Cohda Wireless

SAFER | SMARTER | GREENER

ITS World Congress 2018

Societal Costs of Road Transportation

Intelligent transportation systems (ITS) are designed to enable cooperation between vehicles and road infrastructure, using state-of-the-art CAV applications, to achieve improvements in safety, mobility and the environment

Accidents

In Europe, there were over 38K fatalities and 1.7M injuries caused by auto accidents with 93% due to human error

In the US, there were over 35K fatalities and 6.3M accidents in 2015 costing the US over $720B

It is estimated that V2V communications can address 79% of accidents, while V2I communications can address 26% of accidents and, combined, they can address 81% of all accidents

Traffic

In Europe, 1% of GDP is lost to congestion annually

In the US, 6.9B hours are lost annually in traffic with urban congestion costing the US $160B annually

Estimates indicated that connected vehicle dynamic mobility applications can eliminate one third of travel delay caused by congestion and improve freight deliver times by over 20%

Environment

In the US, transportation contributes 56B pounds of carbon dioxide a year

3.1B gallons, or over $6.5B, of fuel are wasted annually due to congestion in the US

ITS could achieve a 2 to 4% reduction in oil consumption and related greenhouse gas emissions each year over the next 10 years

Source: US Department of Transportation

Who is Cohda?

Cohda Wireless

Cohda Wireless is the leading software and sensor supplier for the CAV and Smart City markets with a vision to make driving safer, more enjoyable and with less impact on the environment.

Mission Statement

License innovative, world leading Connected Autonomous Vehicle ("CAV") solutions to Tier 1 automotive suppliers, ITS Equipment Vendors and METS vendors

VEHICLE-TO-VEHICLE	VEHICLE-TO-INFRASTRUCTURE	VEHICLE-TO-PEDESTRIAN	VEHICLE-TO-NETWORK

Cohda in Brief

- Hardware agnostic, leading supplier of software for the CAV market
- An innovative localization product with application to CAVs, underground mining and indoor retail
- Software proven to work on 5G networks, Wi-Fi and DSRC
- Strong patent portfolio with over 54 granted patents and 51 applications under examination
- Proven scalable platform proven to offer more performance in over 100,000 km of testing in live, zero-tolerance conditions
- Over 65% of vehicles in V2X trials use Cohda solutions and it is the only solution currently in production with an OEM
- Working with 600+ customers, including ongoing CAV trials and several Smart City deployments already in place

GM HYUNDAI Peloton RioTinto

SIEMENS NEW YORK CITY DOT VW

- Engineering team of 30+ experienced PhDs and engineers

Cohda's Sectors

Cohda has applications across a multitude of markets, but is concentrated on the fastest growing segments of the Autonomous Vehicle and Smart City markets

SMART CITIES

Cohda's Smart City architecture allows cities preparing for a CAV future to leverage the infrastructure already in place enabling an array of applications

Cohda's range of foundation applications can be deployed today and have been shown to provide immediate benefits reducing congestion and improving travel time

CAV

Cohda Wireless is a global leader in the mobile outdoor communications

Already solved fundamental communication issues such as CAV localization, sensor fidelity and system cost

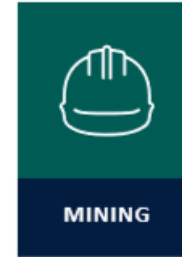Preparing the next generation of CAV application layer software

V2X

Cohda's hardware-agnostic V2X stacks are used in more than 60% of all connected vehicle trials worldwide

Backed by more than 100,000 km of real-world testing

OEM supplier of choice for production vehicles

Selected for the world's first, and second production deployments

MINING

Cohda delivers industry-leading connectivity solutions for the mining industry, improving safety and productivity in challenging environments

Enables vehicles to operate autonomously in GNSS-denied locations

Autonomous vehicles in mining operations can boost productivity 15-20%, according to research trials

Cohda's Product Portfolio

Cohda Wireless

Cohda has developed a hardware agnostic software solution that is enabling hardware products to communicate in the fast developing autonomous vehicle market
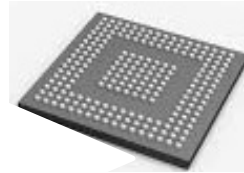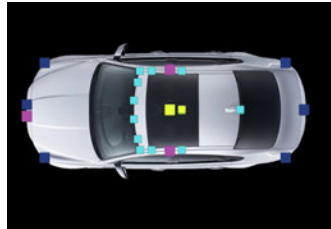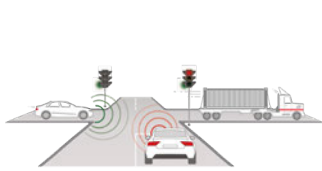
Software: V2X-Stack	Software: CAV Applications	Chip Set Solution	On Board Unit ("OBU")	Road Side Unit ("RSU")
• Mature, hardware-agnostic V2X applications and stack	• Solves critical CAV issues including localization, sensor fidelity and system cost	• Cohda is experienced in the development of automotive grade SDR firmware	• Mature products, ready to be used in large scale field trials and aftermarket deployments	• Similar functionality as the OBU
• Most deployed stack in this rapidly evolving sector with 60% market share	• Improves driving environment monitoring through V2X radar	• Porting of software to multiple chip set vendors	• Small, low cost module	• NEMA4 weather-proof enclosure with integrated antennas and a mounting kit
• Supports wireless 802.11p and 5G mobile networks	• Optimizes traffic efficiency through cooperative cruise control		• Powerful processor running V2X software stacks and applications	• Dual antennas to maximize range and coverage
• Synthesizes data from nearby vehicles and roadside infrastructure to create broader zones of awareness	• Expands driving tasks through accurate positioning		• V2X security with hardware acceleration and tamper-proof key storage	• Covers all the approaches to an intersection with just a single, self-contained unit
• Cohda software has been deployed over DSRC & LTE trials & C-V2X	• Better data collection		• Based upon the automotive-grade RoadLink™ chipset developed by NXP and Cohda	• Available in both mains and power over Ethernet power options
			• Unmatched radio performance in harsh outdoor environments	

