

Project ref no	AAL-4-032
Project acronym	T&Tnet
Project full title	T&Tnet: Travel & Transport solutions through emotional-social NETworking
Dissemination level	Restricted
Date of delivery	10/10/2013
Deliverable number	3.2
Deliverable name	Report on pilots deployment (Plan)
Type	Report (R)
Status	Draft
WP contributing to the deliverable	WP3
WP / Task responsible	KARDE
Other contributors	TELLU, GEO
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Keywords	Deployment, Web, App, Tests, Trials
Abstract (for dissemination)	The purpose of this deliverable is to plan the deployment of the T&Tnet system for user tests and field trials. Specific objectives are to (1) provide assistance for procurement of hardware (mainly PCs and smartphone devices), and (2) show how to install and test the system software, third party software, and communications components. A short contingency plan is also presented in order to prepare for unexpected events or user exit. Finally, we identify the facility requirements for test and trial sites and plan the site preparations and app upgrades.



**T&Tnet: Travel & Transport solutions through emotional-social
NETWORKing**

AAL-4-032

Deliverable

D3.2

Report on pilots deployment (Plan)

Restricted

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VERSION HISTORY

Version	Edited by	Date	Description
0.1	Riitta Hellman	10.10.2013	TOC and first draft.
0.2	Lars Thomas Boye	15.10.2013	Revised content about Android and app.
0.3	Elena Valari	15.10.2013	Author Chapter 2, about web application.
0.4	Riitta Hellman	16.10.2013	Finalising document for review in consortium.
0.5	Nicola Bottone	20.10.2013	Peer review.
0.6	Miguel Ángel Gracia	21.10.2013	Peer review.
0.7	Alejandra Ortiz González	24.10.2013	Peer review.

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1 Introduction

This document is an aid in setting up the T&Tnet system, the devices and accounts for the primary end-users in tests and trials. In order to improve the technical solution, there are also some suggestions on what to test and trial. Everything needed for test and trial deployment is assembled here in brief for convenience.

1.1 Software architecture

From the end-users perspective, the T&Tnet software is composed of two main parts (Figure 1):

1. The **web** application with rich functionality for trip planning, personal preferences, social activities and emotional feedback.
2. The **smartphone** application for in-situ navigation and other on-line trip planning, guidance and functionality.

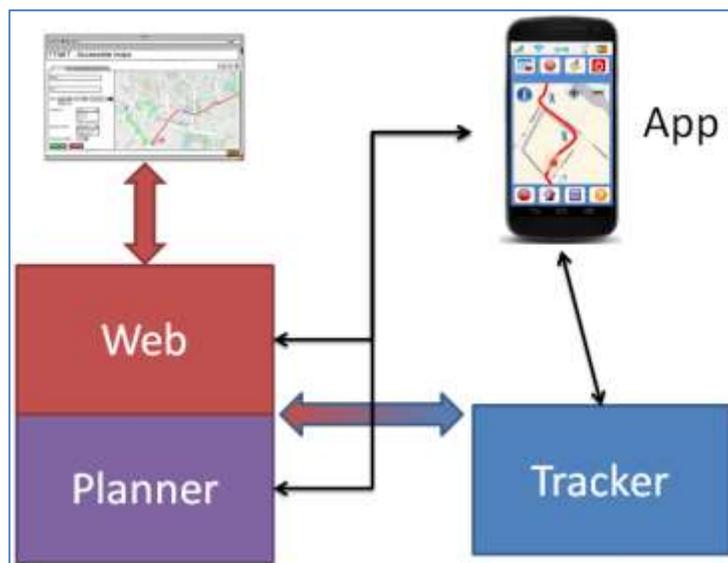


Figure 1: End-user applications in the T&T system.

On the "back-stage", the T&Tnet system consists of three server sub-systems. The Web server holds the web application and T&Tnet user accounts and tips. The Planner sub-system is responsible for route planning and storage, along with route feedback. The Tracker server tracks users during trips and enables friends to locate each other. It also holds user

preferences and has a rule engine for housing server logic and intelligence. Figure 2, gives an overview of the T&Tnet system's architecture, indicating the databases, functionalities, APIs and interconnections of the sub-systems. For more details, see T&Tnet Deliverable R1.4 [1].

