a unique requirement in each row (99 items) against each of the user groups requesting the requirement in columns (see next page for extract).
3. The number of occurrences of each requirement was counted to inform the priority level.
4. The MoSCoW prioritisation of each requirement was determined by considering a number of factors, in addition to the 'number of occurrences' the partners' expertise and experience and the project/product scope.

An extract of the matrix is shown on the next page and the full matrix and full list of Functional and Non-Functional Requirements is available in Appendix C.

Must	• A requirement that must be satisfied
Should	• A critical requirement that should be included if it is possible
Could	• A requirement which is considered desirable but not necessary
Won't	• A requirement that will not be implemented now, but may be considered for the future

MoSCoW prioritisation key

The 'Must' requirements were verified by the Stakeholders via an email exchange (see appendix for materials) as the in-person workshop scheduled for 11th March 2020 was cancelled due to the COVID-19 outbreak.

Overview of Outputs: Extract from Requirements Matrix

		User Groups									
	Feature	Car park owner	Development surveyor	Local authority transport planner	Community member	Charging network operator	Council chairman	Charging network operator	Count	Priority	notes
Goals / Needs	Cost estimator	✓	✓				✓		3	M	A key feature of the tool
…	…	…	…	…	…	…	…	…	…	…	
Pain Points	3rd party delays				✓				1	W	Outside project scope and control
…	…	…	…	…	…	…	…	…	…	…	
Inputs	Batch file of sites			✓					1	C	Limited use case for this feature and potential other ways to achieve same outcome
…	…	…	…	…	…	…	…	…	…	…	
Data entry	Drop down menu	✓			✓	✓			3	S	Reduce user/data entry errors but refer to UI design best practice
…	…	…	…	…	…	…	…	…	…	…	
Outputs	Yes/no, is it possible	✓					✓		2	C	Not necessarily helpful without extra information which the tool is intending to provide
…	…	…	…	…	…	…	…	…	…	…	
Display	GIS layers							✓	1	M	A key feature of the tool
…	…	…	…	…	…	…	…	…	…	…	

Overview of Outputs: User Requirements - User Interface

- From the previous matrix and collected workshop outputs the ‘Must’ requirements for the *user interface*, *user inputs* and *user outputs* are shown across the next three pages:

User Interface

- Web-based frontend for ease of deployment and accessibility
  - Ability to input parameters via forms or graphical controls
- Network capacity view
- Electricity network/cost of connection view
- EV demand/transport model view
- Outputs shown visually with traffic light colouring (Red/Amber/Green)
- User accounts with login to save cost quotes
- Downloading results – export to PDF
- Tested on a range of web browsers and platforms
- Guidance/links to information about service alterations, queue management policy

- The specific controls for data entry (e.g. drop-down menu or radio buttons etc.) will be further explored in user testing

Overview of Outputs: User Requirements - Inputs

User Inputs

- Login credentials (links to SP Energy Networks CRM* system)
  - Ability to specify default parameters/user preferences
- Location (fixed or broad area)
- Number of charge points
- Types of charge points (7kW/22kW/50kW) – drop-down list with hover-over help
- Electrical capacity required
- Budget range for connection
- Number of EVs expected (or user could input number of cars expected)

- Dwell time of cars (Transport Model inputs)

- One way we can help users with data inputs include with hints like, ‘a 7kW charger will add approximately 30 miles worth of charge to a mid-sized EV every hour’.

*CRM = Customer Relationship Management

Overview of Outputs: User Requirements - Outputs

Outputs to User

- Electricity network capacity/EV charging demand heatmaps
- Connection cost estimates
- Charge points possible (count and type – 7kW/22kW/50kW)
  - Additional requirements for smart charging e.g. cost and equipment
- Reports contain maps and supporting data, e.g. limitations and assumptions used by the tool
- Contacts for information for next steps

- Transport model
- Flexibility options
  - Additional requirements for flexibility options
- Different levels of report – initial scope, full business case

Non-functional requirements (1)

In additional to the functional requirements (what the tool will do) described above there are also non-functional requirements (describing how the system works). These are determined by considering user feedback, stakeholder needs and various standards or best practice. The Non-Functional Requirements (NFRs) are grouped by category and the ‘must’ requirements (non exhaustive) are shown over the next pages.

NFR ID	Description
1. Usability	
NFR 1.1	Simple and easy-to-use interface, toolbox format.
NFR 1.2	Ability to pass parameters in a user-friendly manner, i.e. via GUI/forms.
NFR 1.3	Non-technical language throughout user interface or link to glossary of terms.
NFR 1.4	Ability to specify default parameters.
NFR 1.5	Available to use from a range of web browsers and platforms (e.g. Microsoft Edge, Google Chrome, Safari).
NFR 1.6	Provide functionality to minimise data entry e.g. default values.
2. Data	
NFR 2.1	Interface with SPEN CRM software to save quotes to user logins.
NFR 2.2	Adhere to industry requirements for confidentiality and data protection and meet the GDPR (General Data Protection Regulations).
NFR 2.3	All electrical network asset data will be held in CIM (Common Information Model) format.

Non-functional requirements (2)

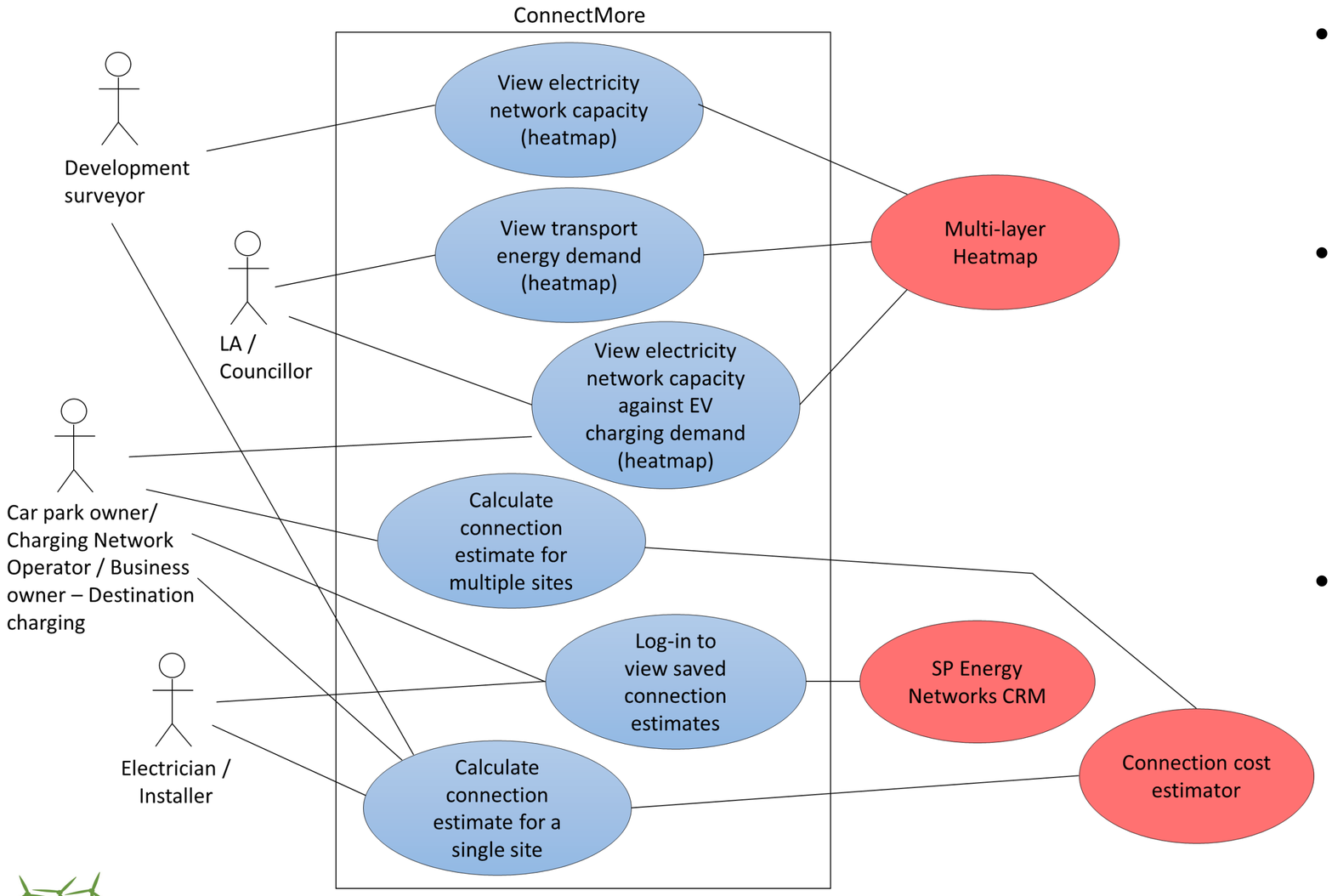
NFR ID	Description
3. Performance	
NFR 3.1	Less than 1 second response time for general navigation in the tool. Including screen navigation and menu operations but excluding any data operations or transactions.
NFR 3.2	A response time for data operations or transactions of less than 10 seconds under anticipated IT loading conditions.
NFR 3.3	Scalable online and storage capability for quotes.
NFR 3.4	The tool is expected to be available 24/7 (99.5% availability).
NFR 3.5	There will be a separate test and production environments.
4. Testing	
NFR 4.1	Support the ability to test all areas of functionality including: data load, transaction processing, reporting, stress testing, communications/failover.
NFR 4.2	Ability to operate system in a test mode prior to production and also during states of system upgrade or change.

Non-functional requirements (3)

NFR ID	Description
5. Error Handling	
NFR 5.1	The tool must be able to recover from failure in a graceful manner, presenting error messages to users in clear, non-technical language.
6. Security	
NFR 6.1	Data encryption in place (at rest and in transit).
NFR 6.2	Security applied to APIs, data import/export, file transfer activities.
NFR 6.3	A facility, hosted in the EU, compliant with ISO 27001.
7. Backup	
NFR 7.1	System should be Disaster Tolerant (backup system within the EU).
NFR 7.2	Data should be backed up when the state of the underlying data changes. In the first instance it is estimated that data will be uploaded annually.
NFR 7.3	The ConnectMore tool backup arrangements will be consistent with the enterprise wide Systems Backup Policy across the Iberdrola Group (2020).
NFR 7.4	Capability to trace the inputs corresponding to a given set of outputs.

User Interface and User Experience Specification Development

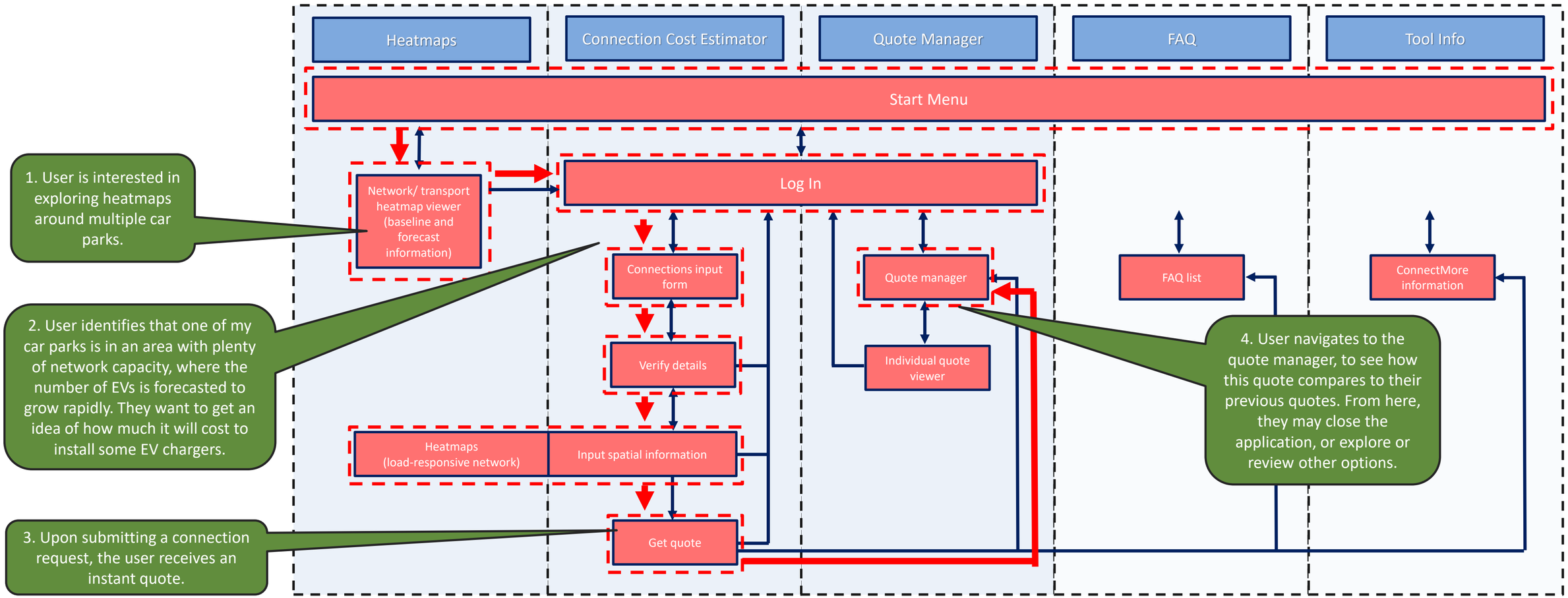
Use Case Diagram



- This Use Case diagram shows the various ways the different users may interact with the ConnectMore tool.
- This section of the report goes into further detail about what features the user may see in the tool and how they may navigate between different parts of the tool.
- The next page shows an annotated user journey example.