Cohda's V2X Stack

The Cohda ecosystem is setting the benchmark for the industry and is trusted by major car manufacturers, Smart Cities and mining companies, with over 600 clients already deploying Cohda solutions
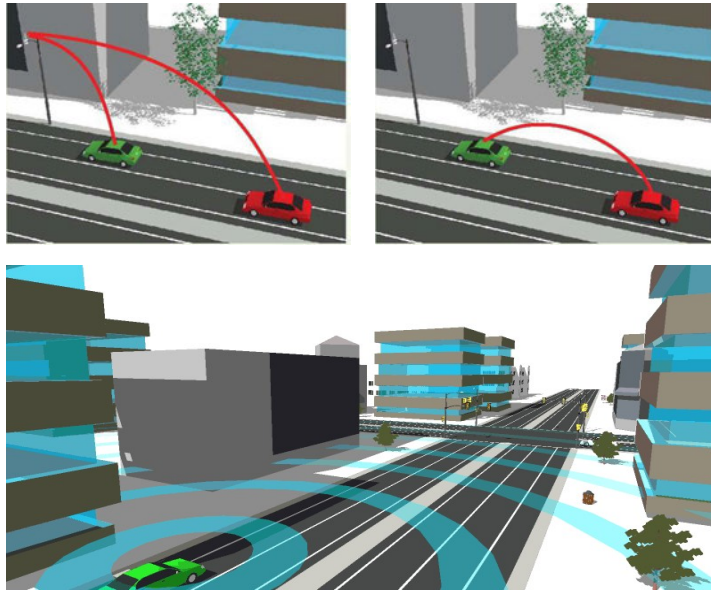
V2X Description

- Cohda's V2X solutions support wireless 802.11p and 5G mobile networks to provide cars with 360 degree awareness, detecting hidden threats beyond anything a driver or on-board sensors can see

- Support for NXP, Autotalks, Renesas and Qualcomm chipsets

- Gathering and synthesizing data from nearby vehicles and roadside infrastructure creates a much broader zone of awareness, setting Cohda Wireless apart from its competitors

- Three Categories in the Ecosystem:

1 Applications Layer

The applications layer is the top–level applications suite which provides information, alerts and warnings to drivers

2 Facilities Layer

The Facilities layer provides facilities to applications for such things as vehicle position, vehicle state, message set dictionaries, Car–to–Car message transmission and reception and threat detection
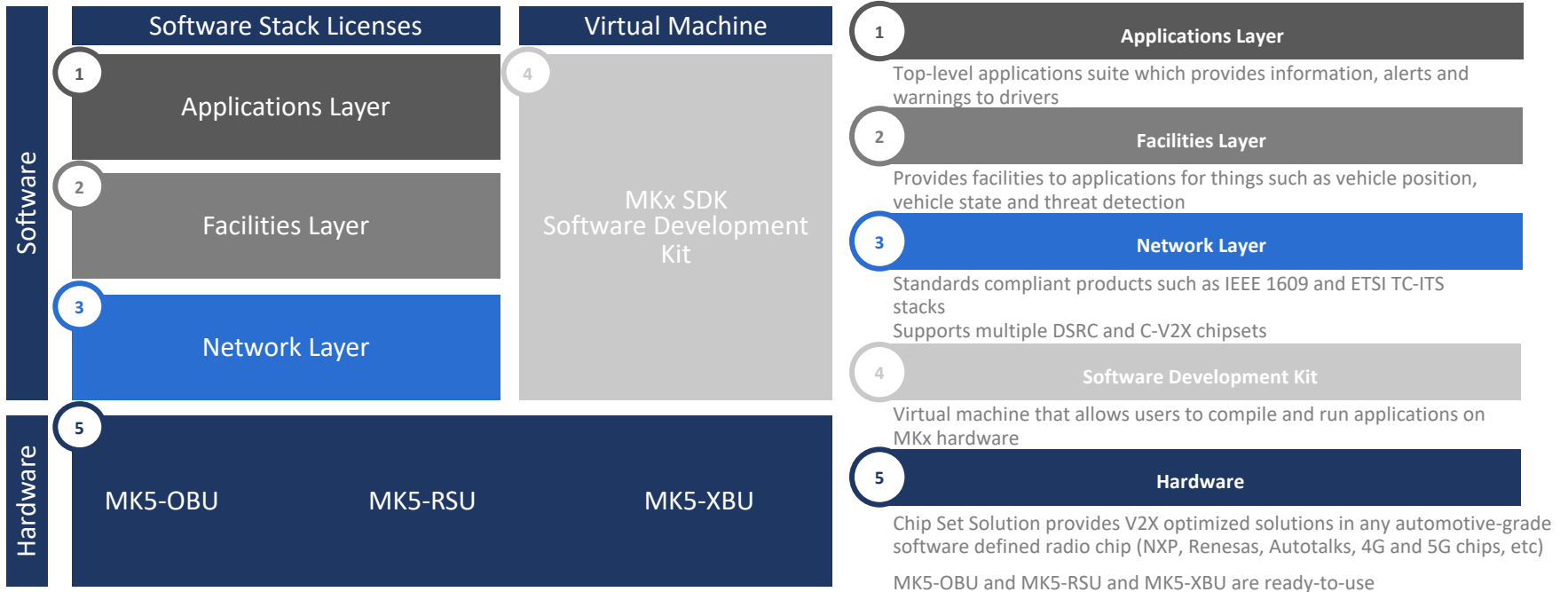
3 Network Layer

The Network layer is comprised of standard compliance stack such as IEEE 1609 and ETSI TC–ITS applications

Cohda's Technology Stack

Choosing to develop within the Cohda eco-system means that you are working with a solution backed by more than one million vehicle-days of testing, and applications that are the industry standard for V2X product development.