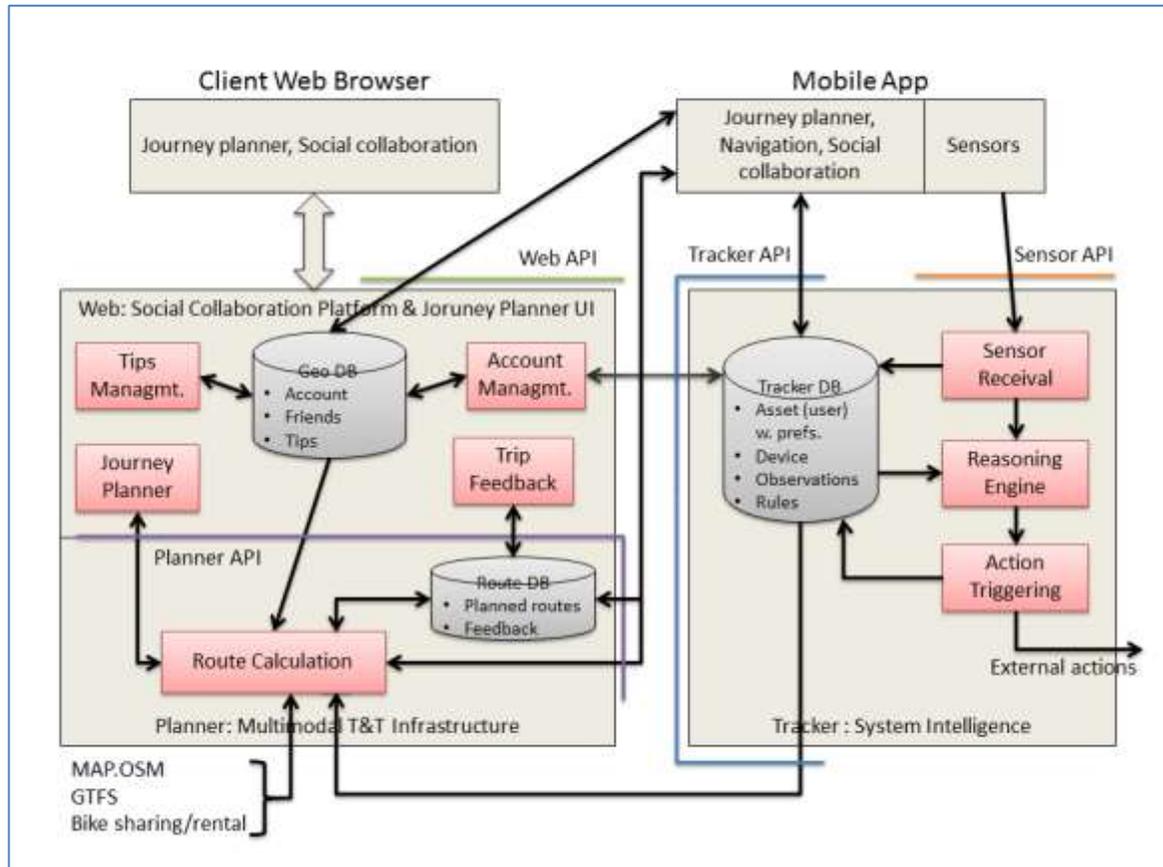


Figure 2: T&T system and software architecture.

This document focuses on the first prototype deployment. See Appendix A for a list of functionality for the first prototype, and for what is planned for the final prototype.

1.2 Test and trial requirements

Persons who participate in T&Tnet tests and trials in each country will need two types of *basic equipment*: a **smartphone** and a **personal computer**, both with **internet access** as the most important infrastructure. There are no principal requirements which demand the end-user equipment to be project-specific. In other words, the end-users may use their own equipment in the tests and trials as long as the equipment meets the basic technical requirements, such as internet access, GPS-functionality etc.

The web application of T&Tnet (Prototype 1) runs in following browsers:

- (i) Google Chrome
- (ii) Firefox
- (iii) Safari

For T&Tnet Prototype 2, Internet Explorer will be added. In general, there are security and functionality issues connected to choice of web browser¹.

The smartphone must run the Android operating system. Suitable smartphones are provided by several producers. Brands such as Samsung, Sony, Motorola, HTC and Huawei offer appropriate devices (Figure 3). Please notice that the T&Tnet smartphone application does *not* run on iPhone (Apple). The smartphones used for T&Tnet must have an integrated GPS-functionality for the T&Tnet services that are based on tracking.



Figure 3: Images of Android smartphones.

1.2.1 Device procurement

Persons who participate in T&Tnet tests and trials in each country will need two types of equipment: a smartphone and a personal computer, both with internet access. Each country will need to decide where to buy their smartphones, PCs and necessary accessories (e.g., earphones etc.) that are needed in tests and trials, or whether they aim to base their tests and

¹ <http://www.digitaltrends.com/web/the-best-browser-internet-explorer-vs-chrome-vs-firefox-vs-safari/>

trials on existing equipment. Researchers and user participants may use their own PCs and smartphones if they so wish and prefer.

