

# City Lynx

Intelligent Planning  
and Shared Driving  
With Your Smartphone





## User Guide

### The City Lynx App - Intelligent Planning and Shared Driving With Your Smartphone

Short title

**City Lynx user guide**

Internal reference

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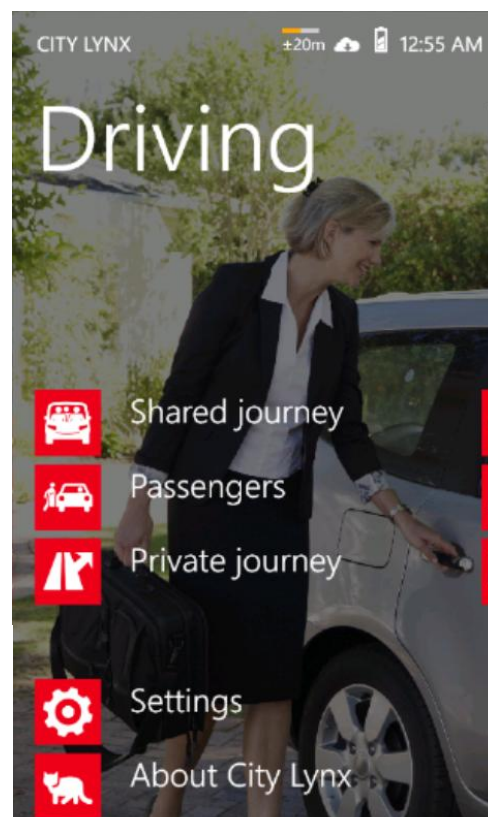
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# Part I – Ready to drive



## Introduction

The City Lynx App revolutionizes the shared use of vehicles. It enables convenient and safe car sharing without requiring a server infrastructure or an expensive switchboard. Share and drive with the possibilities of the 21<sup>st</sup> century!

City Lynx supports planning, driving and billing with technologies known from social networks – easy, fast and always at hand.

Since City Lynx is more than a primitive browser application, the app can make the best possible use of the technical potential of the combination of a modern smartphone with cloud services. This includes the seamless integration of route guidance and telephony as well as the use of NFC tags.

The City Lynx App will be available for smartphones with the platform Microsoft Windows Phone from fall 2013.

### How do you want to use City Lynx?

For using City Lynx, you select one of three domains:

If you use your vehicle and City Lynx on your own, the domain *Solo driver* is the right choice for you. In part II you find examples for the possible uses of *City Lynx with a take-home car*.

If your intention is to use City Lynx with a social group sharing vehicles together, you select the domain *Shared vehicles*. In part II the chapters *City Lynx with a shared car* and *City Lynx with a company car* illustrate the uses of the app in this domain.

If you want to use City Lynx as group for a car pool, to take passengers along in your car or to share rides with others, you select the domain *Car pool*. In part II this type of use is described in the chapter *City Lynx with a car pool*.



During the setup of City Lynx, the first member of a group signing in with the shared Microsoft account selects the domain, which for this group cannot be changed later anymore.

## Preparing City Lynx

For the startup and operation of City Lynx a Microsoft account is required.

- ▶ Set up a Microsoft account, see reference [account].
- ▶ Specify your credit card data in the Microsoft account.
- ▶ Buy the City Lynx App in the Windows Phone Store stating your Microsoft account.



You can watch videos that demonstrate the setup of City Lynx for the various domains on [YOUTUBE].

## Setting up City Lynx

- ▶ Start the City Lynx App on your phone.
- ▶ Select "Setup City Lynx" on the first page to start up City Lynx.

## Agreeing to functionalities

In the first step, the setup assistant asks you to agree to the use of your location data the contacts in your address book. It also asks you to allow City Lynx to stay active with a locked screen.

- ▶ Agree to the use of your location data, so that you can use the convenient functions of City Lynx to the full extent.
- ▶ Allow City Lynx the access to your address book, if you want to use your contacts in City Lynx, e.g. to use your contacts' addresses as journey destinations.
- ▶ Agree to the function "Active with locked screen", to avoid that the battery charge of the phone is used up unnecessarily on longer journeys.

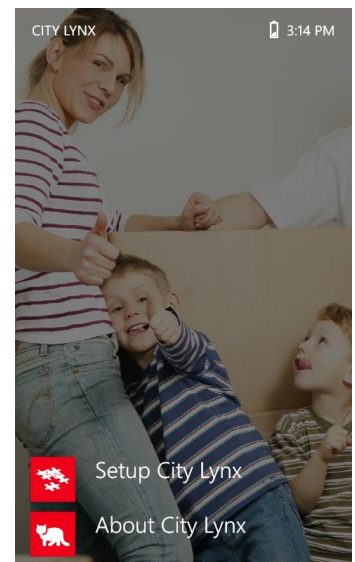


Illustration 1:  
City Lynx before  
setup

## Signing in with a Microsoft account

In the next step of the setup assistant you enter the Microsoft account which you want use with City Lynx. Do not enter your personal account, if you share vehicles with other people, instead use a shared Microsoft account for the whole group set up especially for the use with City Lynx.

- Log in with the Microsoft account that you want to use with City Lynx.

## Permitting access to stored data

City Lynx can only function reasonably if it has a permanent connection to the Microsoft account as well as access to the drivers' data. Therefore please give City Lynx permission to access the following data:

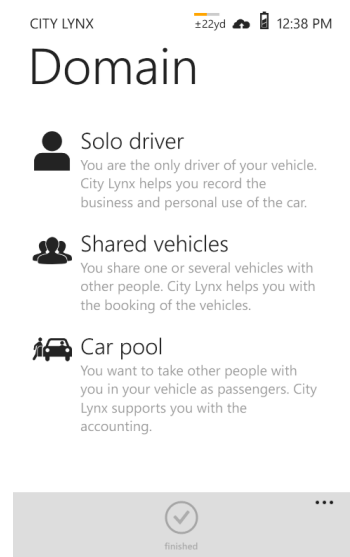
- "Access and edit your SkyDrive"  
You allow City Lynx the access to your SkyDrive storage and enable it to adjust the data stored there: e.g. if drivers make bookings for a shared car or make changes to their bookings, City Lynx needs to be able to synchronize this data on SkyDrive, so that the latest information is always available for the other drivers.
- "Access to your information anytime"  
With your agreement you avoid having to log in again with every new start of the app.
- "Access your e-mail addresses"  
Under "Settings" on the page "SkyDrive", you allow City Lynx to show the e-mail address of the Microsoft account with which you are currently logged in. This is helpful especially if you use the app together with a group of other people.

## Selecting your domain

In the next step you decide which domain of City Lynx you want to use, i.e. how you want to use City Lynx. The first member of a group who signs in with a Microsoft account sets the domain. All other members of the group who later sign in with the same account will see this page, but cannot change the settings.

- Choose the domain for which you want to use City Lynx predominantly:

- a) If you use your vehicle and City Lynx on your own, the domain *Solo driver* is the right choice for you. Drivers of take-home vehicles use this domain to record their business journeys.
- b) If you are in a group using vehicles and the app together with others, *Shared vehicles* is the right choice. This domain is fitted to the demands of users that share vehicles and administer their use with City Lynx ("car sharing").
- c) If you are a member of a car pool, the domain *Car pool* is right for you. In this case you are possibly the only driver of your car, but you take other people as passengers with you, or you ride with other people in their cars as a passenger. You use City Lynx together with the other members of the car pool to be able to share the monthly costs as fairly as possible, supported by City Lynx ("car pooling").



**Illustration 2:**  
Domain selection  
during setup

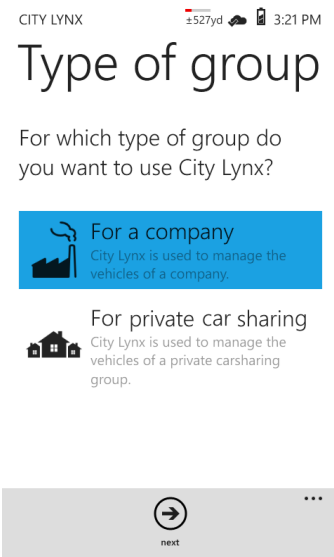
After selecting the domain, *Solo drivers* and members of a *Car pool* arrive at the step *Personalizing City Lynx*. You also continue from there if you are not the first member of the group who signs in for the domain *Shared vehicles*.

### Selecting your type of group

For the domain *Shared vehicles*, the first member of the group who signs in sets the type of group. If you use City Lynx for a company your requirements are different than those of a private car sharing group and vice versa.

Select *For a company* if you want to use City Lynx for a company managing company cars, otherwise select *For private car sharing*. Then tap on the arrow pointing to the right in the app bar.

If you have selected *For private car sharing* the assistant continues with the step *Setting the distribution of costs*.



**Illustration 3:**  
**Selecting the type**  
**of group**

## Providing your company details

For companies the first member provides information on the company, so that e.g. the phone number of the general office is automatically available for all employees.

- Enter the name of your company and the phone number of the general office as well as the emergency number and then tap on the arrow pointing to the right.

The assistant continues with the step *Personalizing City Lynx*.

## Setting the distribution of costs

For the domain *Shared vehicles* the first member of the group sets the two values based on which the distribution of costs is calculated.

- Enter the basic amount into the input field on top of the page. This is the amount that all members of the group have to pay monthly - regardless how much they are driving.
- With the slide control below, you set to what extent the driven distance or the duration of use account for the calculation of the costs which every member will be charged.

The illustration shows a mobile app interface for 'CITY LYNX'. At the top, the status bar shows 'CITY LYNX', signal strength, battery level at 103%, and the time 3:36 PM. The main heading is 'Company'. Below it, a prompt says 'Please fill in the details about your company.' There are three input fields: 'Name' with the value 'Able Corp.', 'Phone number' with the value '415 935 4530', and 'Emergency phone number' with the value '911'. A large, stylized grey figure of a person is in the background. At the bottom, there is a 'next' button with a right-pointing arrow and a three-dot menu icon.

**Illustration 4:**  
Providing company details



## Configuring voting rules

For the domain *Shared vehicles* the first member of a private cars haring group determines what it takes to decide votes.

- Set the number of affirmative votes needed for a positive outcome of a vote.
- Determine the number of votes against which lead to a rejection.
- Set the maximal duration of a vote.

## Personalizing City Lynx

Now personalize your City Lynx app.

- Select from which source the assistant should take the description for your person.

If you have accepted the use of your contacts before, you can use the information from your address book.

If you need to reinstall the app later the option "From City Lynx" facilitates the personalization during the setup. While City Lynx is downloading the list of people from the central storage, the view in Illustration 6 is displayed. After this the list of people who use City Lynx with the shared account appears.

- Tap on your name in the list of people.

*Solo drivers* and users of the domain *Shared vehicles* of the type *company car* now continue with the last step of the setup *Creating sample data*. Car pool members and members of private car sharing groups who are configuring the app for the first time continue by entering a password, see *Ensuring your privacy*.

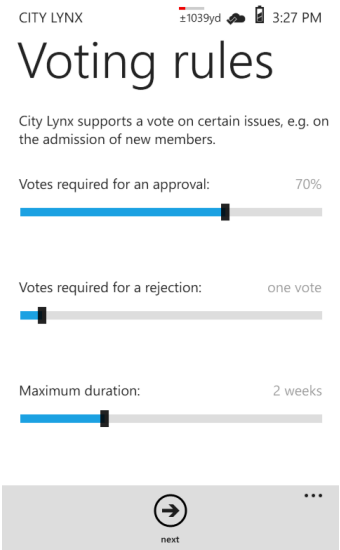


Illustration 5:  
Voting rules

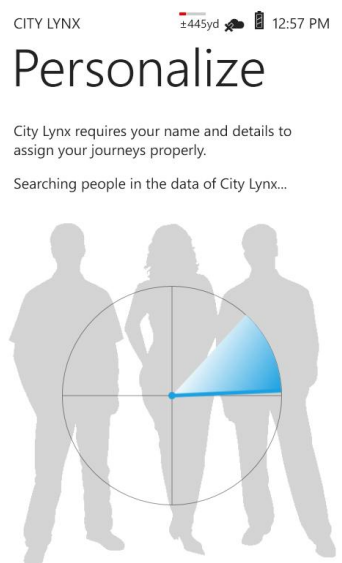


Illustration 6:  
Searching people

## Introducing yourself to the group

If you setup City Lynx for the first time for the domain *Shared vehicles* for a *private car sharing group*, you have to introduce yourself to the other group members. You can leave a text message or a voice memo or upload a photo. The members then vote on your joining the group.

- ▶ Tap on the icons in the app bar to add a photo from an album, to take a photo or to record a voice memo.
- ▶ Tap on the check mark in the app bar to finish the setup of City Lynx.

## Ensuring your privacy

For the domains *Shared vehicles* and *Car pool* it takes only one more step for securing your privacy:

- ▶ Enter a password in order that the destinations and descriptions of your private journeys can only be accessed by yourself. You only have to enter this password once during the setup of City Lynx.

Only if you want to reinstall the app on your current phone or on a new one, you have to enter the password again. Therefore you should store it in a safe place.

## Creating sample data

Your agreement to the creation of sample data is helpful for the comprehension of the scenarios of the user manual, but is not required for the operation of City Lynx.

- ▶ Tap on the check mark in the app bar to finish the setup of City Lynx.

## After the completion of the setup

After the setup you get to the homepage of the app (see Illustration 7). *Solo drivers*, members of a *Car pool* and drivers of *Company vehicles* now can use all functions of City Lynx. For the necessary steps before you start driving with City Lynx for the first time, see *Before starting the first journey* and *Your first journey*. If you don't need to setup a vehicle you can now start *Your first journey*.

If you have set up City Lynx in the domain *Shared vehicles* for a *private car sharing group*, the candidate icon is displayed on the status bar and most of the options of the app are disabled, as long as the vote on your joining of the group is still taking place.

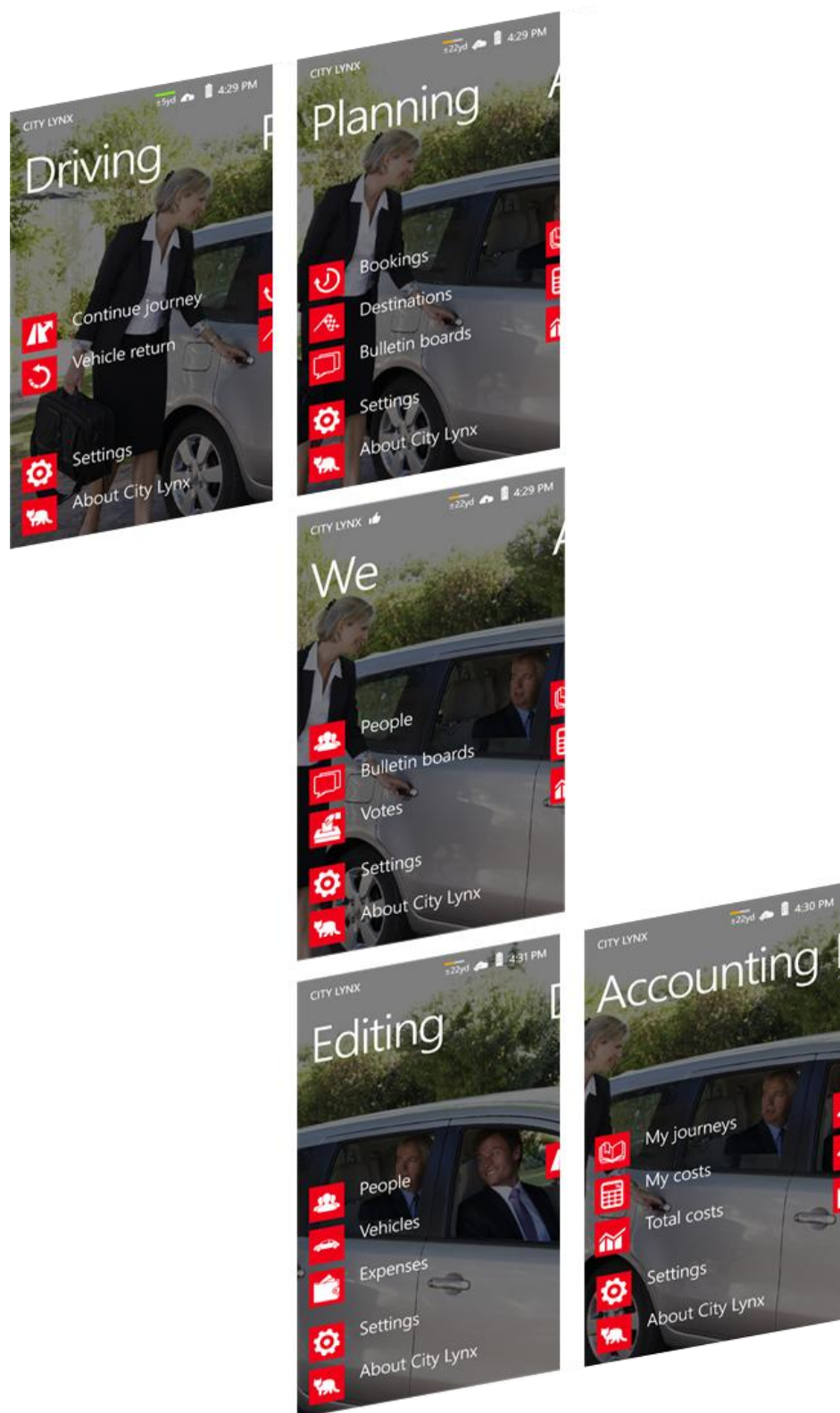


Illustration 7: City Lynx homepage (domain *Shared vehicles*)

## Before starting the first journey

Before you can start your first journey with City Lynx, you need to set up the details of the vehicle you want to drive with.

- ▶ On the homepage flick to the section "Editing".
- ▶ Tap on "Vehicles".
- ▶ Tap on "add" in the app bar.

A page "Add" appears, where you specify what type of vehicle you are driving. You can select a car, a motorcycle, an electric vehicle or a van.

- ▶ Tap on your vehicle type.

A page opens, on which you can fill in the details about your vehicle, e.g. the mileage and the license plate number.

- ▶ Tap into the boxes and enter the information with the virtual keyboard.

Only the two fields "License plate number" and "Description" are mandatory. In addition to that you can enter the location of the vehicle and the phone number of a roadside assistance operator (see Illustration 37).

- ▶ Once you have entered the details, tap on "drive" in the app bar.

A page with the title "Driving" appears, on which you can enter the mileage, fuel or tank capacity, range and consumption of your vehicle. As the fields are preset, this is optional. For using the app, however, it is advisable, to enter the mileage and the range of the vehicle, too.

- ▶ Tap on "costs, fees" in the app bar.

A page with the title "Costs, Fees" opens on which allows you to enter the depreciation caused by the use of your vehicle. You can find hints on the depreciation of various vehicle types per year averaged over 5 years in the [AAA's Your Driving Costs].

- ▶ Enter the figures into the input fields.

In the domains *Shared vehicles* and *Car pool* you can define fees for using the vehicle in the lower part of the page.

- ▶ Enter the figures into the input fields.

Even if you do not fill in any details, you can tap on "finished". In this case, however, City Lynx doesn't record the depreciation of the vehicle and assumes an hourly rate of \$2 per hour. After tapping on "finished", a list of all vehicles appears including the vehicle you have set up just now.

### Your first journey

Now you can start your first journey. *Solo drivers* tap on "Personal use" or "Business use". Members of a *Car pool* tap on "Private journey" or "Shared journey". If you use the domain "Shared vehicles", you tap on "Start journey".

- ▶ On the homepage in the section "Driving", tap on "Start journey".
- ▶ On the page "Book until", set the time how long you want to use the vehicle.

On the next page you can check the current mileage of the car. With the icons in the app bar you can also choose a destination or specify the desired arrival time. City Lynx can also guide you to the current location of the vehicle.

- ▶ Tap on one of the green buttons to enter your input and to start the journey: Tap on the right arrow button to start a journey to a destination. Tap on the left button to start a round trip.

During the journey City Lynx displays the location of the vehicle in a map view. Now you can switch off the screen of your phone to save its battery charge. City Lynx continues running in the background if you have agreed to this before. City Lynx recognizes, when you have arrived at the destination of your journey. It then displays the page "End journey".

- ▶ To end the journey manually, tap on "end journey" in the app bar.

Now the page "End journey" with the current mileage estimated by City Lynx appears.

- ▶ Correct the displayed mileage if it differs from the actual mileage displayed on the dashboard of the vehicle by scrolling up or down, then tap on "finished".

You then return to the homepage of City Lynx. In the section "Accounting" you get to your driver's log by tapping on the entry "My journeys" (domain *Shared vehicles*) or "Driver's log" (domains *Solo driver* or *Car pool*). The list of journeys con-

tains the journey you have completed just now. By tapping on the entry of the journey you get to a detailed view of the journey, in which you can replay the journey on the map view or share the route with the other group members.