User Journey Flow Diagram

Example: A Car Park Owner



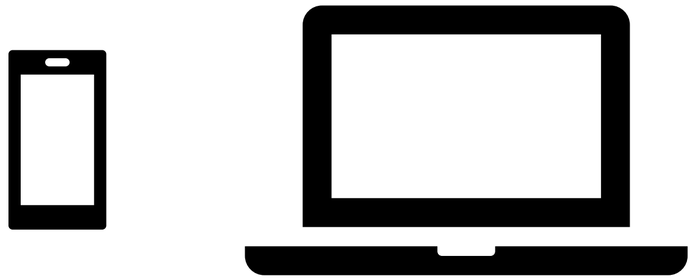
UI Design: the Wireframe

- To progress the design (and development) of the tool EA Technology keep and update a set of wireframes for the tool.
- A wireframe is a graphical skeleton that shows the layout, content and key concepts of a tool/website's User Interface (UI).
- Wireframes facilitate discussions about the functionality and reduce assumptions or errors in the tool build stage. The wireframes will be workshopped with a range of stakeholders.
- 'Mobile first' design means layouts are created for smallest screen first to help prioritise use of space and then scaled up to laptops.

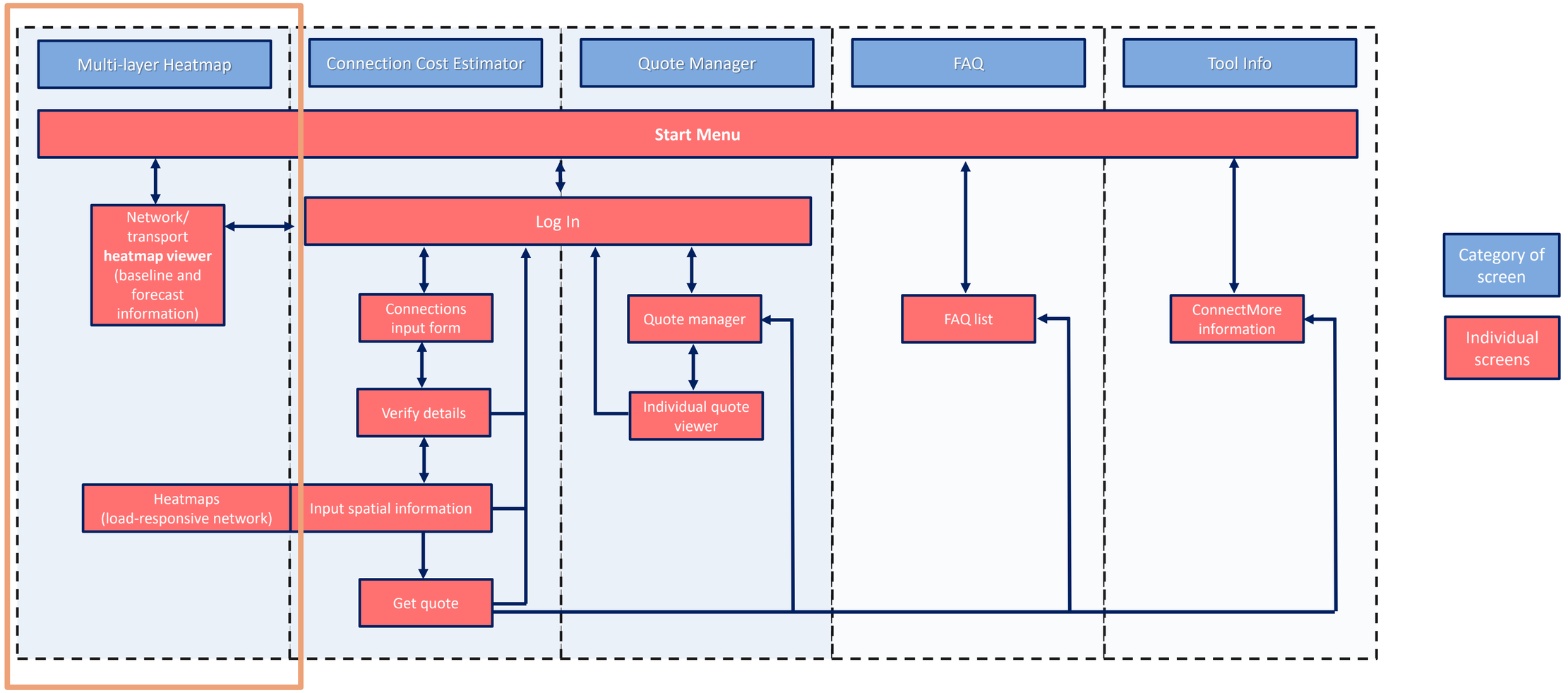
In creating the wireframes examples of decisions that will be made include:

- The number of pages to click/navigate through.
- The appropriate number and type of controls on each view

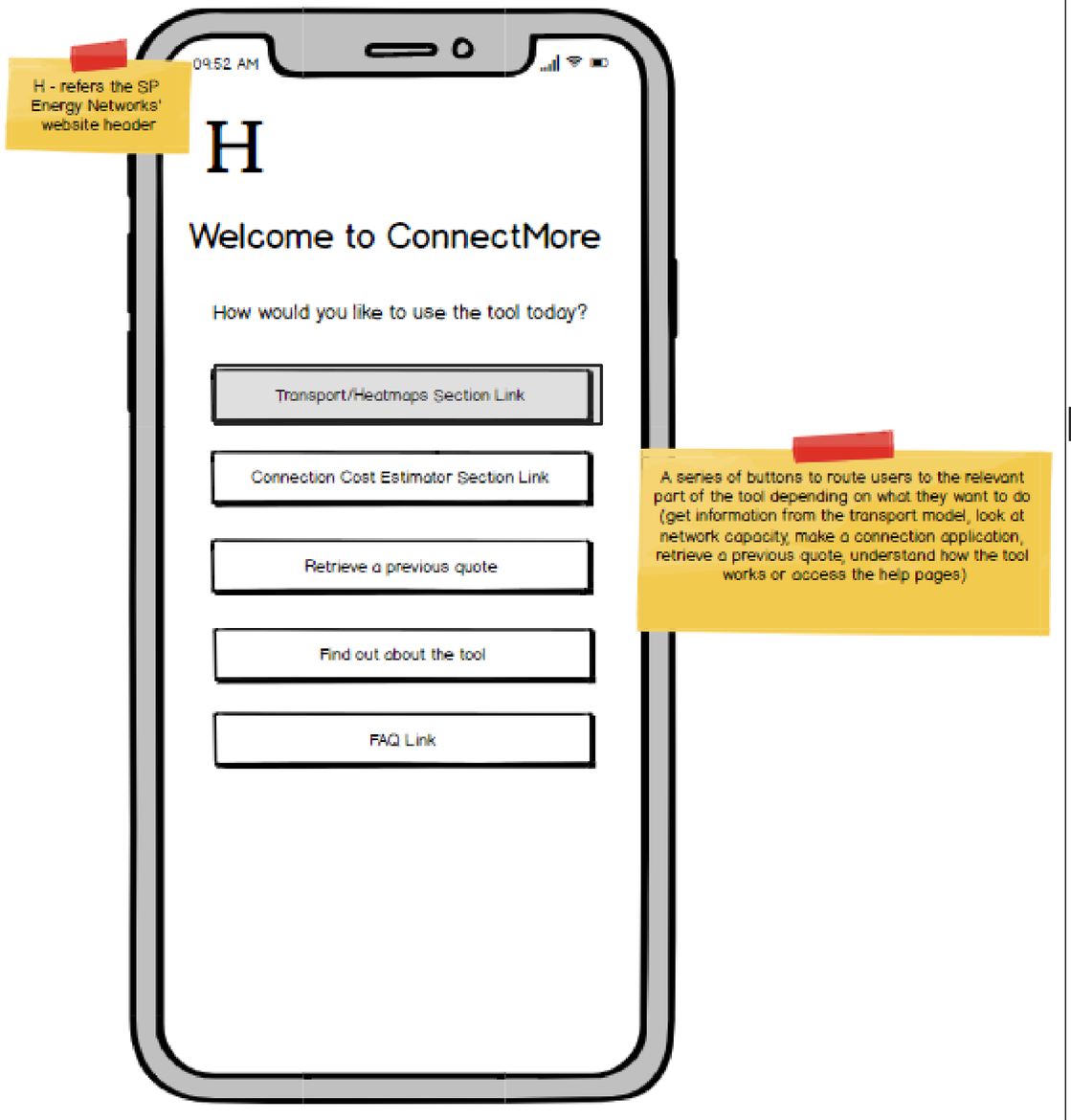
Some examples of the wireframes are provided on the following pages.



User Journey Flow Diagram



Start Menu



Heatmaps page

Transport Elements in ConnectMore: Introduction

- The following pages focus on the transport elements of ConnectMore – what users of this part of the tool will require, the data available, how this could be visualised and combined with network headroom information.

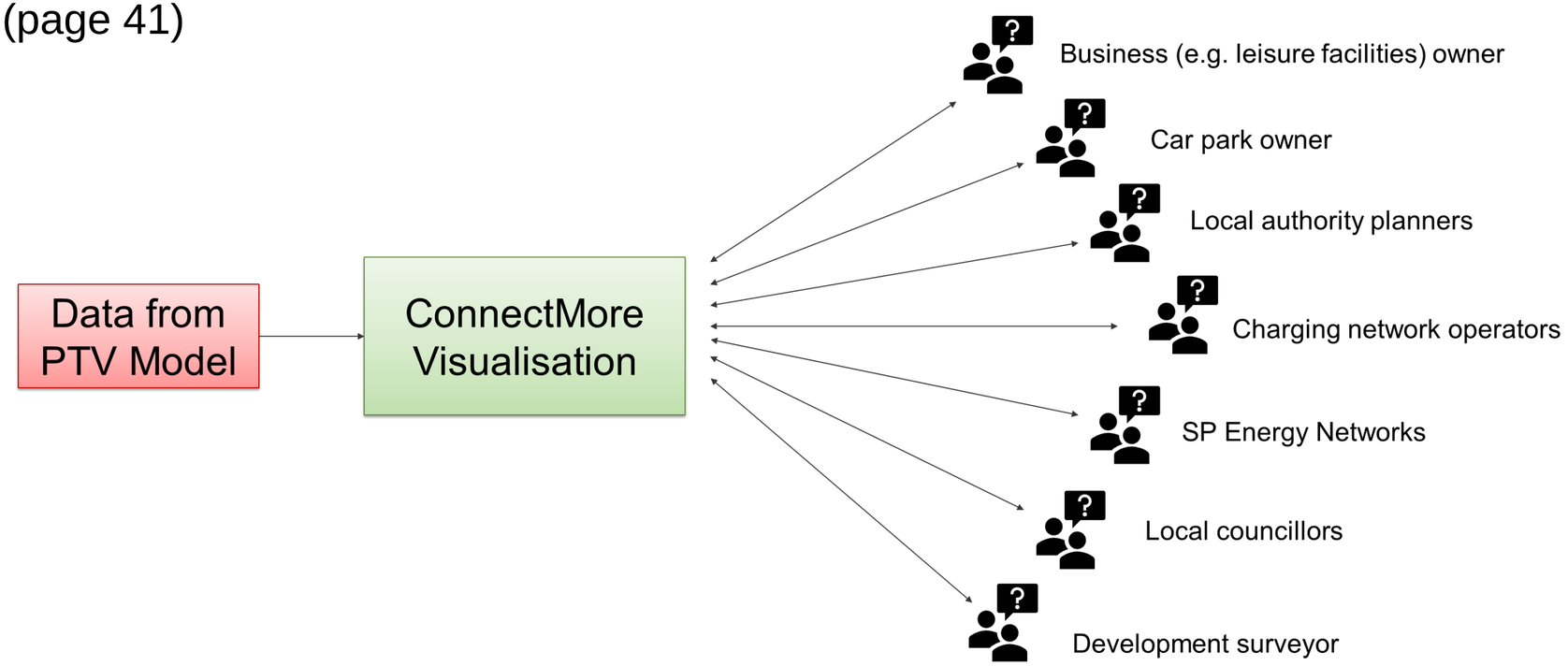
- Early work by PTV on the specification of the transport model has allowed more detailed design to be included for the Transport parts of ConnectMore

- EA Technology have also completed a focus group with potential users of the tool. While other aspects of ConnectMore are available (in part) in existing tools the display of EV demand data is new – hence why additional feedback has been obtained.

- The first focus group was focused on local authorities and transport authorities. Further consultation will be completed in the future with other users (e.g. charging network operators, car park owners etc.)