The researchers' responsibility will be to check that the end-users' equipment is modern enough for the planned test and trial use.

1.2.2 Software distribution

The main distribution channel for the T&Tnet application for mobile phones will be Google Play. For reference, see <https://play.google.com/store?hl=en>

In exceptional situations, the app may be accessed through a link in the web interface of the smartphone.

1.3 What to test and trial

The T&Tnet tests and trials should be organised to enlighten a number of different aspects from deployment and technical quality to accessibility, usefulness and user experience in general. For more detail, see in particular T&Tnet deliverables D.1.1 [2], D.1.3 [3] and D.3.1 [4]. We should test the web application of the system as well as the T&Tnet app on a smartphone.

In Section 5, specific test and trial tasks to end-users are presented in short. Below, the set of general items for tests and trials are listed:

- **Google play:** That the end-user can find the application here and install it on her/his smartphone. We should also test how well automatic updating works, so the app should be kept on and if the application is updated after that new versions are announced, should be checked.
- **Android and smartphone set-ups:** That the end-user is able to set up all features of the smartphone appropriately for the T&Tnet app to work as intended and communicate with the web application.
- **System:** That the end-user can create her/his user account, log in to her/his T&Tnet account, and that s/he can configure the T&Tnet application from there, and that the smartphone app updates accordingly.

- **Web application:** That the web site works as such, and that it is understandable, acceptable, accessible, usable and useful².
- **Smartphone app:** That the app works as such, and that it is understandable, acceptable, accessible, usable and useful.
- **GPS/tracking:** That the trip guiding, including route changes and reports on deviations, works.
- **Connection to external services:**
 - a) Route planning: That the routes, maps and time-tables are available and interact correctly with the T&Tnet system.
 - b) Environment-related (physical) accessibility information.

1.3.1 Errors

For improving the T&Tnet system and its applications, the end-users should already for first tests and trials be asked to make notes of errors and problems, according to a guide (that must be developed), and report to the researchers conducting the tests in that particular country. Researchers will send error reports to Tellu AS³ (smartphone, GPS/tracking) and GeoImaging Ltd.⁴ (web/social networking).

In the first tests and trials, the end-users should be asked to log all error messages manually.

Smartphone app errors

If the smartphone application crashes (the end-user gets a dialog saying that the application stopped responding, and it is then closed), s/he should write down as much as possible about what s/he was doing at that time. If s/he was not using the smartphone at the time, it will be useful to know (approximately) how long after that the application was last started, the crash happened.

If there are other problems, the end-users should make notes of them, and send the system log to the developers (assisted by the researchers) – as explained in Chapter 4.3.

² Test and trial guidelines for observing and recording these aspects will be documented separately. See deliverables [2]-[4].

³ lars.thomas.boye@tellu.no

⁴ elena@geoimaging.com.cy

Web errors

If the end-user experiences a crash on the web (and a lot of computer-language text is shown) they must be asked to copy this and include it in the report. Also otherwise, the end-users must be asked to note functional anomalies (this testing is not about wording or user-friendliness; such issues can be reported separately).

Error codes

For reference, here is the meaning of the codes. Three-digit values are standard HTTP status codes:

- 1xx: HTTP informational response.
- 2xx: HTTP successful request.
- 3xx: HTTP redirect.
- 4xx: HTTP client error.
- 5xx: HTTP internal server error.

1.4 Exit strategy and contingency plan

1.4.1 After-use of software and hardware

If the end-users who participate in tests and trials complete the trials, an option is to let them keep the smartphone and any other equipment (if provided by the project). This issue is connected to the ethics of the project. Suppose that an end-user has become reliant upon the T&Tnet application, it might not be right to remove the equipment. We cannot, however, promise anything about the T&Tnet service as its continued availability depends on the outcome of the project as well as other factors. Moreover, the project cannot continue to pay any internet subscriptions. We should reserve the right to get back the equipment from any end-user who leaves the project early, as we may need to give it to a new participant.

1.4.2 Equipment failure

Equipment failure should not be a big problem, but may occur. If the smartphone(s) fail without visible external cause, we will get a replacement through the guarantee. Possible accidents are dropping and spillage of liquid. We should instruct the participants to keep the smartphone away from liquids and be careful when they use the equipment in field tri-

als, e.g., navigating outdoors. Some sellers offer insurance that will replace a device broken by accident, but this tends to be quite expensive. An appropriate risk reduction strategy is to buy a couple of extra smartphones before they go out of stock, as replacements. If a smartphone breaks and cannot be replaced through the guarantee, the participant should get a new smartphone if possible. However, we cannot guarantee a replacement, and someone who breaks their second smartphone should probably not continue getting replacements.

