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Can valuable ITS data be delivered using machine vision technologies?

www.alliedvision.com

Proposed Agenda

- What is ITS
- ITS the past present and future
- How does it differ from machine vision?
- The landscape of the future
  - What will impact the delivery of visioning technologies
- The availability of data from a camera
- How can that data be used
- To answer the question

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What is ITS?

What is ITS?

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Intelligent Transportation Solutions

What is ITS? - Traffic

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Anything using technology and intelligence to further improve travel, congestion and/or the traveling experience.

- Advanced Traffic Management Systems (ATMS)
- Advanced Traveler Information Systems (ATIS)
- Open Road Tolling
- Lane Control Systems
- Signaling Systems
- Red Light Running
- Speed Enforcement
- Lane Obstruction Detection
- Wrong Way Runningn
- Weather Detection and Reporting
- Variable Speed Controls
- Automatic Accident Detection
- Integrated Corridor Management
- Connected Vehicle
- Smart Mobility/City

Current Markets

Longer-Term Markets

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ITS, the Past, Present and Future

The Past, Present and Future

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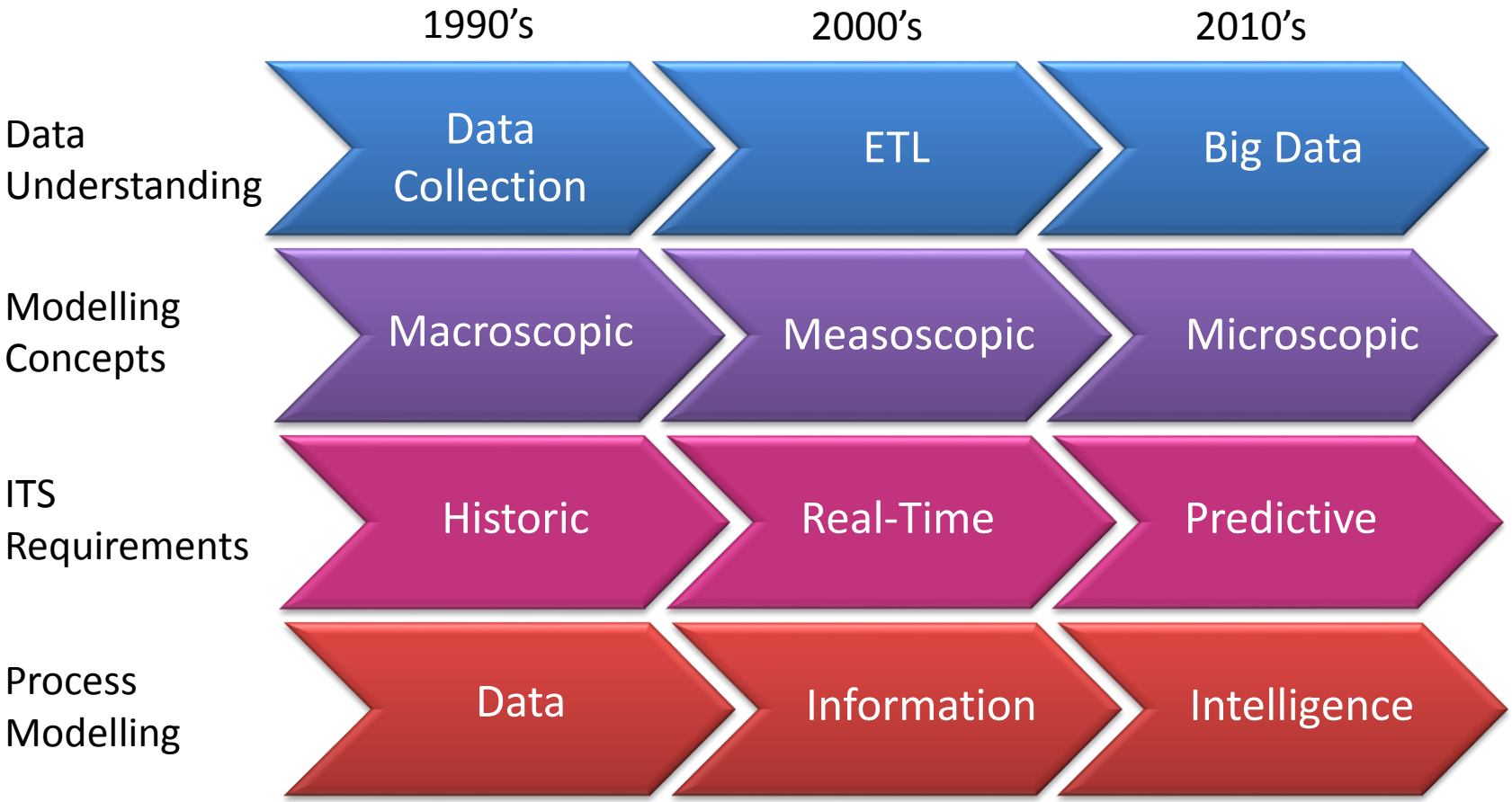