Transport Elements of ConnectMore

- The data available from the transport model has been established by PTV (e.g. in the Model Specification Report)
- There are multiple user groups for ConnectMore who may have different needs. The processing and visualisation in ConnectMore needs to be designed to satisfy these needs.
- In order to achieve the above the following need to be established:
  a) what users want to achieve with the tool (page 40)
  b) the data available (page 41)



Needs of Users of ConnectMore - Transport Elements

- The table shows a summary of the key user groups interested in the transport model element of ConnectMore.
- In addition to the Discovery workshops held in 2019 and described at the start of this report the transport aspects of ConnectMore have been reviewed at an additional focus group workshop held online on 19th June 2020.

User	Using the transport part of the tool to understand:
Local authority planners	Where will there be demand for public EV charging infrastructure? When will this demand occur? What type of chargers will be needed (7kW, 22kW or 50kW)?
Charging network operator	
Local councillor	
Development surveyor	Should EV charging infrastructure be included in a development? Is there sufficient demand to justify it? What type of infrastructure?
Business owner – e.g. leisure destinations	Is there demand for EV charging at their business/car park location(s)? What type of chargers would be needed?
Car Park owners	

Data Available from the Transport Model

- Data will be available for each metric, for each LSOA, in each scenario and model year.
- Data could be displayed ‘raw’ or combined to create additional (new) information.
- A summary of the key data types and figures available is shown in the table below. Further details about data processing are provided in the ‘Data Transfer and Processing’ report.

Data type	Figures available
How much **energy** is required for charging (kWh)	Disaggregated into public charging, private charging at activity (e.g. work), private charging at home Available for each hour of a typical weekday
Number of vehicles arriving	Split into all private cars and EVs Available for each hour of a typical weekday
Number of EVs arriving and charging	Available for each hour of a typical weekday
Dwell time of vehicles charging	Shown as a distribution (e.g. % who dwell for 0 – 1 hours, 1 – 3 hours etc.) Available for each hour of a typical weekday
Energy (kWh) transferred for each charging EV	Shown as a distribution (e.g. % of charge events taking 0 – 5 kWh, 5 – 15 kWh etc.) Available for each hour of a typical weekday

Visualisation of Results in ConnectMore - Transport Elements

Taking the information from the previous two pages the tool visuals will allow the user to:

- see multiple LSOA areas (shown by the light grey boundaries).
- easily compare and contrast LSOAs by the colour coding of the LSOAs.
- gain a quantitative view of each LSOA based on a legend which relates each shade to a numerical value range.
- Visually compare different locations over a wide area or zoom in to view a smaller area.
- save a copy of the view.

These heat map views can be used to show the quantities below, with the user selecting the view they want to see:

- Daily total kWh for public EV charging
- Daily total kWh for private at home EV charging
- Daily total kWh for private at activity charging
- Proportion of trips completed in an EV
- Number of EVs expected in LSOA
- Average dwell time (hours)
- Average energy taken per charging session (kWh)

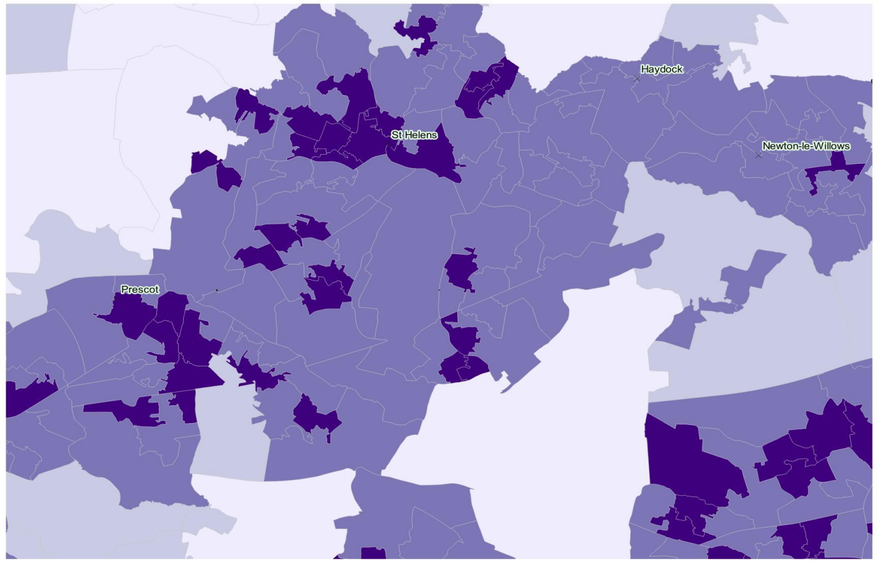


Figure: Example Heat Map View

Visualisation of Results in ConnectMore - Transport Elements

- To inform a connection request the user is likely to be seeking information about the expected demand for charging infrastructure in a specific location (or a shortlist of potential locations).
- Stakeholder engagement has also indicated that users are interested in using the tool to support them in making decisions about the type of charging infrastructure which should be installed (charging rate).

- A heat map would continue to be used but with additional functionality when the user has zoomed in (see figure). This functionality would allow the user to:
  - tap/click on an LSOA to view a call-out displaying numerical values,
  - add the LSOA to a comparison. This comparison would enable users to compare multiple locations and to inform the business case for a connection application.

Figure: Example Close Up LSOA View for Transport Model

Characterising Charging Demand

Charging demand can be described and evaluated by answering three questions:

1. Where?
2. When?
3. How fast?

The transport part of ConnectMore should help the user answer these three questions (as in the table below) which in turn helps provide the information needed to make a connection request.

Question	Notes
Where?	Heat maps allow comparison of multiple LSOA areas Users know the location(s) which they want to review charging demand in Tool needs user-friendly ways for the user to navigate to locations (e.g. postcode, town name or address search)
When?	When (time of day) is important for assessment of additional loading compared to network capacity (and offering smart charging connections) Transport model will predict each metric for each hour of the day at the LSOA level. User may have better estimates for demand at their site. Also predicts all metrics across a long-term time horizon (2020 – 2050)
How fast?	Charging rate is essential for the connection application process and comparing the need for charging infrastructure with available network capacity Transport model does not predict which type of chargers are required Distribution for dwell time (hours) and energy required (kWh) can be used to estimate distribution for what proportion of charging events require different charging rates.

Characterising Charging Demand – How Fast?

- The transport model does not predict which type of chargers (charging speed) are required.
- ConnectMore will include three types of charger: 7, 22 and 50kW.

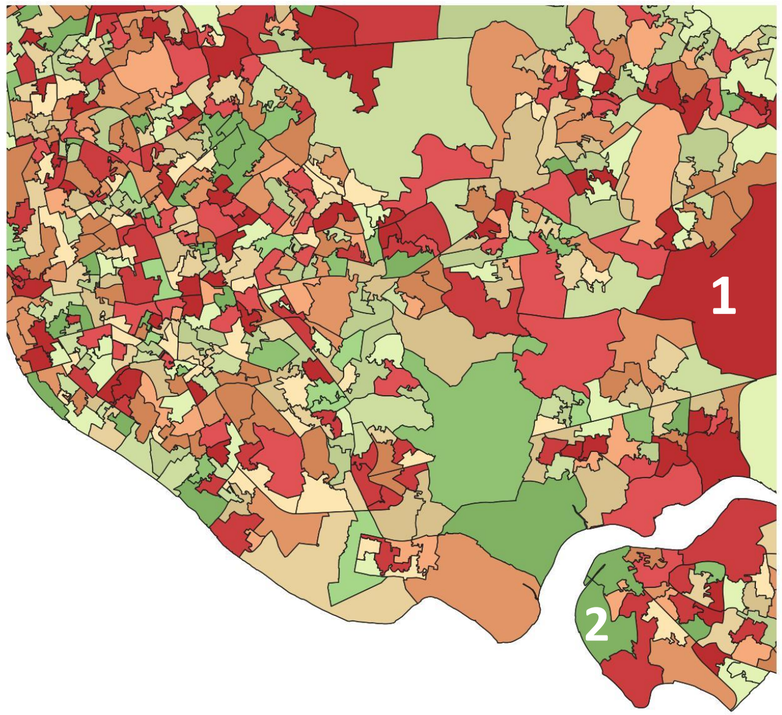
- The distribution for dwell time (hours) and energy required (kWh) can be used to calculate the charging speed required.
- For example:
  1. A charge event with an energy requirement of 9kWh, and a dwell time of 3 hours could charge at 3kW and meet the requirement – a 7kW charger is sufficient in this case
  2. A charge event with an energy requirement of 40kWh, and a dwell time of 1 hour would need to charge at 40kW to meet the requirement – for this example a 50kW charger would be needed

- The distribution for each LSOA will be used to show what proportion of charge events are satisfied by which type of charger
  - In an LSOA where the majority of charge events require little energy, or dwell times are long (e.g. a residential area without off-street parking) 7kW chargers may satisfy the majority of charging requirements
  - Another LSOA where energy demands tend to higher, or dwell times shorter would need higher power chargers to satisfy the users needs.

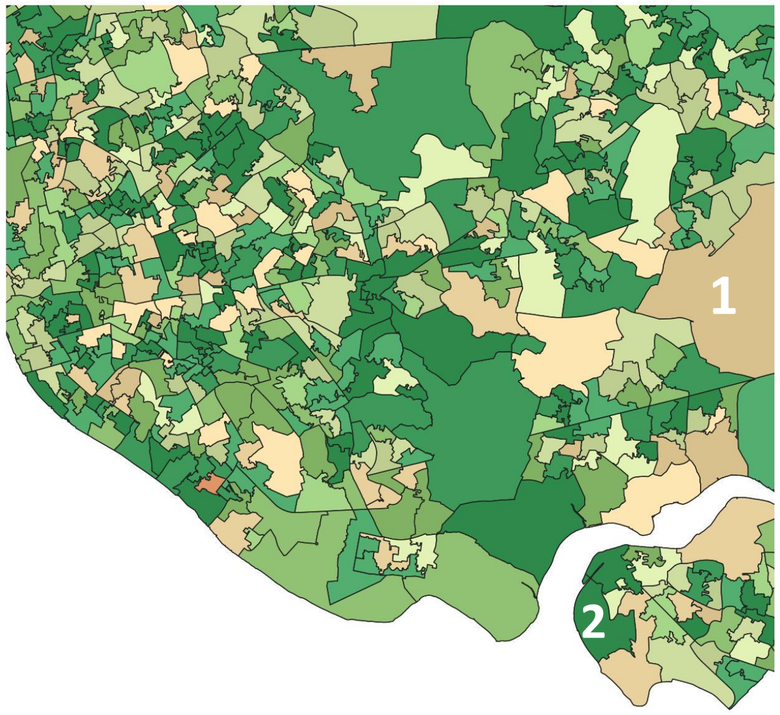
Visualisation of Charging Speed Results

- The diagrams show an example of how the data from the previous slide could be visualised.
- Users could move between the three available charging speeds, with the shading indicating what proportion of charging sessions could be satisfied with each charging speed.

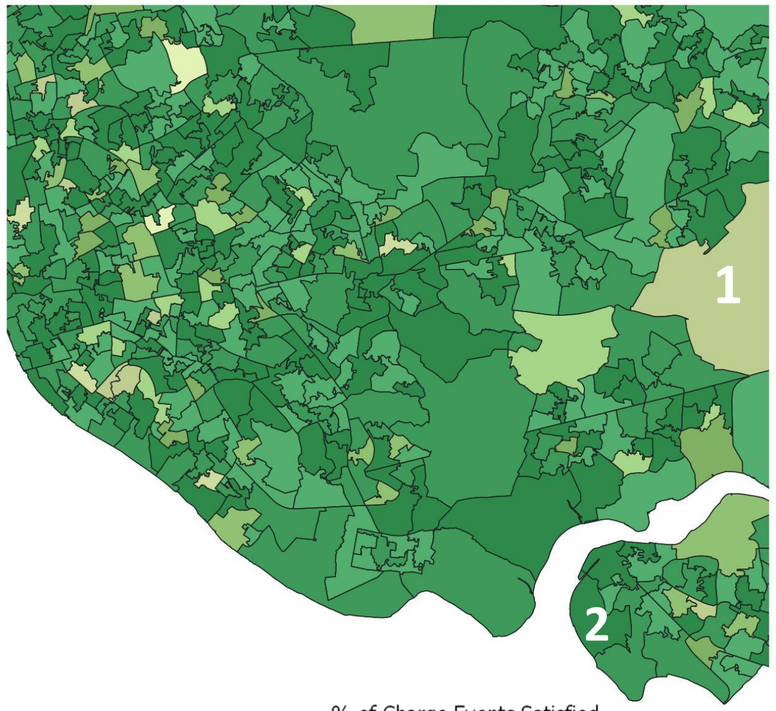
Proportion of Charging Needs Met with 7kW Charging

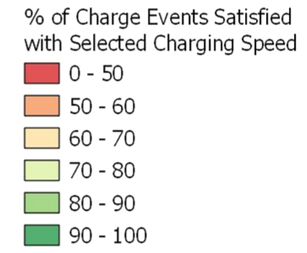


Proportion of Charging Needs Met with 22kW Charging



Proportion of Charging Needs Met with 50kW Charging





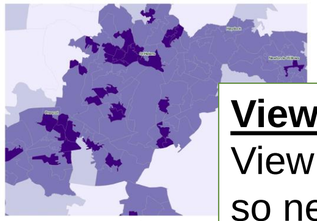
- LSOA 1 – 22kW or 50kW charging would be necessary to satisfy more than 50% of the charging sessions requirements for energy in the time available.
- LSOA 2 – 7kW is likely to be sufficient.