2 T&Tnet web application

In this chapter, there is a description of how a user can set up an account via the T&Tnet web application and then use the supported services. The T&Tnet web application will be available through a specific web address (to be announced later).

2.1 Create the user account

On the home page of the T&Tnet web application there is a "Submitted" form. If it is the first time for the end-user, s/he has to create an account in order to register to the T&Tnet platform. The user clicks on the particular choice/button "Register", in order to create an account. The "Register" button directs the user to the "Register" page on which the user can provide the appropriate information for the creation of the account.

The registration inputs are:

- (i) An e-mail account. The first part of the e-mail will be the username, for example: e-mail: elena@gmail.com and username: 'elena'.
- (ii) A password. For security issues, the system will ask the user to type her/his password two times for confirmation.

The user provides the above input, clicks on the "Register" button in order to complete the account creation.

Continuing, if the user gives an e-mail account or password which is already used by another user, a message appears in order to inform her/him about that s/he has to give different input. In addition, if the user makes a mistake when writing the password (for confirmation), another message appears to inform her/him about this mistake. When the account creation is completed successfully, a message appears in order to inform the user about this. When s/he confirms the account creation, s/he will be able to access the T&Tnet system.

At this point, we would like to point out that the user's password for extra security is stored in the web database in cryptographic form. Specifically, the algorithm which is used for the password encryption for the first prototype is the well-known "MD5". The message-

digest algorithm is a widely used cryptographic hash function that produces a 128-bit MD5it (16-byte) hash value⁵.

2.2 User login

If the user has already created a T&Tnet account, s/he can login to the system from the home page of the T&Tnet web application. The user fills the "Submitted" form on the home page with her/his username or e-mail and her/his password. The login service is completed when the user clicks the "Login" button. If the user has provided correct information, s/he will get access to the supported T&Tnet services, such as planning a trip, browsing the available tips, or adding/removing her/his own tip for a specific location. (Figure 4).

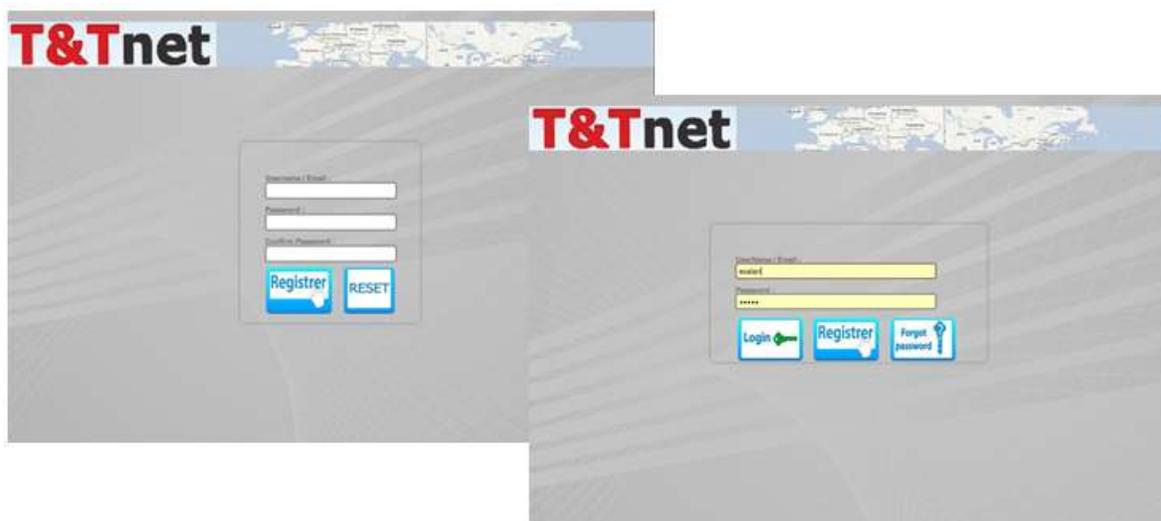


Figure 4: Web application: Register page and login home page.

2.3 Forgot/reset password

If the user has a T&Tnet account but has forgotten it, or wants to renew it, s/he must use this service to set another password. More specifically, again on the home page of the T&Tnet web application there is a button called "Forgot password". This button directs the user to the web page for resetting the password, on which user can set a new password. More specifically, for security reasons, the user has to provide, as input, her/his e-mail ac-

⁵ <http://en.wikipedia.org/wiki/MD5>

count, the same which s/he used for the registration and then confirm this action by clicking the "Reset password" button.