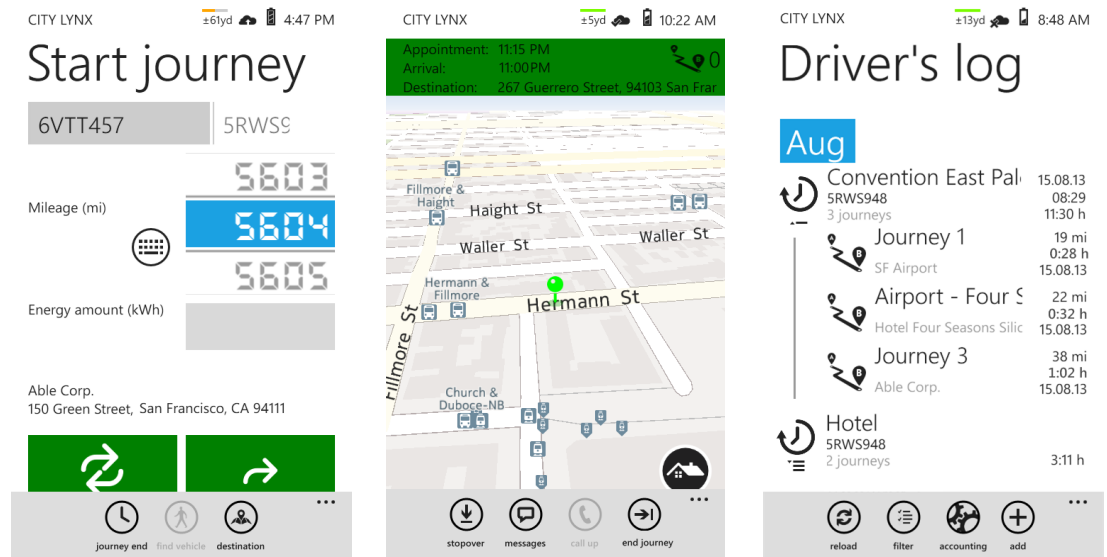


Illustration 8: Your first journey

Illustration 9 gives an overview of starting a journey with City Lynx.

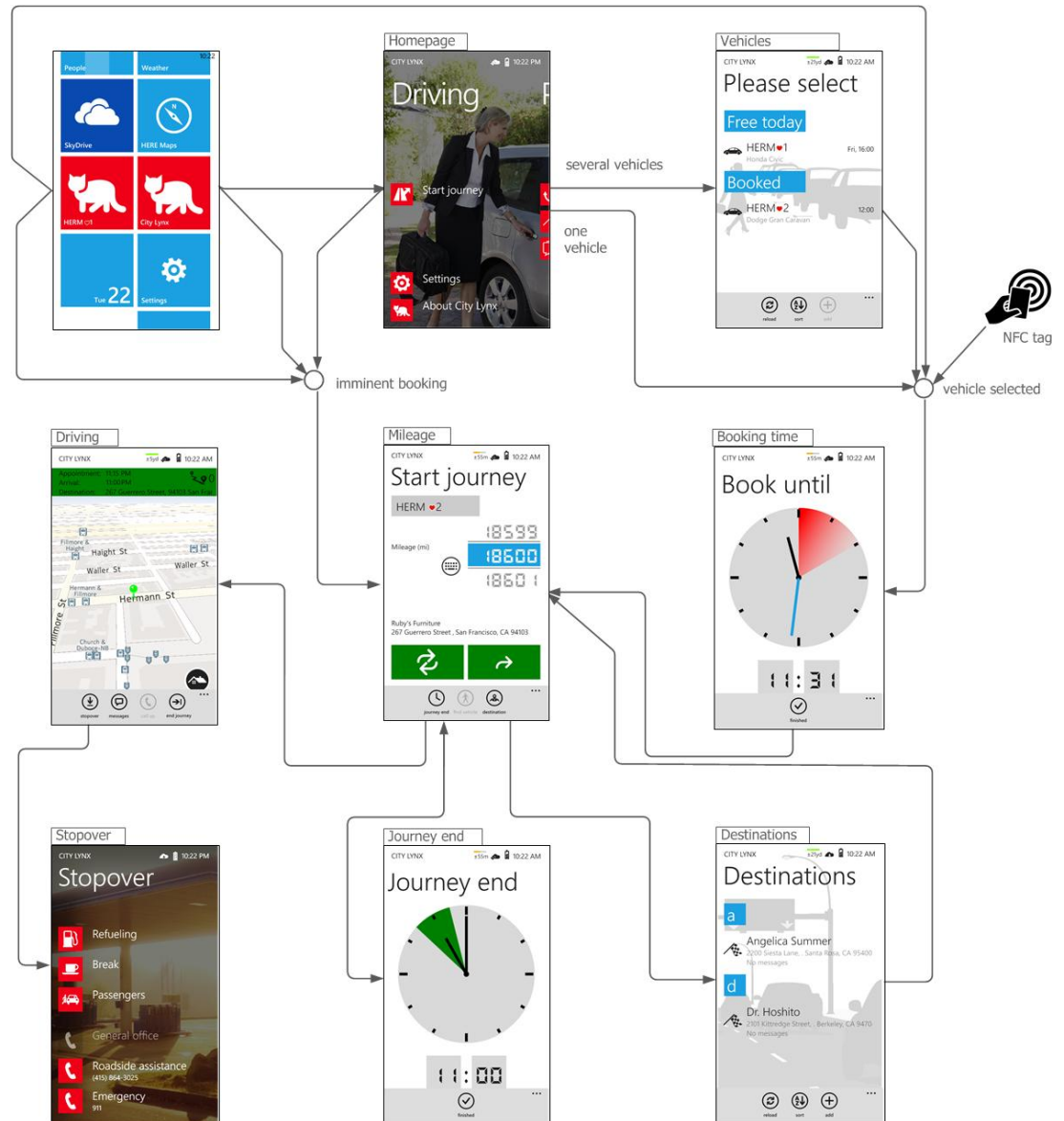
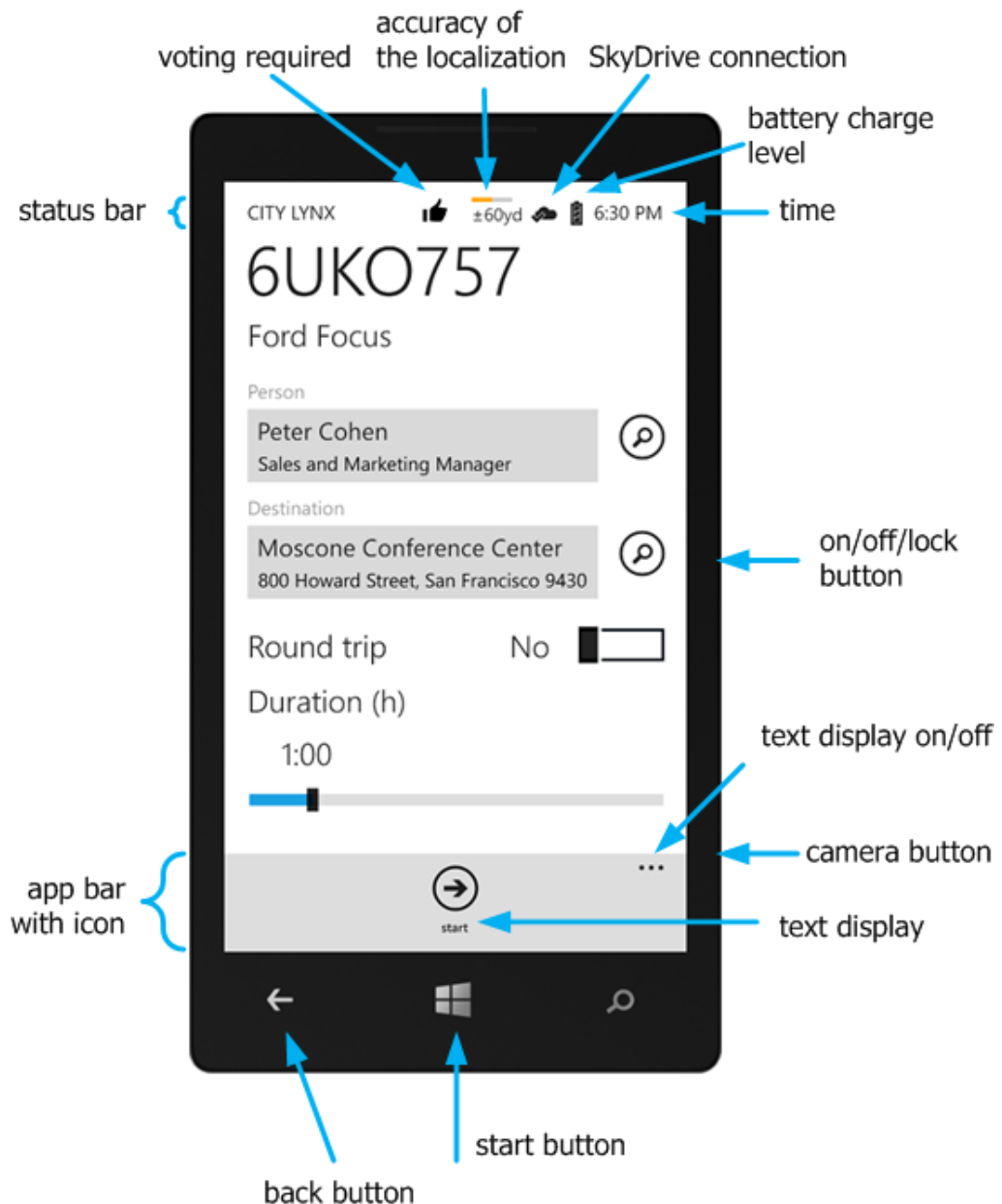


Illustration 9: Start a journey with City Lynx, Shared vehicles



## Overview of the control elements

To operate City Lynx you can use the following control elements. Illustration 10 shows the sections of the user interface and the functions of the control elements which are always available:



### Illustration 10: Sections and functions

A complete overview of all icons can be found in *Part III - City Lynx icons* (starting on page 91).

The button "back" of the phone allows two distinct actions: By tapping on the back button, the last page displayed by City Lynx is shown. By tapping and holding, you get to an overview of all the apps that are currently running on the phone, see Illustration 11. By flicking to the left or to the right, you can switch between them. When you tap and hold the back button, City Lynx is still running in the background. To return to the app, simply tap on City Lynx in the overview. You will get back to the view in which you have been last. Via the start button you can reach the desktop of your phone without ending City Lynx. Tap on the back button, if you want to return to City Lynx.

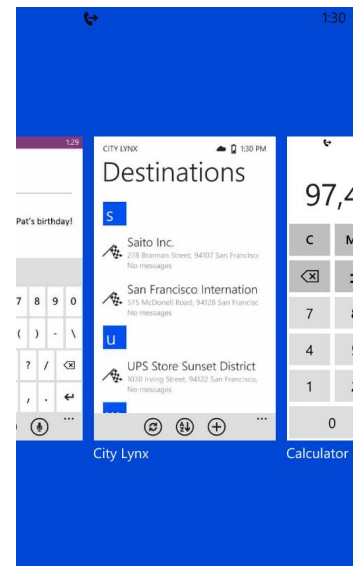


Illustration 11:  
Apps overview

What you will use most of the time working with City Lynx, are the icons in the app bar. If you tap on the three consecutive dots, an explanatory text appears under the icons. By tapping on the button once more, you can make the text disappear again.

The cloud icon in the status bar indicates the status of the connection to the central storage in SkyDrive. If you tap on this icon, you get the details of your current connection status.

Illustration 12 and Illustration 13 offer an overview of the possible states of the SkyDrive connection. The connection to SkyDrive is either available or it is interrupted.

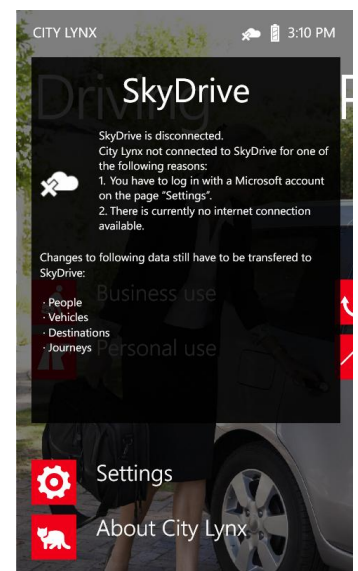
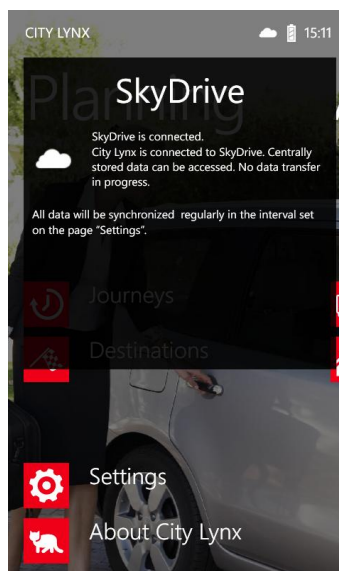


Illustration 12: SkyDrive available,  
SkyDrive not available

Moreover the app can either transfer data from the phone to SkyDrive, or transfer it from SkyDrive to the phone. As soon as the synchronization has been successfully completed, a check mark appears in the cloud icon.

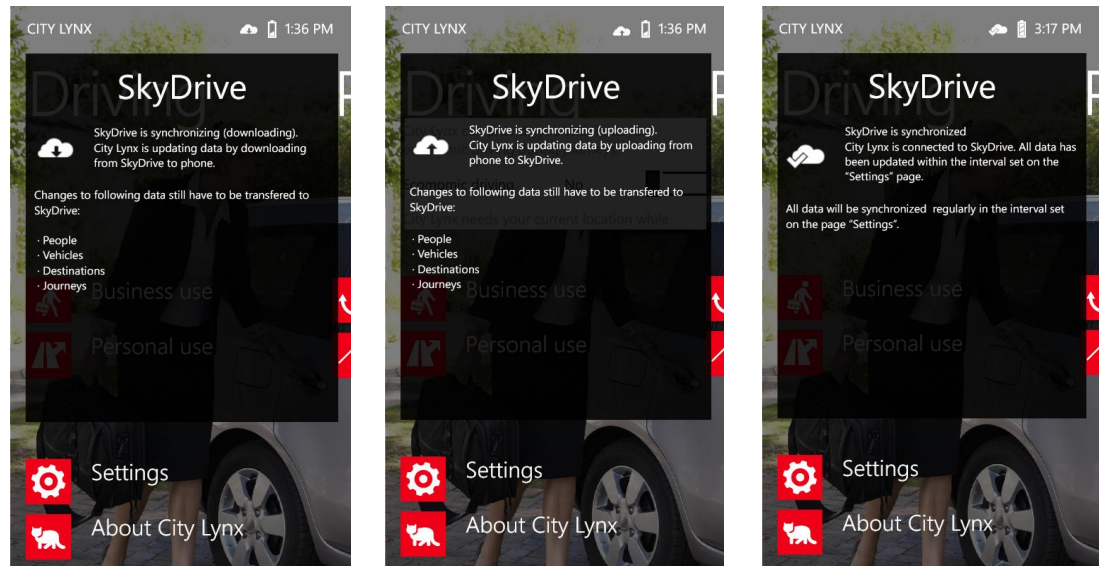


Illustration 13: Synchronizing data with SkyDrive



# Part II – City Lynx in everyday life

This manual outlines different scenarios for the use of City Lynx, which are exemplary for the diverse options and areas of application of the electronic driver's logbook. Different people act as users of City Lynx and provide tips and additional information from their perspective. They are briefly described below.



Peter Cohen works for Saito Inc. at 278 Brannan Street and drives a take-home company car. For tax purposes, he has to document all journeys taken with his Ford Focus and differentiate between private and business journeys. His business journeys include trips to trade fairs and to appointments with clients.

The neighborhood group "Los Hermanos" consists of several families and individuals. They all live in Hermann Street in the Hayes Valley neighborhood and share two cars: a Honda Civic and a Dodge Gran Caravan.



Julia Summer lives with her daughter Lucy in Hermann Street and is a member of the "Los Hermanos". She uses the shared cars mostly to do the shopping or for visits to her mother in Santa Rosa or to her pediatrician of choice, who has a practice in Berkeley.

John Anthony is also a member of the "Los Hermanos". He prepares the monthly billing with help of City Lynx and takes care of the periodic inspections of the cars.





Vanessa Brewer, Joseph Hillman and Ed Shannon live in Pacifica in San Mateo County, California and are employees of the Hotel Continental Union Square in the city center of San Francisco. To save money and spare resources they've started a car pool for their commute to work. Ed Shannon is without own wheels, because his wife took up a job and needs their car. That is why the three now take turns driving with Vanessa's Chevrolet Malibu and Joseph's Buick LaCrosse.

The medium-sized enterprise Able Corp. has company cars that can be used by all employees for business journeys. Employees like Adam Novack drive to client meetings. Others use it to do the shopping for the company.



**The following scenario is not included in the preview of this user guide:**



Octavio Wheeler is a self-employed courier, who is chiefly operating in the urban area of San Francisco. With his GMC Savana he picks up shipments from customers and delivers them to their addressees on several tours each day. Perfect planning and optimal operation of his tours are crucial for his work





# City Lynx with a take-home car



Using NFC tags · spontaneous driving · capturing expenses · reserving a vehicle  
starting a journey · complementing the driver's log · communicating · calculating costs

Peter Cohen uses his take-home company car mostly for business purposes. He is eager to document this business use, because otherwise he has to pay taxes for the complete annual lease value of the car. However, since only his personal use of the car has to be taxed, the percentage of the mileage driven for business purposes can be subtracted from the annual lease value. City Lynx as driver's log helps him to keep record of his mileage and to document his business and private journeys correctly, so that the statement of City Lynx can be filed with his tax return.

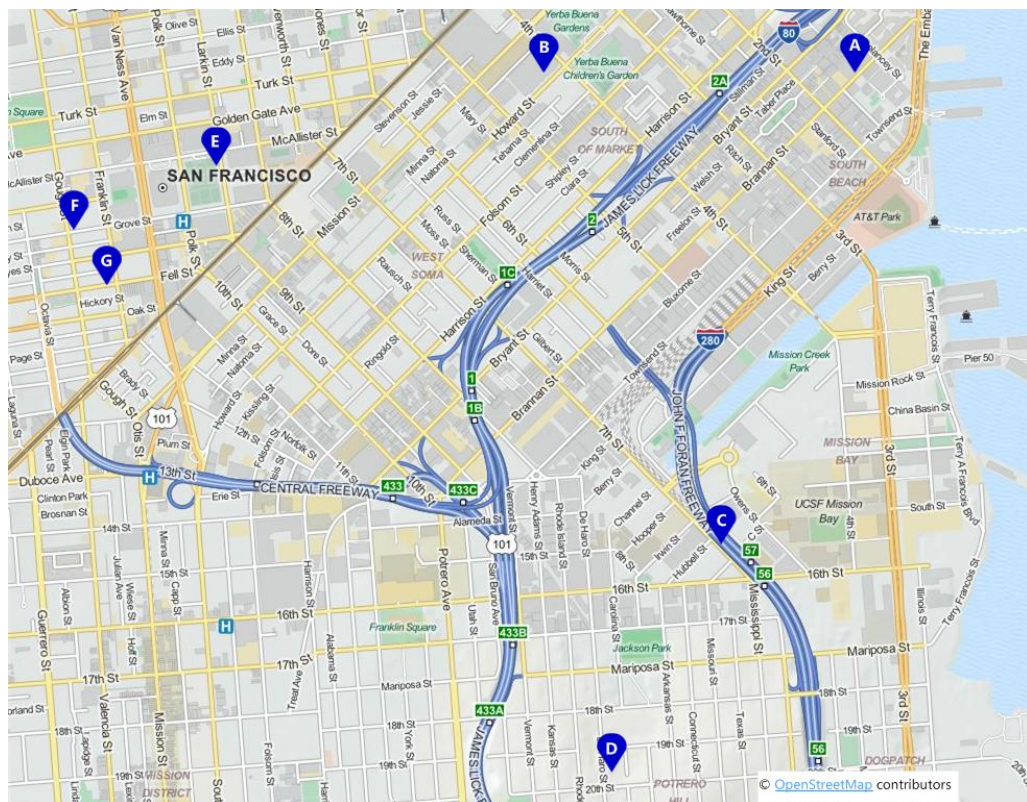


Illustration 14: Peter Cohen's destinations

Peter Cohen bought City Lynx and has already completed the setup choosing the domain *Solo driver*. Colleagues have told him that driving with City Lynx is more convenient if you use NFC tags. These allow a quickstart of City Lynx at the start of a journey and speed up leaving the app when you have arrived at your destination.

Users who drive with an NFC tag place their phones shortly on the tag to start a journey with their car. The phone reads the tag and skips the homepage of the app and the actions that otherwise would be necessary to start a journey. Peter wants to equip his Ford Focus with an NFC tag. He has already bought suitable tags.



Suitable for Windows Phone are all NDEF-formatted NFC tags with at least 100 bytes of available storage. If you try to use an unsuitable tag, City Lynx informs you why this tag is not suitable.

There are several options, where to place your NFC tags, e.g. on the dashboard of the car. Beside NFC tags as stickers, there are also key fobs with an integrated NFC chip.



CITY LYNX

☁ 3:23 PM



Please put the phone on the NFC tag of the vehicle.

Illustration 15: Set up NFC recognition

Peter Cohen puts the NFC tag which he is going to stick on the garage key on the table. He starts City Lynx on his phone and flicks into the section "Editing". There he taps on "Vehicles". In the next view he selects his Ford Focus and arrives at the detailed view of the vehicle, in which he flicks to the left into the section "Car".

There he taps on "Set up automatic vehicle recognition with NFC tags". City Lynx asks him to place the phone on the NFC tag. Peter puts the phone on the tag so that the phone signals the contact with a sound. City Lynx recognizes the tag and associates it with the vehicle. After this association has been made, the vehicle details are shown again.

Next to the description of the vehicle, there is now an icon indicating that the automatic vehicle recognition with NFC is already set up for this car, see Illustration 16.

Before he sticks the tag on his garage key, Peter wants to make sure that the NFC recognition works. He leaves City Lynx by tapping on the start button. Now he puts the phone on the NFC tag. His phone recognizes the tag and asks if it should receive the content and open an app associated with City Lynx. Peter taps on "Accept".

