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Purpose of this document

This document describes the touchscreen interface conception for a consumer electric car.

It contains wireframes and screen flow charts for each menu item.

It is created as a test job to apply for a UI / UX designer role at Tesla Motors.

Goal

Create a basic secondary touchscreen interface concept for an electric car.

Assumptions

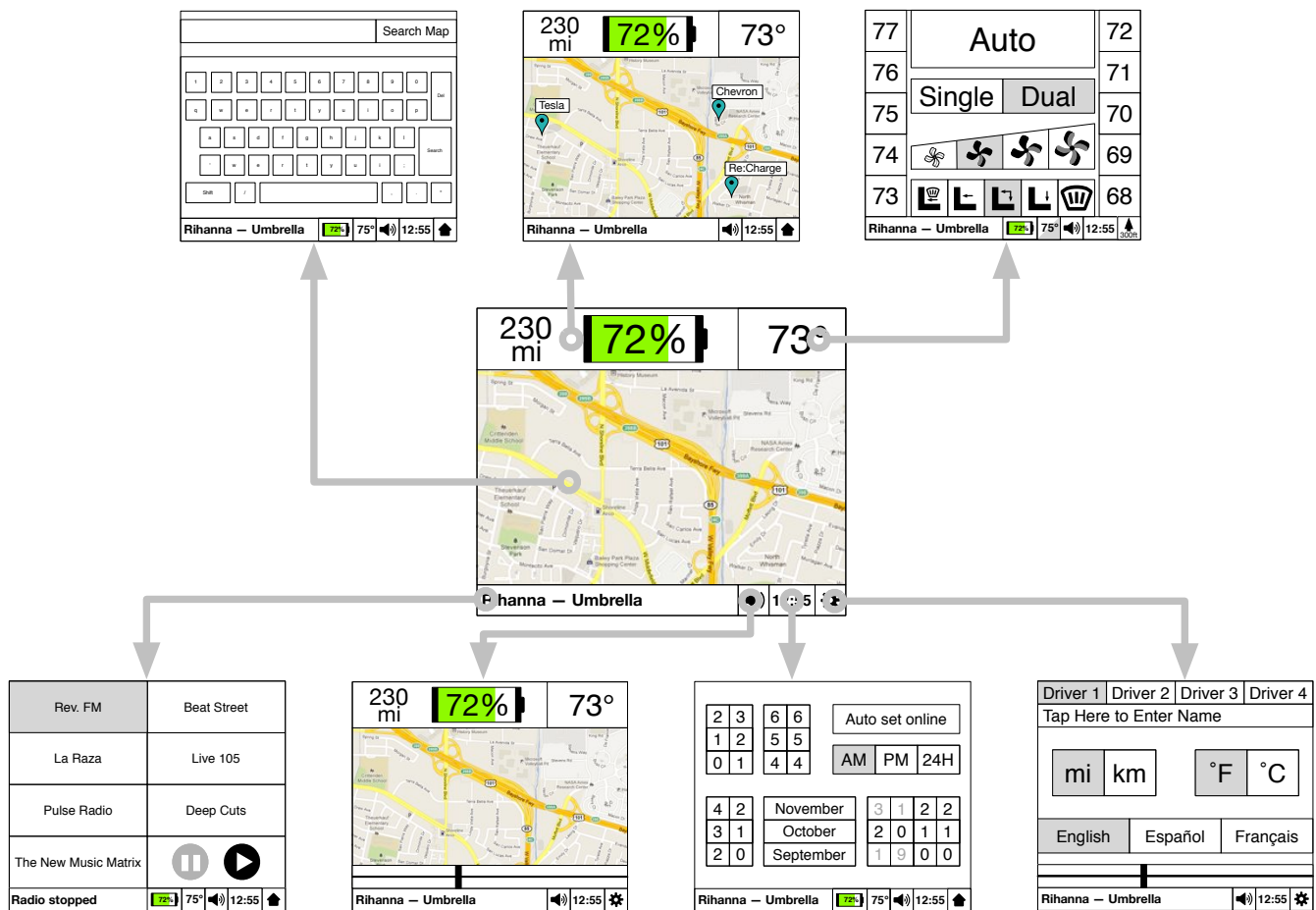
- There is already another system in place to show and control the most important information: speed information, brake on/off indicator, seat belts indicator, passenger airbag on/off;
- The words 'tapping on a...', 'tap', always mean 'single tap'. When a double or a long tap is needed, it is described separately;
- There is a working 3G connection in the car to support some of the interface functions.

Screens

Main Menu

Main Menu is the basic location that is shown when user turns on the engine. It also can be accessed by either 'Home' or 'Next Turn' buttons from all other screens.

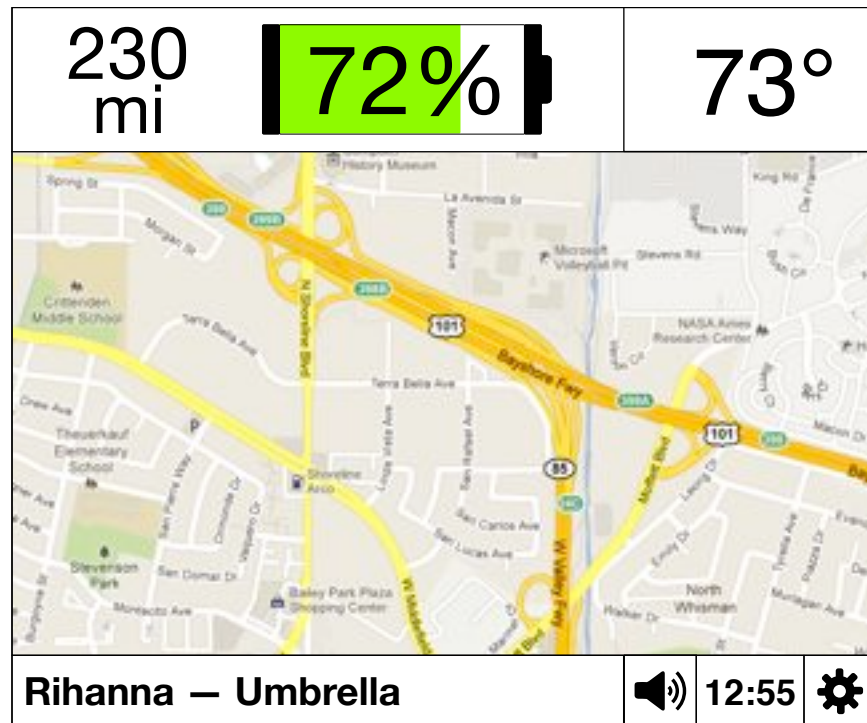
Main Menu consists of seven elements. The size of the elements depends on their importance and amount of information they carry. The most important element is the car charge and remaining mileage, so it is placed in the top left part of the screen and is relatively big in size. As information scanning naturally starts from top left for most people, that is the place for the most important information.