Software

Software Stack Licenses	Virtual Machine
1 Applications Layer	**4** MKx SDK Software Development Kit
2 Facilities Layer	
3 Network Layer	

Hardware

5 MK5-OBU	MK5-RSU	MK5-XBU

1 Applications Layer

Top-level applications suite which provides information, alerts and warnings to drivers

2 Facilities Layer

Provides facilities to applications for things such as vehicle position, vehicle state and threat detection

3 Network Layer

Standards compliant products such as IEEE 1609 and ETSI TC-ITS stacks
Supports multiple DSRC and C-V2X chipsets

4 Software Development Kit

Virtual machine that allows users to compile and run applications on MKx hardware

5 Hardware

Chip Set Solution provides V2X optimized solutions in any automotive-grade software defined radio chip (NXP, Renesas, Autotalks, 4G and 5G chips, etc)

MK5-OBU and MK5-RSU and MK5-XBU are ready-to-use

Cohda's SDK

The Cohda Mobility MKx SDK is a software development kit enabling modifications and customizations of Cohda's robust ecosystems

- The embedded Linux devkit allows for the running and compiling of applications on Cohda's MKx family of products. Both Linux & QNX targets supported

- It includes software (source and binaries) necessary to modify and rebuild the MKx firmware to your specifications

- The SDK includes an emulation environment that allows the development of applications in the absence of hardware

- The emulation environment is a virtual machine, allowing the applications to be built, run and debugged on any PC

- Key Features

  - ✓ Communications Services are looped back at the bottom of the IEEE 1609.4 layer, allowing IEEE 1609 message transmission and reception to be tested

  - ✓ NEMA log files can be replayed by the time / position services, allowing applications that use GPS to be tested

  - ✓ Controller Area Network (CAN) bus log files can be replayed by the Vehicle Interface Services, allowing applications that read CAN messages to be tested

  - ✓ Applications that use the user interface services can be tested using the video and audio of the virtual machine

Standards & Technologies

Cohda development team consistently designs to meet industry standards to ensure technology advancements meet and exceed market needs.

US Standards

- IEEE 802.11p*
- IEEE 1609 WAVE*
- SAE
  - DSRC Technical Committee
  - DSRC Vehicle Safety Subcommittee
- Coexistence
  - IEEE 802.11 DSRC Coexistence Tiger Team
  - ITS America DSRC Coexistence Consortium
- USDOT PlugFests
  - Attended all to date
  - Passed 100% of the test scheduled in October 2017 plugfest

EU Standards

- ETSI C-ITS G5*
- C2C-CC Member
  - Active in WG-COM
- ETSI Member
  - Active in WG4
- ETSI PlugTests
  - Attended all to date
  - Best mobility performance on MK5 hardware

APAC Standards

- IEEE 1609 WAVE
- ETSI C-ITS G5
- Country specific adaptation (compatible with the Korea trial requirements, 3000 vehicle deployed with Cohda stack)
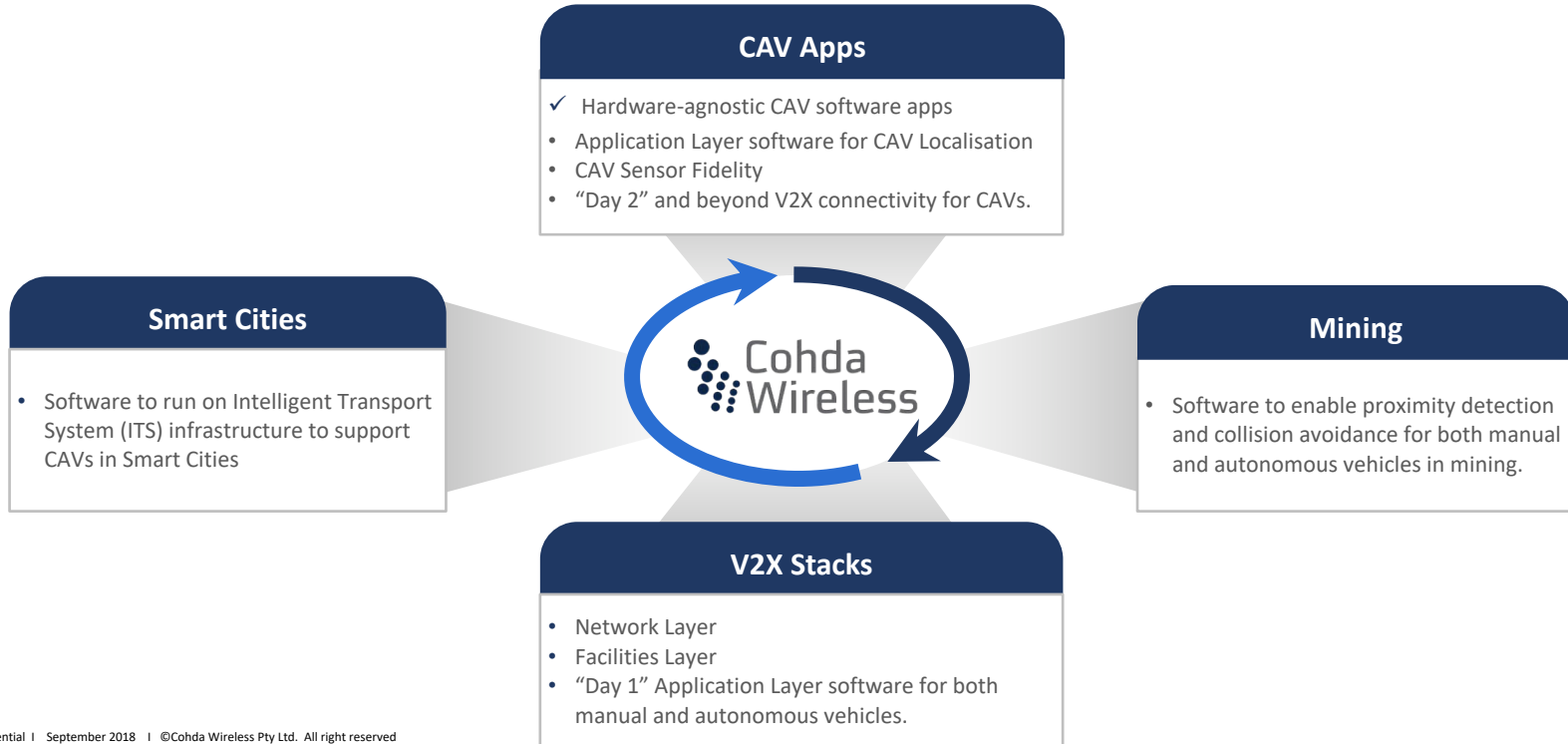
Cellular