City Lynx announces "Starting journey" and displays the mileage of the car, so that Peter can check and correct it before he starts a journey. Peter leaves City Lynx by tapping on the back button. He sticks the tag on his garage key.



Illustration 16:  
After vehicle  
recognition setup

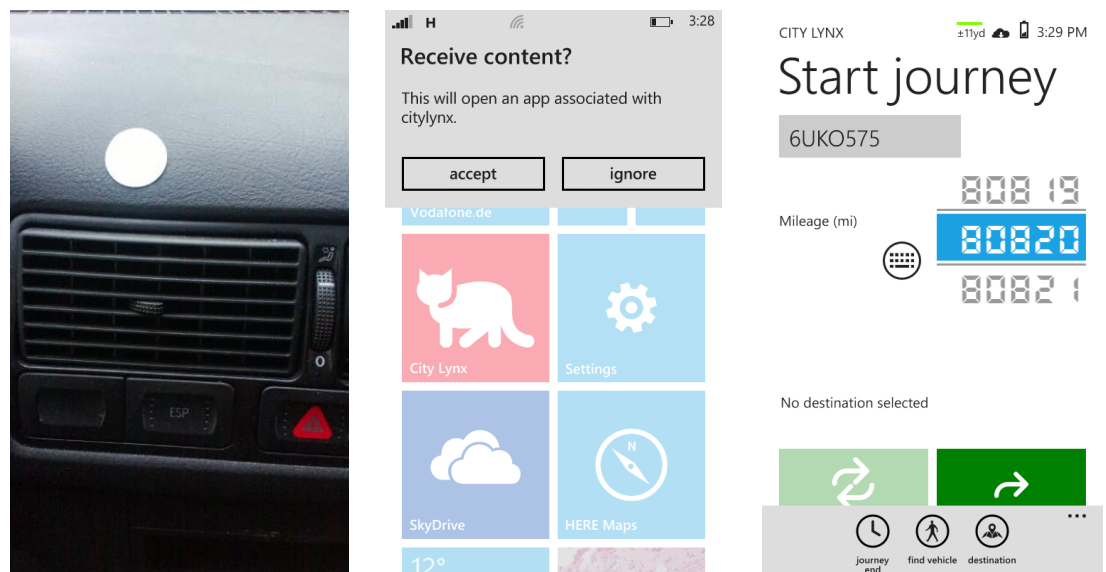


Illustration 17: Starting City Lynx with an NFC tag in the car

Monday, 10:00 a.m.: Peter Cohen walks from his company at 278 Brannan Street (A in Illustration 14) to his car. He wants to go the Moscone Conference Center (B), where his colleagues have been busy preparing an exhibition stand. With a short visit, he wants to check the progress of the construction and leave some informative leaflets. After arriving at the vehicle, Peter pushes the on / off / lock button shortly and places the phone on the tag on the garage key. The tag is recognized prompting the already familiar question if he wants to open an application connected to City Lynx.

Peter fastens his phone to the holder in the car and taps on "Accept". As previously, City Lynx signals "Starting journey". The page "Start Journey" appears on which Peter can compare the mileage stored in City Lynx with the mileage displayed in the car and correct it if necessary. Peter confirms that the value is correct by tapping on the check mark in the app bar and starts driving. City Lynx changes into the drive view, i.e. the view where a map is displayed, on which the location of Peter and his Ford Focus is shown as a green pin.

During the drive to the conference center Peter Cohen decides to refuel. He stops at the next gas station and taps on the "Stopover" icon under the map with the arrow pointing downwards. Peter can now select the reason for the stopover and taps on "Refueling". The page "Refueling" appears. On top of it, there are the current date and time. After refueling Peter

taps into the field mileage, updates the mileage on the following page and leaves the page via "finished" in the app bar. Peter doesn't fill in any other boxes on the page "Refueling", but taps on "Capture receipt" to take a picture of his gas receipt. The camera view of his phone appears. Because his phone is still in the holder, he taps on the front camera icon in the app bar, puts the receipt in front of the camera and takes a picture. City Lynx asks him if he wants to accept the photo or to repeat the action. He taps on "Accept".



A mirror image of the gas receipt is displayed in the preview. As soon as I accept the picture, the display changes and the correct image is shown.

The picture of his receipt is shown in the background. In front of it, there's the page "Refueling" with input boxes for the quantity of refueled gas in gallons and the costs. In the app bar he taps on "finished" and returns to the drive view of City Lynx.

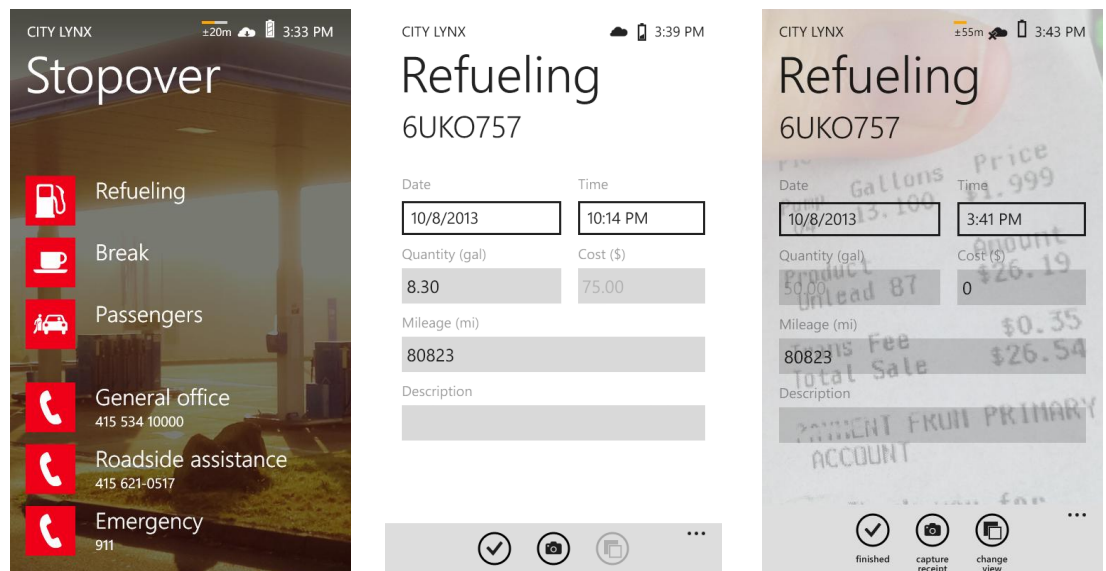


Illustration 18: Refueling with City Lynx

He switches off the screen of his phone. Shortly afterwards he arrives at the Moscone Center (B) at 10:30 a.m. and parks his car. He holds the phone over the NFC tag. With "Accept" he confirms again that he wants to open the City Lynx app. City Lynx announces the end of the journey and says: "Journey finished". Peter accepts the mileage displayed by City Lynx and leaves the app. He takes the phone out of the holder and enters the Moscone Center.



Of course I could fill in the quantity of refueled gas, the costs and the description directly. Via "Change view" in the app bar, I can switch between the photo of my receipt and the input boxes. When I was refueling on my way to the Moscone Center, however, I had to leave soon, therefore I only entered the mileage and took the picture, before I continued my journey.

When Peter gets back into the car at 12:15 p.m., he puts the phone over the NFC tag and confirms the question if he wants to start City Lynx with "Accept". City Lynx signals "Starting journey" and Peter accepts the mileage. The drive view with the map and Peter's location is shown. Peter switches off the screen of his phone to save the battery charge and drives without any further interruptions back to his company at 278 Brannan Street (A), where he parks his car. When Peter puts his phone on the NFC tag on the garage key again to finish the journey, City Lynx says "Journey finished". The page "Finish journey" asks him to check the mileage. The number in City Lynx differs by 1 mile from the number on the odometer of the car. Peter corrects the difference in City Lynx and finally taps on the check mark, by which the journey is completed.

Monday, 05:00 p.m.: To make sure, that his driver's log is suitable for the tax return, Peter Cohen has to edit his business journeys to the Moscone Center and back as well as the details of the refueling. Since he also wants to make a reservation for a tire change, he decides to complete the missing data right now. He starts City Lynx, flicks into the page "Accounting" and taps on "Driver's log". The following page "Driver's log" represents a list of the journeys he has made. He taps on "Journey 1".



He gets to a page with the heading "Date". Next to "Date", he finds the heading "Details". Under "Date", there are the date and the time from "Start" to "End" of his journey to the Moscone Center recorded by City Lynx. On the page "Details" the boxes for "Vehicle" and "Person" already contain the Ford Focus and his name. Peter taps on the magnifier icon next to the input box "Destination" to add the destination Moscone Center. He gets to the view "Destinations" and taps on "add" in the app bar.

The image displays three sequential screenshots of the City Lynx mobile application interface, each showing a different view of a journey record.

- Left Screenshot (Date View):** Shows the 'Date' view with 'Booking start' (07.10.2013, 10:07) and 'Booking end' (07.10.2013, 10:30) fields.
- Middle Screenshot (Details View):** Shows the 'Details' view with fields for 'Vehicle' (6UKO757 Ford Focus), 'Person' (Peter Cohen, Sales and marketing manager), and 'Destination' (Moscone Conference Center, 800 Howard Street, 94103 San Francisco).
- Right Screenshot (Journey View):** Shows the 'Journey' view with 'Description' (Tour 1), 'Purpose' (Business), and 'Round trip' (No).

Each screenshot includes a status bar at the top with 'CITY LYNX' and a time of 5:25 PM. At the bottom of each screenshot is a navigation bar with icons for 'back', 'home', and 'add'.

Illustration 19: How to edit a journey

A page appears, on which he can choose from which source he wants to take his destination. He taps on "address input" and gets to a page "add", where he can enter the details of his destination. At "Description" he enters the text "Moscone Center" and the address "800 Howard Street, San Francisco, CA 94103" into the boxes "Street", "Town" and "Postal Code". He taps on "finished" in the app bar and returns to the page "Journey". Under "Description" it says "Journey 1" in the lowest box. He taps on the box and changes the text with the virtual keyboard to "Visit to exhibition stand". He taps on "finished" in the app bar. Now the view "Driver's log" has an entry "Visit to exhibition stand", under which it says "Moscone Center" in a smaller type size, instead of the former entry "Journey 1".

He flicks to the left and gets to the page "Journey". The switch "Purpose" is turned to "Business", because this is the default setting for the domain "Solo driver". The switch "Round trip" is set on "No". Peter doesn't have to change or add any details on this page.

In the driver's log there is also a "Journey 2". Peter taps on it. He gets to the "Date" page, where, as before, he doesn't change anything, because this page only contains the time frame of his return journey from the Moscone Center. He flicks to the left and gets to the page "Details". Under the boxes "Vehicle" and "Person" containing his Ford and his name he taps next to "Destination" on the magnifier icon to enter his company as destination. He gets to the view "Destinations", taps on "add" in the app bar and selects that he wants to take his destination "From contacts" on the next page. He gets a list of all the contacts which he has stored with an address in the address book of his phone. Under "s" he finds the name of his company "Saito Inc.". He taps on it and gets to the view "Details". At "Description" he replaces "Journey 2" with "Return journey Moscone - Saito". Peter flicks to the left to the next page "Journey". The page contains the statements that the journey was for a business purpose and not a round trip. Because he doesn't need to change these entries, he taps on "finished" in the app bar. On the page "Driver's log" there's now the entry "Return journey Moscone - Saito" with the name of the destination "Saito Inc.", instead of "Journey 2".

City Lynx automatically saves all destinations which are added after making a booking or editing a journey in the list of destinations which you can reach in the view "Journey" via the magnifier icon next to the box "Destination". Next time I need it, I can simply select Moscone or Saito from the list of destinations.



With the start button Peter returns to the City Lynx homepage and flicks to the left to the section "Editing". There he taps on "Expenses". A page with the title "Refueling" appears with the license plate number "6UK0757". The list underneath has an entry with today's date and the time 10:17 a.m. Peter taps on the entry and gets to the page "Refueling", where he finds the date and time of his refueling in the morning. In the background there is a faint photo of the receipt.



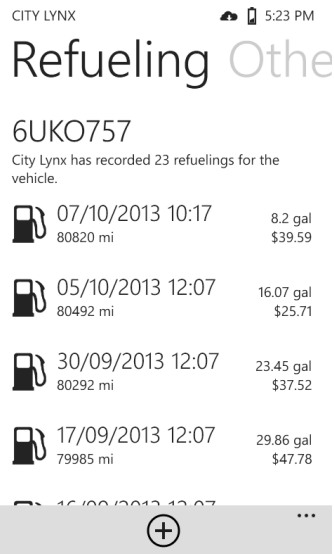


Illustration 20:  
Refuelings

By switching between the photo of the receipt and the view with the input boxes via "Change view", he enters the quantity of refueled gas (8.2 gallons) and the cost (\$39.59). At "Description" he enters "On the way to Moscone Center" and finally taps on "finished" in the app bar.

He returns to the page "Refueling", where he had selected the entry of the refueling for editing. The entry now contains further information: On the left there are still the date and the time. Under this he sees the mileage. On the right there are now the quantity of refueled gas and the costs. Peter leaves the page by tapping on the back button.

After complementing the details of his journeys and the refueling, Peter wants to reserve the Ford Focus with City Lynx for a tire change. Saito Inc. is going take the Ford Focus to a garage for changing the tires and during this time the car won't be available for him. If he enters this appointment in City Lynx, the app is going to remind Peter of the tire change and prevents other bookings for the car during the same time.

On the homepage Peter flicks to the right until he gets to the section "Planning". There he taps on "Bookings" and gets to the page "Bookings", on which all bookings for the car would be displayed in a list. In this case, however, the page is still empty, since Peter hasn't made any reservation yet. He taps on the add icon to add a booking and gets to the page "Reservation". In the box "Description" Peter enters the text "Tire change" with the virtual keyboard. He leaves the purpose switch on "Business". His Ford focus is preset as "Vehicle" and in the box "Driver" he reads his name "Peter Cohen". The field "Destination" is optional. Therefore he skips it by tapping on the arrow pointing to the right in the app bar. The page "Time" appears.

At "Booking start" he selects the date of the tire change and taps into the field for the time next to it. The page "Start" opens and shows a clock face indicating a time one hour in the future, that is 06:30 p.m. since he has to hand in the car keys at the administration's office at 08: 15 a.m. he taps on the edge of the clock face on the 8 o'clock position. The digital

clock under the clock face shows the time 20:00, the hands of the clock indicate 8 o'clock. Since his appointment is at 08:15, he taps again on 8 o'clock position at the edge of the clock face. The hands are turning and stop at 8 o'clock and the digital clock displays the time 08:00. He pulls the minute hand from the 08:00 position to 08:15 and confirms his entry with the check mark in the app bar.

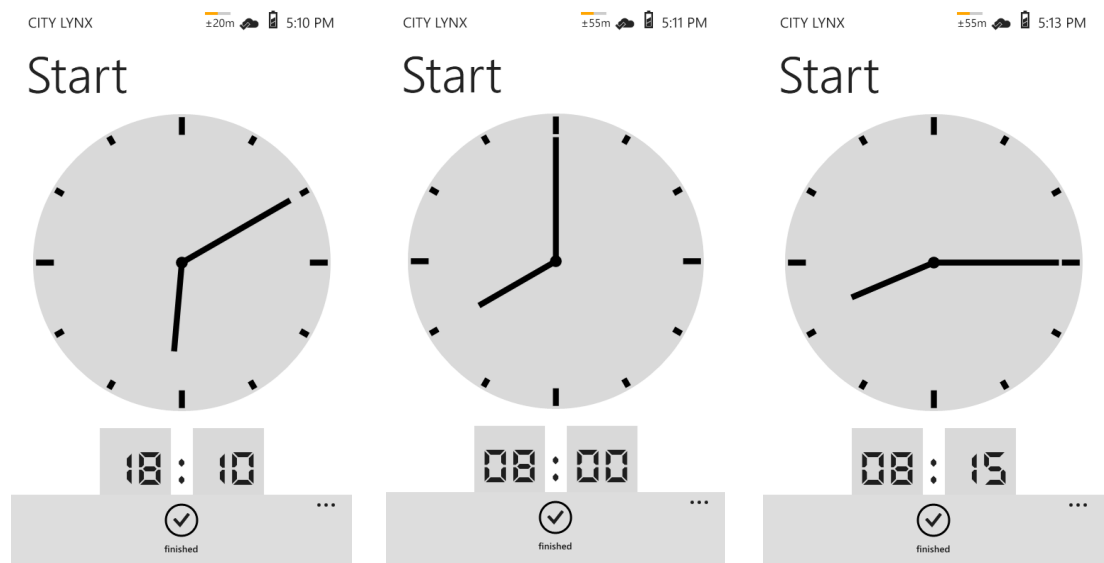


Illustration 21: Scheduling the start of a booking

He returns to the page "Time". At "Booking end" he sets the date of the tire change. He taps into the box for the time on the right and gets to the page "End". It displays a time on a clock face, which is two hours in the future: 19:30. Since he can fetch his car keys at 05:00 p.m. at the administration, he taps on the 5 o'clock position. The clock face and the digital clock change their display to the time 17:00. Peter taps on the check mark in the app bar and returns to the previous page.



I can set the hours and half hours quickly by tapping on the edge of the clock face. If I tap twice on the same position, the time on the 24-hour digital clock is put forward by twelve hours. I can pick the minute or hour hand and turn them to any time I want. If I tap on the digital clock, I can select the hours or minutes from a list.

Peter Cohen leaves everything on the page "Time" as it is and taps on "finished" in the app bar. City Lynx switches back to the view "Bookings", which now contains the entry "Tire change".

CITY LYNX
±20m
5:07 PM

## Booking

Description

Tire change

Purpose Business

Vehicle 6UKO757 Ford Focus

Driver Peter Cohen sales & marketing

Destination

next

CITY LYNX
±55m
5:14 PM

## Time

Booking start 10/31/2013 8:15 AM

Booking end 10/31/2013 5:00 PM

Repetition none

Repeat until 10/29/2013

finished

CITY LYNX
±55m
5:14 PM

## Journeys

Oct

Tire change 6UKO757 0 journey(s)

31.10.13 8:15 AM 8:45 h

reload sort add

Illustration 22: Booking a car

Tuesday, 04:15 p.m.: Today Peter Cohen has a meeting with the client Warren White. While he is driving to the client, Peter wants to keep an eye on the time as well as on the destination, because the route he is going to take is prone to traffic jams at this time of the day. Therefore he sets a time when he needs to arrive at the destination in City Lynx. This way the app will remind him, when the time draws near. With a button in the app bar of the drive view, he could phone the person or company linked to the appointment, e.g. to inform his client, if he is delayed.

Peter Cohen gets into his car at 278 Brannan Street (A) and places his phone shortly over the garage key. Again his phone asks him if he wants to start the application City Lynx. City Lynx announces: "Starting journey" and the page "Start

journey" appears. Peter taps on "journey end" in the app bar and sets the time 17:00 on the view with the clock face. He confirms the time by tapping on the checkmark in the app bar. The page "Start journey" returns, on which he taps on "destination" in the app bar. He gets to the list of destinations where he taps on "add" in the app bar. He selects the option "From contacts" and gets to the address book of his phone. There he selects the name of his client Warren White, whose address "784 De Haro Street, San Francisco, CA 94107" is already stored in the phone. City Lynx displays a detailed view for the new destination "Warren White", where Peter taps on "finished". The app returns to the page "Start journey". The destination "Warren White" is now displayed under the mileage. Peter leaves the switch "Round trip" on "No".

Peter puts the phone into the holder and confirms the mileage, which he had corrected after his last journey by tapping on the check mark. City Lynx shows a map with the location of the car, above which Peter can see the time of his appointment, which he has entered before and an estimated arrival time. Under this there is the address of the destination. All these details are shaded in green.



City Lynx reminds me of an approaching appointment during the journey and allows me to phone the relevant contact without tediously having to search in the address book. For this I have to select the option "no" at the switch "Round trip" and to enter the date of the appointment as end of the journey.

Peter finds himself in a traffic jam on Interstate 280 (C) and the traffic comes to a standstill for several minutes. City Lynx notices this and asks "Turn off motor?" to remind Peter that he could turn off the engine. He follows the advice, because he expects to be caught up in the jam for some time.



City Lynx can give advice on economic driving, e.g. it reminds you to turn off the running engine, if the car is standing. To turn on or off this function I tap on "Settings" on the homepage and flick to the left to the section "Operation". There on top is a switch "Economic driving", which can be turned on or off.

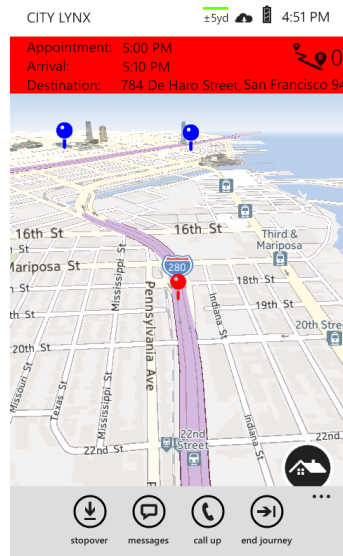


Illustration 23:  
Date reminder

After parking Peter confirms the displayed mileage and ends his journey.

People can be phoned directly out of City Lynx if their name and phone number are in the address book of the mobile phone.



After the appointment with Warren White, Peter Cohen's work day is finished. Now he wants to go to a concert at the SF JAZZ Center (G) with his wife. They've agreed that he is going to pick her up at the Civic Center Plaza (E) at 07:00 p.m. Peter Cohen starts City Lynx, before he gets back into the car and puts the phone into the holder. The City Lynx homepage appears. On the page "Driving" Peter taps on "Private use". City Lynx says "Starting journey" and displays the page "Start journey" with the mileage. Peter confirms the mileage with "finished" in the app bar.