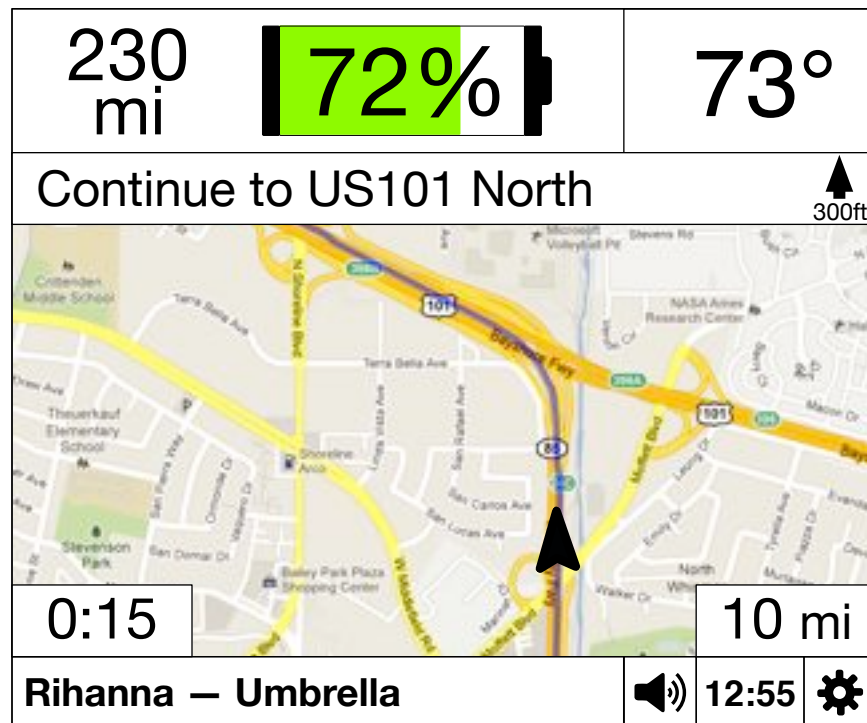
Screen actions

- Tapping on the map takes to Navigation Menu
- Tapping on Charge/Mileage takes to Charge Menu
- Tapping on Temperature takes to Climate Menu
- Tapping on Song/Station Name or 'Radio Stopped' text takes to Radio Menu
- Tapping on Volume brings up Volume bar
- Tapping on Time takes to Time Setup
- Tapping on Setup takes to Personalization

Main Menu Screens



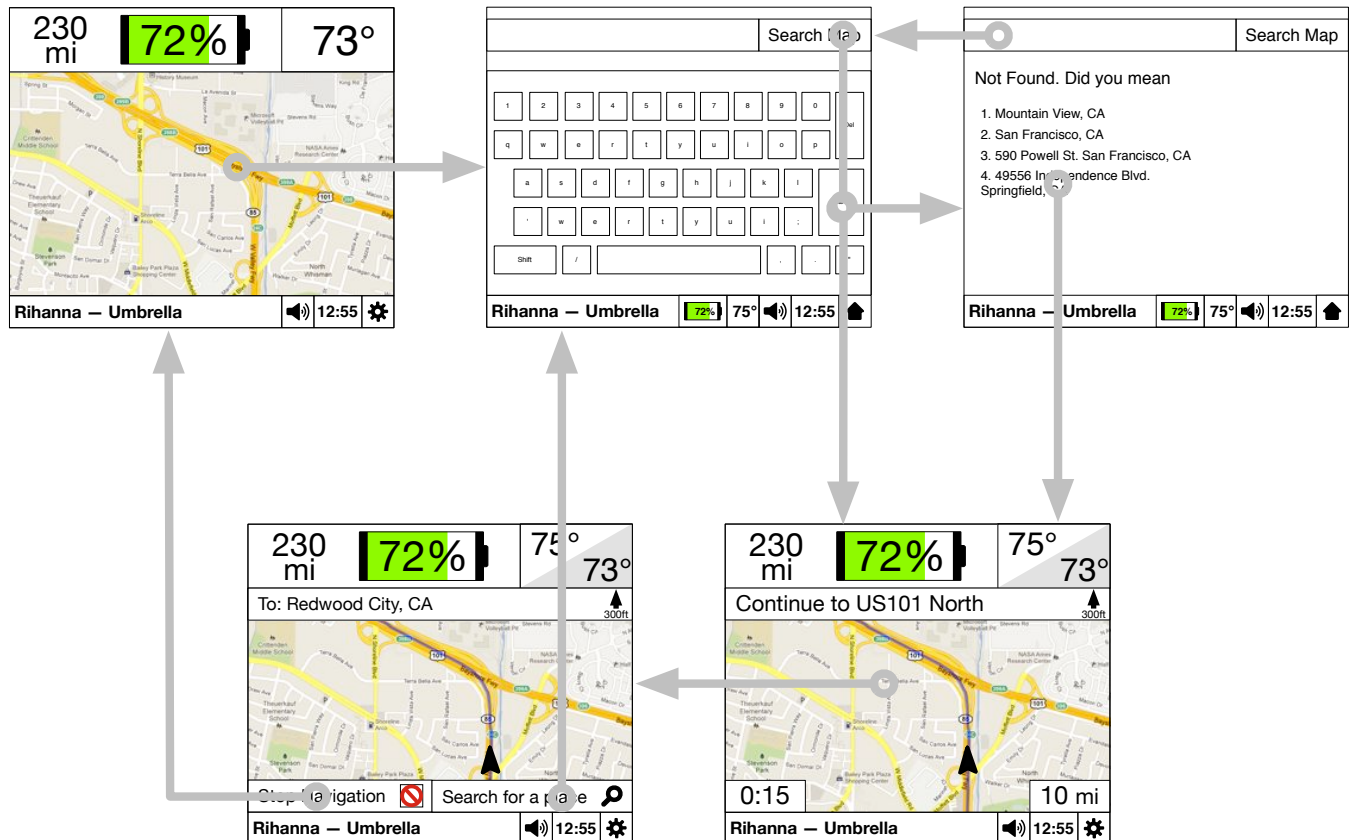
With Navigation on:



Navigation Menu

Navigation Menu can be opened from regular Main Menu by Tapping on the Map. Consists of two main elements: Search bar with search button, and a keyboard. A user can type in the address or place name and navigate to that location.

Screen actions



- Tapping on one of the 'Search' buttons opens either the Main Menu with Navigation (if location is found), or 'Did you mean...' screen;
- If the destination is not found or there are more than one location matching the name, the 'Did you mean...' screen appears;
- Tapping on one of the 'Did you mean...' locations takes user directly to Main Menu with Navigation on;
- Tapping into the text input field on the 'Did you mean...' screen takes user back to the previous menu.

Navigation Screens

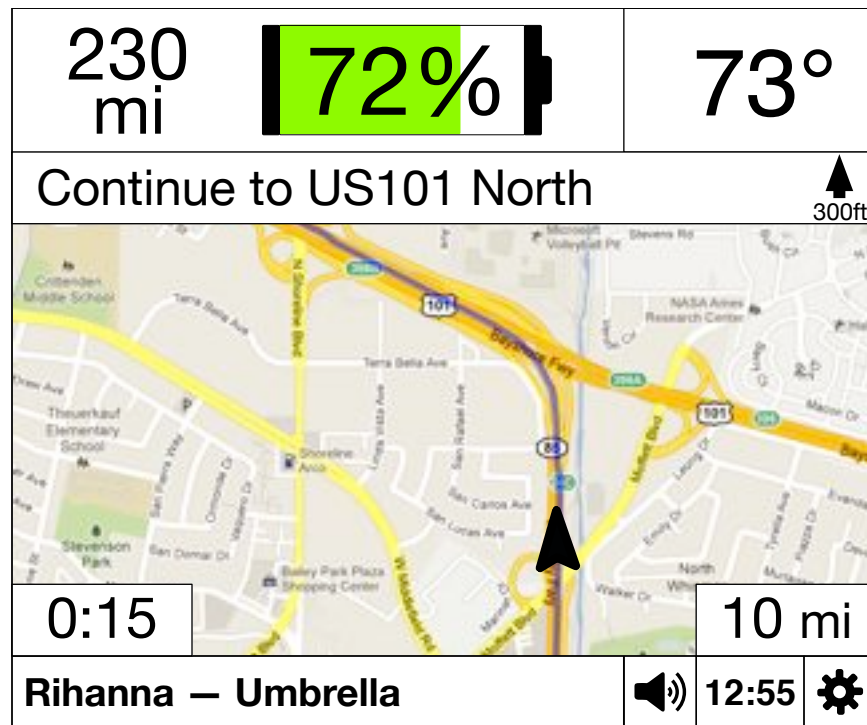
Main search screen has a keyboard and an Extended Frame Menu at the bottom:

										Search Map	
1	2	3	4	5	6	7	8	9	0	Del	
q	w	e	r	t	y	u	i	o	p		
a		s	d	f	g	h	j	k	l	Search	
'	w	e	r	t	y	u	i	;			
Shift		/					,	.	"		
Rihanna — Umbrella						73°		12:55			

If the location is not found or there are multiple versions for the entered name/address, the 'Did You Mean...' screen is displayed:

										Search Map	
Not Found. Did you mean 1. Mountain View, CA 2. San Francisco, CA 3. 590 Powell St. San Francisco, CA 4. 49556 Independence Blvd. Springfield, CA											
Rihanna — Umbrella						75°		12:55			

If the typed destination is found, the system goes directly to Main Screen with Navigation on and shows the route to the destination:

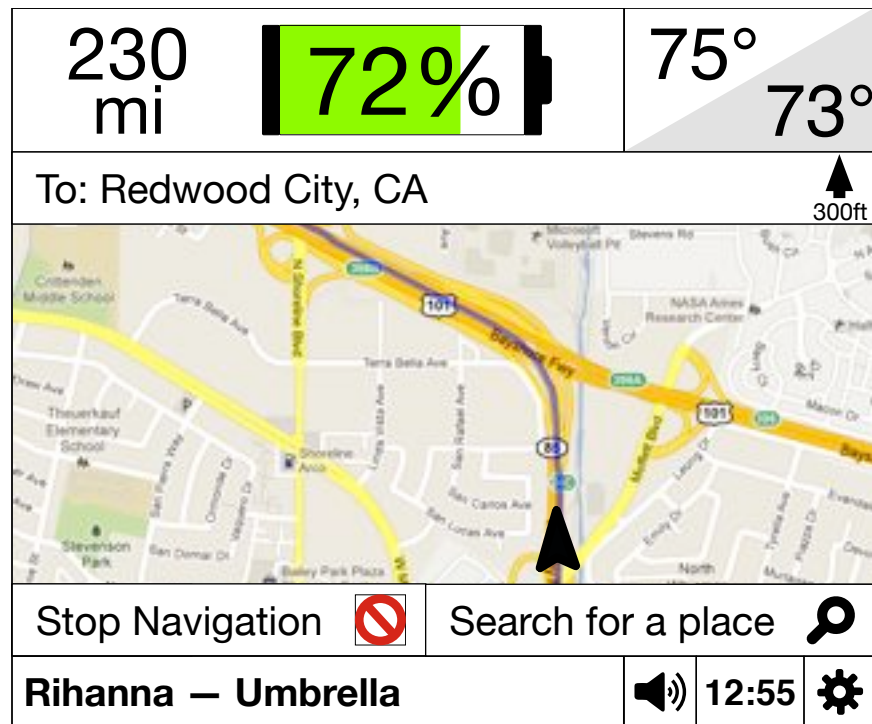


A new information shown in addition to already described one:

- Time left to destination;
- Miles left to destination;
- Next action and mileage to it.

This screen is also the default view for Main Menu with Navigation on.

Tapping on the map brings the additional menu:

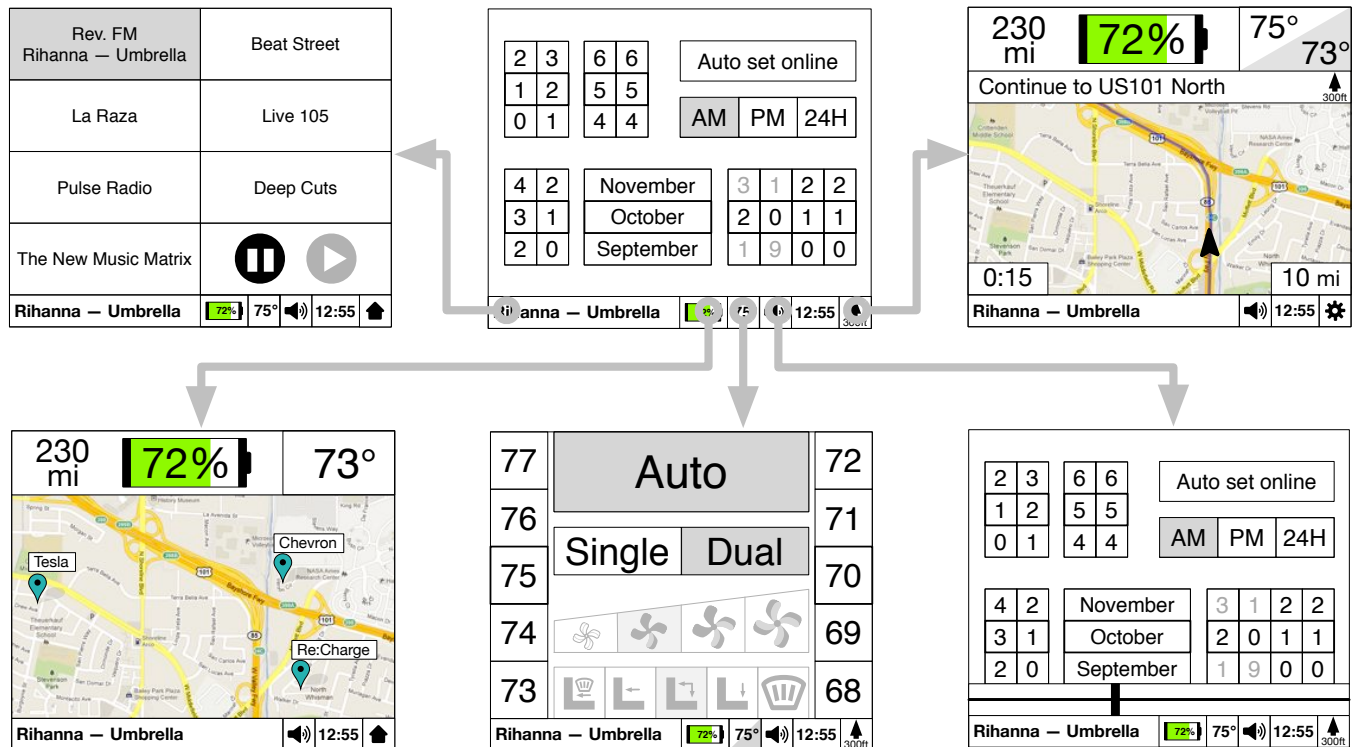


- Map takes the user back to the previous screen, with navigation on;
- 'Stop Navigation' cancels navigation and go back to the original view of Main Screen;
- 'Search for a place' takes the user to the Navigation menu.

