



ODVA
2007

CIP Networks Conference
and 12th Annual Meeting



CIP and Dutch Roads

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**General Session and
Annual Meeting of Members**

www.odva.org

CIP Networks in Action

Presentation

- ▶ Overview of the Players: Dutch Ministry of Transport, Public Works and Water Management (RWS), Astrin, Brimos
- ▶ Overview of the Market: 1998
- ▶ Brimos Objectives 1998 and beyond
- ▶ Why CIP Was Chosen
- ▶ Technical and Equipment Specs
- ▶ Applications in Detail: (A), (B), (C) and (D)
- ▶ Plans for the Future

CIP Networks in Action

Dutch Ministry of Transport, Public Works and Water Management (RWS) business philosophy:

- ▶ Move towards *commercial off-the-shelf* equipment
- ▶ Tender with functional specified project equipment
- ▶ Construct and design tenders
- ▶ Enforce European legislations
 - Machine directive
 - EMC directive
 - Variable Message Signs directive
 - Fixed signs directive

CIP Networks in Action

ASTRIN (Association of Traffic Industries in the Netherlands, branch organization)

► Objectives:

- **Keep** the public highway **traffic possible** by:
 - Supporting the road authority in improving the circulation of traffic
- **Put** efforts into:
 - **Encouraging** members to work together in a collaborative process
 - **Liaising** with Connekt/ITS organization
 - **Liaising** with Ministry of Transport, Public Works and Water Management
 - **Improving** the professionalism among government authorities in **tender practise**
 - **Informing** the industries about new legislation and Standardization like Data communication standards
- **Induce** Public Tender processes to be professional and open

CIP Networks in Action

Brimos (Traffic Guidance Equipment)

- ▶ OEM of
 - Static and electronic signs, for urban areas and roads
 - Mobile guidance and information trailers / systems
 - Traffic monitoring and guidance systems
- ▶ Funded in 1963
- ▶ ISO 9001:2000, EC 12966 certified.
- ▶ Today ~ 75 employees, sales & marketing, engineering, manufacturing, service & support and assembly facilities
- ▶ Present markets
 - The Netherlands, Belgium, Sweden and Poland
- ▶ Customers
 - Dutch government related road administrations, country wide RWS (Ministry of Transport, Public Works and Water Management), province and local councils,
 - Roadwork contractor companies
 - Traffic equipment rental companies

CIP Networks in Action

Brimos OEM business strategy

- ▶ **Steadily expanding** the present market share of fixed signs
- ▶ Selling traffic equipment, **interfacing** connectable via **open** object-oriented **standards**
- ▶ **Integrate Brimos equipment** in projects using *commercial off-the-shelf* industrial controllers and SCADA systems
- ▶ **Induce pro-active standards** via traffic related organizations, work groups and customers
- ▶ **Expanding** business in the **European Community**

CIP Networks in Action

Market status: End of 1998

- ▶ **Installed base RWS, MTM** (Motor Traffic way Management System) since 1970's in place
 - More than 18.000 actuators (Traffic lane signaler) and sensors (Inductive Loops) installed since 1975, mainly on the west coast, replacement market and increase of new systems
- ▶ **Closed markets** due to missing open specifications
- ▶ **Market domination** by 3 players
- ▶ **Brimos** was one of the 5 Dutch and 4 Foreign actuator manufacturers
- ▶ **Lamp/Fiber optical** technology is merging to **LED**
- ▶ **New way of Public tenders**, functional design & construct

CIP Networks in Action

Brimos Objective

- ▶ **From November 1998**
 - Investigate the present Communication Network market players
 - Object oriented
 - Organized as a Global body
 - Installed base
 - Architecture philosophy
 - **ODVA** was the most promising architecture and had the most experienced sponsors and members
 - Take pro-active part in the **RWS - ASTRIN** meetings with the intend to open the market for market players as **Brimos**



CIP Networks in Action

Brimos Objectives (toward open standards)

- ▶ Consider **ODVA's** open network standards in order to open the closed market in The Netherlands
- ▶ Presentations to customer RWS
 - Using one standard (CIP) will save costs in
 - Functional specification phase
 - By using COTS products
 - Ease of architecture (all equipment can talk with each other)
- ▶ Introduce the solutions to the market players
- ▶ Obtain Pilot Projects
- ▶ Position Brimos as quality actuator and sensor OEM

CIP Networks in Action

CIP Network Benefits

- ▶ Vehicle detectors are able to send data based on **events** and not on polling mechanisms
 - Made possible by use of Carrier Sense Collision Detection
 - Producer and Consumer Architecture
- ▶ Seamless **fieldbus** to **EtherNet LAN/WAN** networks
 - CIP on all type of networks
 - From local **field bus** Actuator and Sensor on Gantries (roadside controller) to higher **Local Area Networks**
- ▶ Standard, unmodified EtherNet
- ▶ Installed base

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CIP Networks Challenges

- ▶ Some Dutch customers (councils) felt it was not as experienced as a European standard

