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Marlene Dortch
Secretary
Federal Communications Commission
Office of the Secretary
445 12th St., SW
Washington, DC 20554

Re: Ex Parte Presentation of Kapsch TrafficCom's Investment in the Commercial Use of Dedicated Short Range Communications at 5.850-5.925 GHz Band (5.9 GHz) for Vehicle Safety, WT Docket No. 01-90 and ET Docket No. 98-95

Dear Ms. Dortch:

Pursuant to Section 1.1206(b) of the Commission's Rules (47 C.F.R. § 1.1206 (b)), notice is hereby provided in the above-referenced dockets regarding an *ex parte* presentation on October 29, 2008 by Kapsch TrafficCom U.S. to staff of the Public Safety and Homeland Security Bureau ("PBHSB"). Attending on behalf of Kapsch TrafficCom U.S. were Justin McNew and Suzanne Murtha. Attending on behalf of PBHSB were Brian Hurley; Greg Intoccia; Brian Marenco, Electronics Engineer; Uche Patrick, Engineer, Policy Division; Tom Beers, Chief, Policy Division; and Zenji Nakazawa, Associate Chief, Policy Division. Also attending were Tim Maguire, Engineer, Mobility Division Wireless Telecommunications Bureau.

The purpose of the meeting was to share Kapsch's plans for the deployment of 5.9 GHz-based systems for use for vehicle safety such as tolling and vehicle communications. Discussions included existing 5.9 GHz based tolling systems built by Kapsch, in both the United States and other parts of the world; plans for continued work on building 5.9 GHz based systems in the U.S. and success stories for existing test facilities in the U.S. In addition, parties discussed Kapsch plans for demonstrating multiple 5.9 GHz based systems at the 2008 New York World Congress.

Attached to this notice are copies of the handouts provided to Commission staff during the meeting. A copy of this notice is being provided to those attending on October 29, 2008.

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Kapsch TrafficCom

Introduction to FCC

October 2008

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Kapsch TrafficCom USA is the Sum of Technology and Experience

Kapsch

Kapsch TrafficCom Inc. (Carlsbad, CA)

Market Leading 5.9 GHz DSRC Solutions

Kapsch TrafficCom US Corp (Washington, D.C.)