How to make data available?

- Three data views that could be presented by ConnectMore are shown here. Each would display slightly different data at different levels of granularity.

Transport data views that could be accessed via ConnectMore

Download pdf summary
Can include multiple metrics and different quantities (e.g. all future years, or all scenarios) but needs to not be overwhelming. Potentially user configurable to select:
- Metric(s) to include
- Year(s)
- Scenario(s)
- Data time period



View in ConnectMore – i.e. through heat map
View can probably only show one number at a time, so need to allow user to select:
- Metric to view
- Year
- Scenario

Download data table
Most granular option – suitable for more detailed individual analysis. Potentially user configurable to select:
- Metric(s) to include
- Year(s)
- Scenario(s)
- More granular data for time periods – e.g. including the hourly totals

The focus group held with local authority/transport authority users of ConnectMore indicated that heat maps and data tables were their preferred means to access data.

** subject to commercial model*

Overlay of transport demand and electricity network capacity heatmaps

- The figure on the right shows an early representation of the overlay of the transport energy demand and the electricity network capacity ‘layer’ views.
- The purple shading on each LSOA represents the energy demand for private cars travelling into each area. The location of primary substation groups are shown by a 1km diameter circle around the location. The shading of these circles show the available headroom.
- In this example the graph indicates that there is greater available capacity to connect in Crewe and Knutsford than Sandbach for example.
- The user of the ConnectMore will be able to pan across the region and zoom in and out of specific locations.
- ConnectMore will show a much more detailed representation of network capacity – showing the LV network.

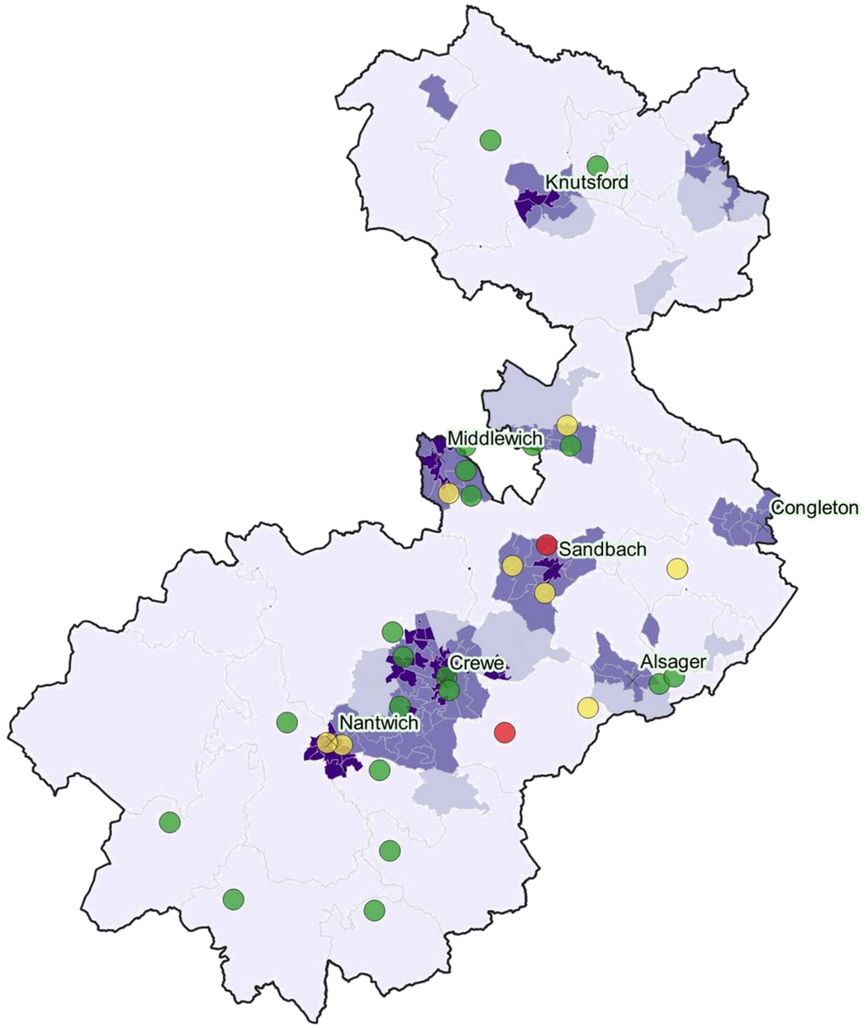
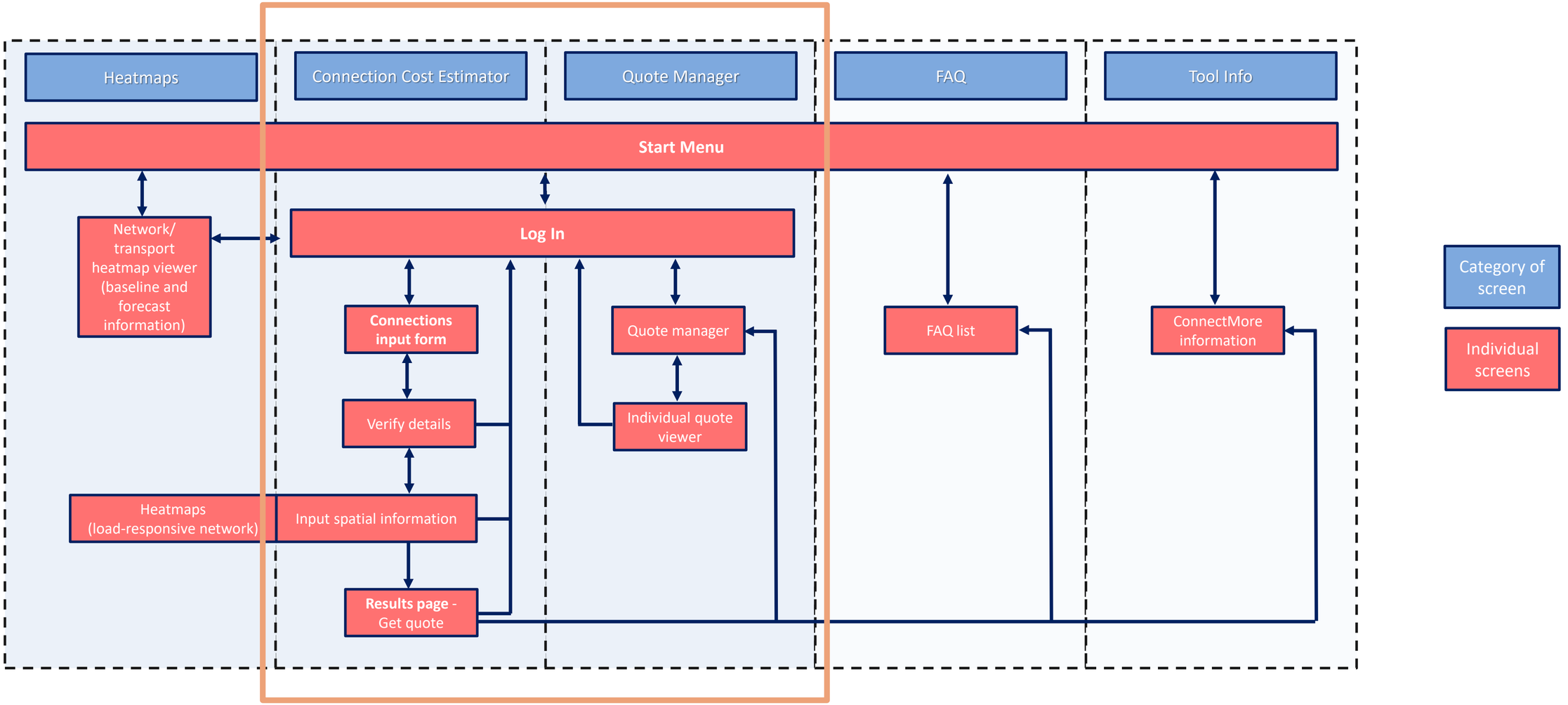
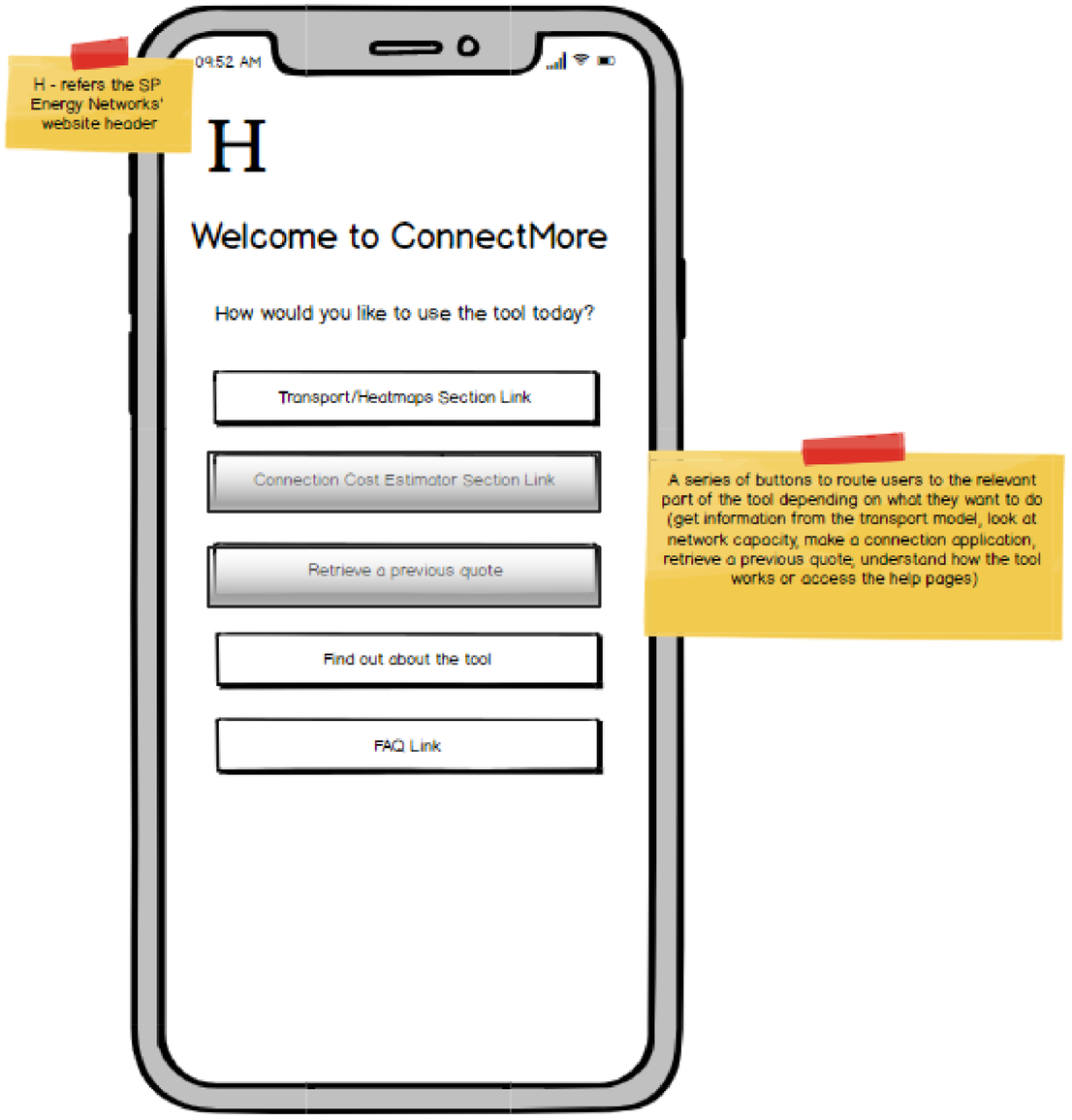


Figure: Heatmap of transport demand and electricity network capacity overlay.

