17th INTERNATIONAL SYMPOSIUM ON A WORLD OF WIRELESS, MOBILE AND MULTIMEDIA NETWORKS
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N2WOMEN MEETING
From Research to Innovation

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The Genesis?

Connect 500 vehicles between themselves and the Internet!
Connecting Vehicles

Why communication in the roads?

**mobile data**
(telcos are seeking WiFi offloading solutions to cope with growth in traffic until 2020)

**continuous connectivity**
(connectivity anywhere, everytime)

**connected cars**
(all Internet-based services in the cars)
Connected Vehicles Applications (ITS.DOT Source)
Connected Vehicles Applications: Self-Driving
How?

Turn cars, buses, boats and trucks into mobile WiFi hotspots

Vehicles are the network elements and build the moving network
Vehicles Advantages

Ideal WiFi Hotspots to expand Internet Access

Gather data in the city and for the city

Data couriers and mules for the IoT

Harsh and catastrophe environments

Avoid collisions and warn of accidents and road problems
Vehicular Networks: How?

IEEE 802.11p Access Network

IEEE 802.11g/n Access Points

Cellular Access Network

Fixed Infrastructure

Internet

RSUs

Ad-Hoc

Mobile Infrastructure
Pilot in the City of Porto

608 vehicles, 57 road side units, 23 sets of sensors
371,000+ unique users (2.5TB/month)
Bus/Fleet Information

Online Dashboard – Bus Stats
Vehicles as Data Mules?
City Pilot: IoT network results

Smart Car Navigation
Healthy Running Path
Garbage Collector

sensors: 722MB/day; >100 garbage containers
How everything started…

CMU|Portugal Project DRIVE-IN through a real need…

We promised to connect 500 vehicles …

… it was not easy…

But we did it! 😊
How everything started…

Technology in a research project
- Innovative, potential to commercialize

Licensing to another company
- Why?

Why not going forward?
- Who are the best people to make something to go forward?
- Ourselves, but are we sufficient?
- Do we have all skills?
- Who do we need?
How to go forward...

Who do we need?

How to get investment? Do we need help? What is the best strategy? Portugal or outside?

How to get the best of our technology and be truly recognized outside?

Contests and prizes to get recognition

- Mentorship?
  - Incubators
  - Several programs such as Cohitec, MBAs
  - Contests
  - How do they help?
Patent

Everything needs to be protected

Why? Investors… making sure we survive

How? Patenting process


Our example:

- Paper on IEEE 802.11p and synchronization aspects on spring 2011
- Licensing technology September 2011
  - To license – include a patent… first version very focused on the technology
- Licensing for Veniam Summer 2012
  - Second version very focused on the box
- Spring 2013
  - Third version focused on the connection manager that makes a glue with the technologies in the box and how to use them together
"Veniam’s technology can connect any vehicle, like a city bus or a garbage truck, to the internet, essentially building a massive ‘network of moving things’.”

"A massive mobile Wi-Fi network that could be a model for many cities…”

"The firm is working to bring a more pervasive Internet to the world, which is something that we need. Cellular signals remain weak, spotty, and expensive. The potential to better connect ourselves is one that I welcome.”

“Free Wi-Fi on Buses offers a Link to Future of Smart Cities”

“Its system can blanket an entire city in seamless Wi-Fi coverage.”
Thanks!

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