The meeting is approaching and the remaining time is now only 9 Minutes. City Lynx signals this by showing the address and time shaded in red. This reminds Peter that his meeting is imminent. Via the phone receiver icon in the app bar he can now call up the person or company linked to the business meeting.

Because he is running late, Peter taps on "call up". He confirms that he wants to phone Warren White and phones his client. They postpone their meeting to 05:15 p.m. The traffic jam resolves slowly and Peter reaches the office of Warren White (D) in time.

Based on the new coordinates of his location, City Lynx registers that the destination has been reached.



There is no need to substantiate the personal use of the car. Only a driver's log about my business journeys is relevant for the tax return. However, since I want to calculate the mileage costs of my car with City Lynx, I also record my private journeys.

The drive view is displayed with the map on which the location of Peter's car is marked by a green tag. It says only "Date: 07:30 p.m." in the green shaded section above the map, because City Lynx assumes a journey time of one hour, if nothing else has been set. The address of the destination is unknown to the app on this spontaneous trip. He still has some minutes left, before he has to leave, therefore he wants to add the destination for the upcoming journey. He taps into the green space above the map. A list of destinations appears.

Last weekend he went to an event at the Civic Center and had his car parked at the Performing Arts Garage (F), where he's going to park again tonight. In the list of destinations he therefore finds the entry "Performing Arts Garage, 360 Grove Street" under "p". He taps on the entry and gets back to the drive view of City Lynx. Above the map it now says "Destination: Performing Arts Garage, 360 Grove Street" among the details of the date.

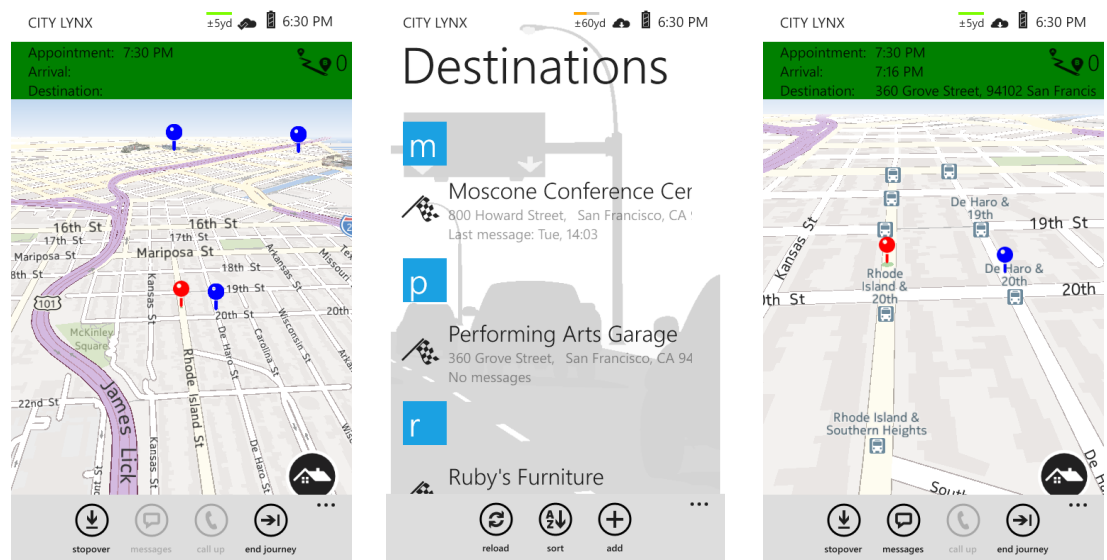


Illustration 24: Adding the destination of a spontaneous trip

He drives from 784 De Haro Street (D) to the Civic Center Plaza (E), where his wife is already waiting for him. She gets into the car and together they drive the short distance to the parking garage (F). City Lynx recognizes that the destination has been reached and displays the page "End journey", where Peter checks the mileage by comparing it to the mileage on the odometer of the car. He adjusts and confirms it. Then he ends City Lynx and walks with his wife to the Jazz Center.

Wednesday, 09:30 a.m.: Peter Cohen has to be at a convention in San Jose at 11:00 a.m. He wants to drive there with City Lynx from his company's office. He starts the journey with the NFC tag on the garage key. As soon as he has fixed the phone to the holder in his Ford Focus, he accepts the notice that City Lynx will be started. City Lynx signals "Starting journey". Peter switches off the screen and starts driving. Once he has parked in San Jose and puts the phone over the NFC tag, he doesn't get a reaction from the phone. He notices that the phone has switched off while he was driving, because the battery charge was too low. Peter doesn't have the time to recharge his phone, before the convention starts. That way he could open City Lynx and end the journey. For the moment the phone remains switched off.

At 04:00 p.m. the convention is over. Peter leaves San Jose with his Ford and connects his phone with the charging cable to the car. Since the battery is completely discharged, he can't start the phone immediately, but has to wait for some minutes. Peter drives to San Francisco without City Lynx. After 30 minutes the fuel level indicator lights up. Peter leaves the highway to refuel his car. While he is refueling, City Lynx comes to his mind and he switches on his phone, which is now sufficiently charged. He decides to record at least the remaining distance to San Francisco with City Lynx. Peter holds his phone to the NFC tag, then puts it back into the holder and accepts the notice for the start of City Lynx. City Lynx says "Starting journey".

City Lynx saves the location of the vehicle at regular intervals during a journey. If City Lynx is left or the phone is switched off, this recording is interrupted. If the app is restarted within 60 minutes or if it is restarted less than 30 mi from the last position recorded, City Lynx assumes that the last journey that was started has not been finished. If City Lynx is restarted in a greater local or temporal distance from the point, where it was left, the app assumes that a new journey has started and the address of the last location before the app was left is taken as the destination for the previous journey.



At "Start journey" Peter corrects the displayed mileage, which is 40 miles short, with the virtual keyboard and taps on the check mark in the app bar. The drive view of City Lynx is displayed. Peter taps on the icon "Stopover" and selects "Refueling" on the following page. He takes a picture of the receipt and notes the mileage, as he has done on Monday. This time he also enters the quantity of refueled gas and the cost to spare himself the editing later. He then gets back to the drive view of City Lynx via the check mark in the app bar. He switches the screen off and drives back to his company at Brannan Street (A). Arriving at his destination he puts the phone on the garage key, accepts the notice to open the app and confirms the mileage.

Since Peter Cohen wants to submit this business journey for the tax return, he edits the journey immediately after arriving back at the office. He taps on the item "Driver's log" in the section "Accounting". In the overview of his journeys, he finds the journeys "Journey 4" and "Journey 5". He taps on "Journey 4". He reads that the journey was started at 9:32 a.m. and that the time 10:18 a.m. is listed at "End", probably because this was the time, when his phone shut down. Peter flicks to the left and gets to the page "Date". At "Destination" he finds the address "Great Mall Pkwy, Milpitas, CA 95035". Milpitas is about 8 miles from San Jose, as Peter can see on a map. He taps on the magnifier icon next to "Destination" and selects the convention center in San Jose from his list of destinations.

At "Description" he replaces "Journey 4" with "Convention San Jose". Below this there are two more boxes. The one on the left indicates the mileage at the start of the journey and the other on the right is for the distance traveled. Peter replaces the 43.6 miles in the second box with the actual 55



miles that he has traveled and saves the journey with "finished" in the app bar. In the view "Driver's log" he then taps on "Journey 5". On the page "Date" the start time of the journey is indicated as 04:40 p.m. and the end of the journey as 05:18 p.m. Peter taps on "Journey". At "Destination" it says "256 Brannan Street". He taps on the magnifier icon and selects "Saito Inc.". Into the box "Description" he writes "Return journey convention San Jose". The mileage at the start of the journey he reduces by 20 miles. City Lynx then corrects the entry at "Distance" from 26.3 miles to 46.3 miles. He confirms his changes with the check mark in the app bar.

At the beginning of the next month: For every month Peter collects a statement of his private and business journeys for the tax return. City Lynx calculates the sums of all driven miles and hours for any period of time he wants. The personal and the business use of the car are identified and listed separately.

Peter starts City Lynx and selects on the homepage in the section "Accounting" the entry "Driver's log". In the next view he taps on the icon "accounting" in the app bar. He gets to the page "Accounting".

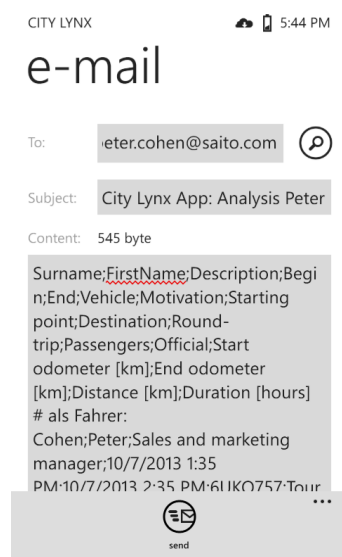
**Illustration 25:**  
Analyzing the  
journeys of a person

the sum of the driven miles on top and below this the time in hours. In the third line the purpose of journey is indicated, i.e. "Private" or "Business": At the first entry it says "Busi-

He finds name and details in the box "Person" on the top of the new page. Under "Person" there are two text boxes for the beginning and end of the period of time for which the statement was made. By default City Lynx sets the previous month as the period of time. At "Start" there is the first day and under "End" there is the last day of the previous month. Next to this in the text box "Total" is the amount of miles that Peter has driven with City Lynx in the specified period of time. The figure underneath states the sum of his driving time in hours. Beneath the input boxes there is a list. On the left side it says two times "6UKO757" and on the right of each entry are three lines in a smaller type size. Each time he finds

ness" and the miles and hours of his business journeys are summed up. At the entry underneath it says "Private" and the sums above this correspond to his private journeys of the previous month.

Since Peter intends to pass the data along with other information and receipts to his tax advisor, he wants to send the results of the analysis via e-mail to himself. He taps on the envelope icon "E-mail" in the app bar.



**Illustration 26:**  
**Send a statement**

Peter's e-mail address. City Lynx writes the text "City Lynx App: Analysis Peter Cohen, period 07.01.2013 – 07.31.2013" into the subject heading and sends the message.

City Lynx memorizes the e-mail address I selected when I sent the first e-mail. The next time I want to send myself the analysis via e-mail, this address will appear in the input box. I can, however, always enter another e-mail address, either manually or via the magnifier icon.



## City Lynx with a shared car



Joining a group · booking a vehicle · finding a vehicle · starting a journey · ending the use of a vehicle · returning a vehicle ahead of time · avoiding conflicting bookings · cancelling a booking · communicating · adding a new vehicle · managing expenses and costs

The members of the Los Hermanos are looking for a simple method to coordinate the use of their two shared cars as flexibly as possible. They find their ideal solution in City Lynx. All members buy the app for their smartphones. A shared Microsoft account is set up.

Now each of them can book their shared cars, and has knowledge of the bookings made by the other group members. If a car is already booked by another member for the desired date, the app informs the user about this and suggests to select another car or to make a phone call to the person who booked the car.

Julia Summer wants to become a member of the Los Hermanos.



I've given Julia an envelope with the key to our safe with the car keys and the name and password for the Microsoft account of the Hermanos.

Julia has bought City Lynx for her smartphone and starts to set it up as described on page 12. She logs in with the Microsoft account "los\_hermanos@outlook.com". While she fills in the details about herself, she enters the phone number of her smartphone at "Phone", so that other group members can contact her by phone. Then she taps on "finished" in the app bar, to make herself known to the other members on the following page. She gets to the page "Introducing" which contains a big speech bubble. In the app bar she reads the option "add photo".

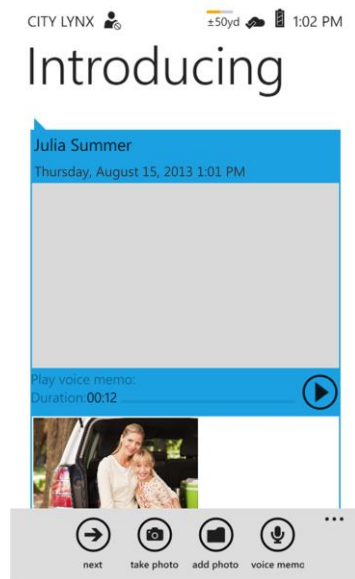


Illustration 27:  
Introducing

She taps on it and selects a picture from one of her albums in her phone. City Lynx returns to the page "Introducing". Now she also wants to add a voice memo. She taps on "voice memo" in the app bar and the recording starts. A dialog appears, saying that a voice memo is being recorded and that the recording can be stopped with "OK". Julia says: "Hello my dear Hermanos, here is Julia Summer, and I want to become your new member. My daughter Lucy and I live in 249 Hermann Street and we are all excited about the new car-share experience. Good luck driving and see you soon!" She taps on "OK" and then in the app bar on "next". She continues the setup as described on page 18.

Now the Los Hermanos can vote on Julia Summer's admittance to the group. By this a misuse of their Microsoft account by strangers is prevented. For this kind of votes, they have decided that a new member will be admitted if 50% of the members have agreed.

While the vote is still ongoing, Julia's use of City Lynx is restricted. She can't use most of the entries on the homepage. City Lynx displays a note that she will have to wait for the result of the vote. John has explained to her that as long as the vote is still taking place, she will see an icon with a person in the status bar. She checks the current status of the vote in the section "We" of the homepage.

Shortly afterwards John Anthony starts City Lynx on his phone. In the status bar an icon informs him that a vote is currently running, in which he hasn't taken part yet. Accordingly, John taps on "Votes" in the section "We". He can see that the current vote regards the joining of Julia Summer and that nobody has voted yet. By tapping on the entry he reaches the next page on which he can cast a vote regarding Julia's joining. The following page shows an overview of the votes in favor and against

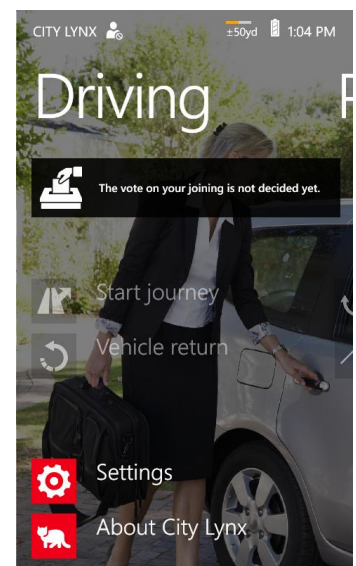


Illustration 28:  
Candidate status

her joining. Tapping on "candidate" in the app bar one can see Julia's introduction and listen to her voice memo.

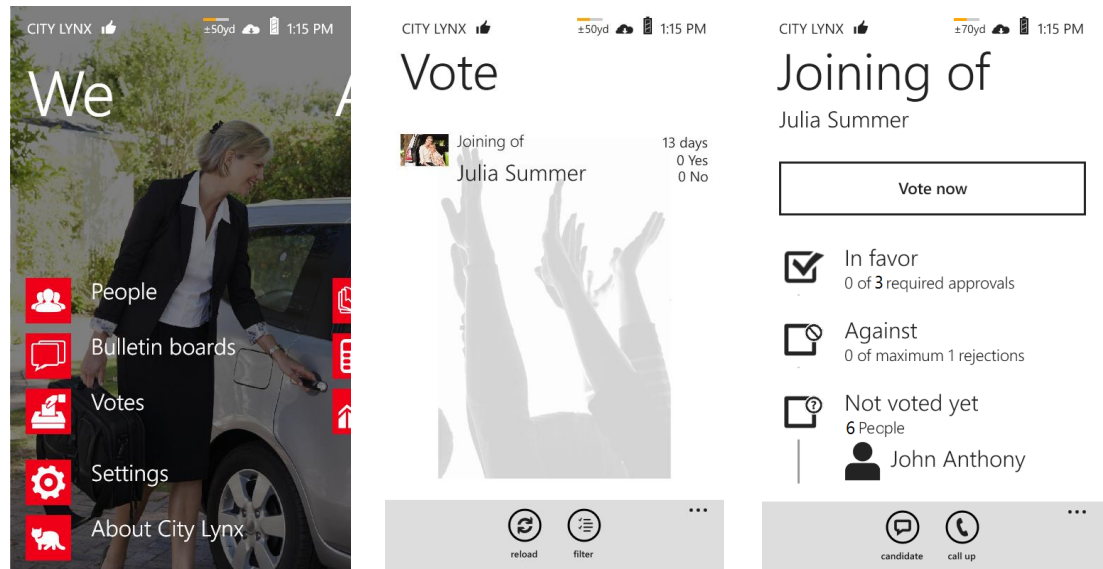


Illustration 29: Vote regarding the joining of a new member

John taps on "Vote now" and then on "Approve". He is now added to the list of people who voted in favor.

After a vote has been cast, it can't be reversed. City Lynx displays a short notice to this effect. If anyone accidentally taps on "Vote now", he can however leave the dialog by tapping on the back button.



On the next day Julia Summer taps on the entry "Votes" in this section "We", to get an idea of the state of the vote. She arrives at the page "Votes", on which she finds an entry with her photo. Next to the photo it says "Admittance Julia Summer". On the right it says how long the vote will be still going on, 13 days, and that there have been 2 votes for her admittance and none against. To learn more Julia taps on the entry. Like, John, she gets to the page with the overview of the result of the votes for and against her admittance as well as the number of votes still pending.

Next to the check mark it says "2 of 3 required approvals". Julia taps on the entry so that she can see who has already voted for her. John Anthony and Pat Melfi have already agreed.

The second entry says that there are "0 of maximum 1" refusals. In the next line she can see that 4 people still haven't voted yet. She recognizes the name of a friend living in the same house. She taps on the name and gets to her friend's detailed view with the phone number. She taps on "call up" and confirms that she wants to make a phone call. Talking to her friend, she tells her that the vote about her admittance to the Hermanos in City Lynx is ongoing and asks her to vote soon. Two days later she's got the required 50% of the votes, whereupon the icon "Person with plus symbol" disappears from the status bar and now all entries on the homepage of City Lynx are active.



The first person who sets up City Lynx for a shared Microsoft account can decide how many votes for or against a proposal are required to decide votes in City Lynx. For the Los Hermanos we thought that 50% of the votes for a proposal are enough as long there are no explicit votes against it. In a small group like ours a single rejection weighs a lot, since we have to trust each other if we are using cars together.

John Anthony has advised Julia that, in addition to her name, she should also enter her address as "Description" in her details, before she books or drives one of the cars.

CITY LYNX ±54yd 9:30 AM

# Me

First name  
Julia

Surname  
Summer

Description  
249 Hermann

Telephone  
1-186-847-16901

finished call up

On the homepage of City Lynx she therefore flicks to the left until the section "We" appears. She taps on "People". A list of the names and details of the other Los Hermanos appears on the screen. Among the other names she finds the entry "Julia Summer" and taps on it. A page with the heading "Me" opens. Under her name she taps on the box "Description". She fills in the short form of her address "249 Hermann", as she has seen it in the other profiles. She also enters the phone number of her smartphone, before she confirms the input with the check mark in the app bar. The list of people reappears, in which there is now the entry "249 Hermann" under the name "Julia Summer".

**Illustration 30:**  
**Personal details**

Sunday 10:00 a.m.: Julia Summer wants to visit her mother in Santa Rosa. She starts City Lynx and flicks to the page "Planning". There she taps on "Bookings" to get an overview

of the bookings of the other Los Hermanos. To her delight, she sees that one of the shared cars is free until 5 p.m. She decides to drive to her mother's immediately.

Via the plus icon in the app bar she gets to a view with the heading "Date". The text boxes "Start" and "End" contain today's date. She turns the switch "Round trip" to "Yes". Now she flicks to the left, so that the page "Journey" appears. There she taps on the magnifier icon.

In the list of the vehicles, she can see that the Honda Civic should be free until 5 p.m. To be on the safe side, she shakes the phone to synchronize the data on her phone with the shared data of the Los Hermanos stored centrally on SkyDrive. The list is updated and the next booking for the Honda Civic is still the one scheduled for 5 p.m. She selects the car, whose license plate number "HERM ♥1" is preset.

"Julia Summer" is already preset in the input box "Person". She taps on the magnifier icon next to the input box for the "Destination" and selects her mother's address "From contacts", because she has saved her address in the address book of phone: "2200 Siesta Lane, Santa Rosa, CA 95404". She writes "Visit with mom" into the box "Description" and leaves the pages by tapping on the arrow in the app bar. The page "Booking" appears. The fields "Booking start" and "Booking end" contain today's date. In the field for the time Julia sets the time for the end as 4:30 p.m. and leaves the page via "finished" in the app bar. The view "Bookings" reappears. She taps on the back button on the phone and gets to the homepage of City Lynx.

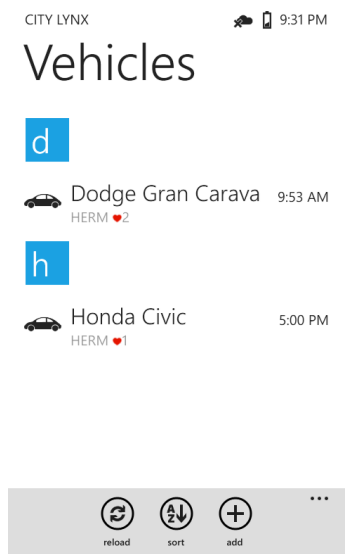


Illustration 31:  
Select vehicle

Shaking the phone isn't the only way to synchronize the data on my phone with the data stored on SkyDrive. All the lists in City Lynx have the "Reload" icon in the app bar. In addition to that, I can set an interval in which the automatic updates are carried out: By tapping on "Settings" on the City Lynx homepage, you reach the page "SkyDrive". In the section with the details about the Microsoft account, an interval between 5 and 30 minutes can be set under the question "Retrieve data automatically?". I've set it to 15 minutes, because I want to be kept informed about the bookings made by the other Hermanos without wasting the data rate or battery charge of my phone unnecessarily. You can see by the arrow in the cloud icon in the status bar, that data is being synchronized.