Continuing, if the provided e-mail account exists in the web database and refers to the particular user, the system sends an e-mail with an active link in order to allow her/him to reset his password. For security issues again, every link which is produced by the system contains a unique token for every "Reset password" request. This token has an expiration time, if the user makes the request for this service and does not follow this link within a given time interval (e.g. 15 minutes), the token will be removed from the system. The active link is in the following form:

<http://<servername>/<TnetWebApp>/reset.php?token=86SKIX3G81>

The active link directs the user to the reset page where the user can provide to the system her/his new password and then confirm this change. Finally, if the reset password is completed successfully, user logs in the system with her/his new password.

2.4 Configure the user profile

In the second prototype, we will support this functionality. The end-user signs in the T&Tnet system with her/his T&Tnet username and password, and looks through the options. Some services/options have defaults, so the end-user should be encouraged to just check if there is something s/he wishes to change before starting to use the T&Tnet app.

2.5 Web application: first prototype functionalities

For the first prototype the functionalities which will be supported by the web application are listed below (see also Appendix A and Deliverable D.2.1 [5] for more detail):

- **Create user account:** An account in the system is created through the web, with an email address and password for authentication. This account is the same for the mobile app.
- **Browse map:** A map is available in the web and mobile app. In addition to all the generic map data, T&Tnet-specific tips can be indicated on the map. The user can specify what types of tips to show (a checklist will be provided with limited categories). Selecting a tip on the map will show any additional information about that

point, such as comments from users. The T&Tnet user can freely browse the map to learn about areas in order to make his trip more comfortable.

- **Plan trip:** User can plan a trip plan for a future point in time. This will be done through the web interface. Especially, the end-user provides start and end points, either by clicking the map or by providing the specific address. For the first prototype, there is only one way to specify a trip by clicking on the map. The user can provide the start and end point of the trip with his personal travel preferences such as kind of public transports, walk distance etc.
- **Enter tip:** A tip is an accessibility-related piece of information about a specific point on the map. Tip types include the location of escalators, stairs, elevators and toilets. We will also support temporal (time-limited) tips, for when a street or accessibility enabler is blocked, broken, etc. Each type has an icon. To enter a tip, the type of tip (icon) is selected. In the web interface, the location is chosen by clicking the map or writing an address. In addition, user can provide a comment to describe the accessibility in more detail, or enter additional info about the spot. For temporal tips, an expected duration must be provided, after which the tip is removed from the system. Tips and comments can be deleted by the user who entered them.

3 Devices and technology

3.1 Smartphones for T&Tnet

Smartphones must be configured before the primary user can start using the system. Internet connection must be set up, there are some other options to set in the Android system, and the T&Tnet application must be installed.

Since all trials will be carried out on Android smartphones, we must use these for internal testing first. These should also be the primary demonstration devices when needed (cf. section about demonstration mode). The application software should perform the same on all commonly available Android smartphone models, so we may also use other, more rare models for internal testing. It is beneficial to perform tests on other devices as the future commercial product will not be limited to a single device or a set of few devices.

The T&Tnet application should run on any Android system of version 2.2 and up, meaning any Android phone sold within the last two years. We may try the application on any Android device, but support for devices other than phones will be limited in the T&Tnet project.

3.2 Internet

Two types of internet connection are possible with the smartphones:

- **Mobile (3/4G):** Uses the cellular network of phone operators, with a SIM-card in the device. No additional equipment is needed, and internet will be available mostly everywhere, but there is typically a cost per megabyte of data traffic generated. 3G⁶ is still the best that is supported by all phones and with wide availability. Some phones and operators now support new high-capacity connections, known as 4G. Availability is still limited, and the extra speed is not really needed for T&Tnet.

⁶ 3rd generation of mobile telecommunications technology. 3G telecommunication networks support services that provide an information transfer rate of at least 200 kbit/s. However, many services advertised as 3G provide higher speed than the minimum technical requirements for a 3G service. Later 3G releases often denoted 3.5G and 3.75G, also provide mobile broadband access of several Mbit/s to smartphones and mobile modems in laptop computers. <http://en.wikipedia.org/wiki/3G>

- **WiFi (Wireless):** The smartphone can connect to a wireless router or similar equipment. This requires an internet subscription, and a wireless router to be installed on the premises. The smartphone must be used within range of the router, no more than a few rooms away. So this is not applicable to the mobile use which is the main focus for the T&Tnet app, and we should not set up any such infrastructure specifically for the T&Tnet project. However, if a phone is to be used frequently within range of a router accessible to the project, it is a good idea to set up a connection (a one-time configuration, usually with a password), to save the costly mobile connection for when there is no alternative.

