Public transit: Information systems of the future
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EDITORIAL

Philippe Martin,
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Right now, public transit information systems operate independently. With multiple layers and a variety of applications and hardware, for all but a few local exceptions, they simply do not communicate with each other.

But they need to be interconnected to deliver intermodal information more accessibly, faster, more reliably and more economically than at present. This will improve the fluidity of travel for people living in large cities as well as for those living in smaller towns or groups of communities. For them, moving from one area to another easily and seamlessly is an everyday necessity. Operators like Veolia Transdev will be able to improve their network operating conditions, and public transport authorities will be able to offer transportation solutions that better compete with cars. The challenge is to make public transportation more attractive within urban areas and across entire regions.

Since 2008, Veolia Environnement Research & Innovation has taken the lead in a research project on transportation intelligence. It is part of the European Bus System of the Future (EBSF) program, coordinated by the International Association of Public Transport (UITP) and supported by the European Union. Involving 23 partners, the work focuses on a telematics architecture—onboard vehicles and in the monitoring rooms on the ground—as well as hardware installation requirements. Projects are currently nearing completion, and will make it possible to coordinate all operators’ information systems by making them communicate with each other using a common language, tying together all systems and information in real time regardless of where they are located.

This standardization of data transfer methods is a first in the transportation sector. In addition to buses, it can be rolled out to all modes of transportation. It will speed up the development of intermodality at the European level and eventually lead to international data exchange standards.

The Veolia Environnement Research & Innovation teams have supervised the work of some fifty people, integrated the various components into the core of the system (Intelligent Transport System) on a test bench and validated the operation of the overarching architecture. They are also developing an innovative remote-diagnosis solution that complies with the new EBSF data transmission standards and are testing it on a pilot operational site in Brunoy (France). This application will enable the Veolia Transdev teams to carry out preventive maintenance.

Other project partners are currently testing passenger information in Bremerhaven (Germany), the use of multi-modal operations in Madrid, remote-diagnosis in Rome and remote-diagnosis and passenger information in Budapest.

We hope you enjoy this issue.

PROJECTS

A real-life test platform
Veolia Environnement Research & Innovation has validated the Smartbus concept on a 1:1 scale test bench.

The Smartbus that takes care of itself
In Brunoy (France), Veolia Environnement Research & Innovation and Veolia Transdev are testing an onboard remote-diagnosis application on ten buses.

METHODOLOGY

Four years of working with the European transportation community
Managed by Veolia Environnement, the project for the telematics architecture for the bus of the future progressed in four stages.

TECHNOLOGIES

Like a smartphone
The telematics components of the European Bus System of the Future communicate using Internet technology.

THREE QUESTIONS FOR...

Stéphane Lapujoulade,
Director of Innovation and Sustainable Development,
Veolia Transdev

The information systems we are working on will be central to tomorrow’s transportation systems, for passengers and operators, as well as for transit authorities.

Emmanuel de Verdalle, Head of the Smartbus research project at Veolia Environnement Research & Innovation

We hope you enjoy this issue.
European Bus System of the Future

The four-year European Bus System of the Future (ESBF) research project was launched in 2008 and involves 49 transportation sector partners in 11 European countries. The total budget of the project is €26 million, with more than 60% of the funding coming from the European Union.

- **Sustainable development**
  Its aim is to modernize buses to make them more attractive: improve their capacity and make them more efficient, cleaner, quieter, more user-friendly, and more communicative. The challenge is to encourage a better balance between public transit and private cars, accounting for increasing mobility while still reducing urban congestion, greenhouse gas emissions and atmospheric pollution.

- **Areas of research**
  The research concentrates on the innovations required for vehicles, transportation infrastructure and operations: rethinking the passenger compartment and seating arrangements to improve fluidity, vehicle access (especially for people with limited mobility), improve the ergonomics of the driver work space and review bus stop design, etc. Another key part of the program deals with information and communication technology.

- **Standardization**
  The project outcomes will include technical recommendations for vehicles, infrastructure and equipment as well as for information systems. The results will be fed into the work by the European Committee for Standardization, with the specifications developed by the profession possibly forming the basis of standards.
Standardizing data transfer methods will boost innovation, and will open the door to developing new services and applications for information and communication technologies (NICT).