On the City Lynx homepage, Julia Summer flicks to the right until she gets to the page "Driving" and there taps on "Start journey". City Lynx knows about her booking of the car and displays the page "Start journey", on which the mileage of the Honda is shown so that it can be corrected if necessary. Since Julia is not yet at the car and still has not taken the car key out of the safe, she taps on the walker icon signifying "find vehicle".

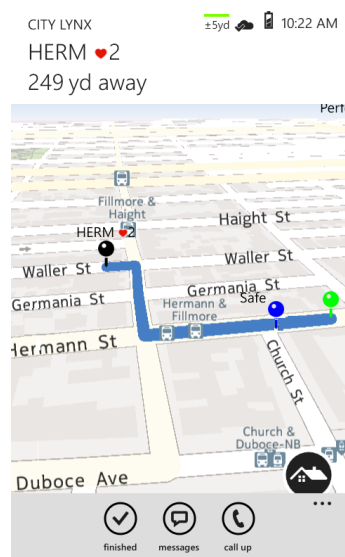


Illustration 32:  
Public destination  
and car location

A map view appears in which Julia's current location, 249 Hermann Street, is shown by a green pin. Above the map is written "249 yd away". A blue line shows the way from Julia Summer's position to the location of the car in Waller Street. There's a blue pin in between both places with the writing "safe" above it. Julia knows that the second car has a parking space in an underground parking garage and that the key safe is mounted in front of the entrance of the garage. She sees that the safe and the parking garage are near her house and she would pass them on her way to the Honda Civic. With her daughter and the child seat, Julia Summer walks straightaway to the safe in 339 Hermann Street.

She finds the safe on the wall next to the garage entrance. First she cannot find the lock to the safe, but she remembers that John had told her that in City Lynx there is an instruc-

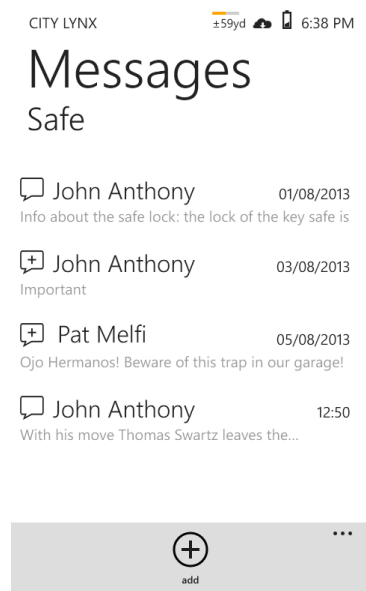


tion on how to open the safe. Looking for the information, she taps on the speech bubble on the app bar. A new page appears which offers the selection of the bulletin board of the Honda Civic or the Dodge Gran Caravan in the section "Vehicles". Julia flicks to the left so that the section "Destinations" appears and selects "Safe". A page opens, on which, under the heading "Messages", there are several messages from the members of the Los Hermanos.

The last and latest message is from John Anthony: "With his move, Thomas Swartz leaves the Hermanos. Julia Summer will take his place and we are pleased to welcome her." Julia taps on the message, and a new page is displayed and the text is read aloud. She can interrupt the playback with "pause".



City Lynx can read out messages only if the appropriate software is installed, see appendix B.



**Illustration 33:**  
Bulletin board of the safe

starts with "Info about the safe lock". She taps on it and learns from the detailed view that the lock is on the right

She taps on the back button. The third message on the bulletin board is from Pat Melfi, who warns of a tricky corner at the entrance of the underground parking garage. The plus sign in the speech bubble refers to an attachment to the message. Julia taps on it and gets the detailed view. Below the message is the preview of a photo of the "tricky corner".

With the back button Julia returns to the bulletin board. Above Pat Melfi's message she finds a message from John Anthony, which also contains an attachment. She taps on it and gets the detailed view, which automatically plays the message from John. He reminds all members that they should always check the mileage at the start and at the end of all car rides. Julia returns to the bulletin board and reads the first message from John, which

side of the exterior of the safe and that the key has to be turned counterclockwise, not clockwise. Julia carries out the instructions and opens the safe. In the safe there are two bunches of keys with tags. On the one bunch she recognizes the license plate number "HERM ♥1" and the description "Honda Civic". She takes the bunch of keys from the safe. On the tag of the other bunch of keys she reads "Dodge Gran Caravan" and a license plate number. There's also a key for the door to the underground parking garage on the bunch of keys.



I've defined the safe as a destination with the address of the underground parking garage and made it public. The default setting for destinations is private, but you can make them public by flipping the switch. With this setting, all members can see the safe on the map and we have bulletin board, on which we can exchange messages.

Julia locks the safe. With the back button she returns first to the bulletin board, then to the map view displaying her own location and the location of the car.

Julia and Lucy walk the remaining 155 yards to the car and get in. As soon as she and her daughter sit with fastened seat belts, she taps on the map view and the check mark. The view "Start Journey" appears again, showing the mileage of the Honda Civic. Julia compares it with the one in the car and taps on "finished", because the value is right. Julia starts driving.



Checking and comparing the mileage is very important for the shared use of cars, since the accounting is based on the recorded data.

To save the battery charge of her phone, Julia turns off the screen and drives to Santa Rosa to her mother. Before the return journey Julia switches on the screen and gets to the drive view of City Lynx, where her current location is shown in green. City Lynx has automatically switched to the next destination. The starting point of her journey, 400 Waller Street, is shown as the new destination. Julia switches off the screen of her phone and drives back to San Francisco.

Near her house she switches the phone on again. City Lynx registers that they are close to the destination and displays the page "End journey", on which she is supposed to check the mileage at the end of the journey. She drives twice around the block, until she finds a parking space in front of the building at 159 Fillmore Street. Julia corrects the mileage estimated by City Lynx, because it is two miles short, and taps on "finished" in the app bar. City Lynx saves the coordinates of the car and displays a page, on which the driven miles and hours are listed as well as the costs that arise from this. Julia and Lucy get off, take out the child seat, lock the car and go to the safe. There Julia locks the car keys and taps on "Finish journey" in the app bar. City Lynx automatically sends her an e-mail with the currently displayed summary.



City Lynx realizes that a journey is coming to an end as soon as you are less than 100 yards away from the starting point or the destination of your journey. If you haven't reached this radius yet or if you have left it again in search of a parking space, City Lynx displays the drive view with the map and the destination on top. In this view you can end a journey by tapping on "End journey" in the app bar.

Though Julia reserved the car until 4:30 p.m. she returns an hour early. Now she wants to make the vehicle available to the other Hermanos. To this end she uses the option vehicle return: On the homepage of City Lynx she taps on "Vehicle return" in the section "Driving". The screen displays a note that Julia will hereby make the vehicle available to the other Hermanos without gaining any financial advantages. By tapping on the icon "location" in the app bar Julia reaches a page displaying the location and mileage of the Honda Civic as they are known to City Lynx. Since the entries coincide with the parking position and the mileage at the end of her journey Julia leaves the page without making any further changes via "message" in the app bar. A page with a speech bubble for a message appears. It already contains the vehicle's license plate number, Julia's name, and a standard text. Julia is happy with the standard text stating that she returned the vehicle at 3:37 p.m. today and taps on "finished" in the app bar.

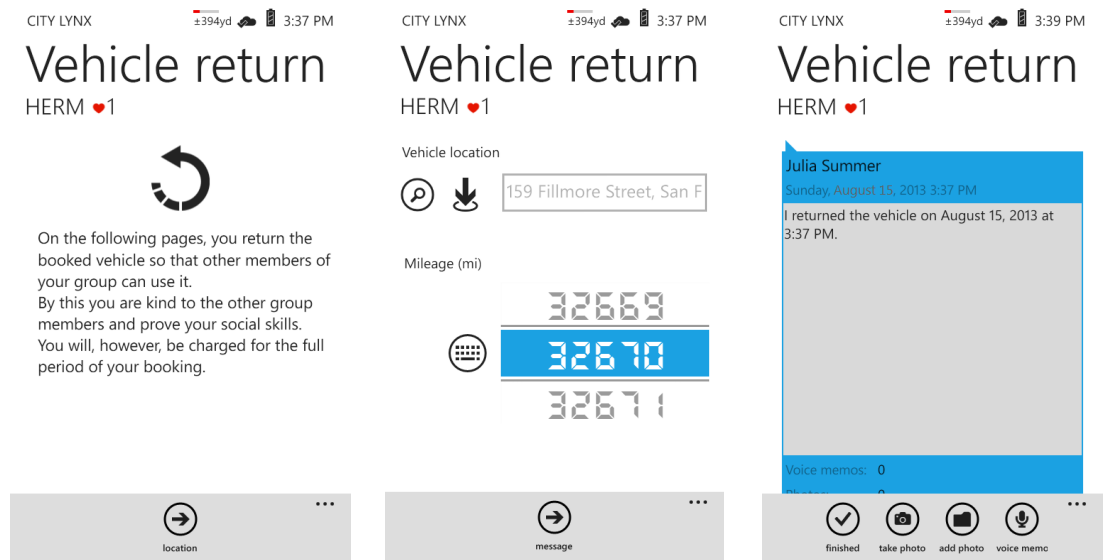


Illustration 34: Vehicle return

The option vehicle return doesn't only come into play when members return a vehicle early. If a member breaks down with a vehicle and cannot return it to Hermann Street this can be documented via vehicle return. In this case it is advisable to enter the position where the member left the car in the field "Vehicle location".



After returning home Julia reserves a car for another journey with City Lynx. On Tuesday at 8 a.m. her daughter Lucy, who has had a cough for several days, has an appointment with the pediatrician Dr. Hoshito in Berkley. So far she always went to the practice by bus and commuter train (BART), but now she wants to go there with the shared car. In the section "Planning" on the City Lynx homepage she selects "Bookings" and gets to the view "Reservation" by tapping on the plus icon in the app bar. There she enters the text "Pediatrician" at "Description" and selects the Honda Civic from the list of vehicles. The input box "driver" already contains her name.

Julia decides to enter the destination, even though that is not necessary. By this she saves herself having to enter the destination when she is starting the journey. She taps on the magnifier icon next to the box "Destination". She gets to a list which contains her destinations as well as the public destinations shared by all Hermanos. She taps on "add" in the app bar. On the next page she selects the option "From map". Thereupon a

map of San Francisco appears on which Julia's location is marked by a pin.

A map of San Francisco appears with Julia Summer's location.

By pinching the fingers and flicking to the left she moves Berkeley to the center of the screen. Then she enlarges the view by stretching the fingers until she can see her destination on the map.

After tapping on it, a red tag appears on the spot and under this the address

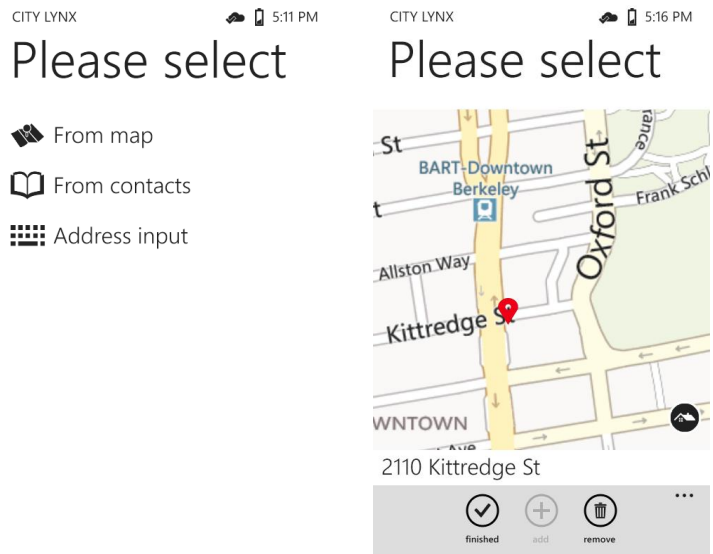


Illustration 35: Select destination from map

"2110 Kittredge Street, Berkeley, CA 94704" is shown. By tapping on the check mark in the app bar, this address is adopted as destination. In the following view "Destination 1" the address is written in the boxes for "Street", "Town" and "Postal code". On top of the page "Destination 1" is preset in the box "Description". Julia taps on the text box, deletes "Destination 1" and replaces it with "Dr. Hoshito". She taps on the check mark in the app bar to adopt the destination for her journey.



It only makes sense to select a destination from the map, if you are familiar with the geography of the surroundings. Otherwise it is easier to enter the address with the keyboard. Because I've been walking from the BART station to Dr Hoshito's for years, I know the area well. And Kittredge Street isn't very long or confusing.



You could just keep the title of the destination "Destination 1" and the description "Journey 1" and start the journey. I changed the title, however, because it helps me to recognize the journey among the other bookings I've made. This way the journey will later be saved in the driver's log with the description "Pediatrician" and the destination "Dr Hoshito", which for me is much easier to recognize than an automatically named "Journey X".

On the page "Reservation" Julia taps on the icon "proceed", the arrow pointing to the right, and gets to the view "Date". She sets the start time of the booking to Tuesday, 07:15 a.m. and the end time to 10:00 a.m. To save the Booking she taps on the check mark in the app bar.

Monday 03:30 p.m.: Julia Summer had to pick up Lucy early from the kindergarten, because her cough got worse. At short notice there's time for an appointment at the practice of Dr. Hoshito at 04:15 p.m. Julia wants to go there on the spot rather than to wait for the next day. It's impossible to get there in time with the commuter train; therefore she wants to take one of the shared cars. She starts City Lynx and taps on "Start journey" in the section "Driving". City Lynx displays a message saying that she has booked a car for Tuesday, 07:15 a.m. and asks her, if she wants to prepone the booking and start the journey now. Julia taps on "Yes".

CITY LYNX

3:37 PM



Your journey ends at 6:22 PM.

The end of your journey overlaps with the following booking: Pat Melfi, journey start at 16.



Illustration 36:  
Time conflict

On the screen a view appears informing her that the journey would end at 6:22 and is therefore in conflict with Pat Melfi's booking from 4 p.m. Julia then selects the option "Change vehicle" in the app bar, hoping that the Dodge Gran Caravan is free.

She gets the list of vehicles, which includes the Dodge. Next to the car it says "19:00", i.e. it is free in the period when she needs it. Julia selects the Dodge and arrives at the view showing the mileage of the car and its license plate number. Since the Dodge Gran Caravan is parked in the underground garage next door and Julia already knows the location of the safe, she doesn't need to tap on "find vehicle" in the app bar. With Lucy and the child seat, she goes directly to the safe and unlocks it. However, the only car key she finds in the safe is the one for the Honda Civic, which Pat Melfi has booked for 04:00 p.m.

With City Lynx you can phone the last person who drove the booked car, therefore Julia taps on the phone receiver icon in the app bar. She wants to find out where the key is. City Lynx asks her if she would like to call John Anthony and Julia taps on "Call up". She phones John and asks him about the key. John apologizes. When John finished his journey, the Gran Caravan was not reserved until 7 p.m according to City Lynx. Therefore he wanted to use the time in which the car was free to change the battery of the remote control in the car key. He assures Julia that he would immediately go and bring the key to the safe. A few minutes later he is at the safe and hands over the bunch of keys which includes the key to the underground garage as well as the key for the car. John also tells her, where to find the parking space in the garage.



In this case I could tell Julia the location of the car space face-to-face, but I've also left the description of the exact position of the car as a message on the bulletin board of the Gran Caravan.

Julia finds the Dodge, opens it, installs the child seat, fastens Lucy's seat belt and gets behind the wheel. Now she can compare the mileage in City Lynx with the one in the car. The values match. Julia taps on the check mark in the app bar and starts driving. She switches the screen off. In Berkeley she switches the screen on again, before she starts the return journey. City Lynx automatically changes to the destination of her return journey, 339 Hermann Street. On her arrival at Hermann Street City Lynx registers the end of the journey automatically. Julia parks in the garage and checks the mileage. After she tapped on "finished", a summary of the driven hours, miles and the costs appears on the screen. Once she has put the keys into the safe, she taps on "Finish journey" in the app bar.

Wednesday, 05:00 p.m.: Julia had booked the Dodge for shopping furniture on next Saturday. Now she has to postpone the shopping trip. To inform the other Hermanos that the car will be free on Saturday and to avoid having to pay for the time of the reservation, she wants to cancel this booking. She taps on the City Lynx homepage in the section "Planning" on "Bookings" and then taps on her Booking "Furniture shop" in the list of bookings. She gets to the page "Reservation". In the lower part of the page she finds a recycle bin icon with a notice that it is still possible to cancel the booking until Friday, 6 p.m. Julia taps on the icon and answers the question if she wants to cancel the booking "Furniture shop" with "Yes". City Lynx then switches back to the list of bookings, from which the entry "Furniture shop" has now been removed.

Bookings can be cancelled until 6 p.m. on the day before. After this cancellations are not allowed.





A few weeks later: The Los Hermanos have found that more and more often they are facing shortages when they are making bookings for the cars for the weekend. Therefore they have decided to buy a third vehicle by special assessment and have chosen the electric vehicle Nissan Leaf, which can be charged with an ePlanet® connection in the underground parking garage [ePlanet®]. John Anthony wants to add the vehicle to City Lynx, in order that the members can start using it immediately.

On the City Lynx homepage, John taps in the section "Editing" on "Vehicles" and then on "add". He selects "Electric vehicle" and gets to the page where he can enter the details for the new car. He enters the license plate number and the description "Nissan Leaf". Then he taps on "driving" in the app bar and gets to the view "Driving". Here he enters the mileage, 28 miles, the battery capacity of 24 kWh, the range of 70 miles, consumption of 32 kWh / 100 mi and the phone number of the roadside assistance. He proceeds by tapping on "costs, fees" in the app bar. The view "Costs, fees" opens. John enters "\$33,000" at "Current value". At "Useful life" he enters 4 years. Finally he enters the "residual value" \$20,500. From this City Lynx calculates the depreciation per month as \$260. In the lower part of the page, he enters the fee which the Hermanos pay per mile for using the Nissan and the fee that they are paying per hour for booking the car. John taps on "finished" in the app bar.

The image shows three sequential screenshots of the City Lynx mobile application interface, illustrating the steps to add a new vehicle.

**Screenshot 1: Electric vehicle**  
 - Status bar: CITY LYNX, ±21yd, 3:55 PM  
 - Title: Electric vehicle  
 - User: HERM ❤️3  
 - License plate number: HERM ❤️3  
 - Description: Nissan Leaf  
 - Vehicle location: Hermanos Garage (with location pin icon)  
 - Distance (yd): [empty field]  
 - Action: Set up automatic vehicle recognition with NFC tags? (with NFC icon)  
 - Bottom bar: driving (with arrow icon)

**Screenshot 2: Driving**  
 - Status bar: CITY LYNX, 55.2.2, ±60yd, 3:55 PM  
 - Title: Driving  
 - User: HERM ❤️3  
 - Mileage (mi): 28  
 - Range (mi): 70  
 - Battery capacity (kWh): 24  
 - Consumption (mi/kWh): 32  
 - Roadside assistance number: 1-222-4357  
 - Bottom bar: [empty field] (with arrow icon)

**Screenshot 3: Costs, Fees**  
 - Status bar: CITY LYNX, ±21yd, 3:55 PM  
 - Title: Costs, Fees  
 - User: HERM ❤️3  
 - Text: The following factors of vehicle depreciation will be accounted by City Lynx:  
 - Table:  

Current value (\$)	Residual value (\$)
33000	20500

Useful life (years)	Depreciation (\$/month)
4	260.42

  
 - Text: The members of the community will be charged as follows for car usage:  
 - Table:  

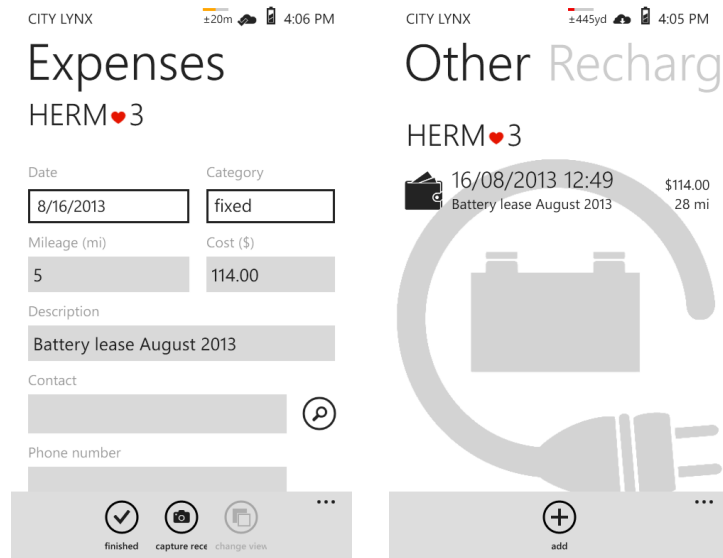
Fee per kilometer (\$/km)	Fee per hour (\$/hour)
0.55	2.00

  
 - Text: Sample calculation (with bar chart icon)  
 - Bottom bar: finished (with checkmark icon)

Illustration 37: Adding a vehicle

For the Nissan Leaf, a monthly amount has to be transferred for the lease of the battery. John therefore enters the cost for the current month. After he has added the Nissan Leaf, he re-

turns via the back button to the homepage of the app. In the section "Editing", he selects "Expenses" and then on the following page he selects the Nissan Leaf from the list of vehicles. In the heading of the following page he taps on "Other" next to "Refueling". In the view "Other" he taps on "add" in the app bar.