- 3G, 4G/LTE
- 5G, 3GPP compatible, C-V2X feature
  - US
  - EU
  - APAC

* PICS list available on demand

Cohda Solutions

Cohda offers the most extensive solutions available to transform our cities and highways, delivering improved safety, and reducing congestion and emissions for a safer, more efficient and environmentally sustainable transport system.

CAV Apps

- ✓ Hardware-agnostic CAV software apps
- • Application Layer software for CAV Localisation
- • CAV Sensor Fidelity
- • "Day 2" and beyond V2X connectivity for CAVs.

Smart Cities

- • Software to run on Intelligent Transport System (ITS) infrastructure to support CAVs in Smart Cities

Mining

- • Software to enable proximity detection and collision avoidance for both manual and autonomous vehicles in mining.

V2X Stacks

- • Network Layer
- • Facilities Layer
- • "Day 1" Application Layer software for both manual and autonomous vehicles.

Connected Autonomous Vehicles

To realize the true potential of the upcoming Connected Autonomous Vehicle revolution, CAV's will need to communicate both with other vehicles and with smart city infrastructure.

Cohda's next generation of CAV application layer software is giving car manufacturers key solutions to push CAV projects forward such as; Improving driving environment monitoring through V2X radar, optimising traffic efficiency through cooperative cruise control, improving driving tasks through accurate positioning and developing better performance data collection.

Deploying tomorrow's CAV projects today.

Solutions:
- CAV Apps
- V2X-Locate
- V2X-Radar

COLLABORATION AND COOPERATION ON OUR ROADS

CAV Solutions: Applications

Connectivity is the key to safer, smarter and greener transportation infrastructure and Cohda is leading the way
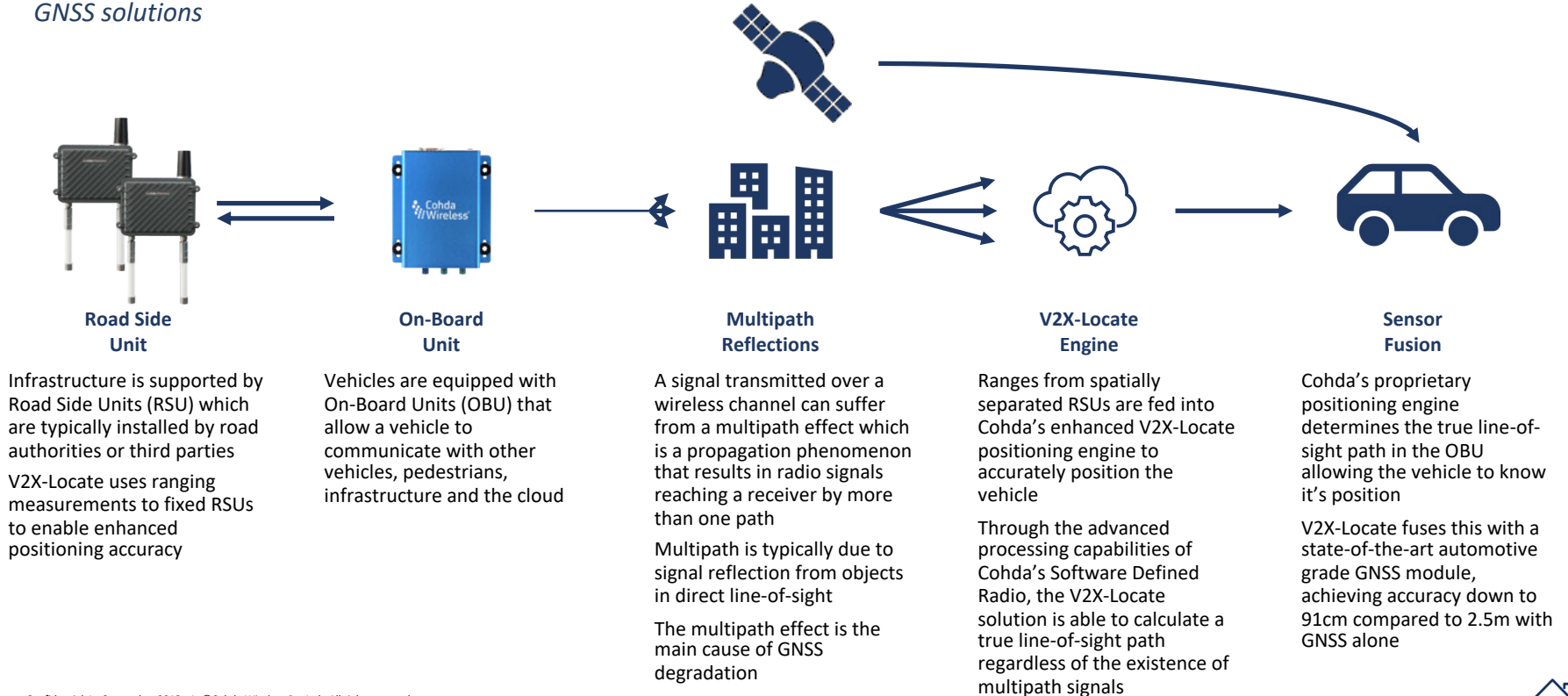