Unmatched End-to-End Solutions for Tolling, Congestion Management

Next generation tolling & traffic management solutions

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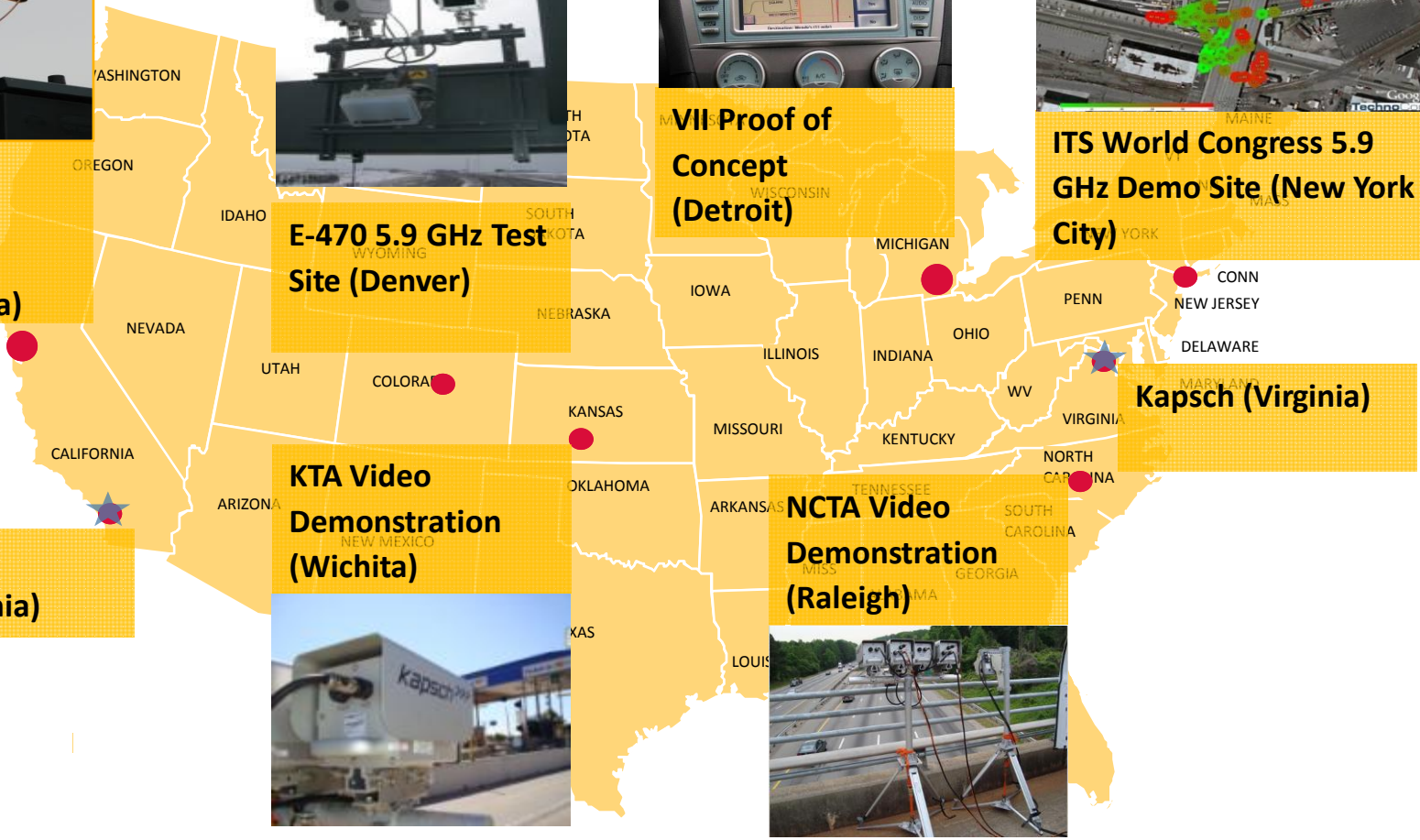
Kapsch throughout the USA

Connected Traveler & SafeTrip 21 (SF – Bay Area)

E-470 5.9 GHz Test Site (Denver)

VII Proof of Concept (Detroit)

ITS World Congress 5.9 GHz Demo Site (New York City)



Kapsch (California)

KTA Video Demonstration (Wichita)

NCTA Video Demonstration (Raleigh)

Kapsch (Virginia)

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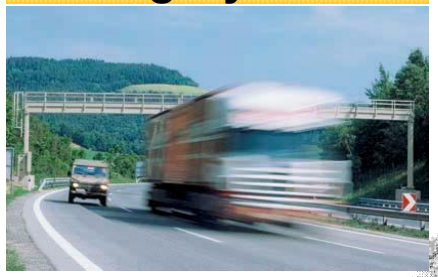
Kapsch as a Global Leader: 140 systems in 30 countries

Tolling Systems

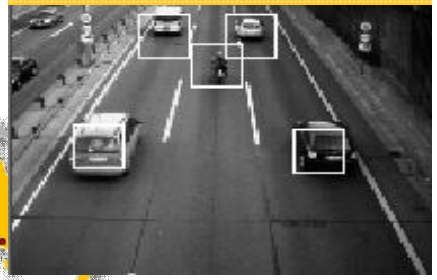


Urban Traffic Solutions

Operations

Components

Traffic



● Offices ■ References

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Fully Interoperable Solutions

Multi Platform Support

DSRC Systems

Cellular

GPS

Operations

Road Operations

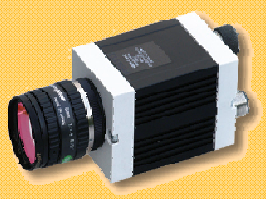
Enforcement System

Back Office System

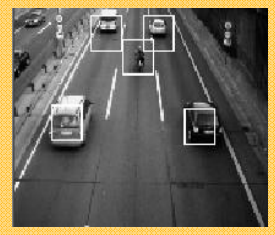
Components

DSRC Products

Video Solutions



Traffic Management



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Intensively Testing Solutions