So, the mobile alternative is needed for T&Tnet, which means a mobile subscription and SIM-card is needed. Many mobile subscriptions are still meant for phone usage, and place a high cost on data transfer, so we would need to look for something tailored to data transfer. It is a good idea to look for smartphones sold with a data subscription. We then get a suitable subscription, and the smartphone is cheaper as it is subsidised by the telecom company in return for committing to their subscription. In contrast to broadband subscriptions, the pricing is often based on how much data is transferred. This can make it difficult to compare the prices. We do not yet know how much traffic the T&Tnet system will generate. The app will be in frequent contact with the servers during trips, but little data is transferred each time, so the total data usage should still be fairly low in the context of today's smartphone data usage.

3.3 Smartphone configuration

This section deals with settings on the phone, outside of the T&Tnet app.

3.3.1 Android settings

The Android system has a number of settings, some of which can be of relevance to our app. These are available as a "Settings" app, and on phones with a menu key they are also available from the menu when on the home screen. We discuss the relevant settings here, grouped by category. Note that the settings app – which settings are available and how they are organised – varies between different phones and Android versions.

Wireless & networks

Wi-Fi should be enabled if any Wi-Fi access points will be used. It may also be used by Google's network positioning algorithm when GPS is not available, but if not used for internet access it should be safe to disable it to save power. To connect to a Wi-Fi access point, enter the Wi-Fi section of the settings to get a list of available access points, select the correct one and enter its password.

Make sure Mobile data is enabled. Bluetooth can be disabled to save power.

Sound

Make sure sound volumes are correctly set (loud enough for the user to hear well). There are several volume settings, for different types of sound, which is why you should check in the settings rather than just using the volume keys.

The user may also want the phone to play a sound whenever any touch controls are used, which is usually a setting called something like *Audible selection* or *Touch sounds*.

Screen and display

There is a setting for how quickly the screen shuts off on inactivity, which can be tweaked for user preference.

Location and security

For location, both wireless networks and GPS satellites must be enabled.

The lock screen, which has its own sub-category or category in the settings, is what initially comes up when the screen is turned back on. This can be disabled entirely, it can require an action such as swiping across the screen, to make sure the screen is not activated by accident (in the pocket), or it can feature security such as entering a code or pattern to prevent unauthorised access. This should be set based on user preference – do not use a lock screen which is difficult to operate.

It is also possible to unlock the SIM card, so that a pin code is not needed when re-starting the phone.

Accounts and synchronisation

A Google account is needed to use Google play (this is usually set during the configuration wizard when the phone is first turned on).

It is recommended to turn off automatic synchronisation of accounts if the phone is only used for T&Tnet, to save power.

Privacy, backup and reset

The option *Factory data reset* resets the system, basically removing all traces of what the user has done with the phone. The phone will restart, and the user will be presented with the initial configuration again, to set it up from scratch. This should always be done if the smartphone is to be transferred from one user to another, either before or after T&Tnet tests and trials.

Language and input

Make sure the local language is selected. The T&Tnet app will eventually be provided in all test and trial languages: Spanish, German and Norwegian.

Date and time

It is important to check that the time and date on the smartphone are correct. Travelling according to the T&Tnet trip plan and schedules for public transportation requires this, as well as tracking position and route progress.

3.3.2 Other settings

As different phones come with different pre-installed software and configurations, and this may also be changed in future updates, we cannot cover all possibilities. It is recommended that someone gets some experience with a phone of the model that will be used by end-users before they are handed out, to see if there is something more that needs tweaking.

All smartphones come with e-mail and calendar apps, and these may be set up to give notifications on received e-mail and upcoming appointments. Check the settings of such apps, and disable notifications.

3.4 System updates

There may at times be updates to the Android system, provided by the phone manufacturer. These can be downloaded and installed directly using the phone's internet connection, but probably only when on Wi-Fi. In such a case, the user may get a notice about an update, in which case s/he should go ahead and let it install.

Before the phone is given to the end-user, the phone should be updated to the latest version available. This is done in the settings, where there is a *Software update* option, usually under *About device*. There may also be settings here to control automatic updates. Check for updates, and if updates are found, repeat the process after the update is installed, until there are no more updates. It is ok to turn off automatic updates, but if the phone is up to date and the end-user will mostly use a mobile internet connection they probably do not need to update during trials anyway.

3.5 Install T&Tnet application

Start the Google play application on the smartphone (Figure 5). This requires a network connection and a Google account to be set in Android. If it fails to start on the first attempt, try again.

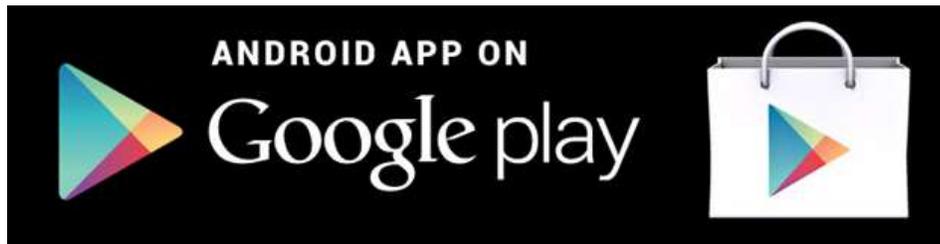


Figure 5: Images of Google play.