Understand Current Sensor Capabilities

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Traditional Sensor Technology is not working

1. Loops – not robust only, high percentage non-operational – limited data
2. Magnetic pucks – Purported to have a 7yr MTBF
3. Radar – do not identify a particular vehicle
4. Toll tag readers – Identify vehicles – but most roads are not toll roads
4. Blue tooth sniffing – about 10% penetration – many issues with picking up signals from buses, trains traveling in parallel to roads, pedestrians and cyclists
5. GPS Floating Vehicle Data (GFVD) - Expensive – only 4% penetration – Freeways and Arterials – poor data quality during issues and incidents
6. Cellular Floating Vehicle data (CFVD) – Expensive – up to 10% penetration (during normal hours) – cannot differentiate a specific road within high network environments, such as a freeway and frontage road
7. Cameras – Can provide Speed, Occupancy, Volume, Classification and a host of other services.

Not robust
Does not identify a specific vehicle

Vehicle identification but limited penetration

Only available technology to identify every vehicle

GFVD – GPS Floating Vehicle Data

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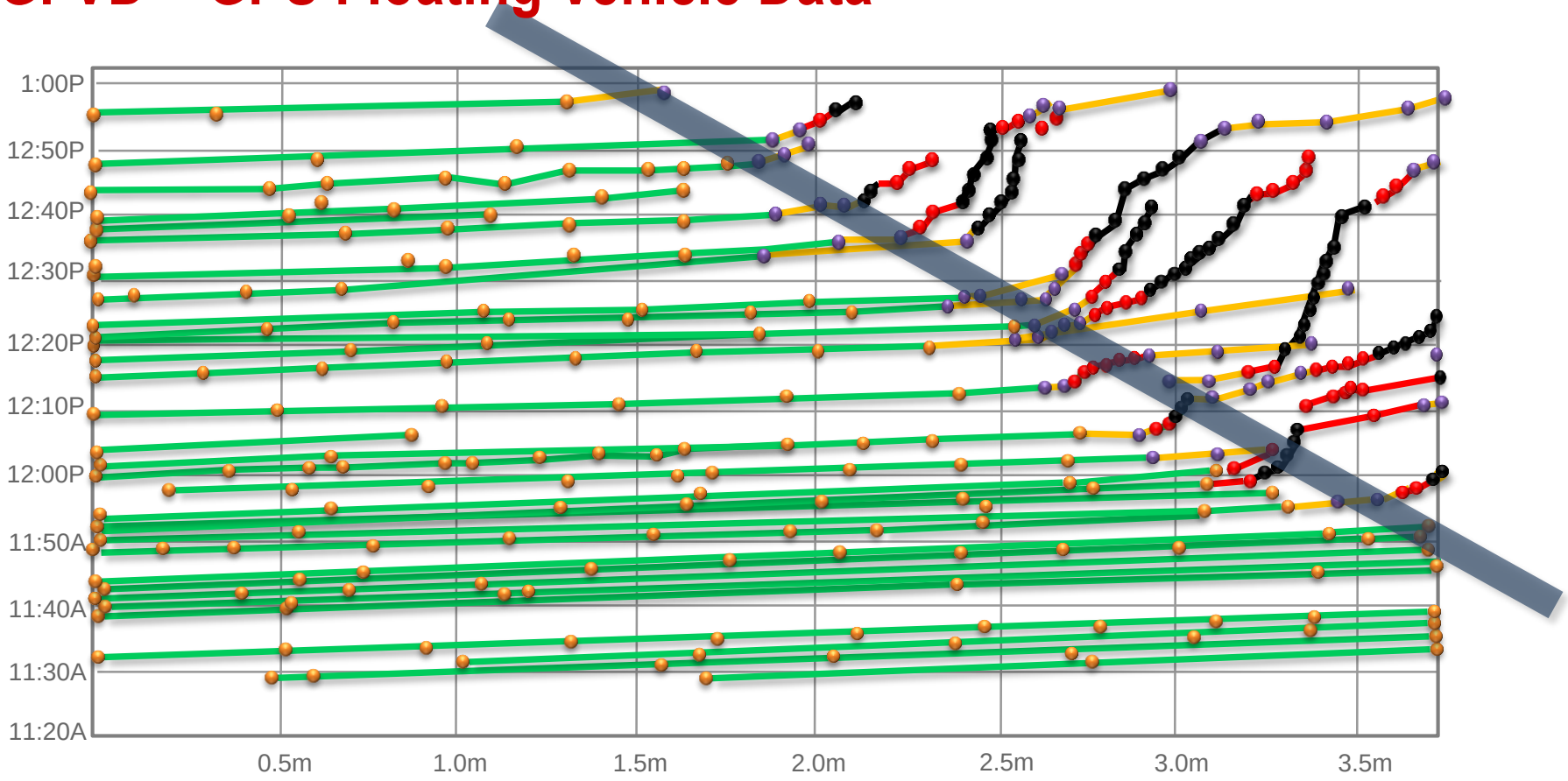
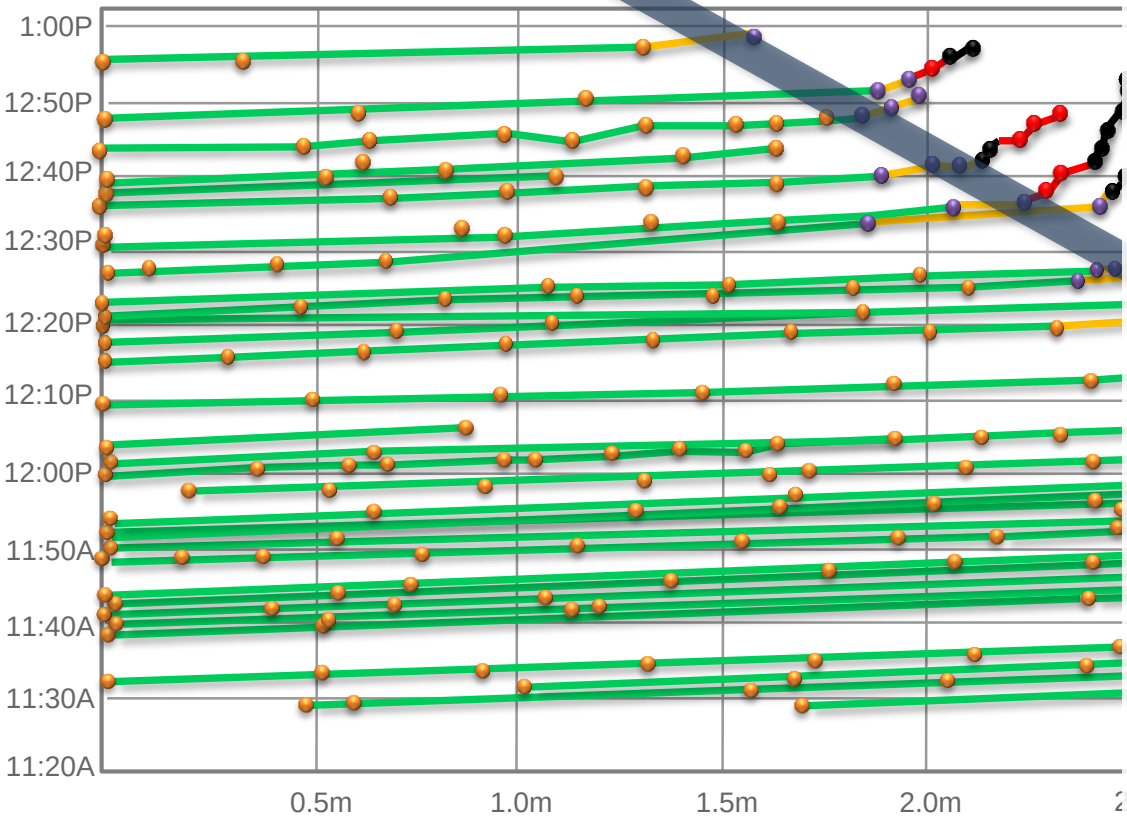


GFVD – GPS Floating Vehicle Data



- Rich data availability
- Speed
- Volume
- Can Clearly identify flow
- Can identify Prediction

- Statistically representative?
- Most accurate at peak flow
- Arterial Assessment?