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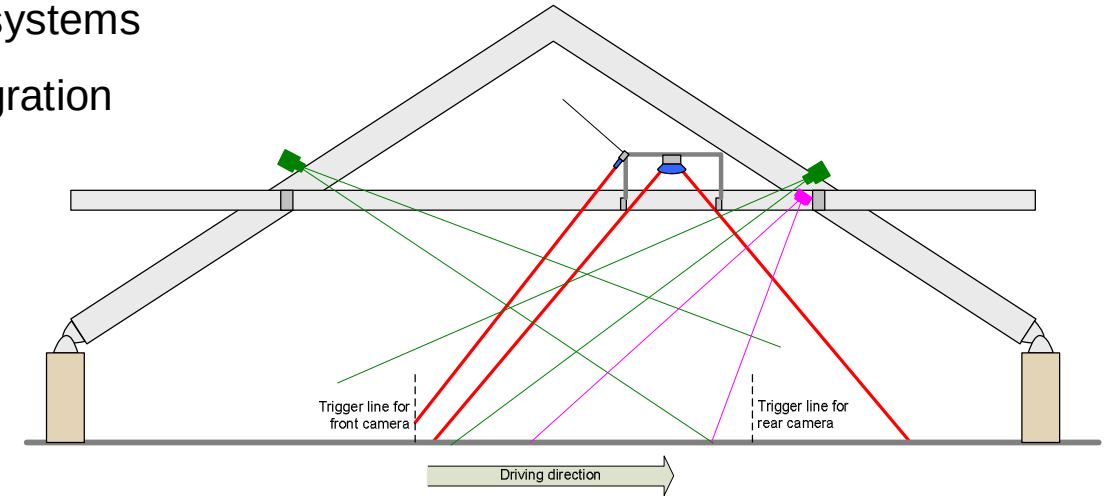
Interoperable DSRC Solutions

- 5.9GHz DSRC is an open standard technology providing robust bandwidth to enable active high-volume communication
- Provides new communication network capability spanning state and local boundaries for new era of interoperability
- 5.9 GHz DSRC is a natural fit for Open Road Tolling and road user pricing systems
- Open standards permits better integration of tolling and ITS on same
- Reduces infrastructure density

Example Installation from E-470



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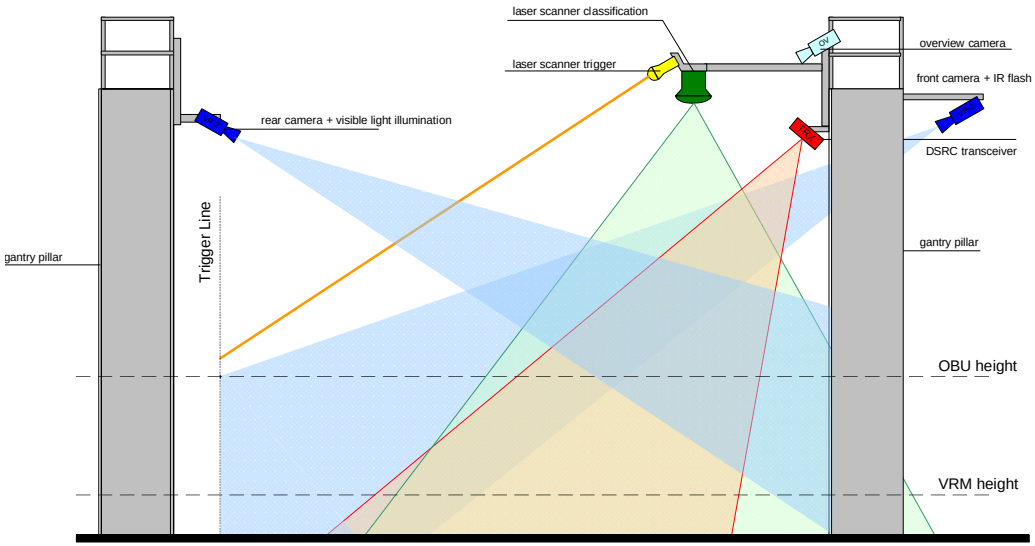
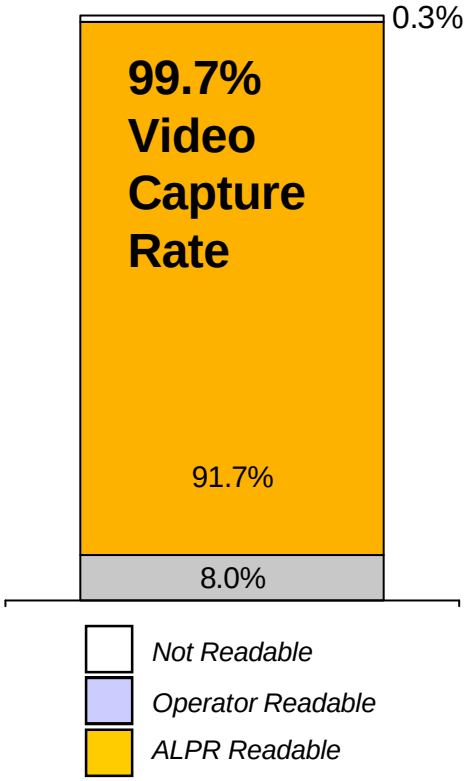
Robust Video Tolling Solutions and 5.9