CAV App Description

- Cohda's mature suite of CAV-specific applications have solved critical CAV issues including localization, sensor fidelity and system cost

- The next generation of CAV application layer software provides car manufacturers with advanced cooperative perception solutions:
  - Green Light Optimized Speed Advise (GLOSA)
  - Platooning
  - Collision Avoidance

- Cohda's applications include multiple world firsts for the CAV sector, such as vehicle localization that achieves sub-meter accuracy working on existing Wi-Fi, DSRC or C-V2X infrastructure and a passive radar system that uses Wi-Fi, DSRC or C-V2X signals to sense the environment

CAV Solutions: V2X-Locate

Cohda's breakthrough positioning software achieves sub-meter location positioning and is over 275% more accurate than comparable GNSS solutions

Road Side Unit

Infrastructure is supported by Road Side Units (RSU) which are typically installed by road authorities or third parties

V2X-Locate uses ranging measurements to fixed RSUs to enable enhanced positioning accuracy

On-Board Unit

Vehicles are equipped with On-Board Units (OBU) that allow a vehicle to communicate with other vehicles, pedestrians, infrastructure and the cloud

Multipath Reflections

A signal transmitted over a wireless channel can suffer from a multipath effect which is a propagation phenomenon that results in radio signals reaching a receiver by more than one path

Multipath is typically due to signal reflection from objects in direct line-of-sight

The multipath effect is the main cause of GNSS degradation

V2X-Locate Engine

Ranges from spatially separated RSUs are fed into Cohda's enhanced V2X-Locate positioning engine to accurately position the vehicle

Through the advanced processing capabilities of Cohda's Software Defined Radio, the V2X-Locate solution is able to calculate a true line-of-sight path regardless of the existence of multipath signals

Sensor Fusion

Cohda's proprietary positioning engine determines the true line-of-sight path in the OBU allowing the vehicle to know it's position

V2X-Locate fuses this with a state-of-the-art automotive grade GNSS module, achieving accuracy down to 91cm compared to 2.5m with GNSS alone

CAV Solutions: V2X-Locate

Connectivity is the key to safer, smarter and greener transportation infrastructure and Cohda is leading the way

V2X-Locate

- V2X-Locate is unique to Cohda. It allows the vehicles to position itself with sub-metre accuracy relative to RSU's, even in tunnels, underground car parks and urban canyons where GNSS along is not sufficient. V2X deployment , vehicles equipped with OBU's, while infrastructure is supported by installation of RSU's.
- V2X-Locate uses ranging measurements to these fixed RSUs to enable enhances positioning accuracy.
- The ranges from spatially separated RSUs are fed into Cohda enhanced V2X Locate positioning engine to accurately position the vehicle. Through the advanced processing capabilities of Cohda's software designed radio the V2X Locate solution is able to calculate a true line-of-sight path regardless of the existence of multipath signals.
- Cohda's V2X Locate positioning system with sub-meter accuracy, over 275% more accurate than comparable GNSS solution.
- Performance exceeds SAE J2945 requirements (68% < 1.5m)

V2X-Locate NYC 6th Ave Test Bed

Percentile	Error
68	67cm
90	77cm
95	83cm
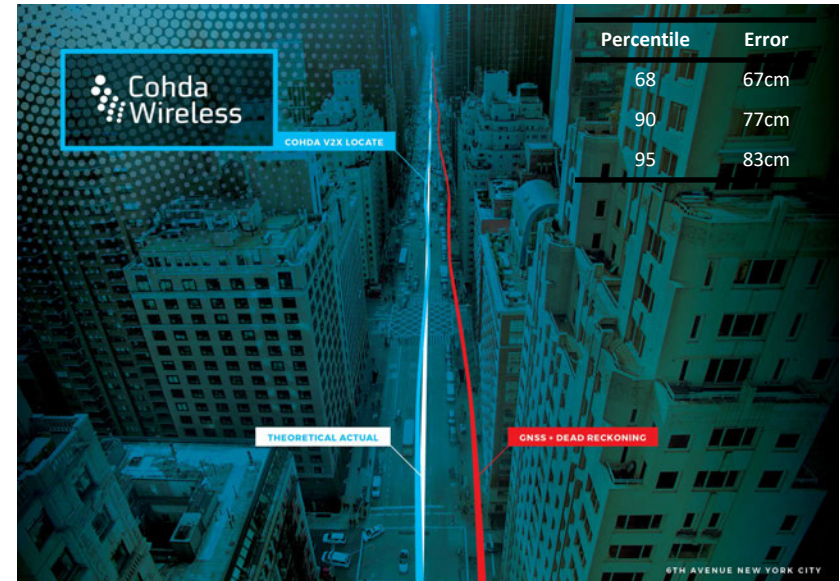
CAV Solutions: V2X-Radar