Extended Frame Menu

Extended Frame Menu is shown on the pages that doesn't have Charge and Temperature information on top of the screen, providing fast access to different menu items.

Screen actions



- Tapping on Radio Bar or 'Radio Stopped' text takes the user to Radio Menu;
- Tapping on 'Battery' button brings up Charge Menu;
- Tapping on 'Temperature' button brings up Climate Menu. Temperature button is shown with the plain background, if temperature is set to 'Single', and with double background if temperature is set to 'Dual';
- Tapping on 'Volume' button brings up Volume bar;
- Tapping on 'Time' information takes user to Time Setup;
- Tapping on 'Home' button (or on 'Next Turn' button, if Navigation is on) takes the user to Main Menu. Depending on whether the Navigation is on or off, Main Menu will either have Navigation items or be a default screen without navigation.

Charge Menu

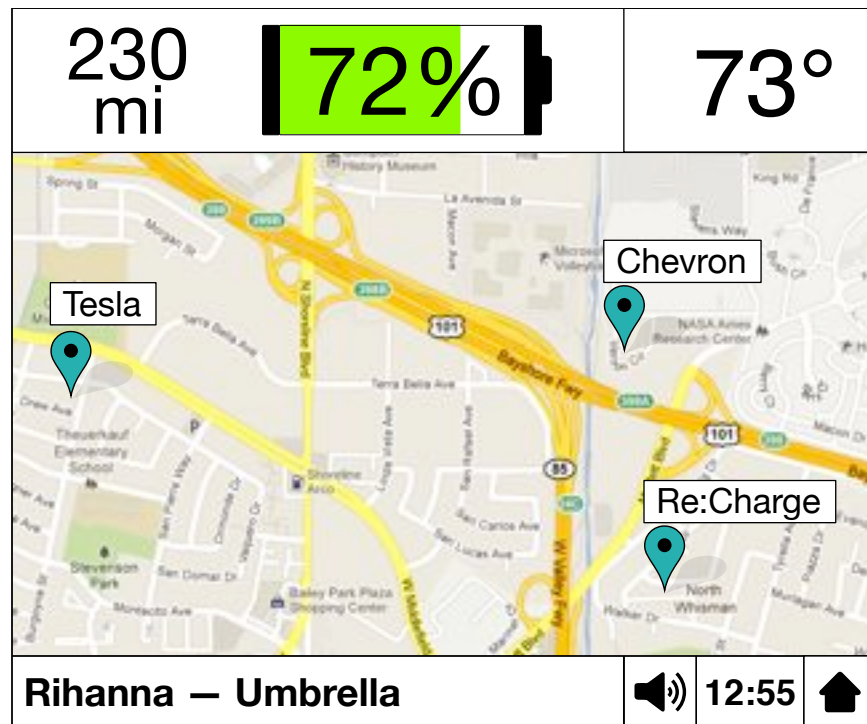
Charge Menu can be accessed both from Main Menu by tapping on the 'Charge / Mileage' information at the upper left, or by tapping the 'Charge' button from the Frame Menu, shown on the screens that don't have a 'Charge / Mileage' button on top right. Charge Menu shows all nearby charging locations on the map.

Screen Actions

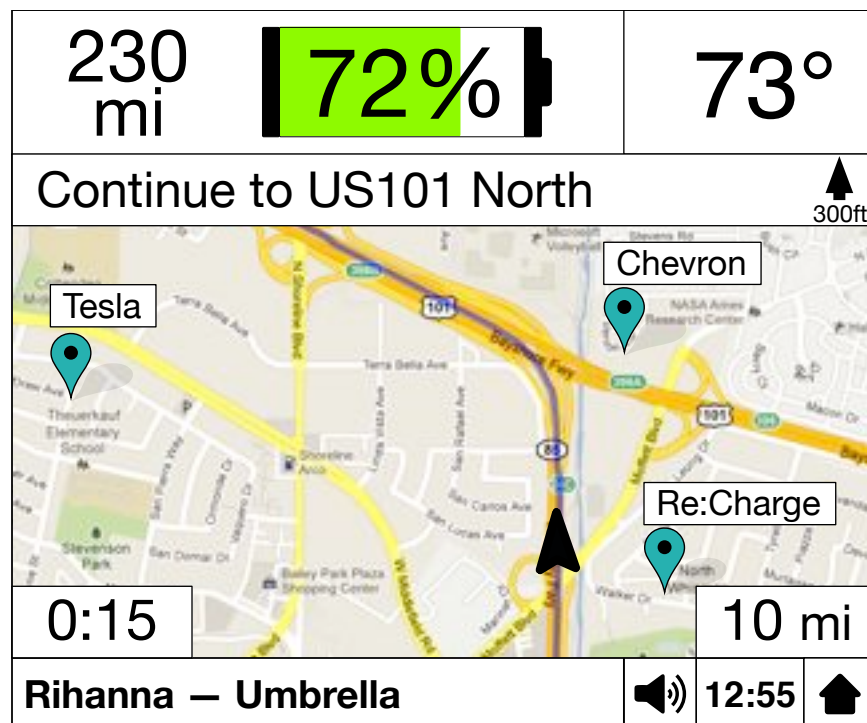


- Tapping on the Map (not on station name) takes user back to Main Menu;
- Tapping on the charging station name brings extended information about the charging station;
- Tapping on the charging station name with additional information shown takes user to the 'Navigate to Station' menu.