The question of transportation fluidity and intermodality in cities and between regions calls for innovative solutions based on new information and communication technologies (NICT).

The IT architecture project for the European Bus System of the Future (EBSF) progressed in four stages starting in 2008, involving around 50 people from 23 transportation sector stakeholders.

Standardizing data transfer is the crucial challenge for the management of smart information across regions.

The IT architecture project for the European Bus System of the Future (EBSF). Veolia Environnement research project launched in 2008, called the European Bus System of the Future (EBSF). Veolia Environnement is participating in the project, which is coordinated by the International Association of Public Transport (UITP). 

What is behind the research you are doing on information and communication technology for buses?

“Our work on the Smartbus is part of a huge European research project launched in 2008, called the European Bus System of the Future (EBSF). Veolia Environnement is participating in the project, which is coordinated by the International Association of Public Transport (UITP).”

What are the areas of Smartbus research?

“Information technology is at the heart of the transportation system of the future for passengers and operators as well as for authorities. Innovations in this area affect ticketing, buying and validating tickets using a contactless mobile phone, information access onboard buses to make transport time ‘productive,’ real-time traffic information at stops and on smartphones, automatic vehicle platooning solutions to increase bus capacity in peak hours, optimizing energy consumption, passenger counting, driver assistance system, video surveillance, operation supervision, vehicle maintenance and more.”

What is Veolia Environnement Research & Innovation’s role in the EBSF (European Bus System of the Future) project?

“We have a presence in technical groups working on both the vehicle and the infrastructure and operations aspects. We are steering the on- and off-board telematics architecture project that involves two working groups on our test prototype (test bench).”

10 to 20%

Today, a complete onboard telematics system on a bus can account for as much as 10 to 20% of the vehicle cost.

What is a bus “system?”

“The bus of the future is not just an innovative vehicle equipped with onboard intelligence connected to back office management on the ground—a Smartbus—it is also a transportation system with its own bus lanes that structure the urban environment with enough flexibility to travel to the heart of urban districts and deposit passengers almost at their doorstep.”

INTERVIEW

Emmanuel de Verdalle
Emmanuel de Verdalle, Head of the Smartbus research project at Veolia Environnement Research & Innovation

The information systems we are working on will be central to tomorrow’s transportation systems, for passengers and operators, as well as for transit authorities.

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**PROJECTS**

**A real-life test platform**

An off-board platform management back office (in a monitoring room) and two onboard (in the vehicles) IT architecture platforms with a driver’s screen: Veolia Environnement Research & Innovation validated the Smartbus concept on a 1:1 scale test platform.

- **Combining existing systems**
  
  To get transportation information systems to communicate with each other, the company and its partners selected off-the-shelf software and hardware data exchange and interface methods. The same applied to data display systems. Once the telematics equipment and solutions were upgraded to Smartbus standards by each of the project partners, Veolia Environnement researchers combined them all on a test bench. It was equivalent to having two buses connected to a back office platform; other buses were simulated, creating a sample bus fleet that covered a geographical area.

- **Scenario tests**
  
  Researchers then defined scenarios that were representative of actual operational situations and replayed data sets recorded in the Group’s buses to test and validate the specification’s systems step-by-step and function-by-function. Does geolocation data pass to all systems via a single antenna? Do all applications display correctly on the driver’s screen? Can vehicles be tracked along their route regardless of type or advanced vehicle monitoring system (AVMS)? Can the overall multi-modal operation of a transportation network be tracked at a regional level?

  After test bench validation, various functions moved to pilot site trials. Once the Smartbus concept has been validated on the test bench and the operation of each application proves itself on the ground, the EBSF architecture can be rolled out across all Veolia Transdev networks. It should be fully operational by 2015.

**Our work went as far as physically integrating the onboard telematics equipment,” explains Emmanuel de Verdalle.**

“The open system we designed works in real life and not just on paper.”