CFVD – Cellular Floating Vehicle Data

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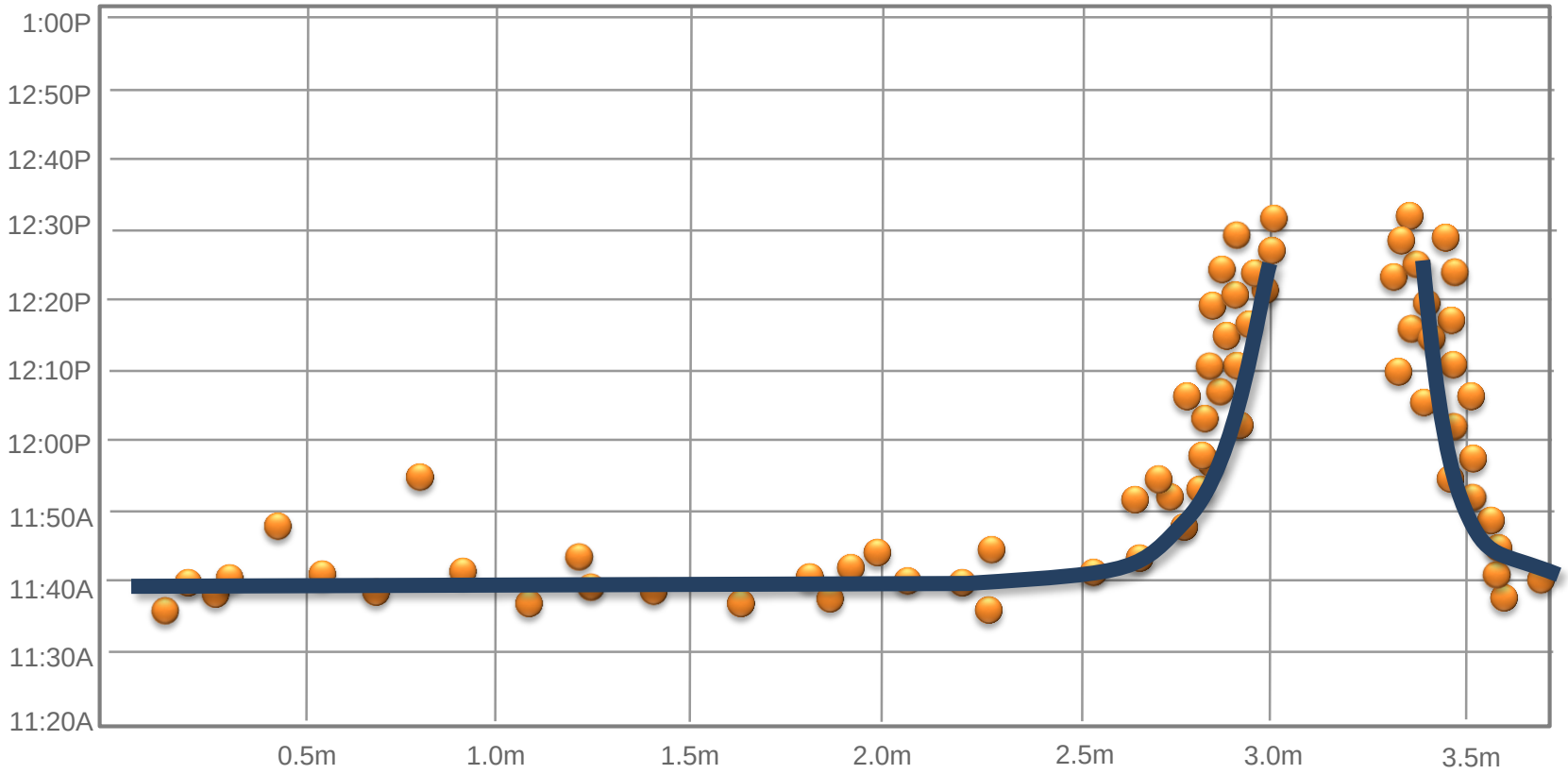
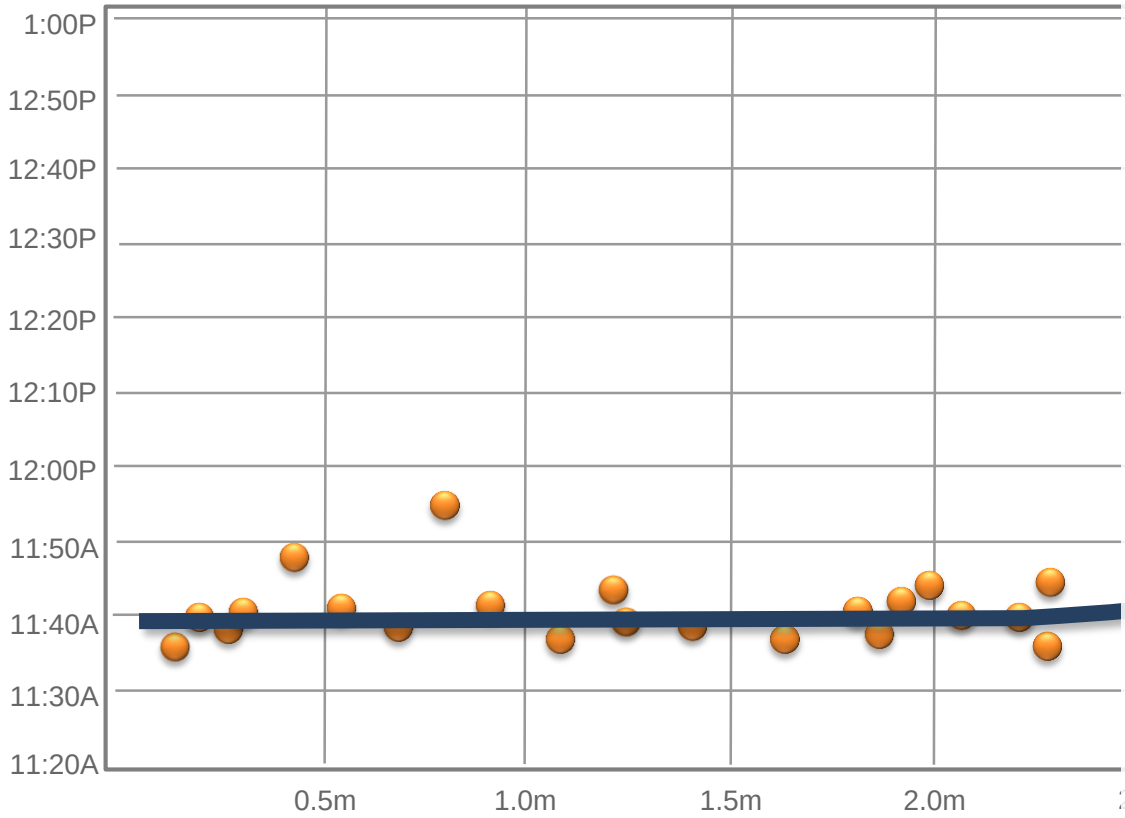


