



Germany: T-City Friedrichshafen Nurturing smart city services from conception to commercial deployment

Executive Summary

The five year old T-City test bed in Friedrichshafen, Germany, is demonstrating how a smart city can combine innovative information and communication technologies, together with a smart energy grid and services, to help improve the quality of life of citizens. Following the completion of the first five-year phase of the project in March 2012, Deutsche Telekom (DT) and the municipal government have agreed to launch the second phase of the project. The city of Friedrichshafen will continue for another three years to serve as a test-bed for innovative healthcare, energy and mobility services.



The T-City in Friedrichshafen is enabling DT to develop and test new products and services, and then showcase them to other cities and industries. DT is also using T-City to help establish an ecosystem of partners to deploy the solutions trialled in Friedrichshafen in other cities, both in Germany and internationally. Several T-City projects, such as Home Network 2.0, have led to the development of DT's connected home platform Qivicon, which will be offered in Germany on a commercial basis from the spring of 2013.

Moreover, the T-City projects provide DT with an opportunity to develop, modify and re-think new products and services in a "live" environment. About one half of DT's projects in T-City, for example, concluded in a straightforward commercialisation; some products were modified and integrated with others, and a minority were discontinued. DT was also able to identify some regulatory barriers for the deployment of new services, and worked with regulators to address them.

In the T-City test bed, different divisions in the DT group are working together to develop and showcase innovative solutions, with T-Mobile and T-Home providing connectivity and customer service; and T-Systems, the systems integrator and consultancy arm, developing an array of solutions, which go well beyond basic connectivity, for different vertical sectors.

Building a city of the future

In 2006, Deutsche Telekom (DT) set up the German City of the Future competition to select a location for its T-City test bed.

An independent jury chose Friedrichshafen, which sits on the north side of Lake Constance in southern Germany, based on two main criteria: population and existing infrastructure.

With a population of 59,286, Friedrichshafen is a small town, where

the impact of innovative and sustainable project ideas would be easier to measure than in larger cities. Moreover, 98.4% of its people are connected either via mobile and fixed-line broadband infrastructure. The first VDSL connection, with a data transfer speed of up to 50 Mbps, was activated in Friedrichshafen in April 2007, and from October 2007, the city's residents and visitors had access to mobile data services with throughput speeds of up to 7.2 Mbps via an HSDPA network.

DT initiated the T-City programme with the following objectives:

- to explore how ICT can help communities,
- to test different kinds of innovative concepts and later showcase them to other cities and industries,
- to involve partners through open innovation,
- to build new vertical industrial solutions beyond connectivity.

For the T-City test bed, DT is developing and showcasing innovative solutions as a group, with T-Mobile and T-Home providing connectivity and customer service; and T-Systems, the systems integrator and consultancy arm, developing solutions for different vertical sectors. Whereas the three divisions had previously run separate projects across Germany, for the T-City, they have established a single location for testing products and services that DT is keen to commercialise.

Importantly, DT is also using the T-City project to establish an ecosystem of partners to deploy smart city solutions in other German cities and internationally. Alcatel-Lucent and Samsung, for example, have worked with DT to provide network hardware, solutions and devices for the T-City.

The Regional Research workgroup in the University of Bonn's Department of

Geography leads the independent social science research on the T-City project. The workgroup monitors the adoption of new products and services by end-users and their reactions. The German Association of Towns and Municipalities has supported the project from the outset, ensuring that the municipal perspective is taken into account. The Association, a voluntary organisation of innovation-oriented communities, is also coordinating the T-City work on smart city solutions with other smart city programmes elsewhere in Germany.

The city authorities and DT's commercial partners are supporting the T-City projects with expertise and manpower, while DT is providing the funding and setting up the infrastructure.

Smart city projects beyond connectivity

Since the launch of the T-City test bed in 2007, DT has completed more than 40 pilot projects in Friedrichshafen across

six different categories: Mobility and Transport, Learning and Research, Tourism and Culture, Citizens and the State, Health and Support and Business and Work. In many cases, DT has added value through the provision of IT platforms, managed services and turnkey solutions. The projects include:

- **De-Mail**, a secure email service, rolled out nationally in 2012.
- **Mobile Home Visit**, a telemedicine project for health insurance companies, doctors, hospitals and patients.
- **eGovernance**, which has reduced queues in local government offices and post offices.

So-called smart energy is also a particularly important component of the T-City initiative. A smart metering solution developed by DT, Technische Werke Friedrichshafen (TWF) and other software companies, has been tested with 1,600 households in Friedrichshafen.