The "Expenses" page appears showing the date and the current mileage on the left side. On the right side he taps into the box "Category" and selects the entry "fixed" instead of "variable". In the input box below he enters \$114 at "Costs".

#### Illustration 38: Documenting expenses



After he entered "Battery lease August 2013", he photographs the receipt for the battery lease, which is later shown in the background. He taps on "finished" in the app bar and returns to the page "Other". There is now an entry with the current date and below this the description "Battery lease August 2013". On the right, there are the entered costs and the mileage.

We document the depreciation of our vehicles, so that we can buy a new vehicle without special assessment after the end of their useful lives.



CITY LYNX ±60yd ☁ 📶 2:04 PM

## Costs of vehicles used

	August 2013	Se	Total \$58.45
	HERM ♥2		\$15.53
	total: \$295.11		
	For 70 % : 59 of 828 mi		
	For 30 % : 3:11 of 30:09 h		
	HERM ♥1		\$42.92
	total: \$392.13		
	For 70 % : 121 of 1206 mi		
	For 30 % : 5:29 of 34:15 h		

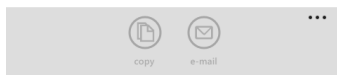


Illustration 39:  
My costs

In the section beneath she can see that she has to pay \$15.53 for using the Dodge Gran Caravan "HERM ♥2" and for using the Honda Civic "HERM ♥1" she has to pay \$42.92. Under each entry the miles and hours traveled with the vehicles and the percentage that Julia has to pay for this are listed.

To find out what costs the other members have to pay for their use of the cars in August, Julia taps on the back button and gets to the homepage of City Lynx. There she taps on "Total costs" in the section "Accounting".

City Lynx displays a page where Julia has to select for which of the three vehicles she wants to check the costs. She wants to see the total costs of the Hermanos for August, therefore she doesn't change the preselection of all vehicles and taps on "proceed" in the app bar. On the page "Costs of vehicles selected" displayed now, she wipes from September to August. Now she can see the expenses for August. On the right there are the total costs for the Hermanos for August, \$687.240.

In the List underneath Julia sees that costs of \$279.89 incurred for the Dodge Gran Caravan and costs of \$408.35 incurred for the Honda Civic in August. Julia flicks to the right to the section "Distribution of costs" and gets an overview of the distribution of costs in August. John Anthony and Pat Melfi have to pay much higher costs for August. To understand the reason for this, she taps on the entries of their names in the list. In August her two neighbors used the

Early September: In the summer Julia was on vacation. She hasn't driven the cars of the Los Hermanos since her visit to the pediatrician. Now she wants to find out, what amount she has to pay to the Hermanos for August. Julia taps on "My costs on the homepage of City Lynx. A page with the heading "Costs of vehicles used" opens. Under the heading she can select the month for which she wants to see the sum of her costs. Julia wipes the entry "September 2013" to the right, so that "August 2013" appears. Now her total costs for August, \$58.45, appear on the right side of this heading.

vehicles much more often, booked the cars for more hours and drove more miles with them than she did.

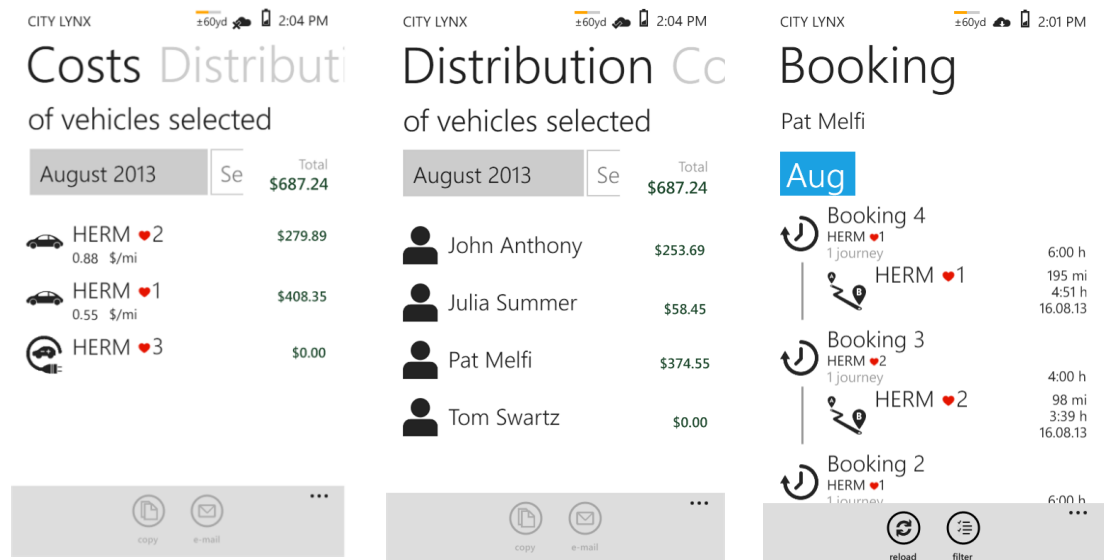


Illustration 40: Total costs and distribution of costs among members



In addition to my driving costs of 58.45, I also need to pay the monthly basic amount of \$4.85, for which I've already set up a standing order.



## City Lynx with a car pool

Recurring bookings · journeys with passengers · picking up passengers · passengers leaving the car · accounting and billing

Vanessa Brewer, Joseph Hillman and Ed Shannon all live in Pacifica, a city spread out along the coast, through which the Highway 1 passes before it joins the Interstate 280 to San Francisco. Via Highway 1 they can easily reach their work place, a hotel in the Union Square area. Because all of them usually work the morning shift, they can avoid the rush hour traffic. The driving distance from their homes to the hotel is between 15 and 25 miles. Since commuting can be quite expensive for individuals, they have teamed up to start a car pool: Individual car pool members are owners of private cars, in which they travel temporarily together with other members of the pool, which is also known as "ride sharing".

Vanessa Brewer lives in the Linda Mar district (pin A in Illustration 41). Three times a week she gives her two colleagues a ride in her Chevrolet Malibu. She lives furthest from San Francisco and it is easy for her to drive by the others' homes on her way north to San Francisco. At two days a week it is Joseph Hillman from Shelter Cove (B), who drives them to work in his Buick LaCrosse. Ed Shannon from Fairway Park (C) cannot provide a car, because his wife needs theirs, after she has taken up a new job. It is very difficult for him to go to the hotel by public transport, because the bus timetable doesn't match his working hours. Not far from his home in Fairway Park (C), however, the Highway 1 becomes a freeway and later joins the Interstate 280 in Daly City. Vanessa and Joseph therefore pass him by on their travel to work and give him a lift. Illustration 41 presents the hotel employees' homes on a map.

With City Lynx Vanessa and Joseph can keep track of the miles that each car pool member rides along as passenger in their cars. This way a straightforward and fair billing for each pool member at the end of each month is easily done. Usually Vanessa and Joseph always take the same routes out to work and back home.

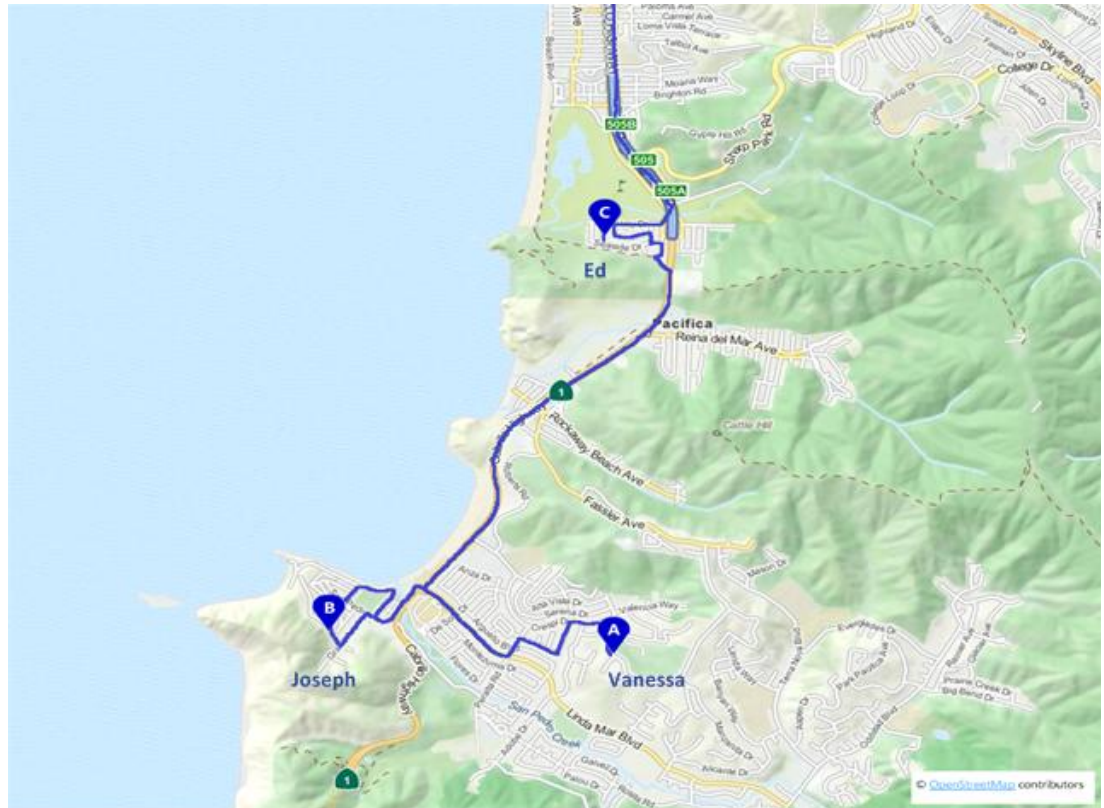


Illustration 41: The hotel employees' homes in Pacifica

Sunday night: Vanessa books her Chevy Malibu for the journey to work for the next day. She taps on "Bookings" and then on "add" in the app bar. On the following page she flicks to the "Details" section, in which the Vehicle input box, is already filled with "4RTH384, Chevy Malibu" and Vanessa Brewer is listed as driver under "Person". From the list of destinations she selects her destination "Hotel Continental Union Square, 450 Sutter Street, San Francisco CA 94108". She flicks to the left so that "Date" is displayed to schedule the start of the journey for 04:15 a.m. and the end of the journey for 05:15 a.m. She writes "Journey out Vanessa" into the box "Description" on the page "Journey". Next to "Recurrence" she selects "Mon-Fri", because she is going to repeat the same journey on

the next days and doesn't want enter a booking for her car for every single day.



At "Recurrence" City Lynx gives you the options "none", "daily" or "Mon– Fri". If you select one of the latter two and start a journey with City Lynx shortly before or after the planned start time of the booking, for Vanessa that is 04:15 a.m., City Lynx assumes that you're setting off for journey for which you booked the car. The app therefore displays the view "Start journey" and announces the destination if you have entered a destination. Since we usually have the weekend off, it makes sense for us to use the option "Mon–Fri".

Monday morning: Vanessa gets into her car at Linda Mar (A) at 04:15 a.m. On the dashboard of her car she has fixed an NFC tag, so that she can start journeys with City Lynx as fast as possible, see page 34. She puts her phone on the tag and answers the question, if she wants to start City Lynx, with "Accept". The app displays the view "Start journey" and says "Starting journey to destination Hotel Continental Union Square". Vanessa checks the mileage and drives to Shelter Cove (B), where Joseph Hillman is already waiting in front of his house.

There she taps on "Stopover", then on "Passengers" and selects "Boarding". The list of all the members of the car pool is displayed. She selects "Joseph Hillman, Shelter Cove". Joseph gets in the car. Vanessa returns to the drive view by tapping on the back button and they continue to Fairway Park (C). They pick up Ed Shan-

non and Vanessa adds his name to the list of passengers, just as she did before with Joseph. Now the three colleagues travel via the freeway to the hotel. In the parking garage of the hotel Vanessa compares

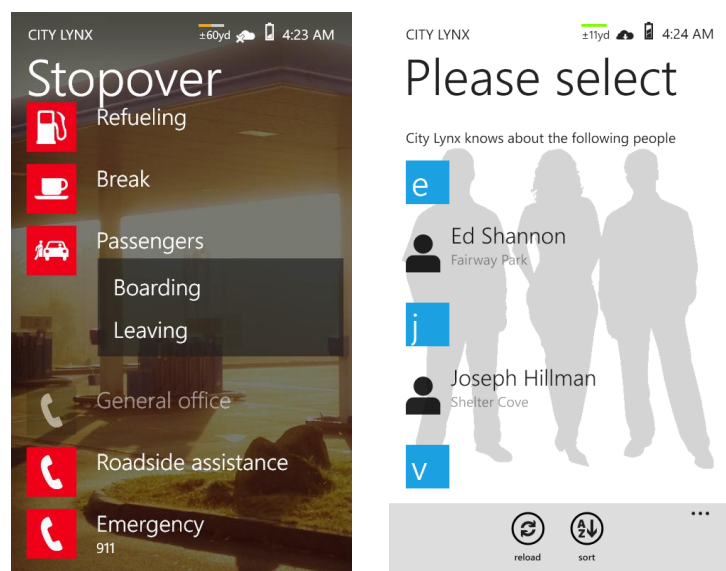


Illustration 42: Passengers boarding



the mileage in City Lynx with that on the odometer of her car and finishes the journey.

On Thursday and Friday it's Joseph's turn to do the driving. First he picks up Vanessa in Linda Mar (A) and later Ed in Fairway Park (C). On Wednesday evening he enters his bookings for the journeys out and back. Like Vanessa he books his car for the journey from his home to the hotel and selects the recurrence "Mon-Fri". For the journey back he taps in the list of bookings on "add" and gets to the view "Reservation". The vehicle "5DOG729, Buick LaCrosse" and the person "Joseph Hillman, Shelter Cove" are preset. He selects his destination "Joseph's place, Sterling Avenue 217, Pacifica, CA 94044" (B) from the list of destinations. He flicks into the section "Time frame" and schedules the "Start" at Thursday, 02:15 p.m. and the "End" at 03:15 p.m. He enters "Journey back Joseph" as "Description". In the Passengers section he taps on Vanessa and Ed in the list of people", so that they both are set as passengers and finally confirms his entries with the check mark in the app bar.

Thursday, 02:10 p.m.: Vanessa, Joseph and Ed meet in the parking garage of the hotel and get into Joseph's Buick. Joseph starts City Lynx. A page with the heading "Passengers" appears, under which it says "Journey back Joseph". On this page the names of Vanessa and Ed are one under the other. Left of each name there is a check mark. Since Joseph wants to take both of them along he taps on "next" in the app bar. The page "Start journey" appears and City Lynx announces "City Lynx - Starting journey to destination Joseph's place". Joseph confirms the mileage displayed, gets to the drive view and starts driving.



Even if we usually repeat our journeys with the same people, it is always possible that someone is ill or on vacation. That is why the passengers listed for the booking are displayed at the start of a journey. This way we can easily remove Ed from the list of passengers on days when he is away for his vocational training before we start our journey. This also ensures that he won't be charged for the miles that we travel on these days. Additional passengers can be added conveniently with the plus icon in the app bar.

He leaves Highway 1 at the exit 505A southbound and drives to Fairway Park (C) to drop off Ed Shannon. In front of Ed's house he taps in the drive view of City Lynx on "Stopover" and in the following view on "Passengers" and "Leaving". The list of



passengers is displayed, from which he selects "Ed Shannon, Fairway Park". Ed gets out of the car. Joseph returns to the drive view by tapping on the back button. Vanessa and Joseph drive on to Linda Mar (A), where Vanessa gets off. As he did before with Ed, Joseph informs City Lynx via the page "Stopover" that a passenger (Vanessa) got off the car. City Lynx switches to the drive view and Joseph drives home (B), where City Lynx recognizes that he has arrived at the destination and displays the page "End journey". Joseph corrects the mileage and ends the journey with the check mark.

The fastest way to include additional passengers for a spontaneous shared journey is by tapping on "Passengers" on the homepage of City Lynx. First you tap on "Passengers" and get to the list of all people, from which you then select the passenger. After this City Lynx returns to the homepage. You repeat this for all further passengers. If you then start a spontaneous trip on the homepage with "Shared journey", the people you have added before will be documented as passengers.



Monday, 04:20 a.m.: Today Vanessa is going to drive to the hotel on her own, since Joseph is ill and Ed is doing a vocational training course. As last Monday, she starts City Lynx with the NFC tag and sets off for her regular journey "Journey out Vanessa". She drives with City Lynx to the hotel and returns home in the afternoon with her regular booking "Return journey Vanessa" without taking along her two colleagues.

Some weeks later, Friday, 04:00 a.m.: Vanessa is on vacation and wants to drive to Lake Tahoe to go camping. She is also recording her private journeys with City Lynx, because she wants to find out the total costs per mile of her Chevrolet Malibu as exactly as possible. She puts her phone on the NFC tag on the dashboard and confirms that she wants to start City Lynx.

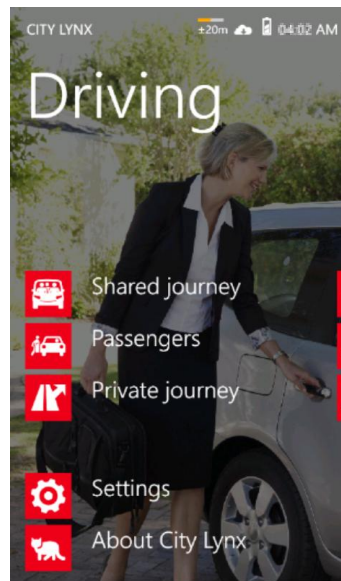


Illustration 43:  
Starting a private  
journey

City Lynx announces "City Lynx – Starting journey to destination Hotel Union Square", since the app assumes that Vanessa wants to set off for her regular commute to the hotel. The page "Start journey" is displayed.

Since Vanessa doesn't want to go to the hotel, but set off for a private trip, she taps in the status bar on "CITY LYNX" and gets to the City Lynx homepage. There she taps on "Private journey" in the section "Driving". City Lynx announces "Starting journey" and displays the page "Start journey". Now Vanessa corrects the mileage, taps on the check mark in the app bar and starts driving. She switches off the screen to save the battery charge of her phone.

By tapping on "CITY LYNX" in the status bar you can reach the homepage from whatever page you are on. If you do this while you are driving, you will read "Continue Journey" in the section "Driving" instead of the other entries.

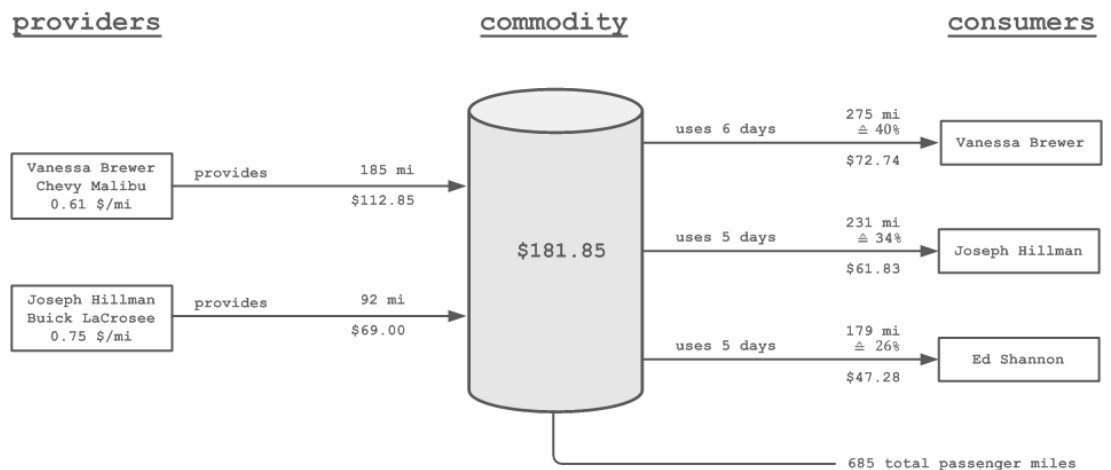


City Lynx generates the bill of costs for a car pool based on the shared journeys and the number of miles that every member has traveled with the car pool. The expenses for shared journeys are calculated on the basis of the total costs per mile for the vehicles. When they set up the profiles for their cars, Vanessa and Joseph entered 61 cents per mile for the Chevrolet Malibu and 75 cents per mile for the Buick LaCrosse (see [AAA's Your Driving Costs]). In the week described above, they all traveled from Monday to Wednesday with Vanessa's Chevy and on Thursday and Friday with Joseph's Buick. On the next Monday Vanessa drove alone on a shared journey. For these six days the cost situation and the distribution of costs therefore looks like this:

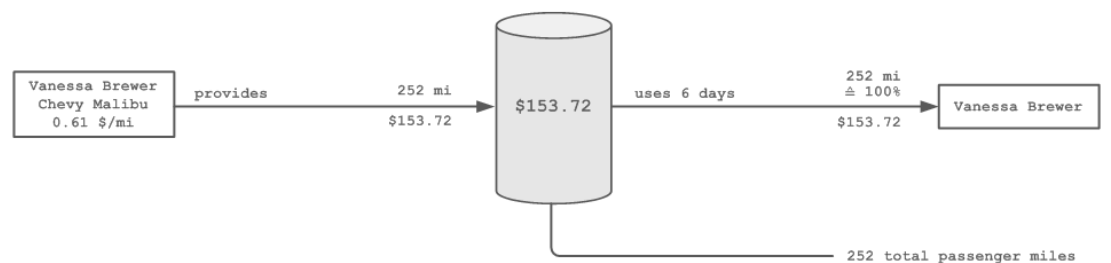
- Chevy Malibu: 185 mi at \$0.61, i.e. \$112.85
- Buick LaCrosse: 92 mi at \$0.75, i.e. \$69.00
- Total: \$181.85

In the period in which these costs incurred, the members of the car pool traveled different numbers of miles with the car pool:

- Vanessa Brewer: 275 mi
- Joseph Hillman: 231 mi
- Ed Shannon: 179 mi
- Passenger miles: 685 mi



*Distribution of costs for car pool*



*Costs for the same period with Vanessa Brewer as solo driver*

**Illustration 44: Distribution of costs for the car pool**

Illustration 44 demonstrates the accounting for the car pool. The percentage share of the total passenger miles (685 mi) is calculated for every member. Each member has to bear the costs incurred according to his or her percentage share:

- Vanessa Brewer: 275 of 685 mi, i.e. 40 %, \$72.74
- Joseph Hillman: 231 of 685 mi, i.e. 34 %, \$61.83
- Ed Shannon: 179 of 685 mi, i.e. 26 %, \$47.28
- Total: 685 mi, 100 %, \$181.85

The result of the calculation is therefore that Ed has to pay \$47.28, of which \$40.11 go to Vanessa and \$7.17 go to Joseph.