CFVD – Cellular Floating Vehicle Data



- Rich data availability
- Speed
- Volume
- Can Clearly identify flow
- Can identify Prediction
- Phones don’t have to be on

- Statistically representative?
- Most accurate at peak flow
- Arterial Assessment?

ALPR – Automatic License Plate Recognition

POP8 -VA

K16754 -VA

WQ786 -MD

LU123Y -TN

PP453Y -MD

FJ897Y -CA

How is Machine Vision different from ITS?

So what does ITS Need Specifically?

- IP Platform
- Compression H.264, Mpeg4, MJPEG
- Firmware – Pixel correction, color correction etc.
- Linux and/or Windows?
- Sensor requirements – HDR, Fast Shutter, 30FPS, Low Lux, Mpixels?
- Integrated communications options
- Extended Temperature Range -40 - + 65C
- IR lighting arrays

ITS Summary

ITS is a very different market, requiring very different product philosophies.

It requires

- Different hardware
- Different software
- Different applications

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The Landscape of the Future

Understanding the Market Drivers

- MAP-21 – focusing on quantified improvement
  - Travel time reliability
  - Average speed by time of day
  - Average volume by time of day
  - Incident resolution and management
- More cameras being used in open road tolling systems than ever before
- More cameras being used in safety applications than ever before
- The World is suffering from congestion meltdown forcing organizations to invest in:
  - Congesting charging
  - Integrated corridor management
  - HOT/HOV lanes
  - Average speed
  - Freight user charging
  - Open road tolling