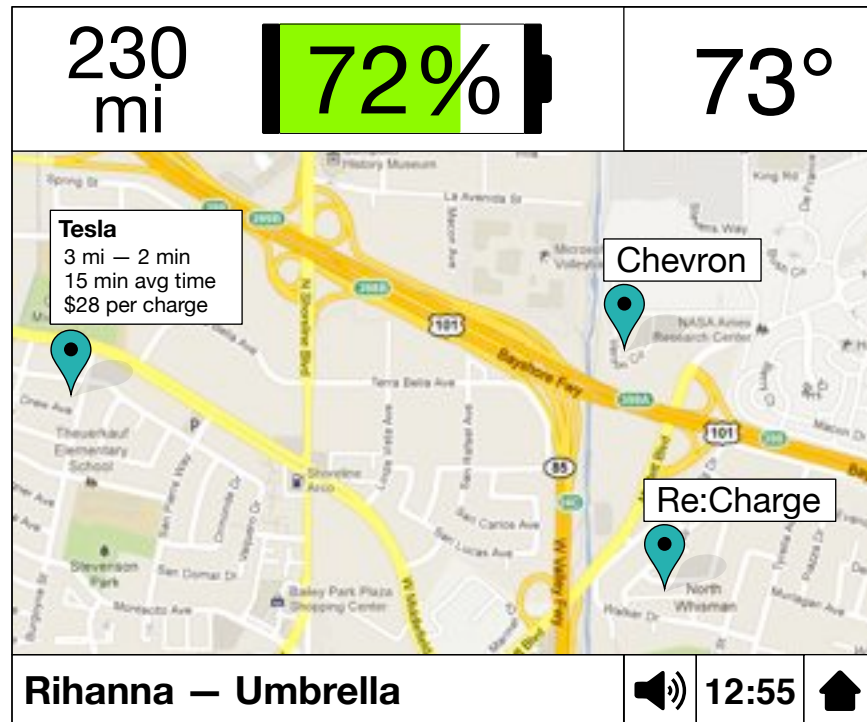
Charge Menu Screens



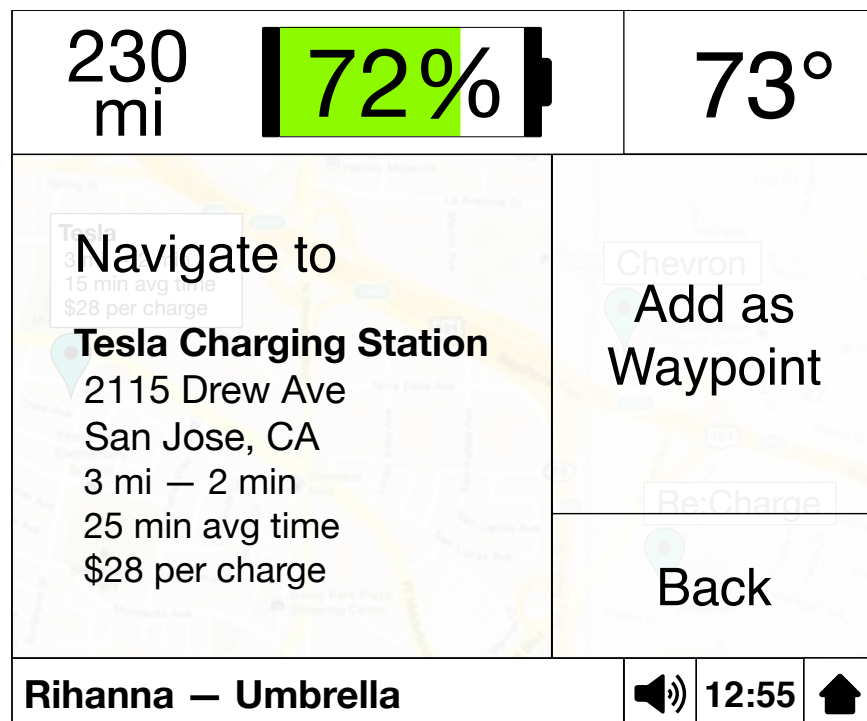
When Navigation is on, Charge Menu is displayed over the Navigation information:



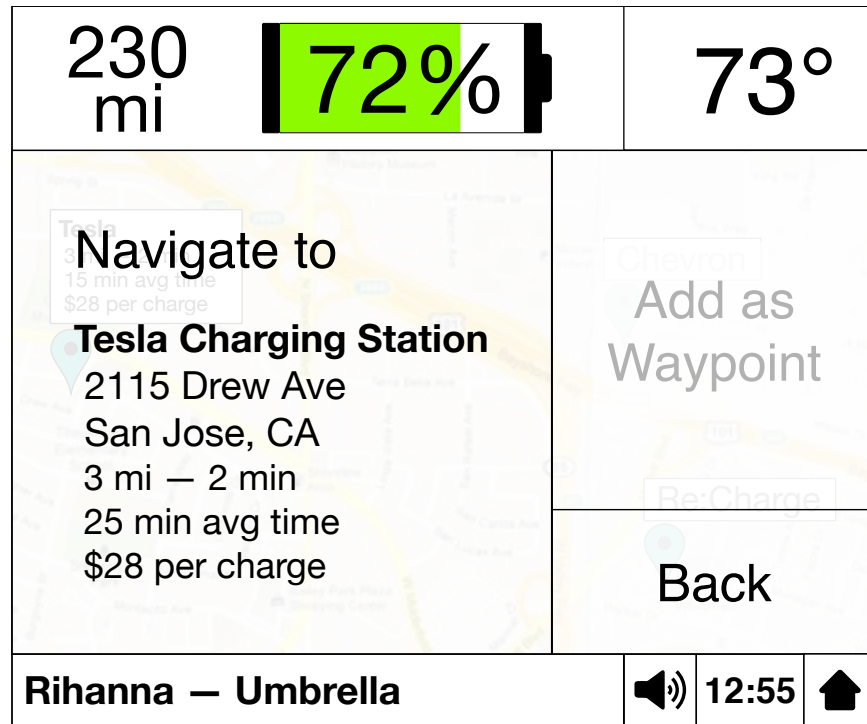
Tapping on Charging Station Name shows additional information box for this station:



Tapping on Additional Information takes user to the 'Navigate to Station' menu, tapping on the map (except other station names) goes back one step:



'Add as Waypoint' button is grayed out if Navigation wasn't engaged before entering Charge Menu:

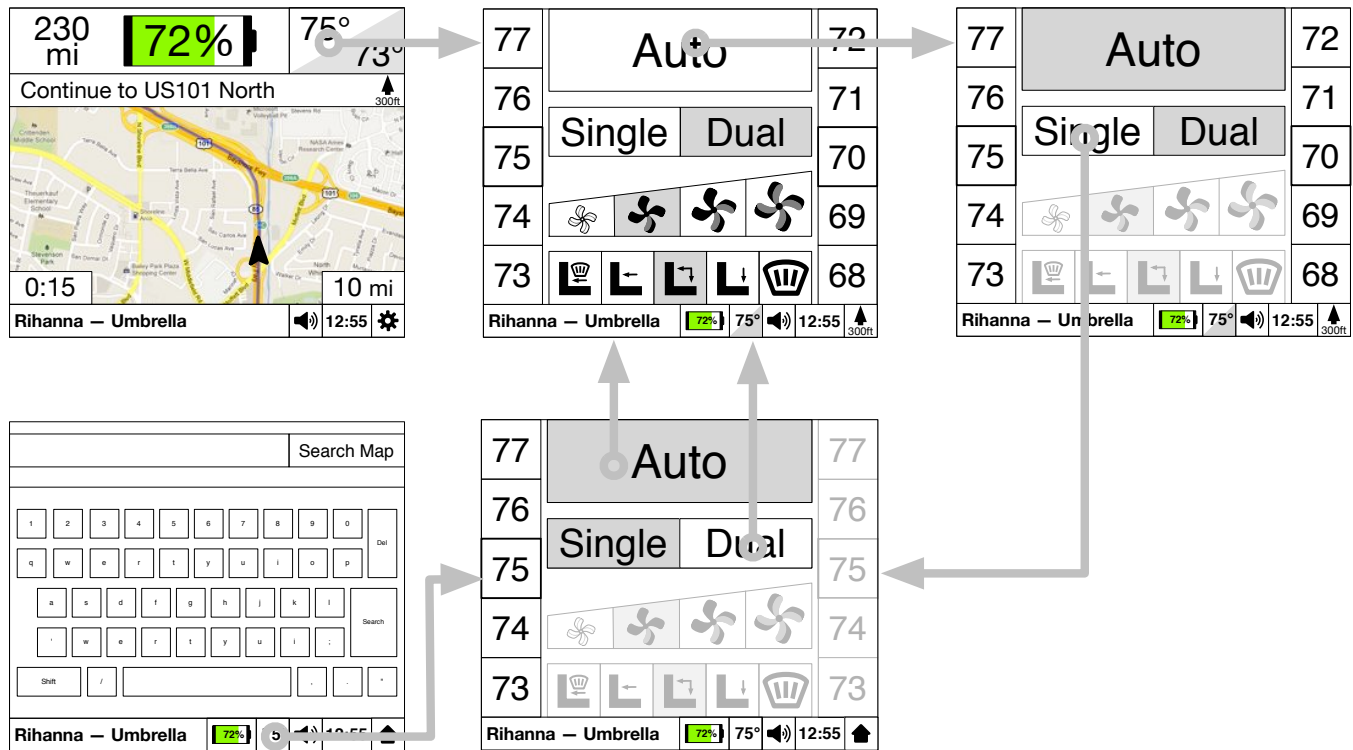


Climate Menu

Climate Menu may be accessed either from the Main Menu (and other menus showing the 'Climate' button at the top right corner), or from the Frame Menu, shown on the screens that don't have a 'Climate' button on top right.