- Robust video tolling solutions with high resolution Kapsch cameras that will aid a 5.9 based system
- The solution is optimized for each individual installation to guarantee highest possible performance rates



June 2008 Testing Results from North Carolina Turnpike Authority



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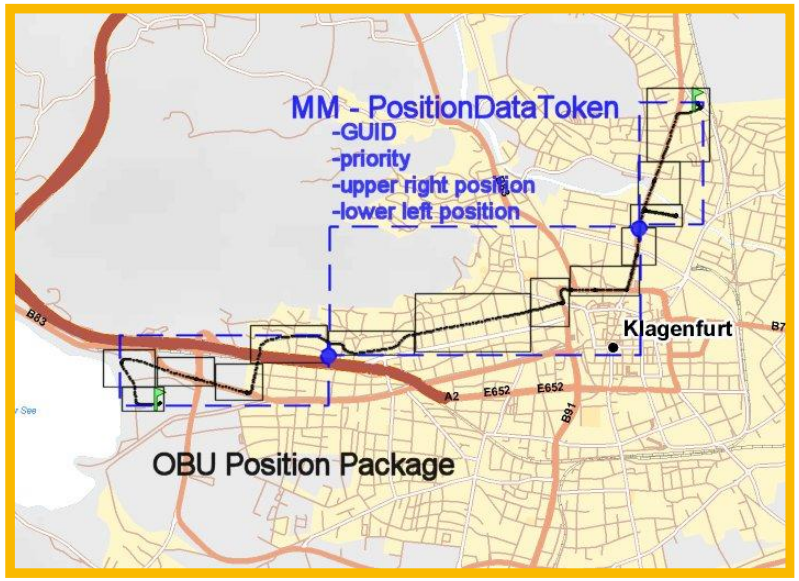
GPS and 5.9 Solutions for Wide Network Coverage

- Kapsch's GPS solutions utilize a Thin Client approach, which forwards GPS locations to a central back office instead of downloading maps of each travelled region
- There are no geo-mapping costs or downloads, which may slow down the system down and increase communication costs
- Will be combined with 5.9 GHz for a highly cost-effective system
- The GPS solution covers rural areas via a map-matching technique that approximates travel routes based on travel times and complete route



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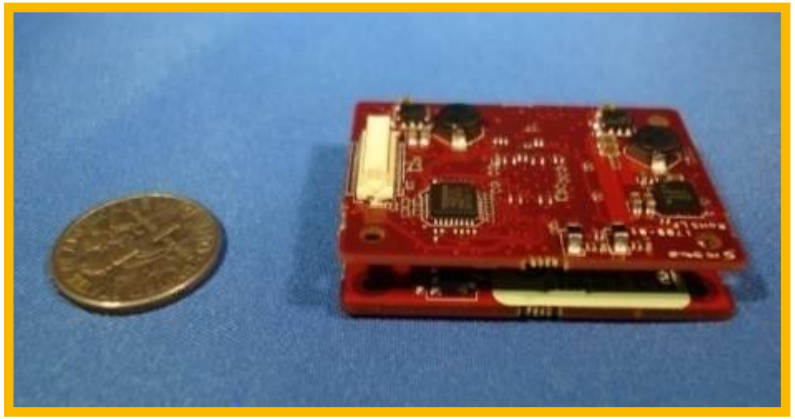
5.9 GHz DSRC Technology