Cohda's V2X-Radar is a game-changing product that will deliver value for drivers of V2X-equipped vehicles, particularly in the early days when the penetration rate of V2X connected vehicles is low

V2X-Radar Description	V2X-Radar Example

- V2X-Radar uses standard V2X radio signals to sense the surrounding environment, transforming a standard V2X communications system into a 360 degree car radar

- V2X-Radar takes advantage of current V2X systems to detect radio signals as they bounce off objects (walls, road signs and other vehicles) while travelling from transmitter to receiver

- By knowing the position of the transmitter, the receiver and the environment, V2X-Radar can use the radio waves to identify objects within that environment, including non-V2X equipped vehicles

- Cohda's V2X-Radar delivers a new 360 degree sensor that can detect buildings, road signs and older vehicles while being unaffected by rain, snow or fog

- V2X-Radar is a passive radar system that can use DSRC, Wi-Fi, C-V2X, or LTE signals as illuminators
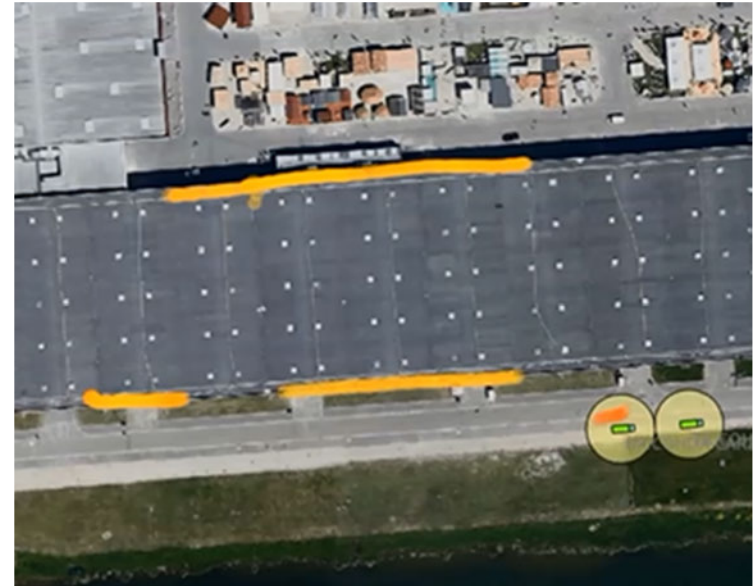
SAFER, SMARTER, GREENER CITY JOURNEYS

Smart Cities

The cities of the future need to be connected, supporting collaborative technology to make them safer and more productive.

Cohda's Smart City CAV Architecture uses foundation applications (such as Green Wave and Signal Priority) deployed to niche fleets (such as heavy vehicles, transit vehicles, and taxis) to directly impacting safety, congestion and pollution.

Cohda's Smart City infrastructure not only offers immediate benefits today, but makes roads CAV ready. Cohda's Smart City infrastructure provides the fundamental infrastructure enabling the cars of tomorrow to drive with the infrastructure of today.

Smart Cities

Cohda Wireless

Applications

More than 60 Applications like
- Hazard Location Warning
- Road Work Warning
- Green Light Optimization Speed Advisory
- Signal Violation Warning (red light violation warning)
- In-Vehicle Signage
- Curve Speed Warning
- Ice Road Warning
- SCMS/PKI Interface
- Vehicle Situation Awareness
- Speed Compliance (SC, SPD-COMP, SPD-COMP / Work Zone)
- Oversize compliance
- Evacuation Notification
- Freight Signal Priority
- Transit Signal Priority
- Platooning

Deployments

- C-Roads (Europe)
- Transport for NSW CITI trial
- Freight Signal Priority PoC in Sydney
- CITE Project (UK)
- C-ITS Corridor (NL/D/A)
- French SCOOP@F
- Safety pilot/ AACVTE
- Connected Vehicle Pilots: Wyoming, NY City - *example*
- Smart City- Columbus, Denver, Austin
- European Truck Platooning Challenge
- Trial: Peloton Platooning – *example*
- Trial: TfNSW Freight Signal Priority - *example*

Peloton Platooning Deployment

Cohda is proving V2V solutions to OEMs through truck platooning research and by providing the V2V connectivity that enables Peloton – the world's first truck platooning deployment

Overview

- Peloton is an automated vehicle technology company hard at work solving the two biggest challenges facing the $700 billion trucking industry: crashes and fuel use
- Trucks are connected using direct V2V communications allowing the rear truck to react immediately to the actions of the front truck
- By electronically coupling the trucks in this way, they accelerate and brake together and can safely operate at closer distances to form a platoon
- The Peloton System has proven savings of more than 7% when platooning using industry standard tests
  - 4.5% for the lead truck and 10% for the following truck
- Peloton selected Cohda to provide the V2V connectivity, which needed to be robust and reliable for trucks following closely at highway speeds

## Two-Truck Convoy Facilitated by Peloton's Platooning System

New York 6th Ave.