These all require MV / imaging technology to be successful

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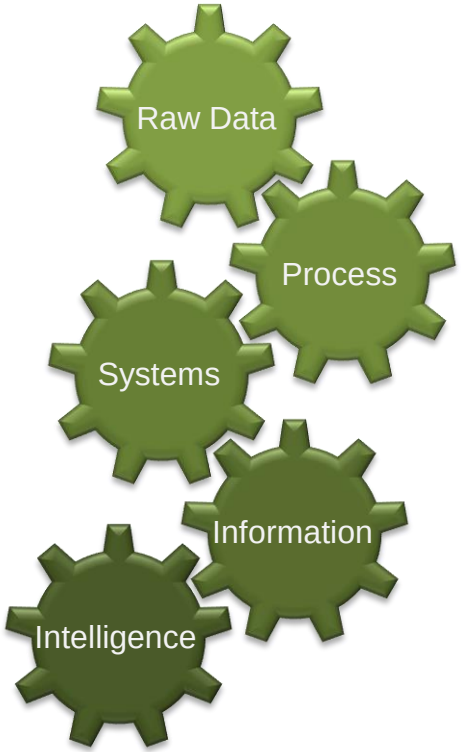
The Road to Improvement

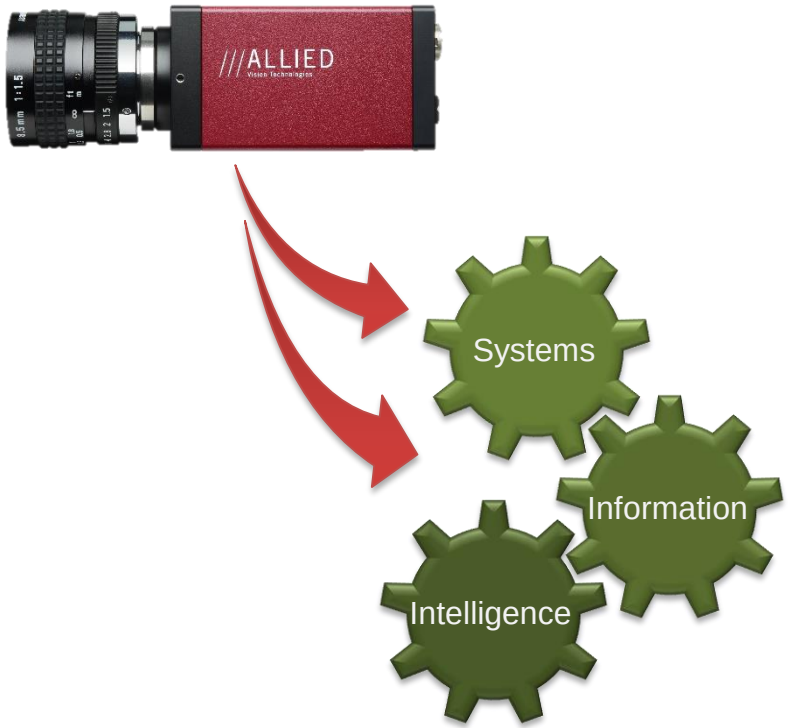
Current ITS Process Flow

- Raw Data – ITS Infrastructure
- Process – Cleanse, Verify, Validate
- Systems – Ingested ATMS/ATIS
- Information – Real-time position
- Intelligence – Actionable
  - Prediction
  - Decision Support
  - Automated Systems
    - DMS Signs
    - Variable Speed Controllers
    - Variable Traffic Light Phasing



Current ITS Process Flow

- Integrating Clever Software
  - Speed
  - Occupancy
  - Volume
  - Classification
  - Wrong-Way Running
  - Pedestrians on Road
  - Cyclists on Road
  - Debris on Road
  - Over height Vehicles
  - Hazardous Materials



In Conclusion

Can Valuable Data be delivered using Cameras?

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- Without any doubt.
- Not only can it, but I believe it will become the defacto standard for all ITS data collection in any country enabling ANPR
- With the integration of ANPR and camera technologies there will be:
  - More data
  - Better quality data
  - More comprehensive data
  - More data availability
- Providing:
  - The opportunity of a microscopic model
  - The opportunity of valuable predictive services
- And Thereafter
  - The opportunity to truly manage our roads efficiently
  - The opportunity to better manage congestion
  - The opportunity to fully identify where capital road building projects are absolutely essential

Thank you all for listening

Any Questions?

Jorgen Pedersen
Business Development Manager (ITS)
Allied Vision Technologies
Jorgen.Pedersen@AlliedVisionTec.com
+1 978 394 0563