- Kapsch is the only company worldwide providing 5.9 GHz DSRC technology and services for both the CVIS and VII Proof-of-Concept programs
- 5.9 GHz DSRC roadside equipment is installed in over 200 locations world wide
  - Detroit (100 units)
  - California (30 units)
  - New York City (45 units) – Tolling & VII demo at ITS World Congress 2008
  - New York State Thruway (18 units)
- 5.9 GHz DSRC OBUs are installed in over 400 trials globally
  - VII Consortium 5.9 GHz DSRC supplier
  - New York ITS World Congress
  - New York Commercial VII trial
  - CVIS program in Europe (ERTICO)



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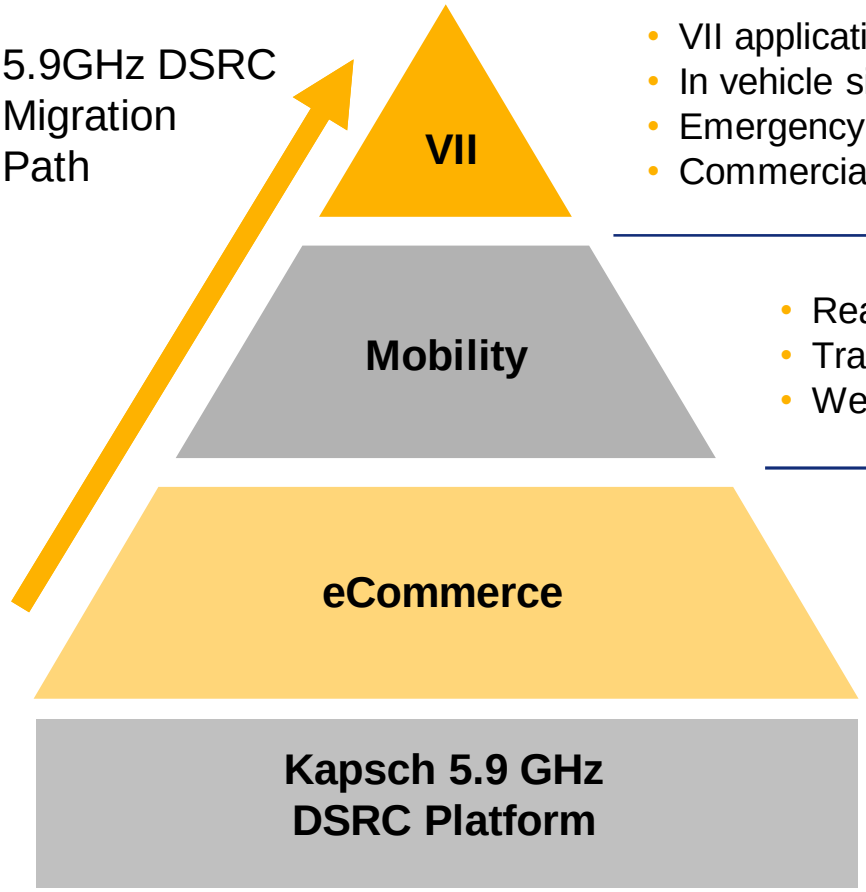
Integrated Mobility Applications and VII

5.9GHz DSRC Migration Path



- VII applications such as crash avoidance
- In vehicle signing
- Emergency vehicle traffic signal pre-emption
- Commercial vehicle inspection

- Real time traffic info (Signal timing, Traveler info)
- Traffic signal priority for transit vehicles
- Weigh in motion

- Tolling & HOT Lanes
- Payment systems (Parking, Gas/Food Payments
- Infotainment

- The 5.9GHz DSRC open standard enables a series of applications that leads to advanced safety functionality via VII
- 5.9 GHz co-exists peacefully with legacy systems