**The Smartbus that takes care of itself**

In Brunoy (France), one of the five pilot sites for the telematics architecture project for the European Bus System of the Future, Veolia Environnement Research & Innovation and Veolia Transdev are testing an onboard remote-diagnosis application on ten buses after test bench validation.

Remote-diagnosis is an innovative application that aims to detect faults in bus components before they fail. Veolia Transdev teams will be able to implement a preventive maintenance process to reduce the number of breakdowns in service and possibly even avoid them altogether.

Automatic feedback of bus data to the operations center is an innovation in itself. Tests being run in Brunoy demonstrate that data transmission to the back office that complies with EBSF standards is happening correctly. Veolia Environnement Research & Innovation is also developing software to analyze data and predict when breakdowns will occur. For this purpose, it is developing algorithms as part of a paper being prepared together with IFSTTAR, the French institute of science and technology for transportation, development and networks.
In the future, there will be standard interfaces for onboard and back office equipments.

What are the two working groups Veolia Environnement is steering on this test bench?

“The first is studying onboard telematics, that is, all the information systems on the vehicle: ticketing, passenger information system, video surveillance, driver assistance system, operation monitoring equipment (location, timetabling, emergency calls and vehicle alarms), and the remote diagnosis system to optimize vehicle maintenance. This group is also examining the installation requirements for all this equipment.”

And the other group?

“The second working group is looking at the telematics architecture for the back office on the ground. This is the off-board pairing for onboard systems: each onboard application has its specific complementary application on the ground. The group is tasked with developing interoperability with back-office systems at the scale of an area—region, country or Europe—and between areas.”

What does telematics architecture mean?

“Telematics architecture refers the way all the data and communications equipment, modules and functions interconnect. With our partners, we have defined the transportation intelligence, the base on which the European Bus System of the Future will be developed.”

starting in 2008, involving around 50 people from 23 transportation sector stakeholders.
Standardizing data transfer is the crucial challenge for the management of smart information across regions.

The IT architecture project for the European Bus System of the Future progressed in four stages starting in 2008, involving around 50 people from 23 transportation sector stakeholders. The expertise contributed by our partners. Our project represents 500 man/months spread over four years. By way of comparison, the other areas of the European Bus System of the Future project each require around 100 man/months."

So, this work is central to the entire project.

“Yes, it is. Because communication between information systems is a common denominator for improving passenger experience and operations. In terms of investment, this telematics architecture project represents 500 man/months spread over four years. By way of comparison, the other areas of the European Bus System of the Future project each require around 100 man/months.”

What expertise is involved?

“This area involves 23 partners, including Veolia Environnement Research & Innovation, representing all transportation sector stakeholders in Europe: the main bus manufacturers, OEMs, operators, research centers and public transport authorities (PTA). Our researchers are specialized in IT networks, telecommunications and system architecture, and they have tapped into the expertise contributed by our partners. Our project management skills were also central to manage the work of some 50 people.”

Why was this work on telematics architecture needed?

“Right now, there are substantial differences between the many on-board applications used on buses, which are based on proprietary systems and do not speak the same language. In short, we are dealing with layers of applications that do not communicate with each other.”

Why is this an issue?

“As a transportation operator, Veolia Transdev is dependent on multiple solutions and equipment that operate according to their individual rules. We do not have any global view over the entire system, especially across several geographical areas, and are not always at liberty to choose our suppliers. For example, if we want to add passenger information to an advanced vehicle monitoring system (AVMS), we have no option but to turn to our AVMS provider. It is also complex and costly to make changes we need to our architecture and maintain it.”

2 to 3 days

At present, installing a new application on a bus requires 2 to 3 days’ work by a technician.

Web-ready vehicles

Veolia Environnement and its partners have defined the framework for installing telematics equipment in buses so that they come off the assembly line ready to house Smartbus applications. These requirements can be summed up in a few key words:

- a dedicated area for installing the boxes,
- standard connections for all computers,
- a single antenna (buses sometimes have several antennas to stay “connected” across each area).

Operational rules have also been defined to keep telematics energy consumption to a minimum, for example, turning off passenger information screens when buses are in the depot.

Standardizing data transfer is the crucial challenge for
Standardizing data transfer methods will boost innovation, and will open the door to developing new services and applications for the management of smart information across regions.