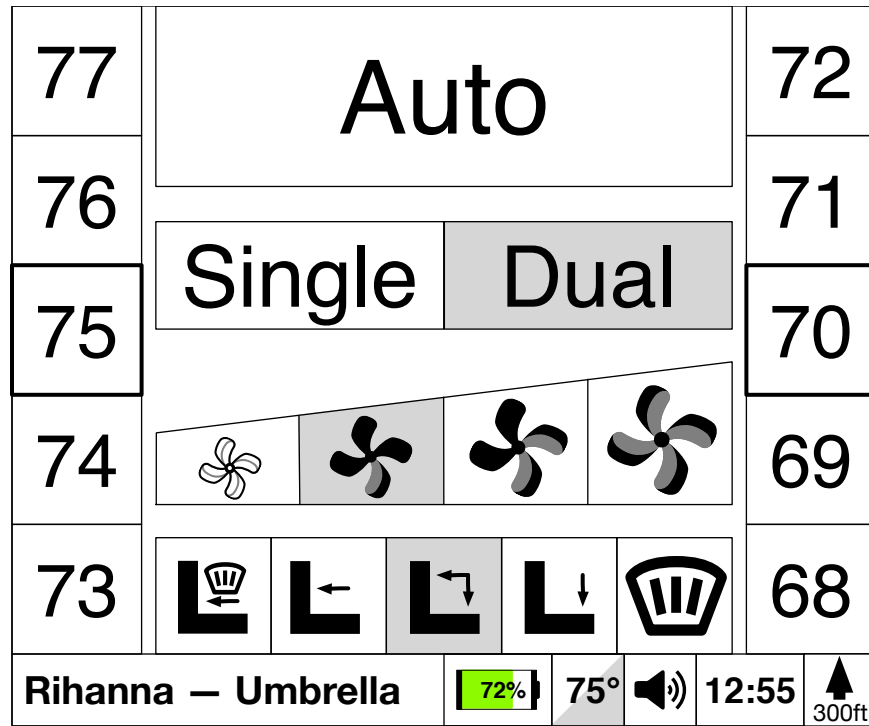
Climate Menu is the place to control the temperature and fan options inside the salon.

Screen actions

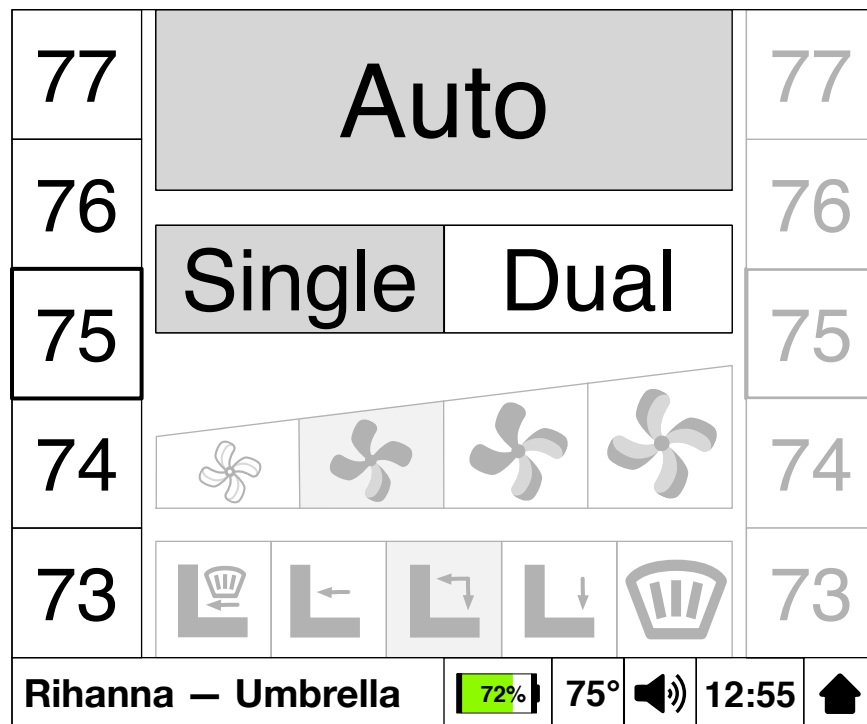


- Tapping the 'Auto' button when automatic mode is off, activates it. The button is highlighted when the mode is on, and fan and air flow settings are grayed out;
- Moving the temperature selector up or down will change the active temperature (it is highlighted in the middle of the selector);
- If the temperature selector is grayed out ('Single' mode is on), moving it up or down will change the settings to 'Dual';
- 'Single / Dual' is a two-option selector, only one choice can be active at a time. Activating the 'Single' mode will automatically put the passenger's temperature settings to the same value as for the driver and gray out the passenger temperature selector;

Climate Menu Screens



When 'Auto' and 'Single' options are chosen, the corresponding menu items are grayed out, but still active:



To change settings user can either select a different option or (in order to disengage Auto mode) change fan or air flow settings:

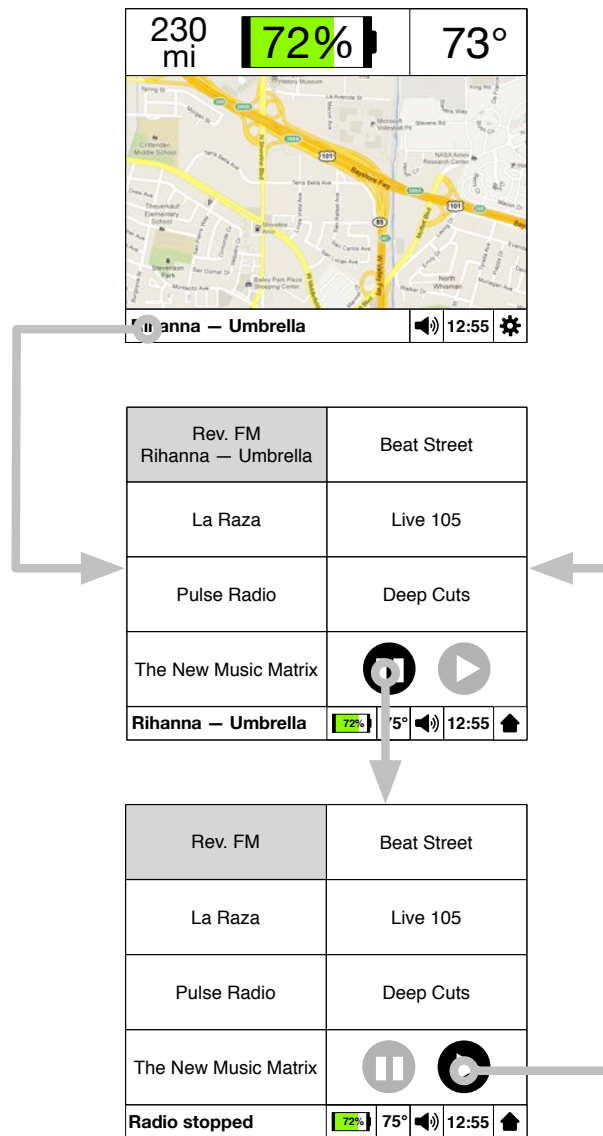
77	Auto					72
76						71
75	Single		Dual			70
74						69
73						68
Rihanna — Umbrella		72%	75°		12:55	300ft

Radio Menu

Radio Menu is accessed from any other menu using the Radio Bar (containing either the name of the song or a 'Radio stopped' text).