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5.9 GHz is the Step Beyond Legacy 915 MHz Systems

915 MHz Legacy Systems

- Legacy 915MHz systems has limited accuracy - it cannot locate a tag within a particular lane
- 915 MHz has limited bandwidth and incompatible proprietary technologies
- In order to enable ORT, 915 MHz involves high infrastructure costs

5.9 GHz DSRC

- 5.9 GHz systems deliver superior technical performance - locating a tag to within +/- 5 cm accuracy
- 5.9GHz has high bandwidth and an open standard, enabling multi-lane-free-flow tolling and added application on one cost-effective infrastructure base

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5.9 GHz DSRC Delivers Significant Advantages over 915 MHz

- 5.9GHz delivers superior technical performance due to greater bandwidth, range, bi-directional communication, and security

	5.9 GHz	915 MHz
Protocols	IEEE, open standard (802.11p)	Multiple versions, many proprietary
Largest Data Rate	3 MBit/s to 27 Mbit/s & 54 MBit/s (w/ 2 channels)	In the range of 500 Kbits/s
Range	Up to 1,000 meters	Approximately 10 meters
Max. Transmit Power (EIRP)	+ 33 dBm (2 W)	+ 33 dBm (2 W), + 36 dBm (4 W)
Competitive multi-vendor market	Expected: Standard open to all vendors	Limited to Title 21 suppliers
Reliability of bi-directional data	High. Designed to meet these requirements	Weak
Capabilities to shape communication zones	Very good	Limited
Size of antennae	Smaller	Larger
“Built-in” localization capabilities	Very good	N/A
Security & Encryption	Up to 256 bit AES encryption	Weak or not implemented

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Superior Performance and Added Functionality

User Benefits

Safety
- VII collision avoidance applications

Reduced Congestion
- Real time traffic info, including signal timing and signal priority for transit vehicles

eCommerce
- Payment applications (Parking, roadside purchases)
- Infotainment

Banking-grade Security
- Security that protects user privacy for payments and related applications,

5.9 GHz DSRC System

Agency Benefits

Maximum Tolling Revenue
- Interoperable free flow tolling & future related applications
- Variable pricing

Open Procurement
- Interoperability creates open procurement from multiple bidders in competition

Mobility
- Lane localization enabling HOT lanes & congestion management

Scalability
- Applications & systems are combined seamlessly
- Cross-border revenue sharing

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Denver E-470 Independent Test Bed

The E-470 test-bed has been operational since February 2008; Southwest Research Institute independently tested the system from August 25 to September 5, 2008

E-470 Performance
(Vehicles Tolled as % of Traffic Volume)

- 5.9 GHz DSRC performance:

  Sample: 10,526 transactions

  5.9 GHz DSRC performance of **100%**

- ALPR performance:

  Human Readable Rate of **98.30%**

  Of 10,828 human readable images, **93.84%** were correctly read by the ALPR system

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Kapsch and SafeTrip 21

- Kapsch's solution is providing the infrastructure for SafeTrip 21 in California and New York (World Congress)
- SafeTrip 21 application integration with New York infrastructure
- Enabling California-based deployment of SafeTrip 21
- Enabling applications development for SafeTrip21