Car pooling has advantages for all three of them. If Vanessa drove to the hotel and back on her own, it would take her only 252 mi instead of 275 mi. But she would have to pay the total costs of \$153.72 by herself. Joseph would drive 220 mi instead of 231 mi if he drove by himself, but he would then have to pay \$165. Ed doesn't have a car and public transport is not an option for him: the first bus runs too late for the morning shift.



## City Lynx with a company car

Booking cars for someone else · making a calls to solve time conflicts · “pin to start” for vehicles · calling to find a vehicle · listening to voice memos about destinations · leaving messages about a vehicle · replaying and sharing journeys · adding journeys retroactively

Adam Novack works for the company Able Corp., which operates several company cars. On Thursday he wants to pick up Mrs. Schmidt, an important client, from the airport with one of the company cars and go with her to a convention in the hotel Four Seasons Hotel Silicon Valley in East Palo Alto. Like the neighborhood group “Los Hermanos” the company Able has a shared Microsoft account, which all employees can use on their smartphones. Able Corp. uses City Lynx with the domain “Shared vehicles”. Unlike the “Los Hermanos”, however, they chose “business use” during the setup of City Lynx. The company uses the app to record all journeys taken with the company cars, e.g. the Toyota Corolla. On Monday the administration assistant Marilyn Chang books the Toyota for Adam Novack to make sure other employees don’t use the car during this day.

On the homepage of City Lynx she selects the entry “Bookings” in the section “Planning”. On the page “Bookings” she taps on “add”. A page with the heading “Reservation” appears. Under “Description” she enters “Convention at Four Seasons Hotel Silicon Valley”. With the magnifier icon she selects the Toyota Corolla with the license plate number 5RSW948 from the list of vehicles. She also uses the magnifier icon to select the driver.

She gets to a list of all people known to City Lynx. The list is ordered by surnames, which is why Adam Novack’s name doesn’t appear immediately on the screen. She taps on the icon “sort” in the app bar.

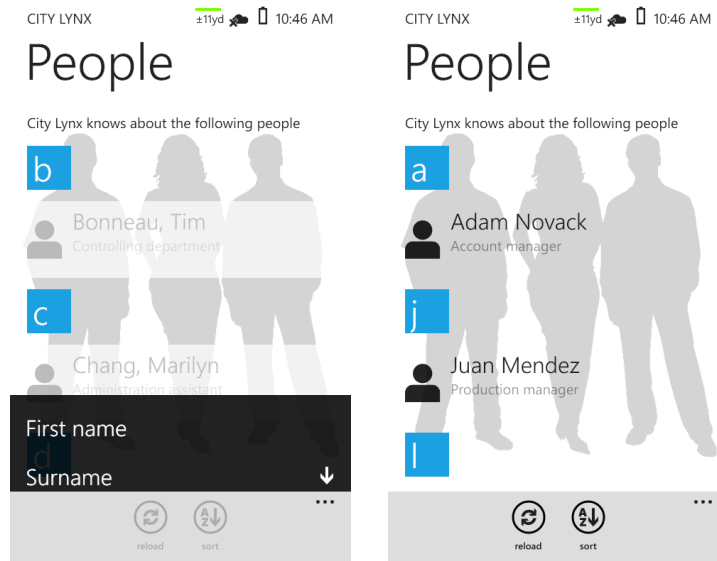


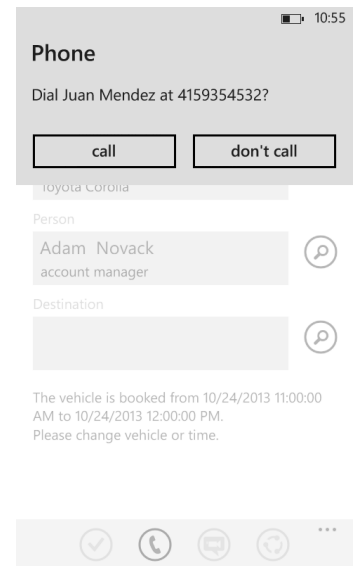
Illustration 45: Sorting the list of people

The context menu with the entries "first name" and "surname" appears. Next to the entry "surname" is an arrow pointing downwards, which signifies that the list is sorted according to the surnames. Marilyn selects "first name" and the list changes its order. Under "a" she now finds "Adam Novack".

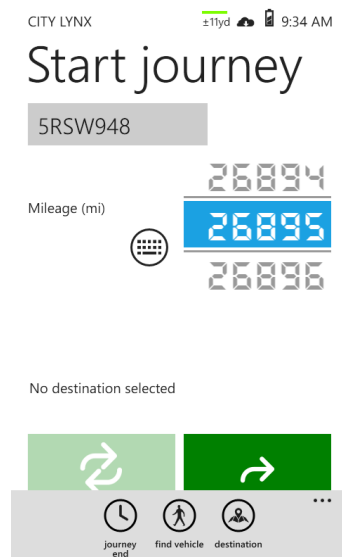
The view "Reservation" reappears. Next to "Reservation" on the right Marilyn taps on "Date". There she enters "Thursday, 09:30 a.m." as start time and "06:00 p.m." as end time of the booking. In the lower part of the screen appears a dialog saying that the vehicle is already booked for 11:00 a.m. to 12:00 p.m. on Thursday. Marilyn taps on the receiver icon in the app bar.

She confirms that she wants to phone Juan Méndez, who has booked the car for that time. Talking to Juan it turns out that his date is a shopping trip which he could easily do with another vehicle, like e.g. the Chevrolet Spark EV. Since she has agreed with Juan that he is going to change his booking, she taps on the check mark in the app bar to finish the booking in spite of the time conflict.

Some minutes later Juan edits his booking by selecting it from the list of bookings. At "Reservation" he taps on the magnifier icon next to "vehicle" and select the entry "Chevrolet Spark EV". He confirms this change by tapping on the check mark in the app bar.



**Illustration 46:**  
Phone call to solve time conflict



**Illustration 47:**  
Starting journey

Before starting a journey, he can phone the last person who drove the car by tapping on the receiver icon. To find out the exact position of the car Adam taps on the icon and confirms that he wants to phone his colleague Walter Thornton. Talking to Walter, he learns where he parked the car one hour ago. After finishing the phone call, he finds the Toyota in the 2nd basement floor of the Levi's Plaza parking garage. He gets into the car and taps on the check mark in the app bar of the map view. City Lynx returns to the view "Start journey" with the mileage of the Toyota.

Thursday, 09:30 a.m.: Adam Novack starts City Lynx and selects "Start journey". City Lynx announces: "City Lynx - starting journey". Since Adam doesn't know where the car is parked, he taps on the icon "find vehicle" in the app bar. A map view appears. Adam's location is marked by a green pin. The black pin with the car icon points to the address "101 Lombard Street". Adam walks towards this address and recognizes that the car is parked in a big parking garage and that he won't find it relying only on the address.

Before starting a journey, he can phone the last person who drove the car by tapping on the receiver icon. To find out the exact position of the car Adam

While driving Adam wants to keep an eye on the time, when Mrs. Schmidt's plane is scheduled to land. Therefore he taps on the clock icon in the app bar. The page "Journey end" appears where Adam can enter a time. He pulls the minute hand to 10:15 a.m. and returns to the page "Start journey" by tapping on the check mark in the app bar. To keep not only the time but also the destination in view while driving, Adam taps on "destination" in the app bar. From the list of destinations he selects "San Francisco International Airport, 575 McDonell Rd, San Francisco, CA 94128" under section "a", whereupon City Lynx returns to the view "Start journey". Adam now confirms the mileage displayed and drives to the airport.



If you want to be reminded of the time of an appointment while driving, you have to enter a time at "Journey end", before you start driving. Ten minutes before the appointed time the section above the map in the drive view will be colored in red. To get a prediction of the arrival time, you can enter the destination of the journey. Another advantage of this is that you could phone a person who is linked to the destination via the "call up" icon in the app bar of the drive view.

Thursday, 11:15 a.m.: Adam Novack and Mrs. Schmidt get into the car to travel from the airport to the hotel Four Seasons Hotel Silicon Valley in East Palo Alto. On the homepage of City Lynx Adam taps on "Start journey". On the next page he taps on the icon "destination" in the app bar. He selects "Four Seasons Hotel Silicon Valley" from the list of destinations. He doesn't enter an end time for the journey, because they still have enough time for their trip to the hotel. He puts the switch "Round trip" on "Yes", confirms the mileage and starts driving.

While driving into Palo Alto he taps on the app bar icon "message" in the drive view, to listen to information on the destination left by colleagues. The bulletin board of the "Four Seasons Hotel Silicon Valley" appears where he finds a voice memo of Juan Méndez. Adam taps on the entry, whereupon the detailed view appears and Juan's message is played:

"On the Highway 101 southbound take the University Avenue exit for Palo Alto. Turn left on University Avenue and take the first right onto Woodland Avenue. Make an immediate right into the University Circle office complex. The Hotel is straight ahead."



After he has listened to the message, Adam taps twice on the back button to return to the drive view. Thanks to Juan's instructions he arrives easily at the destination and parks the car. Since City Lynx has recognized the arrival at the destination, the destination of the return journey, the airport, is displayed above the map. Adam taps on "Stopover" in the app bar and selects "Break" on the next page. The homepage of City Lynx appears. Instead of "Start journey" it says "Continue journey" in the section "Driving". Adam and Mrs. Schmidt get out of the car and enter the hotel.

Thursday, 04:15 p.m.: The convention in the Four Seasons is over and Adam wants to bring Mrs. Schmidt back to the airport, before he returns to the Able Corp. He starts City Lynx on his phone and taps on "Continue journey". City Lynx changes into the drive view. Adam and his client start their journey. Since the hotel is in a one-way, they have to take another route than on their first journey. At the airport Adam parks in the parking garage and accompanies Mrs. Schmidt to the check-in counter.

Thursday, 05:00 p.m.: As he opens the driver's door Adam notices a dent below the door handle, which wasn't there, when he left the car. Another car must have bumped into the door, while trying to get into the parking space next to the Toyota. Marilyn Chang has instructed all employees to document all damages to the vehicles with City Lynx immediately after they have been detected. Adam observes this rule and selects "Bulletin board" on the homepage after starting City Lynx.

In the view that appears next with the heading "vehicles" he selects the entry "Toyota Corolla" and gets to the bulletin board of the vehicle. A new page appears which is headed by the license plate number of the Toyota, "5RSW948". Below this he sees the messages left by other colleagues about this car. The latest message is from Marilyn Chang and is about a month old: "I want to remind everyone to fill up with nothing but premium gas".

Adam taps on "add" in the app bar. A new page appears with a large input box. Adam taps into the box and enters the following text with the virtual keyboard:

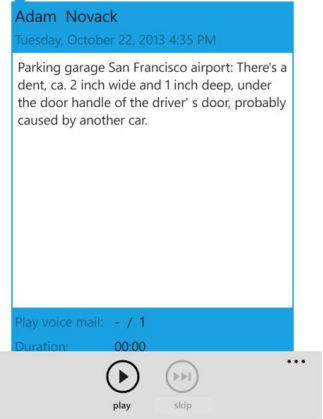
"Parking garage San Francisco Airport:  
There's a dent, ca. 2 inch wide and 1 inch  
deep, under the door handle of the driver's  
door, probably caused by another car."

He taps on the check mark in the app bar  
to save his message. The page "5RSW948"  
with the messages about the Toyota  
reappears. Adam taps on his message,  
to check it. Then he taps twice on the back  
button and gets back to the list of  
vehicles. There he finds the speech bubble  
icon with the number 4 next to the Toyota,  
which indicates that there are four messages  
about the Toyota on the bulletin board of  
the car.

Adam taps another time on the back button and  
returns to the homepage. He taps on "Start  
journey", to drive from the airport to the  
company. City Lynx announces "City Lynx -  
starting journey". Adam confirms the mileage, this time without  
entering an arrival time or destination beforehand. As soon as  
he gets the drive view of City Lynx he switches off the screen  
of his phone. He drives back to the company in Green Street,  
where he parks the car and switches the screen on again. The  
drive view of City Lynx appears. Adam taps on "End journey",  
adjusts the mileage in City Lynx to that in the car and ends  
his use by leaving the car key in the administration's office.

CITY LYNX ±20m 📶 4:40 PM

## Message 5RSW948



**Illustration 48:**  
Message about a  
vehicle



You can leave messages not only for vehicles but also for destinations. Often employees collect new information when they drive to one of our clients for the first time, which they then share with the others. With messages, they describe e.g. how you get to the delivery entrance at the new client's company building.

Friday, 09:00 a.m.: Because the employees of Able Corp. often take part in conventions at the Four Seasons Hotel Silicon Valley and pick up clients on their way to the hotel, Adam wants to share his experiences on this route with his colleagues. His colleague Juan Méndez has done the first step by leaving directions on the bulletin board of the destination. Now Adam wants to illustrate the information so that employees can see the route anytime on a map in City Lynx, in which the route and

comments on the route are displayed. Foremost he wants to get into the details of the different routes to and from the hotel. With the driver's log City Lynx makes it possible to replay routes traveled in retrospect.

Adam selects the entry "My journeys" on the homepage of City Lynx. On the page "My journeys" he finds his booking "Convention East Palo Alto". Adam taps on the icon for this booking and his three journeys which he has made within the time of the booking are displayed. He taps on the second journey with the automatically generated description "Journey 2". A detailed view of the journey with the heading "Journey" appears. In the input field "Description" he changes the text to "Airport - Four Seasons Silicon Valley". He confirms his change with "finished" in the app bar and returns to the driver's log. The second journey of the booking "Convention in East Palo Alto" now has the title "Airport - Four Seasons Silicon Valley".

Again Adam taps on the entry of the journey and gets to the detailed view. In the app bar he taps on "Replay". A map view with the starting point and the destination of the journey appears on which yesterday's route is shown in blue. The green pin moves along the route, as it did during the journey. Within one minute the pin moves from the starting point to the destination.

On places where Adam stopped with his car yesterday, the pin shortly stands still. He recognizes on which parts of the journey he drove slower and on which he drove faster. In addition to that the green bar above the map informs him about the departure and arrival times, destination, distance, duration and average speed of the journey.

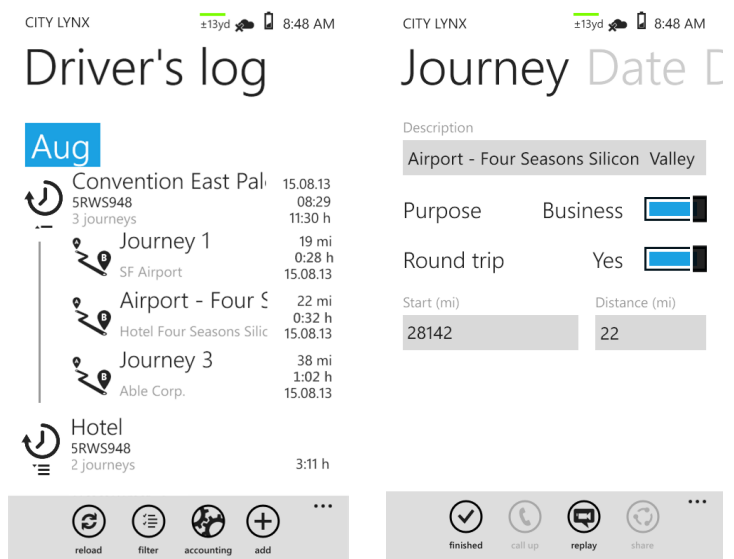


Illustration 49: Driver's log and journey details

Adam taps on the map on a junction for which he wants to leave a message. The page "Message" appears, on which he reads his name above the big input field. He taps on "record voice memo" and speaks the text "Way there: Take to the right and follow the direction "Woodland Circle". Then take the second exit of the traffic circle." and ends the recording by tapping on OK. Then he saves the message by tapping on the check mark in the app bar.

The page "Route" with the map view reappears. At the position where Adam has left his message, there is now a black pin with a speech bubble icon. Adam also taps on three other places in the map and leaves messages. In the view "Route" he taps again on "play" in the app bar. As before the green pin moves from the starting point along the route until it reaches the first speech bubble. At that a page "Message" with Adam's first message opens and is replayed. Adam flicks to the right into the view "Route" on which the green pin now moves on, until it gets to the second speech bubble. Again the message is displayed and read out, whereupon Adam flicks to the right. In the following the third and the fourth message are reached, displayed and read out.

Now Adam wants to share the route so that other employees of Able Corp. can watch the route and the messages. With the back button he returns to his driver's log. Again he puts the finger on the entry "San Francisco airport - Four Seasons Silicon Valley" until the context menu appears. This time he selects the entry "Share route". City Lynx changes to the view "Sharing". He taps on "Store on SkyDrive". By this the journey is stored in the central SkyDrive storage of City Lynx and accessible for all users. City Lynx displays the driver's log again.

Friday 10:00 a.m.: Walter Thornton wants to look at the route that Adam has shared. He taps on the entry "Bulletin board" in the section "Planning". Under the heading vehicles, City Lynx displays an overview of all bulletin boards for the cars of the Able Corp. Walter flicks to the right so that the section "Journeys" appears. There he finds Adam's journey with description, date and destination. He selects the journey and gets to the bulletin board of the journey, where he sees four messages from Adam. He taps on the first message. City Lynx displays the first message Adam has left and replays it. With the back button Walter returns to the bulletin board. He flicks to the right to the section "Route", where he sees the outline of the journey on the map.



Routes which haven't been shared are lost when City Lynx is reinstalled. Subsequently they cannot be replayed anymore. In any case the data of the corresponding journeys are retained.

Since Adam as the key account manager often prefers to drive the Toyota Corolla, he wants to simplify the reservation of this particular car for himself. City Lynx makes it possible to pin vehicles on the startpage of the phone. On the homepage of City Lynx Adam taps on the entry "Vehicles" in the section "Editing". On the appearing page he taps on the vehicle "Toyota Corolla" in the under the section "t" and rests his finger on the entry until the context menu appears. He selects the entry "Pin to start". The startpage of the phone is displayed, where there's now a new tile with the text "5RSW948".

Friday, 11:30 a.m.: At short notice Adam Novack wants to drive to the Able Corp. warehouse, preferably with the Toyota Corolla. Therefore he taps on the start page of his phone on the tile with the text "5RSW948". He gets to the page "Book until", where on a clock face the time when the Toyota is booked is indicated. The section 01:30 p.m. - 04:00 p.m. is colored out, because the Toyota is reserved for that time. The clock hands indicate the current time. Adam pushes the clock hand until the time 01:00 p.m. is displayed. He taps on the check mark in the app bar and gets to the page "Start journey".



As soon as you tap on "finished" in the app bar on the page "Book until", City Lynx enters a booking for the timeframe that you have set before. By this other employees who want to drive the chosen vehicle are informed that the vehicle is currently not available.

Adam taps on "destination" in the app bar and selects "Warehouse Able Corp., 2920 3<sup>rd</sup> Street, San Francisco, CA 94107" from the list of destinations. He adjusts the mileage and starts the journey by tapping on the check mark in the app bar.

Friday, 1:00 p.m.: After his return to the company Adam Novack wants to add a journey to his driver's log. On Wednesday afternoon he had to drive to the conference center at short notice when the battery of his phone was empty. When he picked up the key of the Toyota Corolla Marilyn Chang told him that there were no further bookings for the car for Wednesday. Adam noted down the mileage at both beginning and end of his journey.

City Lynx offers the possibility to add journeys to the driver's log retroactively. For Able Corp. it is vital that all journeys with the company cars are recorded end to end. This is why employees retroactively add all journeys they made in exceptional circumstances without City Lynx.

On the homepage of City Lynx Adam flicks to the section "Accounting" and selects the entry "My journeys". In the driver's log he taps on "add" in the app bar. On the following page he selects the "Toyota Corolla" from the list of vehicles and gets to the page "People" on which he selects the entry "Adam Novack". The page "Add journey" appears on which Adam sets the date to Wednesday's.