Deployed in June 2008, the smart electricity meters send consumption data, via a wireless link or a DSL connection, to energy suppliers, which have made the data available to customers through an internet portal. The monitoring service was later expanded to cover domestic gas and water.

Consumers now have the information they need to regulate their energy consumption, resulting in lower utility bills and a lower impact on the environment. Energy providers have benefited too, as they can adjust energy production to match the demand.

Two years later, the HomeNetwork 2.0 project, led by multiple partners, tested intelligent networking systems to enable the management of electronic appliances in the home. In July 2010, 50 households installed remote sensors to control heating systems and other appliances. Using mobile devices, such as iPads or smartphones, residents are able to control garage doors, window shutters, TV sets and lights. Furthermore, the householders can programme heating systems and other appliances to switch themselves on or off at specific times.



Exhibit 1: DT's Smart Home of the Future

Our 2020 Vision.

QIVICON



Source: www.t-city.de/en

The smart metering and smart home projects trials in Friedrichshafen led to the development of a multi-vendor platform Qivicon, which will be offered across Germany on a commercial basis from spring 2013.

Following the completion in March 2012 of phase one of the T-City test bed, which lasted five years, DT and the municipal government agreed to go ahead with phase two of the project. The city of Friedrichshafen will continue to serve as a test bed for another three years in the areas of healthcare, energy and transport.

T-City: Conclusions and Learnings

Setting up a test-bed in a real city environment gave DT a valuable learning experience about the operational, regulatory and partnership requirements for smart city services.

In T-City, DT has created a complete ecosystem of partners for complex projects, such as smart metering or Home Network 2.0, and explored how a telecoms operator can act as a systems integrator on smart city projects. DT has also gained a better understanding of the regulatory limitations around the ownership of customer data.

Exhibit 2: T-City Friedrichshafen is a showcase of the connected city of the future



Source: www.t-city.de/en

The T-City test bed has also demonstrated that working in a real city environment can present challenges for operators venturing into smart city projects. These include:

- The need to engage a wide variety of stakeholders meant the projects took longer to set up than originally anticipated.
- Creating an integrated view of a smart city has been a challenge: Few cities have CIOs who have a holistic view of the "smart city" infrastructure and services.
- City budget cycles are different from those of commercial companies creating complexities for public-private partnerships. Moreover, local authorities need to provide consistent support to projects regardless of any changes to the municipality government.
- New projects and services often need to be adjusted following trials: About one half of DT's projects in T-City, for example, concluded in a straightforward commercialisation; some products were modified and integrated with others, and a minority were discontinued.
- Last but by no means least, DT and the municipality of Friedrichshafen had to learn together how to explain the value of these new services to citizens, deliver the actual services and manage end-user expectations. Ensuring the active involvement of citizens requires a creative and committed approach.



"T-City has been a real success for us, achieved by working closely together with the city, citizens and partners. We have

implemented new services beyond connectivity in a real life environment, using Friedrichshafen as our living lab to show innovation in practice."

Andreas Knobloch, Vice President Strategy & Communication, T-Systems International

T-City: Partner Background

Deutsche Telekom

Deutsche Telekom is one of the world's largest integrated telecommunications companies with almost 130 million mobile customers, 33 million fixed-network lines and more than 17 million broadband lines (as of June 30, 2012). The DT group provides fixed-network, mobile communications, Internet and IPTV products and services for consumers, and ICT solutions for business and corporate customers. Deutsche Telekom is present in around 50 countries and has over 233,000 employees worldwide. The group generated revenue of EUR 58.7 billion in the 2011 financial year - over half of it outside Germany (as of December 31, 2011).

QIVICON

Initiated by Deutsche Telekom, QIVICON is an alliance of leading industrial enterprises in Germany that aims to raise



the profile of connected home solutions. Together with partners EnBW, EON, eQ-3, Miele and Samsung and other strong brands, DT is developing an ecosystem to support energy efficiency at home, as well as services in the areas of security, convenience and health. The first integrated offers will come to market on a multivendor platform in spring of 2013.

The GSMA Connected Living Programme

The GSMA's Connected Living programme is a three-year market development initiative whose mission is to help mobile operators accelerate the delivery of new connected devices and services. Our target is to assist in the creation of 700 million new mobile connections, whilst stimulating a number of service trials and launches in the Automotive, Education and Healthcare sectors. The Connected Living programme is also working with the city of Barcelona, the Mobile World Capital, to develop and showcase smart city services. Our work focuses on the adoption of mobile based solutions and services to ensure that the cities of the future are safe and healthy places to live and work.

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www.gsma.com/connectedliving/smart-cities



Connected Living