Cohda working with NYC to prove out the value of V2X Locate in GNSS challenged environment…the Urban Canyon of 6th Ave, resulting in location accuracy of <1m 95% of the time.

Overview

V2X Locate NYC 6th Ave Test Bed

- The utility of V2X Locate is particularly evident in GNSS challenged locations.
- V2X deployment , vehicles equipped with OBU's, while infrastructure is supported by installation of RSU's.
  V2X Locate uses ranging measurements to these fixed RSUs to enable enhances positioning accuracy.
- The ranges from spatially separated RSUs are fed into Cohda enhanced V2X Locate positioning engine to accurately position the vehicle. Through the advanced processing capabilities of Cohda's software designed radio the V2X Locate solution is able to calculate a true line-of-sight path regardless of the existence of multipath signals.
- Cohda's proprietary positioning engine determines the true line-of-sight path in the OBU allowing the vehicle to know its position with results: - GNSS performance significantly challenged
  - Cohda's V2X Locate positioning system with sub-meter accuracy, over 275% more accurate than comparable GNSS solution.
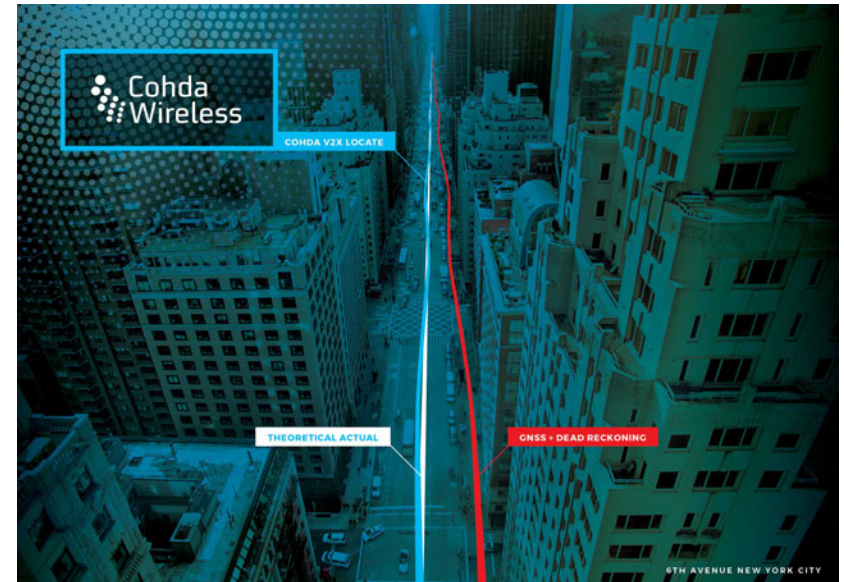
V2X & C-V2X

94 per cent of crashes involve human error, Cohda Wireless's company mission is to make roads safer and better, not just for drivers but the most at risk; motorcyclists, pedestrians, and cyclists.

V2X not only has the ability to eliminate or reduce the severity of up to 80 percent of non-impaired-driving crashes, but it can reduce congestion and create greener more efficient transport systems.

Cohda's SW is compatible with rel.14 3GPP

Cohda is working with all major cellular chip set suppliers

V2X & C-V2X

Applications

More than 60 Applications like
- Stationary Vehicle Ahead
- Emergency Elect. Brake Lights
- Intersection Collision Warning
- Emergency Vehicle Warning
- Traffic Jam Ahead
- Forward Collision Warning
- Blind Spot Warning
- Lane Change Assist
- Left Turn Assist
- Motorbike Approaching Warning
- Do Not Pass Warning
- Curve Speed warning
- Ice Road Warning
- Rear-cross Traffic Assist
- Transit Signal Priority
- Green Light Optimized Speed Advisory
- V2P Vehicle to Pedestrian

Deployments

- 2017 General Motors Cadillac CTS - *example*
- 2017 O-Bahn Bus – *example*
- 2018 NVIDIA DRIVE™ - *example*
- 2019 VW Golf
- 2019 VW Passat
- 2019 3rd OEM (still under NDA)
- Ducati Digital Shield Pilot
- Jaguar Land Rover Autonomous Trial – *example*
- Telstra V2X over LTE Trial – *example*

Cadillac CTS Deployment

Cohda's V2X software enables cooperation between vehicles and infrastructure to improve safety and mobility and provide a positive environmental impact

Overview

Cadillac CTS

- Cohda Wireless supplied General Motors with it's industry leading DSRC solution, comprised of 10 DSRC V2X applications including intersection collision warning, hazardous location warning and emergency vehicle warning
- The 2017 Cadillac CTS is the first OEM deployment of V2X technology and uses the Cohda-based DSRC solution and GPS to transmit and receive as many as 1000 messages per second from other vehicles as far as 300 meters away
- Cohda's V2X software provides 360 degree awareness by gathering and synthesizing data from sensors on nearby vehicles and roadside infrastructure to detect hidden threats by extending the horizon of awareness beyond what the driver can see

Public Transport V2X

Cohda Wireless has a proven suite of "Day One" applications that have become the industry standard in automotive V2X production and are already deployed on O-Bahn buses in Australia

Overview

- Cohda has deployed a V2X solution for 175 O-Bahn Buses in Adelaide, South Australia
- The V2X enabled buses are equipped with:
  - Collision avoidance on the track
  - Distance following warnings
  - Remote operation of boom gates
- Cohda has integrated V2X and Transit Signal Priority on Yarra Trams in Melbourne
- Cohda is a Member of the iMOVE CRC, an Australian Cooperative Research Center focused on ITS for transport and mobility
- Cohda is also a member of the Australian Integrated Multimodal Ecosystem (AIMES) Test Bed for buses, trams and autonomous vehicles