Via the arrow in the app bar he reaches the page, on which he can set the time of the beginning of his journey: On the left a 24-hour timeline shows when the Toyota was booked and when it was free on Wednesday. Between 12 and 4 p.m. a dark gray bar shows that the vehicle was booked. Underneath a colored marker shows that the vehicle was free from 4 p.m. The numerical display on the right shows the time 16:00. Adam taps slightly below 16:00 on the timeline which causes the colored marker to jump to this position. The display on the right adjusts itself so that it

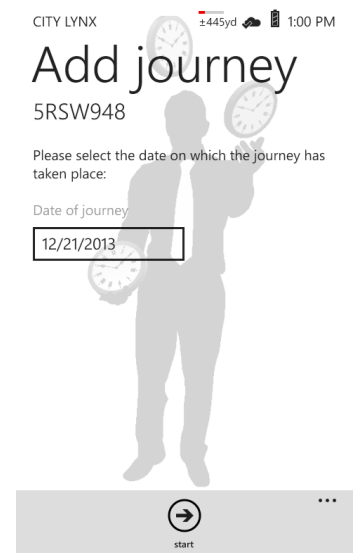


Illustration 50: Add journey

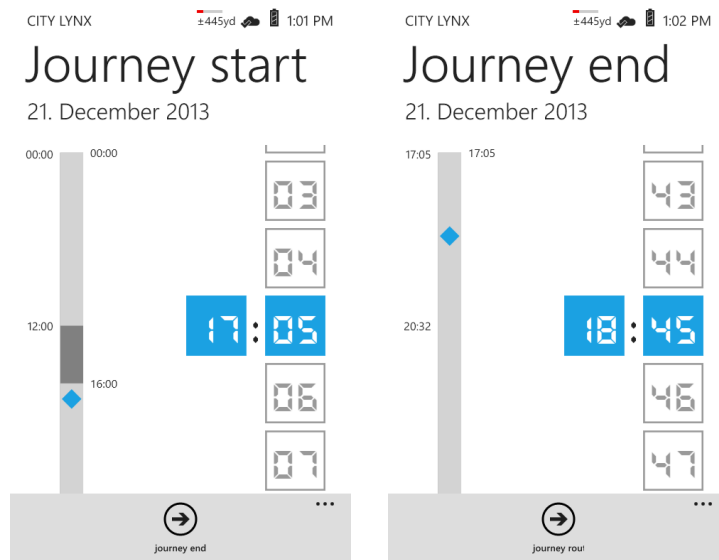


Illustration 51: Journey start and end

marker is in the position of the time 20:30. Adam taps into the middle between 5 p.m. and 8:30 p.m., and the marker jumps to this position and the display on the right shows the time 18:45.

The colored marker is positioned at the end of the booking from 12 to 4 p.m. on the page "Journey start". One could however also tap on a time before 12 p.m. in order to add a journey. Only the dark gray area can't be tapped on when a journey is added.



Now Adam taps on "journey route" in the app bar and reaches the page "Journey route" on which City Lynx displays the mileage of

the end of the previous journey. It coincides with the mileage Adam had noted down. In the field "End (mi)" he enters the mileage he noted down for the end of his journey. He selects his destination from the list of destinations. After tapping on "details" in the app bar a new page appears. The field "Driver" already contains his name. Adam enters the text

"Scheduling Moscone Center" and moves the switch "Round trip" to "Yes" before quitting his entries via the symbol "finish" in the app bar. The screen displays the driver's log again, which now contains the new journey "Scheduling Moscone Center".

CITY LYNX
±445yd
1:02 PM

## Journey route

5RSW948

Start (mi)  
23111

End (mi)  
23123

Destination  
Moscone Conference Center  
800 Howard Street, 94103 San Francisco

CITY LYNX
±445yd
1:03 PM

## Details

5RSW948

Driver  
Adam Novack

Description  
Scheduling Moscone Center

Purpose  
Business

Round trip  
Yes

→
details

✓
finish

Illustration 52: Distance and Details



# Part III – City Lynx icons



## 1 Icons on the City Lynx homepage



**Start journey** (domains *Shared vehicles* and *Car pool*)  
If the time for a booking is approaching, the page "Start journey" is displayed. Otherwise, a vehicle has to be selected first (if there are several vehicles available), before you arrive at this page.

**Private journey** (domain *Solo driver*)  
The page "Start journey" is displayed. City Lynx classifies the subsequent journey as "personal use".



**Business journey** (domain *Solo driver*)  
The page "Start journey" is displayed. City Lynx classifies the subsequent journey as "business use".



**Shared journey** (domain *Car pool*)  
The page "Passengers" is displayed if a booking exists for which passengers have been listed. On this page passengers can be selected or their selection confirmed before the page "Start journey" is displayed. If no booking with passengers exists, the page "Start journey" is displayed directly. City Lynx stores the following journey as "shared journey", i.e. it will enter into the accounting for the car pool.



**Passengers** (domain *Car pool*)  
The list of all people is displayed, from which a person can be selected as passenger. This person is then treated as a passenger of the journey.



**Bookings**  
The page "Bookings" opens, which says which vehicles are booked for what time by other users (domain *Shared vehicles*).

The page "Bookings" opens, on which all bookings are listed (domains *Solo Driver* and *Car pool*). For a car pool, the list also contains the bookings of the other members of the pool.



**Destinations**  
The page "Destinations" with an overview of all known destinations opens. In this view, destinations can be edited, added or deleted. Destinations can be added "From contacts", "From map" or by "Address input".



**Bulletin boards** (domains *Shared vehicles* and *Car pool*)  
A page opens, on which a bulletin board can be selected, where messages can be read or left to communicate with others. In the section "Vehicles" the bulletin board of a vehicle can be selected. By flicking to the left to the section "Destinations", the bulletin board of a destination can be reached. This way specific information on the route to a destination or flaws or damages of a vehicle can be shared.



#### My journeys (domain *Shared vehicle*)

The page "My journeys" opens and gives an overview of all journeys of one's own which have been documented with City Lynx. As in a driver's log (see below), they can be edited in retrospect.

#### Driver's log (domains *Solo driver* and *Car pool*)

The page "Driver's log" opens and gives an overview of all journeys documented with City Lynx. Journeys can be edited in retrospect, e.g. a destination or a description of the purpose of a journey can be added.



#### My costs (domains *Shared vehicles* and *Car pool*)

A page which sums up the personal total costs of the last three months appears. The page illustrates, how these costs come about, e.g. the basic costs, the costs of the miles traveled and the costs of the hours for which the cars have been booked are listed.



#### Total costs (domains *Shared vehicles* and *Car pool*)

If desired one or more vehicles can be selected first, before on a next page in the section "Overview of costs" the total costs for all people for the selected vehicles are displayed. By flicking to the left the section "Distribution of costs" appears, which explains how the total costs are divided among the members of the group.

#### Costs (domain *Solo driver*)

A page opens, on which the operating costs of a vehicle can be seen.



#### People (domains *Shared vehicles* and *Car pool*)

The page "People" opens, on which all people sharing the same Microsoft account for City Lynx are listed.



#### Me (domain *Solo driver*)

A page with your personal details is displayed. This is the place to edit details like your name or description.



#### Vehicles

A page "Vehicles" opens, which gives an overview of all vehicles registered in City Lynx. Here vehicles can be added, edited or deleted from the list.



#### Expenses

A page opens, on which expenses can be listed. Refuelings can be documented and edited in the section "Refueling". Other expenses, e.g. tire changes or insurances, can be documented in the section "Other".



#### Vehicle return (*Shared vehicles*)

A vehicle can be returned while it is still booked by a driver. Possible reasons why a vehicle is returned ahead of schedule are:

1. The drivers doesn't need the vehicle any longer. By returning the vehicle, the driver gives the other members of the group the opportunity to use the vehicle.
2. The vehicle has a defect.  
By returning the vehicle, the driver communicates to the other members that the vehicle is not available and that a repair or a maintenance measure is necessary.



#### Votes (*Shared vehicles*)

The page "Votes" opens. It displays the votes currently taking place to which the members of the group are to cast their ballot. For a group it's possible to set up votes on various issues, e.g. the joining of new members.



#### Settings

The page "Settings" opens, on which the Microsoft account related to City Lynx is defined. Other settings, e.g. for the operation of City Lynx, can be set up on this page as well.



#### About City Lynx

Opens a page with information on the app and its publisher. This user guide can be downloaded from this page.

## 2

### Icons in the status bar of City Lynx



City Lynx is connected to SkyDrive.



City Lynx is not connected to SkyDrive for one of the following reasons:

1. You need to log in with a Microsoft account on the "Settings" page.
2. At the moment the phone has no internet connection and therefore no access to SkyDrive.
3. SkyDrive is not available.



#### SkyDrive synchronization

City Lynx is updating by synchronizing the data in the phone with the data in SkyDrive. If people, vehicles, destinations or journeys have been changed, added or deleted by other users, City Lynx adopts these changes.



#### SkyDrive synchronization completed

City Lynx is connected to SkyDrive and all data has been updated within the interval set on the "Settings" page.



#### Candidate status (domain *Shared vehicles*)

Candidates for the membership in a group see this icon, while the vote on their admittance is still pending



#### Pending vote (domain *Shared vehicles*)

This icon signals to members of a group that there is a pending vote for which they haven't voted yet.



#### Battery charge state

This icon represents the charge state of the battery in four levels.



±60yd

#### Accuracy of localization

The accuracy of the localization is represented in four levels and measured in yards.



#### reload

The data displayed on the screen is updated. If other users have changed or added data in the meantime, these changes become visible. Another way of inciting a reload is shaking the phone.



#### sort

The list displayed can be sorted according to other criteria. First a context menu opens, in which the current criterion, e.g. "Surname" in "People" is marked by an arrow and other criteria can be selected, e.g. "First name". If another criterion is selected the list will reappear in the changed order.



#### add

A new entry is added. A page with the required input boxes opens.



#### accept

Depending on the situation, this causes an action which is described by one of the following texts:

1. finished
  - confirms the user input on the current page.
2. book anyway
  - applies, if you book a car for a time, when another person has already booked it. Normally you use this only if you have clarified that the other person doesn't really need the car anymore.
3. start anyway
 

A journey is started, even though there is a time conflict with a later booking for the same vehicle. Normally you only use this if you have clarified that the other person doesn't need the car anymore or if you assume that your journey will be finished before the next booking begins.



#### messages

A page opens on which messages about this vehicle or this destination can be read, listened to or added.



#### find vehicle

A map view is displayed, in which your location is indicated by a green pin and the location of the vehicle by a black pin. The route to the vehicle is also indicated. Above the map it says the distance to the vehicle in yards.



#### accounting

A page is displayed, which shows the name of the person using City Lynx on this phone on top. The miles and hours traveled which were logged with City Lynx for the last month are listed

below. In a list view the data is broken down into the various vehicles or private or business journeys. A statement of this data can be copied into the temporary storage or sent via e-mail.



#### e-mail

A page opens, on top of which there is an input box for an e-mail address. Under this the subject line is filled in automatically. A detailed statement of the journeys for a specific vehicle or person is listed in a big input box underneath. You can enter an e-mail address, either manually or taken from the contacts in your address book and send the e-mail.



#### send

The data displayed is sent by e-mail.



#### copy

A detailed statement of the journeys made with a vehicle or by a person is saved in the clipboard of the phone. This way it can be used by other apps.



#### proceed

Tap on this button and you proceed to the next page.



#### delete

On various pages a selected item can be deleted.



#### call up

Initiates a phone call to a specific person. Depending on the situation you are offered to call one of the following people:

1. When you are looking for the parked vehicle or before you start a new journey: you can call the last person who drove the car.
2. When you are making a booking for a car or are driving spontaneously: you can call the person who has booked the vehicle for the same time
3. During the journey: you can call the person to whom you are driving.



#### stopover

The journey is interrupted. A page appears which asks you to select the reason for the stopover.





#### next destination

For the return journey of a round trip, this button allows changing to the next destination, i.e. the starting point of the outward journey.

#### end journey

A journey that isn't a round trip can be finished at any time via this button. The page "End journey" appears. The mileage displayed on this page needs to be checked against the mileage on the odometer of the car.



#### take photo

City Lynx changes into the camera view of the phone and allows you to take a picture. By this you can capture receipts, which helps you record the expenses. Photos can also be taken and saved if you want to leave a message on a bulletin board of a vehicle or a destination.



#### front camera

Activates the front camera of the phone. A receipt or the like can be photographed while the phone is still fixed to the phone holder in the car.



#### change view

If a receipt has been photographed to record an expense, this photo can be shown in the background or the foreground. If the picture is in the foreground, it can be moved into the background so that the input boxes for filling in the expenses are seen in the foreground.



#### voice memo

City Lynx starts recording a message. Via tapping on "OK" the recording is ended.



#### pause

If you tap on a message on the bulletin board of a vehicle or a destination, City Lynx begins to read it out to you. Tapping on the pause icon, interrupts the reading out. "Pause" also pauses the playback of a voice memo.



#### play

The paused playback of a voice memo or message is continued. After you have selected a message on the bulletin board of a vehicle or a destination by tapping on it, you can tap on the "Play" button to make City Lynx read it out to you.



#### skip

City Lynx skips the message and starts reading out the next message.



#### destination

The list of destinations is displayed from which you can select a destination for the journey you are about to start.



#### map view

The destination is displayed on the map.



#### routes

An overview of all the routes you have taken to travel to a specific destination is displayed. In the domain Shared vehicles this overview also contains the routes that other group members have taken to get to this destination if they made their routes available by "sharing" them with the group.



#### mapping the route

The route from your current location to the destination is delineated in a map. The distance to the destination is displayed above the map.



#### journey end

The page Journey end is displayed, on which you can set a date when you want to reach the destination of the journey that you are about to start.



#### show (domain *Shared vehicles*)

The route of a completed journey is replayed in the map view. For this the journey needs to be selected in the driver's log first. In this view, which can be reached by tapping on "show", comments can be added on various points during the route, e.g. for leaving messages to obstacles or hazards on the route.



#### Sharing (domain *Shared vehicles*)

The page "Sharing" opens. The recorded route can now be stored on the SkyDrive and is thereby made accessible to the other users of the same Microsoft account. Routes that are not shared will be lost after a reinstallation of the City Lynx app. On the page "Sharing" the route can be sent via an e-mail as well.



#### pace

A menu opens, in which you can select the speed in which a route is replayed. It's possible to replay a route within an hour, in the original pace or twice as fast.

## Other icons of City Lynx



This icon appears on two pages of City Lynx:

### 1. Domain

During the setup of City Lynx this icon represents the domain *Solo driver*. If you are going to use City Lynx by yourself and not as a member a social group or car pool, tap on this icon, which will then be highlighted. Then tap on "finished" in the app bar and the domain is set up.

### 2. People

Every individual on the page "People" is represented by this icon.



### Shared vehicles

During the setup of City Lynx this icon represents the use of City Lynx in a social group with one or several shared vehicles on the page "Domain". If you tap on the icon, it will be highlighted. After tapping on the icon "finished" in the app bar this domain is then set up.



### Car pool

During the setup of City Lynx this icon represents the use of City Lynx for a car pool on the page "Domain". If you want to share rides with City Lynx, tap on this entry, which is then highlighted. After tapping on "finished" in the app bar this domain is set up.



### Look up an item

Vehicles, people or destinations can be looked up and selected.



### Aerial view

Changes the display from a map view into an aerial view (or "satellite view").



### Hybrid view

Changes the display from an aerial view into a hybrid view: This view combines aerial view and street view.



### Map view

Changes from the hybrid view into a map view.



### Motorcycle

This icon appears on two pages of City Lynx:

### 1. Vehicles

In the list of vehicles this icon represents a motorcycle.

### 2. Add vehicle

This icon represents the vehicle type "motorcycle".



#### Car

This icon appears on two pages of City Lynx:

1. Vehicles

In the list of vehicles this icon represents a conventionally fueled car.

2. Add vehicle

This icon represents the vehicle type "car".



#### Electric vehicle

This icon appears on two pages of City Lynx:

1. Vehicles

In the list of vehicles this icon represents an electric vehicle.

2. Add vehicle

This icon represents the vehicle type "electric vehicle".



#### Van

This icon appears on two pages of City Lynx:

1. Vehicles

In the list of vehicles this icon represents a van.

2. Add vehicle

This icon represents the vehicle type "van".



#### Set up automatic vehicle recognition with NFC

This icon represents the option to set up an NFC tag, so that a journey is started automatically when the phone is placed over the tag. By tapping on this icon you get to a page on which a selected vehicle can be related to an NFC tag by holding the phone over the tag.



#### Vehicle recognition with NFC is set up

If the automatic vehicle recognition with NFC tags has been set up for a vehicle, this icon appears next to the license plate number in the vehicle details.



#### Refueling

For documenting expenses with City Lynx, every refueling is marked by this icon in the view "Refuelings".



#### Charging

For documenting expenses with City Lynx, every charging of an electric vehicle is marked by this icon in the view "Chargings".



#### Expenses

For documenting your expenses with City Lynx, expenses which are not refuelings or rechargings of vehicles are marked by this icon in the view "Other".



#### Select destination from map

This icon represents the option to select a destination from the map. If you select "From map" you get to a view with a map, on which the own location is marked by a pin. With gestures like panning, pinching and stretching your fingers or tapping on a place you can select a destination from the interactive map. Destinations that are already stored in City Lynx are marked by blue pins on the map.



#### Select destination from contacts

This icon represents the option to select a destination from the contacts in the address book of the smartphone. If you select "from contacts", the address book opens, whereby only contacts for which addresses have been stored are displayed. The contacts can be sorted according to the names or the addresses. Tap on a contact to select it as a destination for the journey.



#### Destination

This icon represents a destination in the list of destinations.



#### Virtual keyboard

This icon marks the option to enter data using the virtual keyboard.



#### Time conflict

This icon denotes a conflict with an existing booking.



#### Finished journey

In the view "Journeys" every finished journey is marked by this icon. Next to the icon there are the description and, in a smaller type size, the destination of the journey.



#### Location of vehicle

After tapping on "find vehicle" this icon marks the location of the vehicle in the map view or the aerial view.



green

#### Current location

In the map view or aerial view your own location is marked by a green pin. The green pin appears when you are looking for your vehicle with "Find vehicle" or if you select a destination from the map.



red

#### New destination

This marks a new destination, which has selected from a map. If you select a destination "from map", a map view or aerial view appears on which your own location is marked by a green pin. If you tap on a place on the map to define a destination a red pin appears on the place. By tapping on the check mark in the app bar, this new destination is accepted.



blue

#### Known destination

Known destinations in the map view or aerial view are marked by this icon.



#### Refueling

In the view "Stopover" this icon marks the option to refuel during a stopover. On the following pages City Lynx assists the user at recording details of the refueling, and the receipt can be photographed, too.



#### Charging

In the view "Stopover" this icon marks the option to recharge an electric vehicle during a stopover. On the following pages City Lynx assists the user at recording details of the charging.



#### Break

In the view "Stopover" this icon marks the option to interrupt the journey for an indefinite time, e.g. to make a lunch break or to go shopping. If the user taps on this icon, the homepage of City Lynx appears. Instead of "Start journey" (domains *Shared vehicles* and *Car pool*) or "business use" or "personal use" (domain *Solo driver*) it says "Continue journey". To continue the journey after the break you tap on this entry on the homepage.



#### Passengers

In the view "Stopover" this icon marks the option of letting passengers board or leave the car. The options "Boarding" and "Leaving" appear. By tapping on one of these entries the list of all people known to City Lynx appears. People who are already in the car are not included in the list that is displayed after the selection of the option "Boarding". People who haven't been added as passengers are not included in the list displayed after the selection of the option "Leaving". If you tap on a person in the list, City Lynx documents this person as having "boarded" or "left" the car, i.e. as having joined or as having quitted the shared journey.



#### Call up

In the view "Stopover" this icon signifies the option to make a phone call. The entry "General office" is only available if the phone number of the company's general office has been entered at "Settings". Likewise the entry "Roadside assistance" is only available if a phone number has been entered. The entry "Emergency", however, is always available for an emergency call

# Lists and appendixes





## A List of references

Reference	to
[AAA's Your Driving Costs]	American Automobile Association: Your Driving Costs, <a href="http://exchange.aaa.com/wp-content/uploads/2013/04/Your-Driving-Costs-2013.pdf">http://exchange.aaa.com/wp-content/uploads/2013/04/Your-Driving-Costs-2013.pdf</a> accessed on: 12/20/2013.
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[ePlanet@]	IFS Informationstechnik München: <i>ePlanet@ - Wall Sockets turn into Charging Stations</i> , <a href="http://www.eplanet.biz/">www.eplanet.biz/</a> , accessed on: 12/20/2013.
[SkyDrive]	Microsoft: SkyDrive, <a href="https://skydrive.live.com/">https://skydrive.live.com/</a> , accessed on: 12/20/2013.
[YOUTUBE]	IFS Informationstechnik München: <i>Setting up City Lynx App for company cars</i> , <a href="http://www.youtube.com/watch?v=UvZeb4MFxEk">http://www.youtube.com/watch?v=UvZeb4MFxEk</a> , accessed on: 12/20/2013.

## B How to install the speech synthesis

As described on page 57 City Lynx can read out messages to you. This feature requires the speech synthesis, which needs to be installed first:

- At "Settings" select the sub-item "Language and region".
- Tap on the field "Phone language" and select "English (USA)" from the list of languages.

A dialog "Download language features?" appears if these haven't been installed yet.

- Agree to the download with "Yes".

The following process is quite time-consuming and the phone does not give a feedback on its progress. Please note that the installation of the speech synthesis will only be successful, if the battery charge is sufficient. It is therefore advisable to connect the phone to the battery charger, until the installation is completed. After the completion of the installation you have to restart the phone.



## Information on the Document

### Status

Designation

**approved**

**This document is subject to active change management.**

### People and Roles

People

**Dr.-Ing. Markus A. Stulle**

**Bettina von Staden**

**Sebastian Möller**

Roles

**Product manager**

**Reviewer**

**Reviewer**

### Storage location

Path

**\\ifshome.muc.smarttrust.de\IFS\Produkte\Mobile Anwendungen\02  
Arbeitspakete\BZ-14820 (Bedienungsanleitung City Lynx App, englisch)\06  
Spezifikation\Thema 14820, City Lynx User Guide, Version 1.2.docx**