2008 New York

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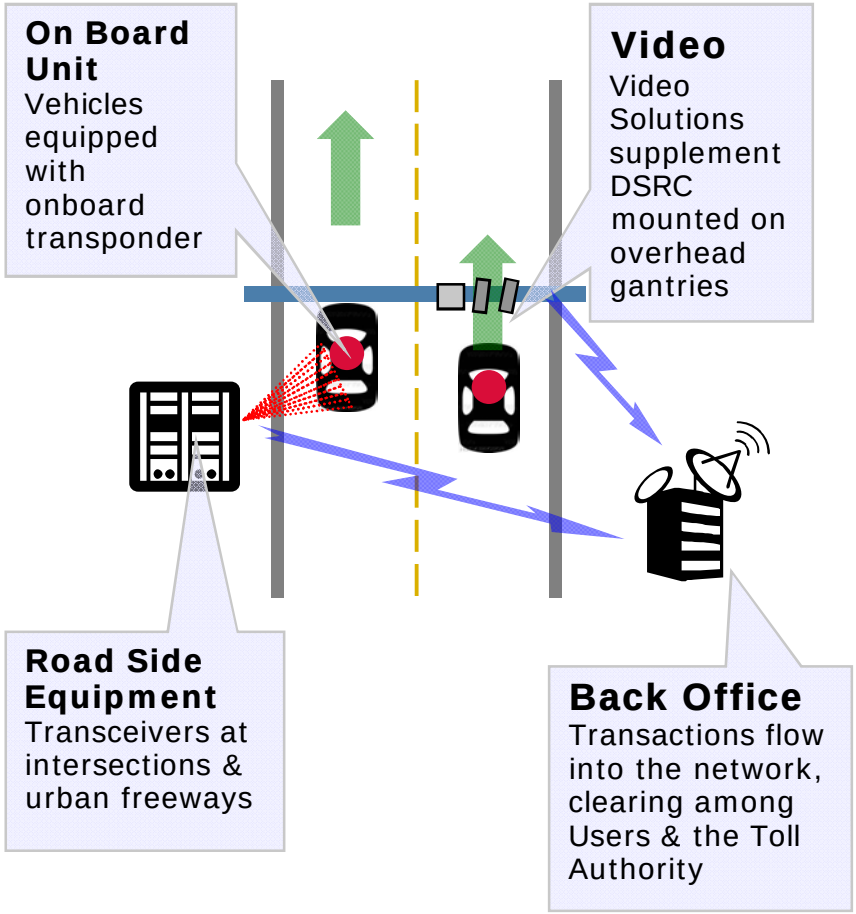
Road Tolling Solutions to Maximize Revenue

Kapsch 5.9 GHz DSRC Tolling Solution



- 5.9 GHz DSRC superior performance drives a more accurate, higher capacity system
- Kapsch's leading tolling performance is driven by leading vehicle capture/read rates and enforcement
- Higher capture rates maximize revenue to agency
- With greater bandwidth and speed, 5.9GHz DSRC clears large transaction volumes in less time than legacy systems

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Flexible Variable Pricing Scheme

HOT Lane Variable Pricing

- Kapsch's Self-Declaration Tag allows drivers to declare occupancy at the press of a button
- Declared vehicle occupancy allows the HOT system to use variable pricing: the toll can be priced based on
  - Number of passengers
  - Time of day, and/or
  - Degree of congestion

Open Road Tolling Variable Pricing

- Variable Pricing in ORT is based on factors determining pricing at the lane level, relayed to the driver through message signage
- Key factors include:
  - Distance Traveled in ORT
  - Vehicle Multiplier
  - Axle count,
  - Vehicle weight,
  - Emission class
  - Road type, location
  - Peak hours, day of week, holiday

HOT Variable Pricing Functionality

HOV 1	$2.50
HOV 2	$1.50
HOV 3+	Free

Example Off-Peak Toll Pricing

HOV 1	No Entry
HOV 2	$3.00
HOV 3	$2.50
HOV 4+	$1.00

Example Peak Toll Pricing

Tolling Variable Pricing Functionality

2 AXLE	$0.00
3 AXLE	$4.00
4 AXLE	$8.00

Example Axle-Based Variable Toll Pricing

WEEK	$2.50
SAT	$1.00
SUN	$0.00
RUSH HR	$4.00

Example Day/Time Variable Toll Pricing

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Shared Systems: Leverage Functionality and Cost Savings

Shared infrastructure:

- Control Centre/Traffic Management Centre
- Civils and Utilities
- Communications Network
- Roadside Cabinets
- Gantry and structures
- CCTV Video

Shared Sensor Equipment:

- Detection/presence
- Vehicle count,
- Traffic flow/speed,
- Traffic mix,
- Probe vehicles,
- Vehicle width/height detection
- DSRC for tolling/communications