The question of transportation fluidity and intermodality in cities and between regions calls for innovative solutions based on new information and communication technologies (ICT).

The IT architecture project for the European Bus System of the Future progressed in four stages starting in 2008. It involved around 50 people from 23 transportation sector partners: manufacturers, OEMs, operators, research centers and public transport authorities.

**METHODOLOGY**

Four years working with the European transportation community

Led by Veolia Environnement Research & Innovation, the telematics architecture working group for the European Bus System of the Future progressed in four stages, starting in 2008. It involved around 50 people from 23 transportation sector partners: manufacturers, OEMs, operators, research centers and public transport authorities.

1 year to define needs

Three working groups met to collect operator and public transport authorities’ needs concerning vehicles, infrastructure and operations. Collating all the responses led to an exhaustive list of needs.

18 months to establish specifications

Two working groups (onboard telematics and back office telematics) reviewed the current status of the technology, selected the best standards available, defined the telematics architecture and described the standard data exchange mechanisms. Each group’s work was broken down into tasks (networks, advanced vehicle monitoring system, passenger information, driver terminals, remote-diagnosis, installation requirements and vehicle interfaces for one group; networks, multi-AVMS data exchange between vehicles, passenger information and remote diagnosis for the other). A technical meeting for each task was held every three months on average.

6 months to upgrade existing equipment

Each partner upgraded equipment and applications to comply with the EBSF standards.

1 year test bench trials

Veolia Environnement Research & Innovation installed the equipment and solutions developed in phase 3, and tested and validated each system architecture function successively.

2008 2009 2010 2011 2012

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**Why is it complex and costly?**

“Today, when we add a new application function, we need to develop specific programming for nearly every operations center because there are as many information systems as there are cities or geographical areas that contract with us to operate their bus networks. And each time, every interface has to be re-examined or a new component has to be added to the architecture. Similarly, we have dedicated maintenance for each system, which prevents us from capitalizing on any economies of scale. In addition, the location of the systems differs from one bus to another and we have to deal with hardware redundancy issues.”

**For example?**

“Each system requires geolocation, and that means additional antennas on the vehicles. The connectors for computers installed on buses differ from one system to another. On the ground, the issues we encounter at the back office level are similar. Reducing the number of antennas, cables, boxes and connectors will make maintenance operations a lot simpler. Vehicle monitoring systems are equally problematic in terms of the diversity of data formats and connections.”

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With the ESBF architecture, regardless of geographical area or system, it will be possible to access data as varied as bus position, customized passenger routes, the next stop, vehicle speed, traffic conditions and more. The arrival time of each passenger can be calculated.

The management of smart information across regions.
So, it’s quite complex really.

“Yes, and the complexity of organizing transportation networks only serves to compound the complexity of managing information systems. Several operators serve the same geographical area and each operator has its own information system, which in turn has a mixed set of applications and hardware... Data is simply not shared. Some degree of interoperability may exist at the local level, driven by public transport authorities, but they are still specific regional solutions. The intermodality of transportation data transmission remains a difficult, lengthy and costly process. It is essential that we manage to harmonize solutions at the European and even global level, since Veolia Transdev operates worldwide.”

What is the key to getting transportation data systems to communicate with each other?

“Implementing a standardized architecture. Our research has focused on defining mechanisms that will enable applications to communicate with each other so they can be easily interconnected and share key data via an Internet network. In the future, there will be standard interfaces for onboard equipment and for back office equipment, standard protocols for data transmission between vehicles and infrastructure—a single pipe as it were—and standard rules for installing onboard equipment.”

The more information we can provide about transportation availability, the more we can reassure passengers and simplify their journey. This is even more important as the population ages.

When information takes passengers by the hand

With a smartphone, the Internet becomes as mobile as the telephone and its owner. With the Smartbus, information will be able to pass freely between various transit networks and modes. This dual revolution is bringing about a radical change in passenger information. In the future, it will be possible to choose any route and combine public transit networks with personal modes—commercial or not—such as taxi, bicycle, car sharing, etc., and be directed by an electronic roadmap that updates in real time throughout the journey. This continuous support will avoid the random nature of transfers in particular and also provide alternative solutions in the event of traffic disruptions. Veolia Environnement Research & Innovation has undertaken extensive application development in order to provide this service.