V2X Enabled O-Bahn Bus

Jaguar Land Rover Trial

With a proven suite of CAV products focused on the platooning of autonomous vehicles, Cohda is leading the way in fully autonomous off-roading

Overview

- Land Rover is creating a fleet of 100-plus research vehicles, with the aim of making fully autonomous off-roading the new norm
- Land Rover was eager to explore how connectivity would play a part in the future of four-wheel-driving
- The multi-million dollar autonomous all-terrain driving research project envisaged a self-driving car that can navigate both on-road and off-road, as well as in difficult weather conditions
- The key to success was Cohda's MK5 On-Board Units and software
- The Cohda-enabled wireless V2V communications system instantly shares information such as vehicle location, wheel-slip, changes to suspension height and wheel articulation, as well as All-Terrain Progress Control and Terrain Response settings between the two vehicles

Land Rover Off Road Connected Convoy

- Range Rover Off Road Connected Convoy Pilot

NVIDIA DRIVE^{TM} V2X/Video Fusion

Cohda's V2X software stack expands the abilities of a vehicle to allow it to detect threats beyond line-of-sight by fusing V2X with video-based target classification on an NVIDIA platform

Overview

- The NVIDIA DRIVE platform combines deep learning, sensor fusion and surround vision to enable autonomous driving
- The system is capable of understanding, in real time, the surroundings around the vehicle, precisely locating itself on a HD map and planning a safe path forward
- Cohda's V2X solutions, which support both wireless 802.11p and 5G mobile networks, provide cars with hidden threat detection by extending the horizon of awareness beyond what the driver can see or on-board sensors can detect
- The integration of Cohda's V2X solutions to NVIDIA DRIVE's system strengthens its ability to see beyond the vehicle-centric perspective by gathering and fusing data from sensors on nearby vehicles and roadside infrastructure – creating a much broader zone of awareness

NVIDIA DRIVE^{TM}

Telstra V2X over LTE Trial

Cohda, in conjunction with Telstra, is playing a pivotal role in developing CAV technologies over 4G and 5G networks

Overview

- Telstra believes its 4G and future 5G networks can play a vital role in supporting the faster rollout of intelligent transport systems and Connected Vehicle applications, making implementation of the technology cheaper and more efficient
- The South Australian trial confirms that 4G can support Connected Vehicle applications, which include:
  - Alerting a driver to roadworks ahead
  - Giving green light priority to high priority vehicles
  - Optimal green light timing, where the vehicle is informed of the optimal speed to approach a traffic light to get a green light when they arrive, therefore allowing a more continuous flow of traffic
- Cohda, in partnership with Telstra, successfully trialed Cohda's Connected Vehicle technology over Telstra's 4G network in South Australia, a pivotal first step in developing CAV technology

Telstra 4G Trial

ATP Automotive Testing Papenburg GmbH operates one of the largest and manufacturer independent automotive proving grounds for passenger and commercial vehicles in the world

Overview

- ATP has replaced their proprietary traffic control system with state of the art V2X using Cohda Wireless technology
- 30 RSU are installed on the track with 100% coverage
- In each car an OBU will be installed. In total 400 OBUs will be used
- The OBU reports the current position and in combination with the FCW the driver receives a warning about possible collisions
- Traffic Control Center software will be developed by ATP
- ATP is very interested using V2X Locate for improving positioning as soon as they have the base system running

Proving ground ATP Automotive Testing Papenburg GmbH

ATP: Automotive Testing Papenburg
FCW: Forward Collision Warning

ENHANCING SAFETY IN THE MOST CHALLENGING OF ENVIRONMENTS

Mining

As mining companies constantly seek a competitive advantage in a price sensitive industry, research shows that autonomous vehicle operations can increase productivity by 15 to 20 per cent and truck uptimes by up to a fifth.

Cohda Wireless has developed a range. Of mining specific solutions that offer safety and productivity solutions today, but pave the way for the autonomous mines of tomorrow.

Solving major subterranean positioning problems facing the industry. Cohda Wireless has become the supplier of choice to METS and mines.

Mining

Cohda Wireless

Applications

More than 20 Applications like
- Proximity and Collision Warning
- Forward Collision Warning
- Intersection Collision Warning
- Emergency Electronic Brake Light
- Hazardous Location Warning
- Stationary Vehicle Ahead
- Emergency Vehicle Warning
- Road Side Alerts
- In-Vehicle Signage
- Virtual Traffic Signal
- Clear Path Ahead
- Vehicle Location
- Personnel Location
- Asset Location

Deployments

- Rio Tinto Kennecott ,Utah - *example*

Rio Tinto Underground Trial

Cohda is playing a pivotal role in developing underground positioning technologies and applications

Overview

Kennecott Utah Copper (KUC) Trial

- Cohda's V2X Locate technology proving that it plays a vital role in supporting operations underground - reducing accidents and improving productivity
- The KUC trial confirms that V2X Locate can support standard surface applications optimized for underground tunnel use, which include:
  - Proximity and Collision Warning
  - Forward Collision Warning
  - Variable Speed Warning: where the speed limits can be set by the operational team for particular sections in the underground mine tunnel
- Cohda, in partnership with Roobuck, also successfully trialed Cohda's mining units MK5 XBU with equipment tags and personnel tags
- Fully functional proximity warning during network backbone power failure

Contact Us

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