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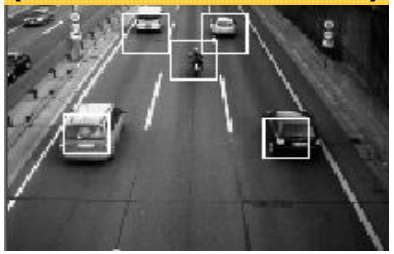
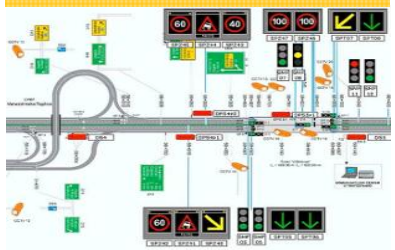
Active Traffic Management using 5.9 GHz DSRC and VII

Traffic Monitoring (Telematics, ETC, Video)



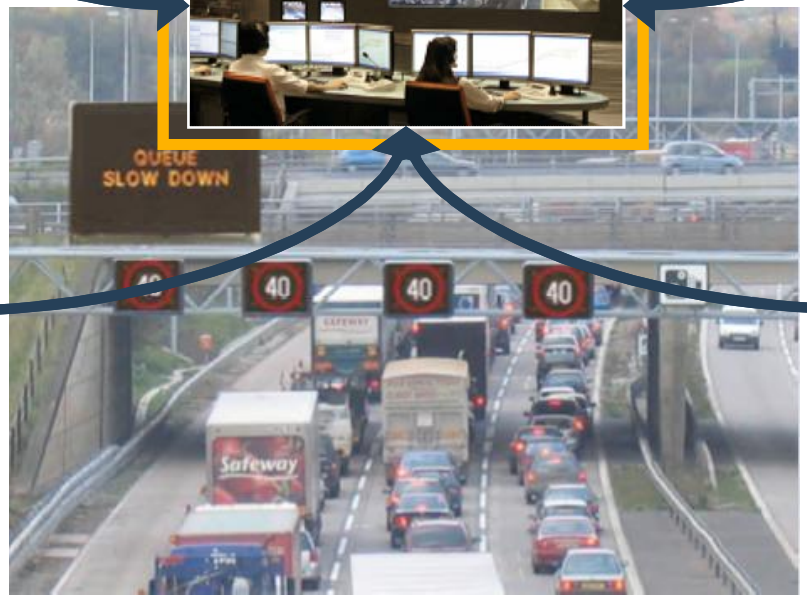
Traffic Signal Control



Traffic Management Center

Incident Management

Traffic Weather Information Systems



HOT/ Managed Lanes

Connectivity & Safety

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Compelling Cost-Benefit Analysis

ATM and Managed/HOT Lanes benefits include:

- Improved safety
- Reduced congestion
- Provide more reliable journey times
- Reduce impact of incidents and congestion
- Improve driver comfort
- Improve the environment
- Singularly or combined, provides benefits

Cost-benefit performance of ATM Combined with Managed/HOT Lanes*

	Demand			Supply
Application	**Active Traffic Management**	**Managed / HOT Lanes**	**Combined ATM + Managed HOT Lanes**	**Motorway Widening**
Costs Base	£5.6 M/km ($10.5M/km based on M42 cost data)	£1.8 M/km ($3.4 M/km)	£6.4 M/km ($12M/km)	£18 M/km to £25 M/km ($34 M/km to $ 47 M/km)
Cost Benefit Ratio	**6.8**	**8.3**	**18.4**	**2.3**

* Based on Cost Benefit Analysis by Booz & Company

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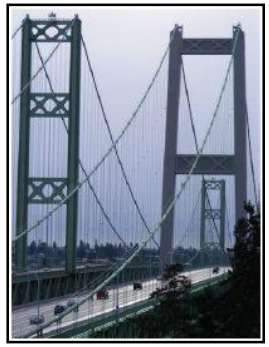
5.9 GHz can Seamlessly Integrate with Existing Infrastructure

Current Situation	Peaceful Co-Existence	Legacy 915 MHz Phase-Out	Total 5.9 GHz systems enabling Next Generation Solutions
• 915 MHz systems currently in place	• 5.9GHz easily and seamlessly installed next to legacy 915 MHz systems • Proven zero interference	• Users gradually migrate to 5.9 GHz tags and accounts • Added functionality increases with migration	• 5.9GHz DSRC handles 100% of traffic • The tolling platform is now able to deliver value to all users • Future applications including VII bolt-on seamlessly



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