Standardizing data transfer methods will boost innovation, and will open the...
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The question of transportation fluidity and intermodality in cities and between regions calls for innovative solutions based on new information and communication technologies (NICT). Standardizing data transfer is the crucial challenge for the management of smart information across regions.

50 people from 23 transportation sector stakeholders.

The IT architecture project for the European Bus System of the Future progressed in four stages starting in 2008, involving around 1,000 buses.

Won’t this standardization limit operators and software companies?

"On the contrary, it will be an opportunity for them! Standardizing data transfer methods has no effect on the content of applications. It simply means adopting the same language for accessing and disseminating data. Using this language, everyone will be able to develop their own applications. Given the amount of new data available, it will be a boost to innovation. Rather than wasting time and money on developing interfaces between proprietary systems, everyone will be able to develop high value-added applications to deliver quality service for passengers, real-time personalized information, fleet management, remote-diagnosis solutions, and so forth."

It takes 10 people a year to add a telematics application to a fleet of 1,000 buses.

Will telematics equipment also be standardized?

"It will be pooled. For example, there will be a single antenna for geolocation and communication between vehicles and the back office on the ground. The driver will also have a single console for all the applications. Today, drivers have several display units: ahead/behind schedule, video surveillance, ticketing, etc. In the future, all these applications will be displayed on a single screen. Sharing equipment in this way will avoid function redundancies. This will reduce capital costs, improve driver work space ergonomics and overall aesthetics."

So, eventually all onboard equipment will be housed in a single box?

"The standardization rationale points toward integrating all modules into a single physical computer; it would be easy to upload applications to it, like a smart phone, rather than having a separate box for each application. In the longer term, our aim is to improve system communications and make it more compact."
TECHNOLOGIES

Like a smartphone

The various telematics components of the European Bus System of the Future (EBSF) communicate using Internet technology. That’s precisely what makes a Smartbus smart. The EBSF telematics architecture has been designed as an IP network (managed by an Internet protocol). Because they are connected directly to a shared network, the onboard and back office applications can exchange their data, no matter what telecommunications standard is used (Wi-Fi, 3G, LTE, etc.).

Zero configuration
Simply connect an application to the network for it to communicate with its peers. This plug & play mechanism avoids a time-consuming setup.

Service availability
Smartbus architecture is similar to a service-orientated architecture. Data is exchanged via a provision of services; each application is able to disseminate services and subscribe to them. For example, as soon as the system is equipped with a geolocation application, all the other applications connected to the network have access to this service.

Browser
The driver console and screen also incorporate Web technology. It has the equivalent of an Internet browser, providing access to onboard application pages.

* With the EBSF architecture, regardless of geographical area
  * or system, it will be possible to access data as varied as bus position, customized passenger routes, the next stop, vehicle speed, weather conditions and more.