Press the search field/magnifying glass on the screen, enter "T&Tnet" and hit enter. One of the search results will be an application simply called T&Tnet, with recognisable icon (Figure 6) and Tellu as publisher. Press it to see the details.



Figure 6: T&Tnet app icon on Google play (draft).

Press the download button to download and install. We need to allow automatic updates for this application. The Google play user interface is changed from time to time. There used to be a *Manage*-button taking you to the page with the automatic update checkbox, but in the current Play version I found it on the left side in the same screen I used to install the application. If you have trouble locating it, try going back to the front page of Google play and look for a downward arrow or a *My apps* option in the line along the top. This will take you to a list of installed applications, and you can access T&Tnet and look for the automatic update checkbox.

If you are unable to install the application from Google play, contact Lars Thomas Boye in Tellu AS (lars.thomas.boy@tellu.no). If necessary, the application may also be made available for download on the web, which means it can be downloaded by entering the right URL in the browser and then installed from the downloaded file. Tellu can provide a web download from Tellu's server, but we should strive to use Google play and automatic updates.

Go into the list of apps and drag the T&Tnet icon to the home screen, to make it easily available to the user. Also consider customising the home screen to make it as easy as possible to locate the app, such as minimising the number of screens or placing the T&Tnet app on every screen.

When ready to start setting up the app, refer to the next section.

4 T&Tnet smartphone application

This chapter describes setup and technical aspects of the T&Tnet app. The prerequisite to use the app is that it is downloaded and installed from Google play (see previous chapter). For online use, a T&Tnet account is also needed (see Section 2).

4.1 Login

The first time the app is started, the user is asked to log in with username and password. This is for the T&Tnet account, created on the web, and is needed for real, online use. This login can be remembered, so that it only needs to be done once, and the app will go straight to the main menu on subsequent start-ups. Since this requires writing text, it may be performed by a helper before handing the phone over to the primary user. If there is a problem with the login, check that the username and password are correct (they work on the web), and that the phone has an internet connection. An active logout must be performed to clear the app for a new login.

4.2 Demo mode and simulation

It is also possible to run the app in a test/demonstration mode, selected from the login screen, allowing it to be tried and demonstrated without an account or network connection. In this mode the app will not communicate with any of the T&Tnet servers – everything is offline (except map tiles – the map requires an internet connection to show tiles). The app has the necessary test data built in. There is a set of trips, a set of tips to show on the map, and a set of user preferences.

For the demo mode, simulation of travel can also be enabled in the app settings. In this case, selecting a trip to start will update its schedule to start at the present time, and a fake position giver will be running, providing position observations according to the route so that it will appear to the app (and anyone watching the map) that the user is actually travelling along the route. The speed of the simulation can also be set in the settings, affecting both the route and the fake positions, to run through the route much quicker than real-time.

4.3 App settings and logging

The app has some settings (not be confused with the preferences of the user), which are available from the login screen and also from the app menus. Settings include server addresses and simulation options. The app will come with the appropriate default values for normal use, and end-users should not need to enter these settings, but they are there if needed for technical reasons.

Another feature available in the settings is loggers. The app code can log a lot of what is going on, and this can also be written to file and sent to the developer for analysis. There are a set of loggers – each functional module typically has its own logger. Log level controls how much to log – from Debug (everything) to Error (only errors). For each logger, a file name can be specified, in which case this logger writes to file (several loggers can write to the same file). Each log file will get its own entry in the *Log files* page. Here, a file size limit can be changed, and the current contents can be sent to the developer (Tellu).

In case of a recurring error, it is helpful if logging to file can be done while the error occurs, and the log file is sent to the developer.

4.4 Status of the T&Tnet application

Once a user is logged in, the app continues running in the background until an explicit exit or logout is done from the menus. As long as it is running, a T-shaped icon is shown in the notification bar of the phone. The colour indicates the overall status (Figure 7).



Figure 7: T&Tnet status icon (draft).

The app has a status screen, available from the main menu. It will show the current status of individual components such as positioning (GPS) and connectivity with the various servers. A status is indicated with a coloured LED image.

Status codes have the following meaning:

- Grey: Inactive/off. The function is not needed at this time.
- Green: OK. On and working correctly.
- Yellow: Temporary unavailable/error. This means either a transition state such as waiting for a reply, or an error of a temporary nature (may escalate to red if not resolved).
- Red: Error. This means either an error which will not rectify itself, or the feature having been unavailable (yellow) for some time.