Radio Menu allows user to listen to one of maximum ten local radio stations.

Screen Actions



- Tapping on the station name highlights and automatically starts the station, and shows the name of current song, if the station provides song information;
- Tapping on 'Pause' button when radio is active stops receiving the translation, removes song tags from the station name and puts the 'Radio stopped' notification to Radio Bar. 'Pause' button becomes grayed out and inactive;
- Tapping on 'Play' button when there is no radio played (the button is active), plays / resumes the selected station;

Radio Menu Screens

When the radio is played, the 'Play' button is grayed out and song name is displayed both under the current station name in Radio Menu, and at the bottom left part of the screen:

Rev. FM Rihanna — Umbrella	Beat Street
La Raza	Live 105
Pulse Radio	Deep Cuts
The New Music Matrix	 
Rihanna — Umbrella	 73°  12:55 

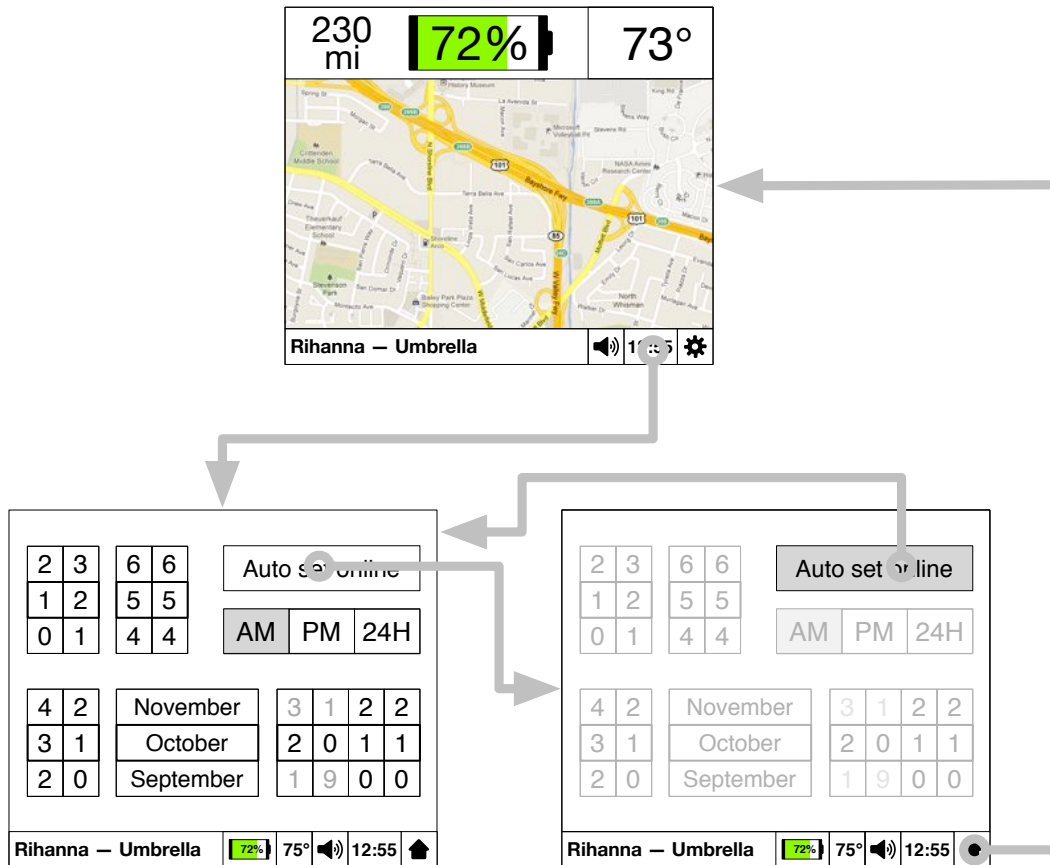
When radio is stopped, the 'Pause' button is grayed out. There is no song name under the station name, because nothing is played, and there is a 'Radio stopped' notification at the bottom left part of the screen:

Rev. FM	Beat Street
La Raza	Live 105
Pulse Radio	Deep Cuts
The New Music Matrix	 
Radio stopped	 73°  12:55 

Time Setup

Time Setup is accessed through the time button at lower right part of the screen.

Time Setup menu allows user to set up time and date, either manually or automatically (using GPS location and 3G connection).



Screen actions

- For number and month selection elements, dragging the elements up puts the lower elements to the 'active' place. 'Active' is an element in the middle of each selector;
- Tapping the 'Auto set online' button activates the automatic time sync with internet. All other items are grayed out and inactivated. 'Auto' mode can be switched off by tapping the same button again;
- Tapping or sliding on the 'AM / PM / 24H' selector chooses one of three options and highlight it. Only one option can be selected at a time;

Time Setup Screens

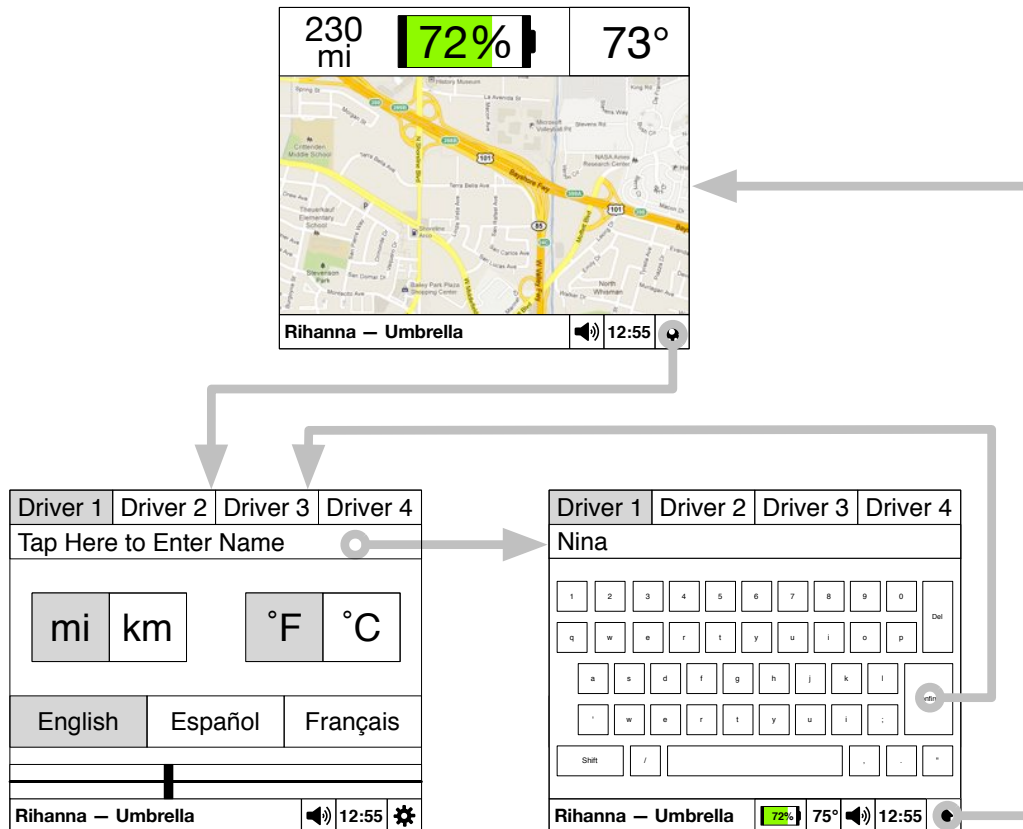
2	3	6	6	Auto set online			
1	2	5	5				
0	1	4	4	AM	PM	24H	
4	2	November		3	1	2	2
3	1	October		2	0	1	1
2	0	September		1	9	0	0
Rihanna — Umbrella				 72%	75°		12:55 