>>> interview continued

```quote
Whatever the supplier, specific services will be installed as plug & play applications, meaning they will be automatically configured.
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**What are the benefits of a standardized interconnection for information systems?**

“The benefits for each operator will not just be interconnected on- and off-board telematics and the ability to make them communicate, but also the ability to enable communications between the IT infrastructures of various operators. Data system interoperability is central to developing travel intermodality, providing passengers with quality services tailored to modern lifestyles at the best possible economic and environmental cost. Ultimately, it is the attractiveness of public transit that is at stake.”

**Can the solutions developed be applied to other modes of transportation?**

“Yes, they are intermodal. They can be applied not only to buses but also to light rail, interurban coaches, car-sharing and more. The technology already exists for transmitting data between various transportation data systems, but it is time-consuming and costly to implement. By designing a standard and interoperable communications architecture, we can overcome that weakness. We can then roll out intermodality across one or several geographical areas, and that will certainly accelerate its development.”

The solutions developed within EBSF project will accelerate...
How will passengers benefit?

“Once transportation network information systems can communicate easily with each other in an open system, passengers will have access to intermodal information for their journey across one or several geographical areas, involving all modes of transportation available to them to get from point A to point B. By offering end-to-end solutions like this, we can reduce car dependency in large cities.”

But route planners already exist.

“Yes, but they are only used in several large cities and pioneer trial regions and cities. In Sweden, the Netherlands and Germany, for example, multi-modal route planners are already in use. In France, there are examples like the cities of Paris, Lyon, Marseille, and the regions of Alsace, Bouches-du-Rhône and Alpes-Maritimes, and on a smaller scale Valence. In the future, this information will be made available to the greatest number, and will be more detailed and personalized. Intermodality will also be more widespread. It will take into account complex bus networks along with other transportation modes to enable door-to-door journeys: taxis, bicycles, rental cars, ridesharing and more.”

“The more information about transportation availability, the easier the journey.”

Jean-Laurent Franchineau, Head of Transportation Research, Veolia Environnement

“As an international operator, we have come up against a vast array of information systems and telematics equipment that differ by operator and geographical area, and the administrative difficulties that this creates.”

How will transportation operators and transit authorities benefit?

“They can buy vehicles pre-equipped with a basic telematics architecture—an Internet network and antenna—and a space reserved for hardware. Whatever the supplier, specific services will be installed as plug & play applications, meaning they will be automatically configured. This has the advantage of letting them base their hardware and solution choices on cost, ease of maintenance and vehicle operational flexibility.”

What are the financial savings?

“Right now, equipping a bus with a complete onboard information system can represent as much as 10% to 20% of the vehicle’s cost. That’s a lot. And then it takes two to three days to add a new feature to each bus, which means it takes about 10 people one year to equip a fleet of 1,000 buses. Standardizing the telematics architecture will significantly reduce purchase, installation, operations and maintenance costs. Related work on buses will be easier. There will no longer be any need to spend time and money on developing interfaces. Opening up application development to more competitors will likely impact prices, as will removing redundant software and hardware (driver terminals, access portals, GPS, communication gateways, warning signals, fleet management, etc.).”

inter-modality and reduce operations and maintenance costs.
Standardizing data transfer is the crucial challenge for the management of smart information across regions.

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Interview continued

It is essential that we manage to harmonize solutions at the European and even global level, since Veolia Transdev operates worldwide.

- **You mentioned operations flexibility.**
  “Once applications can be loaded in just a few minutes, vehicles can be assigned to different networks in response to service demands or operational needs, with passenger information and advanced vehicle monitoring system services continuing to work. In particular, it means they can be configured for convoy platooning in peak service times, like the modularity concept studied in the EBSF project. Improved real-time fleet management will enhance the quality of service delivered to passengers. What holds true for an operator like Veolia Transdev will apply equally to other operators, as well as between different public transport modes, or even between transit authorities, since vehicles will be able to communicate with each other. This improves transfers, response to crisis situation management and more.”

- **Fleet takeovers will also be easier, won’t they?**
  “Absolutely! At present, when there is a change of operator following a bidding process, either new telematics tools have to be installed throughout the newly acquired fleet, or the existing information systems have to be adapted. In the future, we will just have to upload our applications to the existing architecture.”

- **Why is Veolia Environnement Research & Innovation steering this working group?**
  “As an international operator, we have come up against a vast array of information systems and telematics equipment that differ by operator and geographical area, and the administrative difficulties that this creates. We have a stake in defining a standardized architecture. Beginning in 2002, we have been particularly proactive in working with the profession to define functional innovations to be integrated in buses, and responding as part of the UITP (International Association of Public Transport) to the call for projects published by the European Commission under the FP7 (Seventh Framework Programme). For us, this project is an opportunity to work with all the transportation industry’s stakeholders.”