5 Test and trial tasks with focus on functionality

Laboratory test tasks as well as free field trial tasks should be composed on the task platform that was established in the evaluation of the paper mock-ups (see Deliverable D.2.1 [5]). Tasks that are suitable for both technology platforms (web on PC and app on smartphone) should be performed in each environment. In free trials, end-users should, in addition, be able to use the T&Tnet system without too many pre-defined tasks at the same time as they are asked to create a rich selection of test activities.

Below, a short list is presented, for testing and trialling the T&Tnet software (tasks that are not part of the first prototype are marked with 'P2').

5.1.1 Task 1: Menu and "More" submenu

PC: Browse through the web application, choose all sections of the web and create an overview of the system. Also, use available help functionality.

Smartphone: Browse through the app, choose all sections of the app and create an overview of the system. Also, use available help functionality.

5.1.2 Task 2: Settings

PC: Change settings (to activate system intelligence). (P2)

Smartphone: Change settings (to activate system intelligence). (P2)

5.1.3 Task 3: New route

PC: Plan a new route from A to B, preferably also a route that includes changing from one transportation medium to another.

Smartphone: Plan a simple route from "here" to e.g., home. (P2)

5.1.4 Task 4: Visibility to friends

PC: In trip planning phase, make yourself visible to friends on a map, preferably so that in free trial, meeting friends will be possible. (P2)

Smartphone: Make yourself visible to friends on a map, preferably so that in free trial, meeting friends will be performed. (P2)

5.1.5 Task 5: Saved routes gallery

PC: Browse saved routes and make changes to at least one route. (P2)

Smartphone: Browse saved routes and initiate guiding. (P2)

5.1.6 Task 6: Get tip

PC: Study tips of a particular area along a route that you are planning.

Smartphone: Study tips for a particular area along a route where you are navigating.

5.1.7 Task 7: Give tip

PC: Enter a tip for a particular route that you have followed.

Smartphone: Enter a tip for a particular route that you are following (while navigating).
(P2)

5.1.8 Task 8: Give feedback

PC: Walk through the detailed feedback functionality after a trip. (P2)

Smartphone: Enter a simple feedback just after finishing a trip.

References

- [1] Deliverable R.1.4 First functional requirements and API Specification for T&Tnet Services (Internal Report). T&Tnet project, 2013.
- [2] Deliverable D.1.1 User needs analysis. T&Tnet project, 2013.
- [3] Deliverable D.1.3 User requirements and specifications of user groups. T&Tnet project, 2013.
- [4] Deliverable D.3.1 Pilot assessment and evaluation plan. T&Tnet project, 2013.
- [5] Deliverable D.2.1 T&Tnet services mock-up. T&Tnet project, 2013.

Appendix A: Functional specification

The following table is taken from Deliverable R1.4 – First functional requirements and API Specification [1], and lists all the intended end-user functionality of the T&Tnet system. It included the priorities for the implementation of these functions in the web and mobile clients. Priority values:

- 1: A priority for the first prototype.
- 2: Medium priority – needed for the final prototype but not for the first prototype.
- 3: Low priority – also wanted by the end of the project, but not essential.

Code	Function	Web priority	App priority	Comments
A.1	Create user account	1	-	
A.2	Edit personalia	2	-	
A.3	Edit preferences	2	2	
A.4	Preference update	3	2	Informing the user of a change made
A.5	Connect to friend	2	3*	* Accept/reject friend request
A.6	Reset password	3	-	
B.1	Browse map	1	1	
B.2	Plan trip	1 / 2*	-	* 2 for Shared/synchronised
B.3	Request navigation	-	2	
B.4	Receive shared route	2	3	
B.5	See planned trips	2	2	
B.6	Cancel trip	2	2	
B.7	Print route on paper	3	-	
C.1	Trip alert	-	2	
C.2	Navigation guidance	-	1	Map mode is priority 1, others may be added later
C.3	Deviation detection	-	1	
C.4	Error notification	-	2	
C.5	Route recalculation	-	2	
C.6	Pause navigation	-	2	
C.7	Share position	-	2	
C.8	Find friends	-	2	
C.9	Meet friend	-	3	
D.1	Emotional feed-	2	1	

	back			
D.2	Enter tip	1	2	
D.3	Report bad tip	3	3	
E.1	Send alarm	-	2	
E.2	Initiate phone call	-	3	
E.3	Web message box	2	-	
E.4	E-mail notification	-	-	3 (by e-mail)
E.5	Secondary user notification	-	-	2 (by SMS/e-mail)