If 'Auto set online' option is chosen, the car uses location information from built-in GPS, and syncs the date and time online using built-in 3G. All other settings are grayed out and inactive:

2	3	6	6	Auto set online			
1	2	5	5				
0	1	4	4	AM	PM	24H	
4	2	November		3	1	2	2
3	1	October		2	0	1	1
2	0	September		1	9	0	0
Rihanna — Umbrella				 72%	75°		12:55 

Personalization Menu

Personalization Menu can be opened only from original Main Menu and Main Menu with Navigation on. It allows up to four drivers set up their preferred menu language, type in a name, select to show mileage in either metric or imperial system, and choose between Fahrenheit and Celsius for the in-salon temperature status.



Screen actions

- Tapping on 'Driver 1' ... 'Driver 4' buttons switches between four different driver profiles;
- Tapping on 'mi / km' and '°F / °C' chooses between two options. Background of a chosen option is highlighted. Only one option can be selected at a time for each switch;
- Tapping on the Language selects this language and highlight it. Menu language will be changed upon selection. Only one option can be selected at a time;
- Volume Bar is always shown on this screen. Tapping on it / moving the slider to the right increases the volume. Tapping / sliding to the left decreases the volume.

Personalization Menu Screens

'Tap Here to Enter Name' is an input text field.

Driver 1	Driver 2	Driver 3	Driver 4
Tap Here to Enter Name			
mi km		°F °C	
English		Español	
Rihanna — Umbrella			12:55

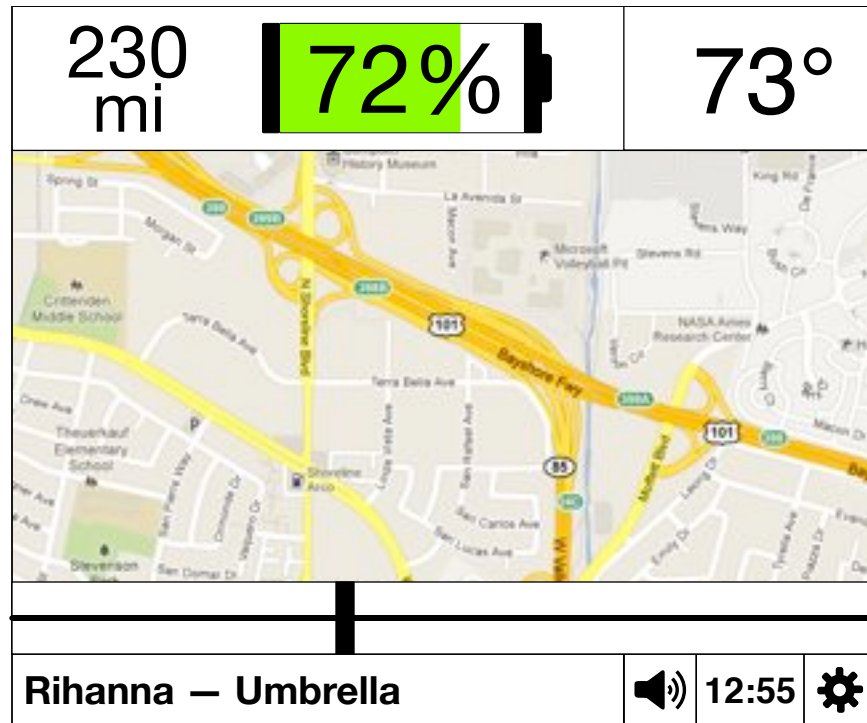
Tapping at the input field 'Tap here to enter name' shows a big keyboard. 'Confirm' button goes back to the previous screen, showing the entered value in the input field.

Driver 1	Driver 2	Driver 3	Driver 4																																																				
Nina																																																							
<table border="1"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>0</td><td rowspan="2">Del</td> </tr> <tr> <td>q</td><td>w</td><td>e</td><td>r</td><td>t</td><td>y</td><td>u</td><td>i</td><td>o</td><td>p</td> </tr> <tr> <td>a</td><td>s</td><td>d</td><td>f</td><td>g</td><td>h</td><td>j</td><td>k</td><td>l</td><td colspan="2" rowspan="2">Confirm</td> </tr> <tr> <td>'</td><td>w</td><td>e</td><td>r</td><td>t</td><td>y</td><td>u</td><td>i</td><td>;</td> </tr> <tr> <td>Shift</td><td>/</td><td colspan="4"></td><td>,</td><td>.</td><td>"</td><td colspan="2"></td> </tr> </table>				1	2	3	4	5	6	7	8	9	0	Del	q	w	e	r	t	y	u	i	o	p	a	s	d	f	g	h	j	k	l	Confirm		'	w	e	r	t	y	u	i	;	Shift	/					,	.	"		
1	2	3	4	5	6	7	8	9	0	Del																																													
q	w	e	r	t	y	u	i	o	p																																														
a	s	d	f	g	h	j	k	l	Confirm																																														
'	w	e	r	t	y	u	i	;																																															
Shift	/					,	.	"																																															
Rihanna — Umbrella		72%	75°	12:55																																																			

Volume Bar

Volume bar is an overlay item, that can be opened on any screen using the 'Volume' button. Short tap opens the Volume Bar, longer or double tap mutes all sounds.

Volume Bar works as a slider. Sliding right increases the volume, sliding left decreases it, up to muting all sounds at far left position.



If the sound is muted through the slider, double or long tap restores sound level to it's neutral position.

When switching to a different screen, Volume Bar stays open until the 'Volume' button is taped again.

Further improvements

Current version of the secondary touchscreen interface doesn't use 3G connectivity a lot, but there is a lot of room for improvements and new features:

1. Location-aware online services: real-time traffic, online check-in to the place, online look up for a highest-rated location. More like Yelp, but in your car. There could actually be an interface to access Yelp right from the car, using the same login and password, if a user already as a Yelp login;
2. Destination-aware weather forecasts;
3. Destination-aware map layer of charging stations, if the system sees it's impossible to get to destination on the same charge;
4. Appointment reminders, pushed online from service-centers to the car notification system;
5. Online radio (Pandora etc.), that will go in place of FM-radio in cars and basically everywhere;
6. Voice control. Voice interfaces, along with touchscreen, is the future, especially for cars, when you need to have your hands free most of the time.