As soon as the Smartbus concept has been validated on the test platform and in the...
Everyone will be able to develop high value-added applications to deliver quality service for passengers.

**What did your work actually involve?**

“We manage our partners’ developments and act as a systems integrator to test and validate the system’s brain that enables all the equipment to communicate. The system’s brain has already been used in a real-life test bench. It can operate with suppliers’ equipment and applications from various developers.”

**How did you work together?**

“The partner’s teamwork led to specifications, which we are implementing on our test bench. Each partner contributed its equipment, upgraded to comply with the EBSF specifications. We incorporated these elements when we reproduced the onboard architecture of a vehicle. We devised a number of test scenarios for our platform and examined how it worked on a physical architecture with a single antenna, a single Internet network and a single screen in the driver work space.”

**Are you carrying out trials in the field?**

“Each part of the architecture is tested in the field: we are testing remote diagnosis at a company pilot site in Brunoy (France). Some of our partners are testing other applications: passenger information in Bremerhaven (Germany), multi-modal operation in Madrid, remote diagnosis in Rome and remote-diagnosis and passenger information in Budapest.”

**What results have you seen from your work?**

“We will be presenting the results to the international transportation community in November 2011 in Paris. Basically, the telematics architecture that complies with the EBSF standards works. The system is operational for each of the application functions tested at the pilot sites.”

**When will we see Smartbuses on the streets?**

“The aim of the European Bus System of the Future project is for the new architecture to be deployed by 2015. Rollout will be gradual: for example, standard connections will be integrated over time. However, starting in 2012-2013, vehicles can already be equipped. Our test bench demonstrated that Smartbus architecture can be rapidly implemented using existing solutions that are upgraded to comply with EBSF specifications. Based on our work, we have already defined recommendations for our group’s purchasing department so they can draft our calls for tender accordingly.”

Field, rolling out the EBSF architecture will start in 2012, and be working by 2015.
What benefits will Veolia Transdev see from Smartbus innovations?
“The work coordinated by the International Association of Public Transport (UITP) will result in data exchange standards shared by all onboard information systems used on buses. This is a crucial step forward for Veolia Transdev on two counts. First, it will enable us to respond to a demand voiced by municipalities and passengers for more services: information, ticketing, improved management, etc. Right now, because of isolated information systems and equipment, it is difficult to add new applications, and it’s a nightmare at the technical level! Standardizing telematics architectures is a key innovation for developing new information services for public transit. It is clear that we can best differentiate ourselves by the services we provide. We want the greatest number of geographical areas and passengers to benefit from solutions that are reserved for a very small elite at this point in time because of the cost involved. That means they are limited to very large cities or pilot operations involving just a few buses.

The second benefit from the Smartbus for us is fleet management, which means will be able to fully leverage our size advantage. It will provide us with the means to transfer vehicles very flexibly from one area to another to match needs, using the same telematics services.”

What do you see as the advantage of working with all transportation professionals on this project?
“We’re simply doing our part! As a leader in our sector, we have a responsibility to help the profession progress by investing in a project that can move us all forward. Given our size, the extent of our fleet and the services we have developed, we have the capacity to be the driver that provides our profession with a standard telematics architecture and to bring together solutions that currently do not communicate with each other.

Additionally, innovation in the area of mobility doesn’t just mean technical progress, it also involves the way we work together. The future isn’t just standards imposed by a dominant player, operator or manufacturer on a local or national area, but rather solutions defined jointly with all transportation industry stakeholders irrespective of any boundaries. Without this professional cooperation, each player will be held back from delivering a broad spectrum of services. As an international and multi-modal player, we also have a strategic interest in capitalizing on our innovations across the broadest possible geographical areas.”

Specifically, how will the company roll out the Smartbus?
“The work done on bus IT architecture should result in a European standard within one or two years. We are already anticipating the publication of this standard. We are starting to spec our purchases with it in mind, and we will be advising municipalities about the specifications for their fleets. Together, we can help develop fleet investment and upgrade projects as well as onboard services that are more economical and flexible than today. We will draft our rollout plan next year, with our first priority being Europe: France, the Netherlands, Germany, part of the UK, the Czech Republic, Spain and Portugal—for a start. We also clearly see a bridge that can be built with other modes of transportation. Our light rail and bus engineering subsidiaries are working on developing architectures shared across the same geographical area. The telematics architecture for the Smartbus within urban boundaries is just as valid at the regional scale for light rail, tram-trains, regional express rail and interurban bus services.”

Standardizing telematics architectures is a major innovation for developing new information services in public transit.