User Journey Flow Diagram

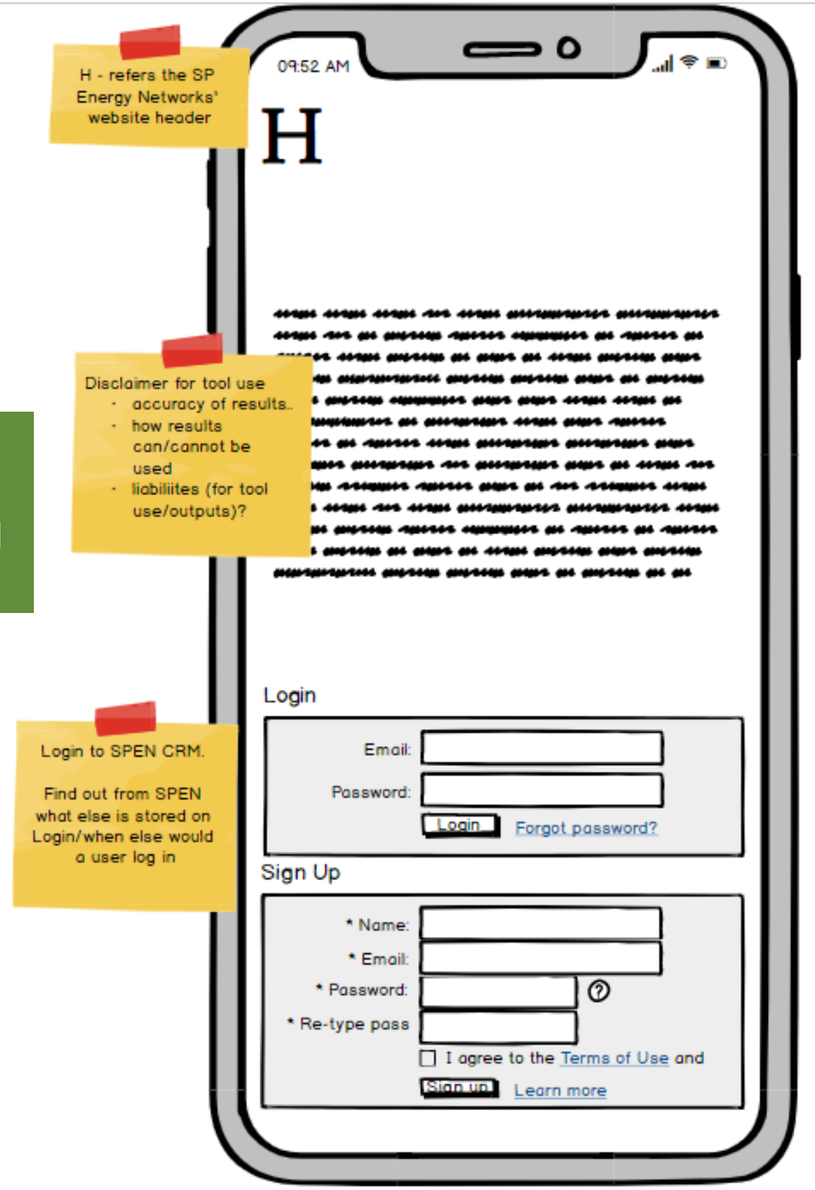


Start Menu



Login page

Interface with SPEN CRM tool



Connection Cost Estimator – Input form

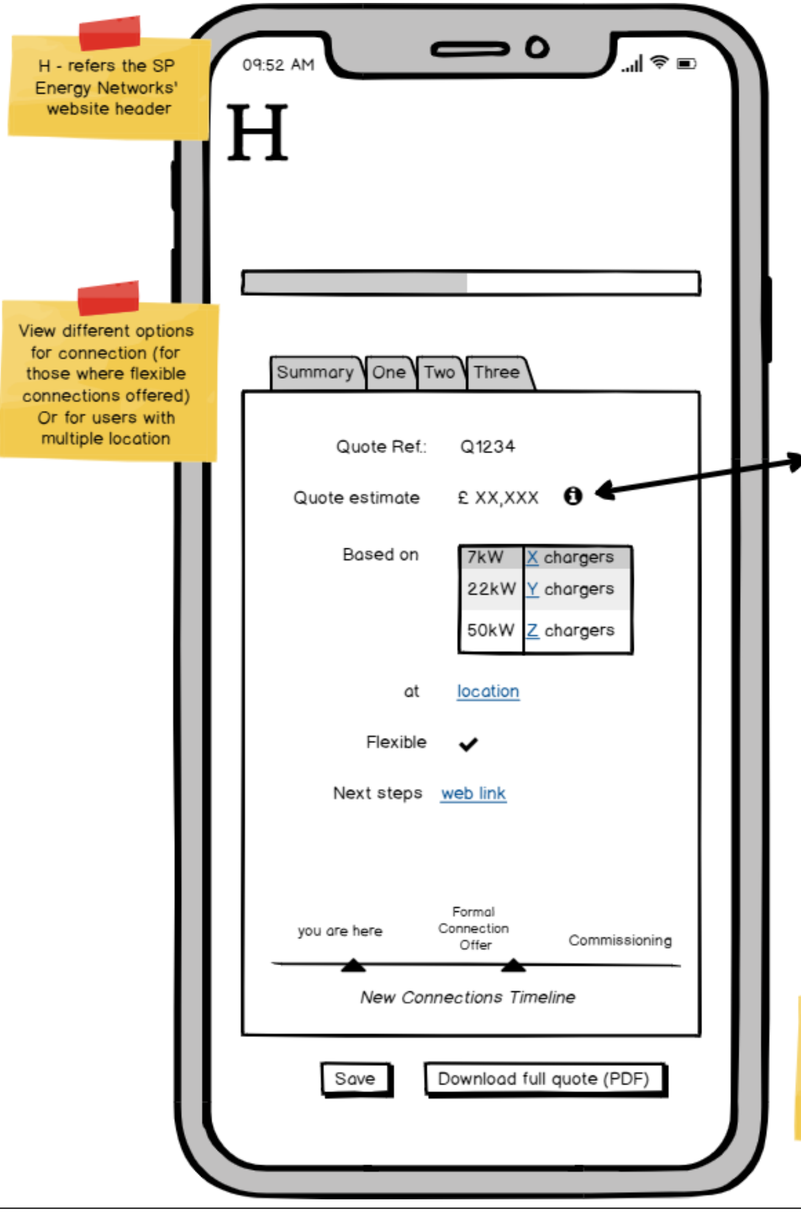
Q1. Checks that the postcode in question is within SPEN's license area (and not IDNO) --> display message, containing info about what to do if postcode outside of SPEN's area

--

Q3. Check that the needs cannot be met by service alteration - guide user through checks

... pages In between similar to Northern Powergrid's Autodesign developed and supported by EA Technology

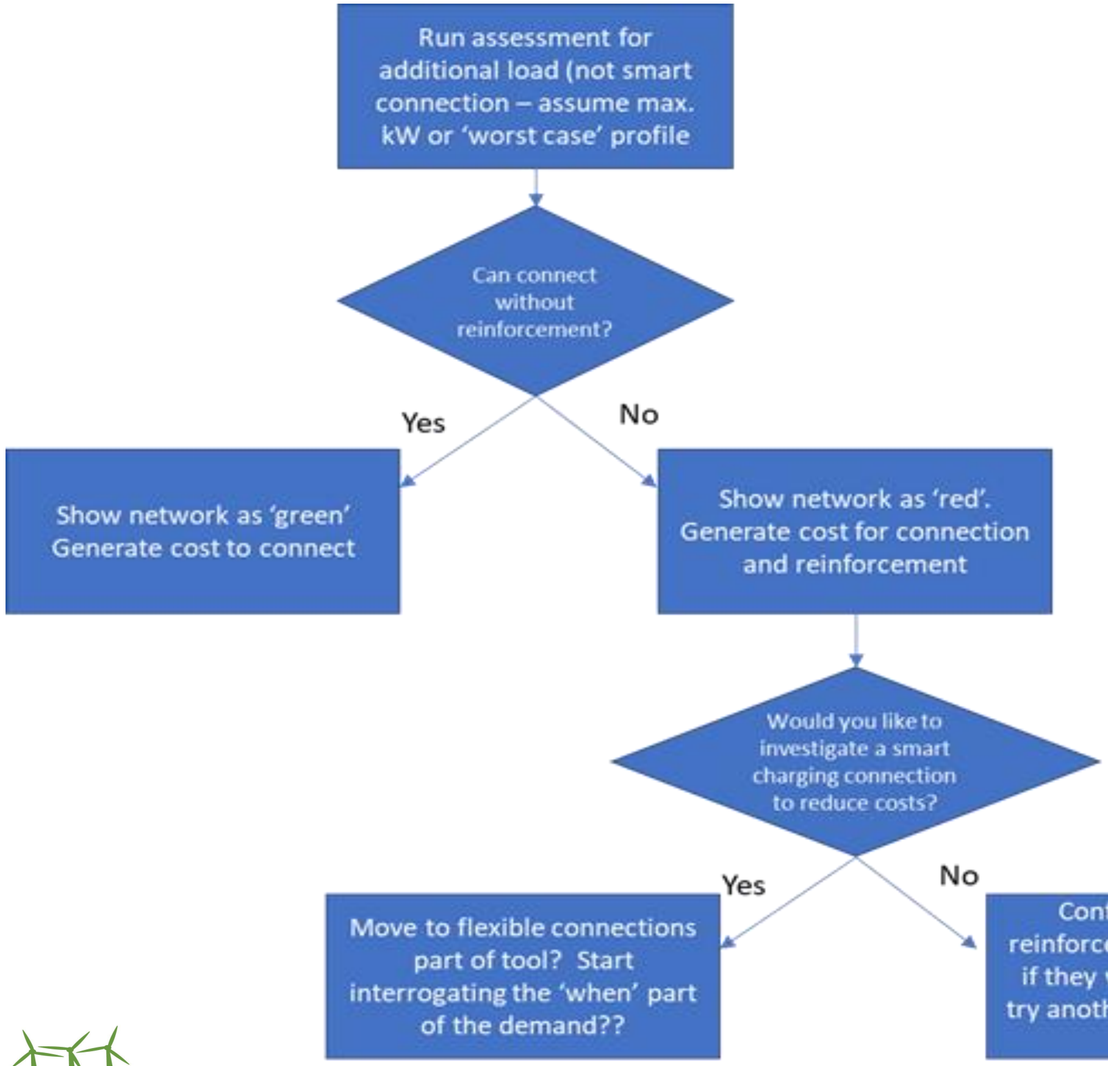
Connection Cost Estimator - Results page



hover over shows typical Bill of Materials considered / any exclusions

Full quote includes summary information &:
- all options?

Incorporation of Smart Charging Connection in the Costing Estimation



- Where the network capacity is limited users would benefit with being presented with *smart charging connection* options which should reduce either their cost to connect or time to connect.
- The acceptability of a smart charging connection will be influenced by the management of charging would adversely affect the end customers (the people charging) this in turn is dependent on a number of factors, such as:
  - EV battery size,
  - SOC of the EV battery,
  - the distance (energy) required for the EV driver to get to their next destination with a charging point.
- The information from the transport model is intended to assist users in assessing whether a smart charging connection is suitable in their area.

Incorporation of Smart Charging Connection in the Costing Estimation

- The data from SGS (information on schemes A to G can be found in the SGS deliverable) is processed to define a logic tree structure for the tool to use and to filter viable solutions for each connection request based on location and related network constraints and network apparatus (e.g. local/central controller).
- In order to assess whether a smart charging connection is able to meet the needs of the chargepoint while maintaining the network within thresholds the tool will take an estimated demand profile for the proposed site (without smart charging) and the network state from the DEBUT load flow results and calculate whether there is likely to be enough flexibility in the system to offer the client the requested capacity.
- In reality, the network demand around the connected charge point would be monitored in real time and, should this be approaching limits, the chargepoint hub would be asked to reduce its load. The algorithm used across connected charge points will be up to the chargepoint operator.

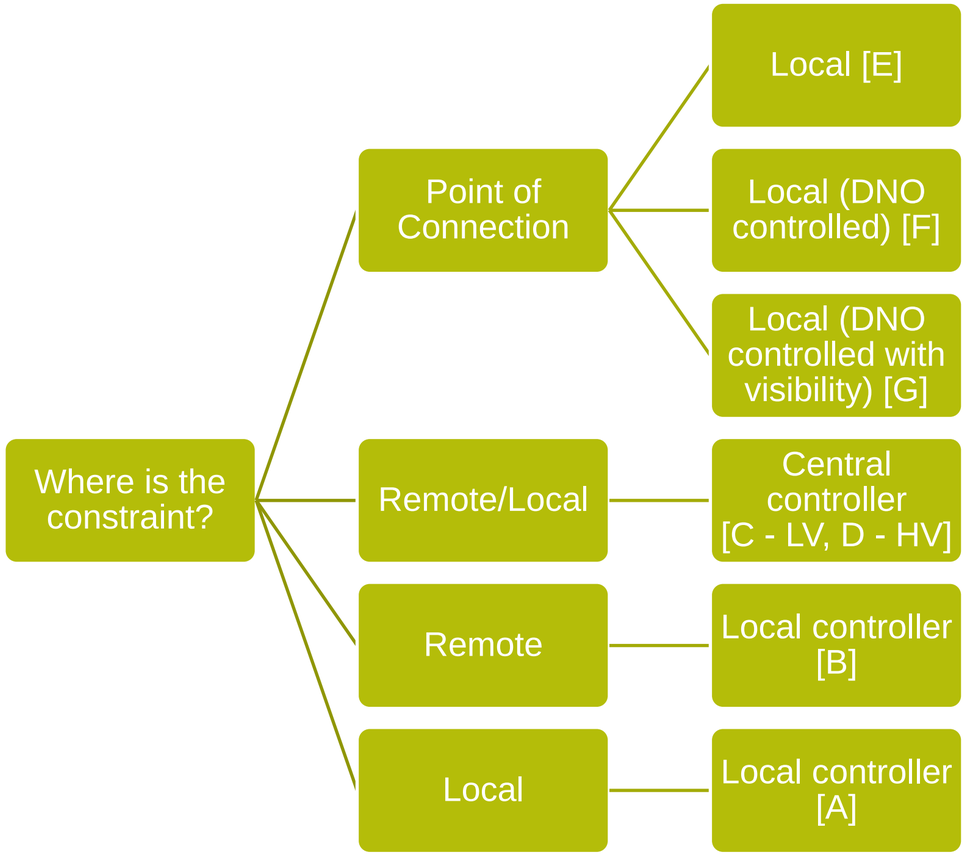


Figure: Logic tree to filter viable solutions for given connection request

Next Steps

Next Steps

- Agile development means cross-functional teams deliver multiple iterations of a product with new versions being delivered frequently.
- This work is organised into a ‘backlog’ that is prioritised based on business or customer value.
- The goal of each time-bounded iteration (or ‘sprint’) is to produce working code or a product increment which can be reviewed by stakeholders.

ConnectMore code development	Jun 2020	Jul 2020	Aug 2020		Sept 2020		Oct 2020		Nov 2020		Dec 2020		Jan 2021		Feb 2021		Mar 2021	
Milestone					LV Capacity Assessment						HV Capacity Assessment						Transport Model Integration	
Sprint plan (subject to change)	Sprint 1	Sprint 2	Sprint 3	Sprint 4	Sprint 5	Sprint 6	Sprint 7	Sprint 8	Sprint 9	Sprint 10	Sprint 11	Sprint 12	Sprint 13	Sprint 14	Sprint 15	Sprint 16	Sprint 17	Sprint 18

Figure: ConnectMore tool sprint timeline

Next Steps

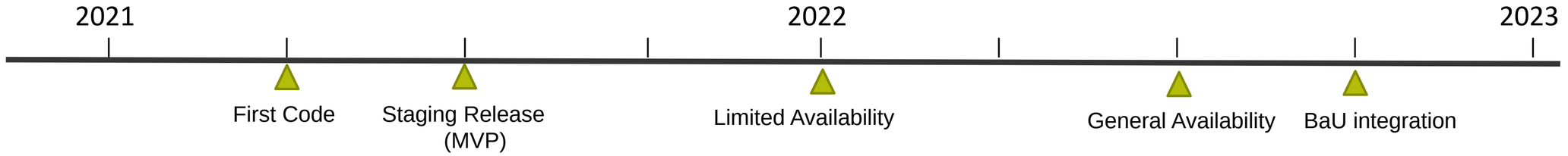


Figure: ConnectMore tool deliverables timeline

The ConnectMore deliverable milestones as they stand for the Charge project are shown on the timeline.

'Staging release' on the timeline refers to a Minimum Viable Product (MVP) which has sufficient features to deliver value to the users. The final, complete set of features is only designed and developed after considering feedback from the product's initial users.

The MVP will include:

- EV chargepoint connection budget estimator for MANWEB license area (including capacity assessment for meshed networks). Output will include options for smart charging connection.
- EV charging demand heatmap interface (PTV model information).
- Electricity network capacity heatmap interface.

Appendices

Appendices

- Appendix A: Stakeholder Workshop 1: User Profiles - materials and outputs
- Appendix B: Stakeholder Workshop 2: User Interface - materials and outputs
- Appendix C: Requirements Matrix [live document]
- Appendix D: Requirements Verification Workshop

Appendix A – User Profiles

- Appendix A1. The presentation shown during the workshop https://eatl.sharepoint.com/sites/ChargeProject/Shared%20Documents/Stakeholder%20Information/ConnectMore%20Stakeholder%20Workshops/01%20User%20Profile%20Workshop%20JUL%2019/2019-07-11%20Charge%20Project%20FINAL.pdf

- Appendix A2. *Explain Market Research*'s outputs from the workshop - https://eatl.sharepoint.com/:p:/s/ChargeProject/EZpCElDBOS1Bvad116TrfPIB5RFkT3xwEC8EWOVSHPrSuw?e=pYgQ6c
  - Appendix A2i. The 12 persona profiles determined at this workshop are reproduced on the following pages.

Chris James – Electrician & installer

Profile

- Chris is a 40 year old male, who is an electrical contractor with 20 years of experience
- Chris has worked his way up as an Apprentice to complete his degree
- Chris is married with children and is looking forward to his retirement
- Chris spends his time between the office and site visits
- He's always connected to the internet and utilises digital tools a lot within his role
- Chris has an interest in EV charging but limited experience in this area at the moment

Goals & needs

Chris needs…

- A tool with a simple and clear interface across devices
- A tool that provides an instant yes/no indication for his customer
- A tool that provides accurate indicative costs
- A tool that allows him to input and search based on precise technical details, such as postcode and MPAN

Motivation

Chris would like…

- A tool that is customer driven and can support him to provide better customer service
- A tool that is up to date with reliable information that can be given directly to his customer

This is because as an electrician and installer, Chris needs to be able to work efficiently to provide better customer service

Pain points

Chris' current pain points are…

- Not having access to accurate and up to date information for his customer
- Barriers to him providing speedy customer service

Use scenario

Chris would usually be…

- Using the tool to generate an output based on a client request
- Either on site with the client using his smartphone, or at the office using his laptop
- Always connected to the internet

Key quotes about ConnectMore

"I would use ConnectMore as a daily use tool"

"This better not be complicated"

"If it's not accurate it'll affect my bottom line"

Dan Sprake – Car park owner

Profile

- Dan is a 60 year old male, who is the owner of a multi-storey car park
- Dan doesn't have a strong academic or educational background and has worked his way up through the company
- Dan is married with children
- Dan does not have any experience of EV charging

Goals & needs

Dan needs…

- A tool that is simple, with a toolbox format
- A tool that can provide budget estimations
- A tool that will educate on the connections process – with a clear guide and checklist
- A tool with images and videos to help understanding
- A tool that generates a quick response

Motivation

Dan would like…

- To understand the different types of chargers and connection points available
- To understand what demand this would have on the car park
- To be able to connect directly with developers to take this forward

This is because as a car park owner, Dan needs to install charge points, but first needs to understand demand and the types of charges needed

Pain points

Dan's current pain points are…

- Local authority targets and quotas on the percentage of charge points needed
- The use of jargon
- Knowing where to find this tool

Use scenario

Dan would usually be…

- Using the tool as a one off for a specific project
- In the office on desktop computer

Key quotes about ConnectMore

"I just want someone to tell me the answer"

Laura Khan – Motorway service stations

Profile

- Laura is a 36 year old female, who works in planning for the motorway service station
- Laura has a degree in Planning and experience in strategical infrastructure planning
- Laura has a general awareness of EV and understands that charging points are needed in service stations

Goals & needs

Laura needs…

- A tool that will clearly identify capacity for connection
- The ability to forecast EV uptake to understand impact on future demand at motorway services
- A tool that can outline the options and impact for number and type of charge points
- A tool that can help her understand the ‘bigger picture’ of EVs and chargers, including smart solutions
- Outputs that can be exported and printed

Motivation

Laura would like…

- To be able to look at different scenarios within one interaction
- To have an understanding of the costs relating to these different scenarios

This is because as a motorway service station planner, Laura needs to be able to look at scenarios and costs to inform business decisions

Pain points

Laura’s current pain points are…

- Understanding the implications of different scenarios and factors
- Complex language and information
- Understand how the process works as a whole

Use scenario

Laura would usually be…

- Trying out different scenarios to understand how many charge points may be needed and what type
- Assessing from the office desktop computer

Key quotes about ConnectMore

“I need the knowledge to build a business case”

“I’m not an electrician”

“What are my options here?”

Chris Allen– Community group representative

Profile

- Chris is a 58 year old female, who is an active member of her village community group
- Chris is married with older children
- Chris is degree educated with a professional background in accounting
- Chris currently works part time and volunteers in the local community in her spare time
- She is eco-conscious and has an aspiration for her village to be carbon-neutral
- Chris enjoys the outdoors and walks with her dog
- Chris has an amateur interest in EV charging and connections; her son has an EV and she has taken responsibility for researching EVs on behalf of a rural community group
- She is comfortable using the internet for shopping and information finding

Goals & needs

Chris needs…

- A tool with a simple interface with non-technical language – 'non-professional' option to simplify
- To be able to get an answer with limited data
- To be able to access clear and up to date data for her rural area
- A tutorial guide and videos
- To be able to understand what capacity and options are available in her area
- To be able to access outputs that are downloadable/ available offline

Motivation

Chris would like…

- To drive her village towards its carbon-neutral goal
- To be able to understand the options available in the rural area; charge point options, costs, charge time
- To be able to gather information to support grant applications

This is because as a community group representative, Chris needs to understand what might work for the rural area, and have the right evidence to apply for community grants to take this forward

Pain points

Chris' current pain points are…

- Feeling she doesn't know where to start
- Getting explanations in layman's terms
- Finding recommendations how to proceed
- Being charged to access this information

Use scenario

Chris would usually be…

- Finding the tool via a Google search for 'Can I have a charge point?'
- Accessing at home from her laptop or tablet
- Connect to home broadband

Key quotes about ConnectMore

"Can I have a charge point?"

"How can I find out more about community charging schemes?"

"I want it to be quick and easy to use"

"I didn't realise it was all going to be so complicated!"

Cybil Knight– Hotel owner

Profile

- Cybil is a 54 year old female, who owns and runs a hotel with her husband in rural Wales
- The hotel also has spa and gym facilities
- Cybil left education at the age of 18 and has worked in the hospitality industry since
- Cybil has very little spare time, but enjoys relaxing with a gin when she can
- Cybil is comfortable with IT day to day; designing promotion materials, completing hotel admin and advertising on social media

Goals & needs

Cybil needs…

- Clear guidance to allow her to approach an installer with a basic understanding of the options available
- Non-technical language and a glossary of terms
- Outputs shown visually with traffic light colouring
- An explanation of options and associated costs, with relevant caveats and warnings
- The ability to view options based on a budget
- To understand if EVs would benefit the hotel and if she would need to charge for the service
- To contact information for any additional queries
- An autosave function

Motivation

Cybil would like…

- To attract more visitors to the hotel and remain competitive
- To understand what is feasible for the hotel
- To understand the ballpark cost to take this forward

This is because as a hotel owner, Cybil wants to attract customers and meet their changing needs, but needs to be sure her investments will pay off

Pain points

Cybil's current pain points are…

- Locating the tool online
- Not having technical knowledge and feeling overwhelmed by too much information
- Not having experience with this type of tool before and lacking confidence as a result
- Having the time to input data required
- Having to pay to access the tool

Use scenario

Cybil would usually be…

- Accessing the tool on her tablet computer with broadband connection
- Using the tool for one specific project
- Looking to understand basic options and costs

Key quotes about ConnectMore

"Will it be too complicated for me?"

"Will I get more people visiting the hotel if I install a charger?"

"'Is it what my installer needs? Will it help us speak the same language?"

Dave Ward – Housing association – Sustainability officer

Profile

- Dave is a 45 year old male, who holds the position of Sustainability Officer for a large housing association
- Dave is degree educated and has spent most of his career working for the housing association
- He's worked in sustainability related roles for the last seven years
- Dave is divorced and enjoys cycling in his spare time
- Dave also works part time as a DJ
- He has non-technical knowledge of EVs and Connections

Goals & needs

Dave needs…

- To be able to produce key deliverables from the tool; summary reports with maps and support data
- Plenty of evidence to support recommendations for location options, such as network availability, costs and timescales
- To be able to export digitally and print outputs
- To be able to save his report or quote

Motivation

Dave would like…

- To be able to see long-term forecasts for capacity and need across locations
- To improve current developments based upon customer demand
- To plan for future developments
- To meet housing sector standards and requirements
- To understand the options and costs quickly
- To support the move for internal fleet of maintenance vans to go electric

This is because as a Sustainability Officer, Dave wants to ensure future planning supports customer needs, and he must be able to evidence this to his superiors

Pain points

Dave's current pain points are…

- Understanding if connections would work across brownfield and greenfield sites
- Accessing up to date information at all times that works with a rolling budget
- Accessing maps with high level of detail needed
- Inputting future developments into tool to understand impact; new sites, number of houses, predicted load, new roads etc

Use scenario

Dave would usually be…

- In the office on his desktop, with the latest version of Windows
- Accessing the tool regularly for different scenario testing
- Downloading and printing outputs for use on-site

Key quotes about ConnectMore

"It needs to make my job easier"

"It needs to be up-to-date"

"'It would be an asset to our business"

Anna Castillo – Leisure place owner

Profile

- Anna is a 45 year old female who is the owner of a leisure place
- She has an entrepreneurial background and a BMA
- She has worked in a number of organisations across different sectors, with a focus on maximising profit
- Anna does not have any technical background or experience
- She is married with young children, and is looking to build up a nest egg for the future
- With a young family Anna is particularly focused on health and wellbeing, and enjoys travelling and experiencing culture with her family
- She's ambitious and looking to maximise her role, which means she is open to change and flexible in her business approach

Goals & needs

Anna needs…

- A yes or no answer as to whether she can connect and charge EVs on her premises
- Information that's represented visually and clearly
- No technical jargon

Motivation

Anna would like…

- A tool that provides easy to understand outputs for the non-technical
- Outputs that are visual and to the point
- Outputs that give a cost indication for connections
- A tool that provides guidance on suppliers and operations to take connections forward

This is because as a leisure place owner, Anna needs to maximise profit whilst investing in new technology to meet evolving customer needs

Pain points

Anna's current pain points are…

- Not having the time to fill in a lengthy form
- Understanding technical jargon
- Determining the costs vs benefit to her business
- Understanding the overall process and next steps

Use scenario

Anna would usually be…

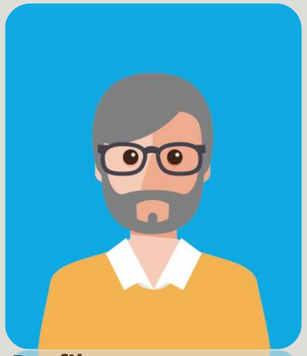
- Doing an initial sense check/ test run on her smartphone while out and about
- Using the tool in full in the office on her company laptop
- Wireless internet – limited signal

Key quotes about ConnectMore

"This is more complicated than I thought"

"I can't believe how many options there are"

Brian Roberts – Parish/town council



Profile

- Brian is a 65 year old male, who has been Chairman of the Council since his early retirement
- Starting his career as an apprentice, Brian worked his way up to Senior Manager prior to retirement
- Brian is married with two older children who are at university, he still supports them financially
- Brian has technical experience built up across his career; however he isn't up to date with new technology
- Brian has a passion for serving his community, and keeps himself busy with community service and public events
- He keeps up on current affairs through the local printed newspaper
- Brian is also passionate about the environment, with an interest in climate change and renewables

Goals & needs

Brian needs…

- Outputs that include high level cost and risk implications
- A tool that helps him understand the risk and benefits of EV connections in his locality

Motivation

Brian would like…

- A tool that provides an initial yes/no indication of capacity in the local area
- A tool that also provides wider information on the EV initiative and wider impact
- A tool that presents outputs visually and in a printable format

This is because as a Council chairman, Brian must listen to the interests of his community and be able to evidence to council members any risks or benefits

Pain points

Brian's current pain points are…

- Not having the knowledge to fill out complex forms or understand technical jargon
- Waiting for the council clerk to report on the system outputs
- Being wary of the 'myths' relating to EVs and charge points
- Convincing other council members of the benefit of EVs in the community

Use scenario

Brian would usually be…

- Working from home on his smartphone to do an initial assessment
- Sending the link through to his clerk to use in the office via desktop
- Connected to private Wi-Fi

Key quotes about ConnectMore

"We need one of those, they've got one, we want one"

"Let's get the clerk to do this"

Richy Rich – Charging Network Operator

Profile

- Richy is a 42 year old male, who is in a short-term role as charging network operator
- Richy is divorced without children
- Richy has a Masters in Business and Marketing and refers to himself as a ‘professional entrepreneur’
- Richy is a forward thinker and often changes his job to follow new technologies and innovation
- Making money is Richy’s primary motivator, so he can enjoy regular holidays to the Maldives
- Richy spends his weekends socialising at parties
- Richy is also a sports car enthusiast and has recently purchased the new Tesla model

Goals & needs

Richy needs…

- Information that is focused and clear
- Accurate cost indications
- To be able to search multiple locations at one time
- Answers in less than five minutes

Motivation

Richy would like…

- A tool that provides instant answers to support client proposals and ensure return on investments
- A tool that can support him bringing his product to market
- A tool that can help him identify key areas of footfall for future projects

This is because as a charging network operator, Richy needs to be able to see quickly what options are available to ensure return on investment

Pain points

Richy’s current pain points are…

- Not having information to hand ‘in the moment’ during client meetings
- Reading through detailed and technical information to determine return on investment
- Basing client proposals on information that is misleading or not kept up to date
- Paying more to get accurate and up to date information

Use scenario

Richy would usually be…

- In the office on his Mac costing up a proposal for a client, or on his iPhone in a face to face client meeting
- Accessing the system quickly to get an immediate response
- Always connected to the internet

Key quotes about ConnectMore

“I managed to cost that site in less than five minutes”

“I need clear information for my business case”

John Smith – Local Authority – Transport and Spatial Planning

Profile

- John is a 42 year old male, who is the Transport and Spatial Planning Manager for the Local Authority
- John has a degree in Geography
- He has worked for his current Local Authority for 10 years, previously holding a similar position in another Local Authority for 10 years
- John works full time, but has flexible working – with two days on the road/ working from home, and three days based in the office
- John is a family man with two children and a dog
- He drives a diesel car
- John enjoys dog walking, football and Formula One
- John has some knowledge of the principles of EVs, but not in relation to the technical aspects

Goals & needs

John needs…

- To be able to view the best locations and capacity in the area
- The option to export information directly from the tool that can be placed straight into his planning applications

Motivation

John would like…

- To access information to support internal planning applications for specific projects and locations
- A tool that has similar functionality to other systems he's familiar with, such as traffic models
- The functionality to change the map view and overlay external maps

This is because as a Transport and Spatial Planning Manager, John needs the tool to support his internal planning applications, to ensure projects are based in the best locations with the right capacity

Pain points

John's current pain points are…

- Having to pay to access the tool
- Knowing that the tool has the most up to date information
- The compatibility of the tool with existing systems

Use scenario

John would usually be…

- Using his work laptop with Windows 8
- Using Chrome or Internet Explorer
- Connected to home or office internet
- Hooked up to the Local Authority system at all times – with restricted access remotely
- Submitting an application to be able to download any software or plug-ins

Key quotes about ConnectMore

"Is there a cost?"

"How does it link to my software?"

"My computer's a bit old, will it still work?

Sian Evans – Development Surveyor

Profile

- Sian is a 35 year old female, who is a Development Surveyor in a medium-sized organisation for a commercial housing provider
- Sian has been in her current role for five years
- She has been chartered for two years and is looking to move into a managerial role
- Sian is often out on-site, but also works from the office, with one day working from home
- In her free time, Sian enjoys running, Zumba and cycling

Goals & needs

Sian needs…

- Evidence for the feasibility of new schemes
- An indication of related costs
- A tool that can support her in producing feasibility reports – with costs and risk assessments
- The ability to work offline and download documents

Motivation

Sian would like…

- To access information that will support her planning applications
- To be able to carry out a cost benefit analysis based on the information
- To understand if a lower voltage connection will reduce costs

This is because as a Development Surveyor, Sian needs the whole picture to gauge what type of EV chargers would be best for the site based on current plans and infrastructure, without large cost implications

Pain points

Sian's current pain points are…

- The costs of connections across projects
- Outputs that state 'no demand' as this isn't helpful
- Limited internet connection or signal from remote sites

Use scenario

Sian would usually be…

- Using the tool for more than one project
- Working to a Local Authority directive
- Accessing the tool on-site in different locations
- Using work devices such as Android smart phone, laptop with Windows 8 or iPad tablet computer
- Devices will be around three years behind latest model

Key quotes about ConnectMore

"Is it available in Welsh?"

"Why does it cost so much?"

"I need data for my feasibility study"

Paul Jones – Regional Transport Manager

Profile

- Paul is a 47 year old male, who is a Regional Transport Manager
- Paul started as an apprentice and has worked his way up through six to seven different roles – with around five to six years in each role
- He has gained all his experience ‘on the job’ with mainly operational practice
- Paul is now less ‘tech savvy’ as he manages a team who complete the technical work on his behalf
- Paul is office based, with network meetings once a week in different regions
- Paul is single and in his spare time enjoys trips to the pub and rambling
- He is also interested in model railways, music and real ale

Goals & needs

Paul needs…

- A tool that is simple to use
- A tool that provides outputs for costs and viability, to understand level of risk
- Imagery to input directly into planning applications
- To see demand scenarios and forecasting for what is currently available and what would be required in the future
- The functionality for GIS overlay
- The option to export and print out outputs – both high level and detailed information

Motivation

Paul would like…

- A tool that will enable his team to access detailed information, but with a one page summary output for him to review
- A tool that can provide the information needs to support planning applications

This is because as a Regional Transport Manager, Paul needs to review the community benefits of EVs, whilst ensuring future proofing and the meeting of government standards

Pain points

Paul’s current pain points are…

- Being constrained to locations adjacent to transport infrastructure, such as stations and railway lines
- The cost of connections and charge points

Use scenario

Paul would usually be…

- Accessing the tool from his office on his laptop, with good internet access
- Using Windows 8

Key quotes about ConnectMore

“Who in my team can use this?”

“My locations are fixed, the network has to come to me”

Appendix B – Stakeholder workshop materials

- Appendix B1. The presentation shown at the workshop https://eatl.sharepoint.com/:b:/s/ChargeProject/ERrETH-HbAFOq0mMjeH7tZYBtKXyaTeeI7ksU2_C8GnhIA?e=mSA77L

- Appendix B2. *Explain Market Research*'s output summary https://eatl.sharepoint.com/:p:/s/ChargeProject/EXFNRyowM9dIp97niCiCm9EBijoG0F05d36iO4rX4pgi7w?e=JWOpab
  - Appendix B2i. The extended persona profiles are reproduced in this document.
  - Appendix B2ii. The user interface workshops are reproduced in this document.

Appendix B2i. The extended persona profiles

Dan Sprake – Car park owner

Goals and Needs

Dan needs…

- A tool that is simple, with a toolbox format
- A tool that can provide budget estimations
- A tool that will educate on the connections process – with a clear guide and checklist
- A tool with images and videos to help understanding
- A tool that generates a quick response

Pain points

Dan's current pain points are…

- Local authority targets and quotas on the percentage of charge points needed
- The use of jargon
- Knowing where to find this tool

Inputs and Outputs

What inputs are needed?

—Postcode

—How many chargers

—Type of charge needed

How could they be entered?

—Keyboard

—Drop down menu

What outputs are necessary?

—Is it possible?

—Cost and benefits (carbon and financial)

How could these be displayed?

—Forecast risk metric updated regularly

—What to do next? £6 contractors would pay for leads, handover to contractors

User Story

Card

As a car park owner

I want/need to know if I can fit EV chargers and how much it will cost

So that I will know if it's worth fitting them

Conversation

Keep it simple

Confirmation

Can I see how many people have them installed (from previous users of the system to prove tool)

Can it…

Sian Evans – Development Surveyor

Goals and Needs

Sian needs…

- Evidence for the feasibility of new schemes
- An indication of related costs
- A tool that can support her in producing feasibility reports – with costs and risk assessments
- The ability to work offline and download documents

Pain points

Sian's current pain points are…

- The costs of connections across projects
- Outputs that state 'no demand' as this isn't helpful
- Limited internet connection or signal from remote sites

Inputs and Outputs

What inputs are needed?

—Number of housing units

—Assessment of number of vehicles on site

—Total energy load

—Extra costs for EV charge, location, type of property (exec/social etc)

How could they be entered?

—Populate simple tabular information

—Grid reference of polygon on map software

—Touch screen entry to map software

—Radar button with correct wording

What outputs are necessary?

—Cost of connection

—Regular updates of costs estimates

—What type of charging is needed

—Timescale and complexity

—Radar button

—Size of electric sub needed

How could these be displayed?

—Cost per unit/per acre

User Story

Card

As a Development Surveyor

I want/need cost information and barriers to connection that is updated over time

So that calculate development appraisal profiles for sites and projects

Conversation

Scope for sensitivity analysis between various sites

Confirmation

Can I clear costs and timescales for new site provision

Can it provide comparison data between sites and price change over time, provide cost changes if local battery storage or other technologies are installed, enable me to sign up for connection approval process?

John Smith - Local Authority – Transport and spatial planning

Goals and Needs

John needs…

- To be able to view the best locations and capacity in the area – *localised scenarios planning*
- The option to export information directly from the tool that can be placed straight into his planning applications
- *Land ownership data*
- *Demand capacity*

Pain points

John's current pain points are…

- Having to pay to access the tool
- Knowing that the tool has the most up to date information
- The compatibility of the tool with existing systems
- *Understanding non-charging energy demand*
- *Programme coordination*

Inputs and Outputs

What inputs are needed?

—Other GIS lawyers – household info (address), upload a 'layer' for key scenarios

—Batch files multiple sites

—Needs existing connection registrations already built in (MPAN)

How could they be entered?

—UPRN – google style, polygon and specific area (set road)

—Tick on/off on infrastructure/capacity options

—EV registration by postcode

—5,10,15 year forecast on demand

—What infrastructure is needed to support

What outputs are necessary?

—Report which SLA are attracting most interest (requests, queries)

—Individual site specific and wider polygon

—Outline assumptions on charging behaviour

—DVLA info

How could these be displayed?

—Report – tick SLA of interest (last 12 month queries)

—Spatial map info

—Recommendations on levels/volumes

—Additional request for SPEN reporting

—Understand alternatives – tool to 'flag' options e.g. if no grid capacity, exportable as layer to add into other GIS

User Story

Card

As a local authority

I want/need to forecast demand

So that I can set the correct level of investment, for strategy

Conversation

Future proofing, in advance and down the line, what types of chargers are appropriate at different levels/volumes

Confirmation

Can I input batch files for multiple sites

Can it be readily incepted by other colleagues, accessible

Chris Allen – Community group representative

Goals and Needs

Chris needs…

- A tool with a simple interface with non-technical language – ‘non-professional’ option to simplify
- To be able to get an answer with limited data
- To be able to access clear and up to date data for her rural area
- A tutorial guide and videos
- To be able to understand what capacity and options are available in her area
- To be able to access outputs that are downloadable/ available offline

Pain points

Chris’ current pain points are…

- Feeling she doesn’t know where to start
- Getting explanations in layman’s terms
- Finding recommendations how to proceed
- Being charged to access this information

Inputs and Outputs

What inputs are needed?

—Budget range available

—Postcode and/or specific address

—Charge point type

How could they be entered?

—Pinpoint on a map, charge point type

—Drop down options

—Non-jargon ‘help’ options

What outputs are necessary?

—Visibility of existing chargers

—Available network capacity

How could these be displayed?

—Visibility – mapped (link to zap map?)

—Network capacity (heatmap)

User Story

Card

As a village community member

I want/need to install EV charging points

So that visitors and residents without off-street parking can charge their cars

Conversation

Link to zap map

Confirmation

Can I understand if and where I can install EV chargers at appropriate cost

Can it give me up to date and accurate information

If too costly/not feasible at current time, need a way to register for future alerts if circumstances change, chat facility of help, charge perimeters automated to find a more feasible site

Chris James – Electrician & installer

Goals and Needs

Chris needs…

- A tool with a simple and clear interface across devices
- A tool that provides an instant yes/no indication for his customer
- A tool that provides accurate indicative costs
- A tool that allows him to input and search based on precise technical details, such as postcode and MPAN

Pain points

Chris' current pain points are…

- Not having access to accurate and up to date information for his customer
- Barriers to him providing speedy customer service

Inputs and Outputs

What inputs are needed?

—Numbers of charge points needed

—Maximum rating of units

—Existing sight capacity

—New capacity needed

How could they be entered?

—Address

—MPAN

What outputs are necessary?

—Cost for upgrade of service

—Budgetary quotation

How could these be displayed?

User Story

Card

As a Installer

I want/need a budget quote

So that I can quote accurately to the customer

Conversation

Need transparency of capacity, can I have more capacity for only small additional cost to futureproof the site?

Confirmation

Can I firmly quote from the information provided

Can it

Richy Rich – Charging network operator

Goals and Needs

Richy needs…

- Information that is focused and clear
- Accurate cost indications
- To be able to search multiple locations at one time
- Answers in less than five minutes

Pain points

Richy's current pain points are…

- Not having information to hand 'in the moment' during client meetings
- Reading through detailed and technical information to determine return on investment
- Basing client proposals on information that is misleading or not kept up to date
- Paying more to get accurate and up to date information

Inputs and Outputs

What inputs are needed?

—1 charger and x options for location (multiple chargers and locations)

—Potential flexibility, other local flexibility

—Guest usage (create account after you have done some work), seasonality

—When will charge and for how long

—Other transport plan impact

How could they be entered?

—Plot on a map

—Drop down menu

—Overview (zoom in and out)

—Detailed information per charge

What outputs are necessary?

—Cost (breakdown) for chargers in each region

—Options for flexibility

How could these be displayed?

—Layers

—Interact with council planning portal

—Record wish list and generation storage

—If it's too expensive record capacity

User Story

Card

As a Charging network operator

I want/need to be able to plan for a specific charge point, look at region and see where usage and cost are low and then drill seamlessly to the specify charge point and add additional information and go out

So that I can see the cost of insulation and predicted use. User registration is painless. I can save and come back later to populate, using rough locations for each one

Confirmation

Can I save work, refresh data fast, record wish list, seamlessly go to high quality to low quality detail, I can view/test a single charge point for cost and demand with options to adjust and save.

Can it add data for flexibility, add data on transport constraint, demand 48, weekly, seasonal patterns. Nature of constraint, conditions for flexibility. View data at different granularity (24 hour, 48 hour, weekday, weekend, weekly, monthly)

Brian Roberts – Parish/town council

Goals and Needs

Brian needs…

- Outputs that include high level cost and risk implications
- A tool that helps him understand the risk and benefits of EV connections in his locality

Pain points

Brian's current pain points are…

- Not having the knowledge to fill out complex forms or understand technical jargon
- Waiting for the council clerk to report on the system outputs
- Being wary of the 'myths' relating to EVs and charge points
- Convincing other council members of the benefit of EVs in the community

Inputs and Outputs

What inputs are needed?

—Location (fixed or now/broader)

—Number of cars/EV's

—Dwell time

—Budget

How could they be entered?

—Postcode (click a map, draw a polygon or GPS)

—Fixed number for range

What outputs are necessary?

—Yes/no – can we connect

—Then a cost/cost breakdown of options/solutions

—Recommended type and rating/number of chargers

—Timescales for development

—Risks and benefits of EV's, snapshot in time warnings/high interest

—Links to how to get a formal connections quote

How could these be displayed?

—Prioritise cheapest option but display alternatives

—Export to printable PDF (with button) with clear outputs and summaries, jargon reference section

User Story

Card

As a council chairman

I want/need an easy to use tool with clear outputs and little previous knowledge required

So that I can convince other councillors of the benefits of EV's

Conversation

Provide useful information and links; clear readable outputs for helping business case

Confirmation

Can I understand the inputs/outputs and get a straightforward answer

Can it be as precise and easy to use as possible, find it in a Google search

Appendix B2ii. User interface activity sheets

Dan Sprake – Car park owner

Network mapping

Positives

—Lots of detail, almost too much detail

Negatives

—Have to keep digging – want an indication earlier on

—Does it take into account future developments already planned

Transport mapping

Positives

—Future scenario of growth of EVs

—Time spent at location – dictate the speed of a charger

Negatives

—How accurate are future predications?

Improvements

—How accurate is the guide cost?

Improvements

—Show ‘sensitivity’ for future scenarios

—Distance travelled

Key Points

What should be avoided?

What could cause confusion?

—Too much information – immediately switch off

What works well?

—Keep it simple

—Intuitive functionality

—Apps/familiar interface

Sian Evans – Development Surveyor

Network mapping

Positives

—Lots of detail

—Understand where can be developed for planning

Negatives

—Have to keep digging – want an indication earlier on

—Does it take into account future developments already planned

—Almost too much detail

Transport mapping

Positives

—Compare different sites

—More relevant for brownfield sites

Negatives

—Less relevant to persona – go where client site dictates

—Does it let you see enough detail?

Improvements

—Quicker being able to interpret the data (narrowing it down to what is relevant to you)

—Quicker visual of feasibility

—An app for a ‘quick look’ at options

—Option for ‘quick response’ or detailed response

—Note: better for small users

Improvements

—Look at impact of developing new sites on EV flow

—Sensitivity studies for the future

—Does it include lorries and busses?

—Are vehicle to grid (v2g) taken into account?

—Can you see how closely post ‘future’ scenarios

—Ability to plot indicated sites

—Indication of time spent at locations during travel

Key Points

What should be avoided?

—Too much information –more than a lot of users need

—People will lose trust if it is not accurate/doesn’t work

What could cause confusion?

—Need a level of technical expertise to work

—Concern over accuracy of predictions – does it include all load types?

—Long term future is very important for this audience

What works well?

—Need right balance of data detail

—Zooming/scrolling

—User friendly, interactive

—Good to be able to draw a plot and then view lots of different scenarios at a click (trends over different

John Smith - Local Authority – Transport and spatial planning

Network mapping

Positives

—Traffic light

—Breakdown of cost options

—Influence scenario

Negatives

—What are the prior assumptions?

Transport mapping

Positives

—Overlap, GIS, aggregated

Negatives

—3D not necessary

—Not as easy to interpret

Improvements

—See detail on assumptions made in tool – see how can influence red/amber/green

Improvements

—Scenario forecasting – additional layer

—Output results

Key Points

What should be avoided?

—Over simplifications

—Over complications

—What could cause confusion?

—Assumptions without understanding behind it

—Understanding on street/off street options

—What works well?

—Pre-formatted menu – option for level of detail

—Turning options on/off for scenarios

—Easy costing – breakdown options

—Domestic vs non-domestic breakdown

—Being able to manipulate assumptions/scenarios

—Importing data

Chris James – Electrician & installer

Network mapping

Positives

—Fully costed

—Flow is what is needed – put in what you want and get a quote out

—NPg mapping backdrop much better

Negatives

Transport mapping

Positives

Negatives

—Mapping background

—Layers and legends not clear – what am I looking at? E.g. flow data or traffic

Improvements

—'Wizard' type guidance of steps to follow for input

—Give other options which could impact/reduce costs – change inputs easily to see difference/impact

—Need assurance of the quote in order to confirm costs to a customer (consider profit margin for installer)

Improvements

—Would like to understand public parking arrangements (installers client may need to know this)

—Understanding land ownership in areas for EV charging availability – so know where projects can take place

Key Points

What should be avoided?

—Get to the point – don't need explanations of terms/capacity etc

What could cause confusion?

—What are the assumptions made in the costing?

—What is included and what is not?

What works well?

—Option to select what type of user

—Needs a wizard approach – step by step which guides through

—OS MasterMap data – looks better so worth the cost

Chris James – Electrician & installer

Network mapping

Positives

—Fully costed

—Flow is what is needed – put in what you want and get a quote out

—NPg mapping backdrop much better

Negatives

Transport mapping

Positives

Negatives

—Mapping background

—Layers and legends not clear – what am I looking at? E.g. flow data or traffic

Improvements

—'Wizard' type guidance of steps to follow for input

—Give other options which could impact/reduce costs – change inputs easily to see difference/impact

—Need assurance of the quote in order to confirm costs to a customer (consider profit margin for installer)

Improvements

—Would like to understand public parking arrangements (installers client may need to know this)

—Understanding land ownership in areas for EV charging availability – so know where projects can take place

Key Points

What should be avoided?

—Get to the point – don't need explanations of terms/capacity etc

What could cause confusion?

—What are the assumptions made in the costing?

—What is included and what is not?

What works well?

—Option to select what type of user

—Needs a wizard approach – step by step which guides through

—OS MasterMap data – looks better so worth the cost

Richy Rich – Charging network operator

Network mapping

Positives

—Easy plotting

—Familiar

Negatives

—Lowflow wide but fairly basic

Transport mapping

Positives

—Clear

Negatives

—How up to date?

—Need variation, daily, monthly?

—Land ownership not included

Improvements

—Clear statement on data, age for both, synchronisation of the data and overlay

—Do the tools work at different zoom levels (regional/city/village/street)

—Specific details of constraint (extent/hour)

—Save versions

—Be able up upload a series of postcodes via a CSV

—See future network plans, planned network work

—Put voltage and power curve on a feeder when available

—Ability to export pdf, excel and jpeg

—Ways for users to provide feedback

Improvements

—Last update of data

—Overlay now and future scenario with plans

—Input data to update forecast changes in transportation flow

—Seasonality

—Show variability of journey time/data quality

—Ability to export pdf, excel and jpeg

—Need to take into account planning portal info

—Ways for users to provide feedback

—Track detail of usage – system level requirement (where, what, sessions completed, sessions abandoned)

Key Points

What should be avoided?

—Must have clear statement on colour use and meaning

What could cause confusion?

—Different date ages

—Explanation of transport model and loadflow calculation

What works well?

—Plotting

—Legend

—Information input other information by menus

Brian Roberts – Parish/town council

Network mapping

Positives

—Easy to use

—Simple map background

—Quick results

Negatives

—Auto-download PDF

—Easy to draw through invalid ground

—Aspect ratio problem on small screens on NAT

Transport mapping

Positives

—Future scenarios

—Colour coded zonal view

Negatives

—Too many layers

—Lots of data and views – too many for a laymen

Improvements

—Option to download PDF

—Block invalid ground types e.g. houses

—Save results to login (i.e. editable and can return to)

—Must be friendly to all screen sizes including phones

Improvements

—Option to view more detail if techy user – needs to be simpler for laymen

Key Points

What should be avoided?

—Barrage of information automatically

—Complicated/slow to use, too many initial options

—Jargon

—Too many output options/scenarios

What could cause confusion?

—Colours – too many or colour blind confusion, want something intuitive not use of legends

—Out of date networks/data/results

What works well?

—Popups/hover for more info

—Simple maps, clear intuitive interface

—Saving results

—Works on many platforms

Appendix C – Requirements Matrix

- Please see accompanying spreadsheet for full list of Functional and Non-Functional Requirements

Workshop slideshow (emailed to stakeholders)
https://eatl.sharepoint.com/sites/ChargeProject/Shared%20Documents/Stakeholder%20Information/ConnectMore%20Stakeholder%20Workshops/2020-03-11%20ConnectMore%20Workshop%203%20v1.0.pdf