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The Process for Decision

- ▶ Since November 1998
 - ODVA and local ODVA supporter was approached
 - RWS – ASTRIN Network Interface **Workgroup I** was founded
 - No result
 - Participants: Siemens, Vialis, TPA, GTI, Imtech and Brimos,
 - RWS – ASTRIN Network Interface **Workgroup II** was founded
 - No result,
 - Participants : RWS, Siemens, Vialis, TPA, and Brimos,
 - RWS – ASTRIN Network Interface **Workgroup III** was founded
 - DeviceNet (CIP) was proposed, also based on an RWS study where EtherNet/IP was advised (2004)
 - Participants : RWS, Peek Traffic, Zelisco and Brimos,
 - Proposal was overruled by Internal RWS and Profibus DP was selected as standard; the DeviceNet I/O map was used
 - RWS – ASTRIN Network Interface **Workgroup IV** was founded
 - EtherNet/IP was advised
 - Participants ea : Brimos, CSC, Imtech, Ko Hartog, Futurit (Swarco), Sues NL, Siemens traffic NL, TPA, Vialis and Zelisco NL.
 - RWS accepted the advice for EtherNet/IP 2007.12.21
 - ASTRIN Network **EtherNet/IP project group** was founded
 - An ASTRIN Proposal was made how to fund and maintain EtherNet/IP object definition for traffic equipment.

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Equipment Used by Brimos

- ▶ Cisco Systems
- ▶ Hilscher intelligent Allen-Bradley I/O modules
- ▶ HMS interface modules
- ▶ Rockwell Automation/Allen-Bradley Controllers

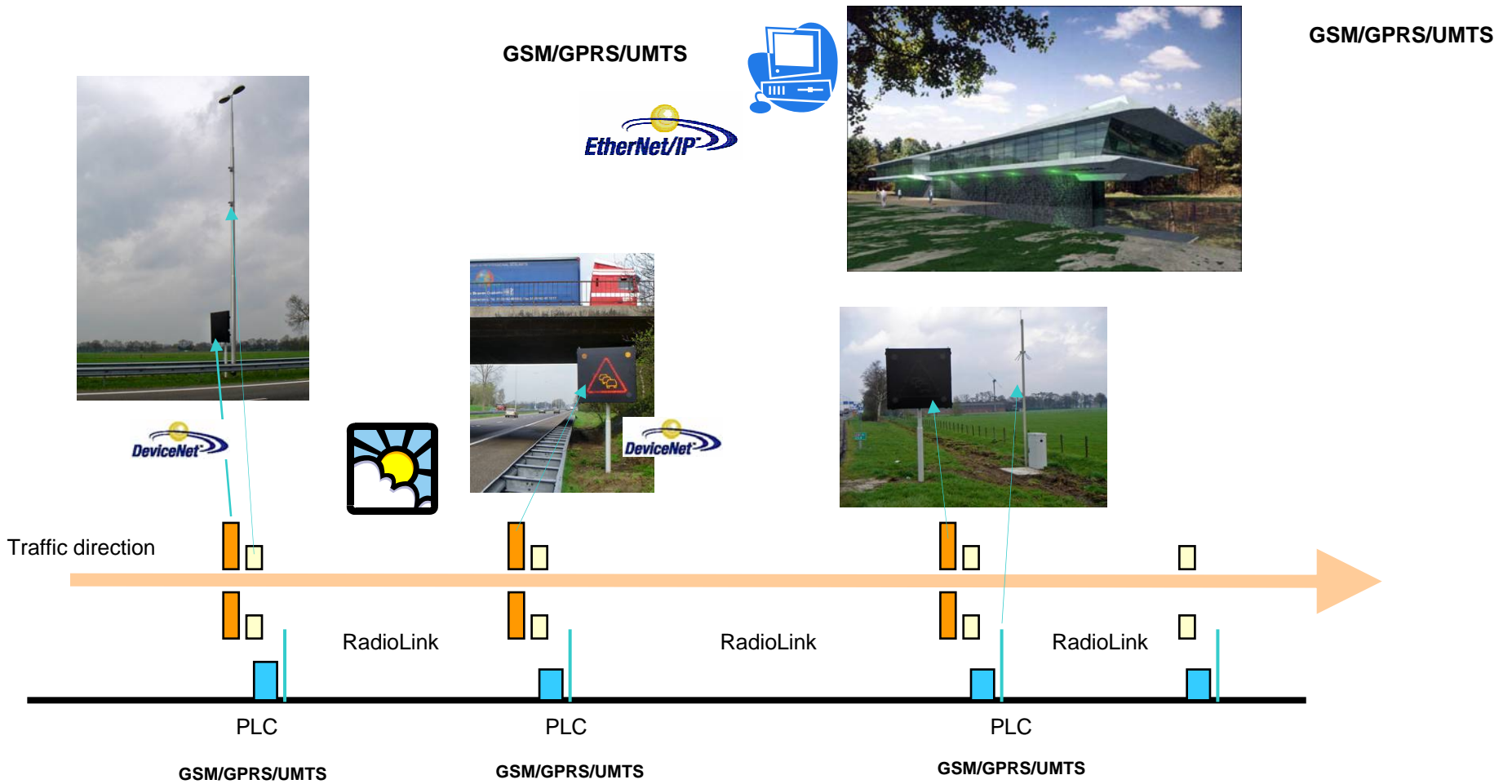


CIP Networks in Action Application (A)

What did Brimos do to use and show the benefits of COTS and CIP

- ▶ **Traffic Jam** detection / **pre-warning** system projects, using DeviceNet for Traffic lane Signaler, and GPRS (Wireless) EtherNet/IP SCADA communication.

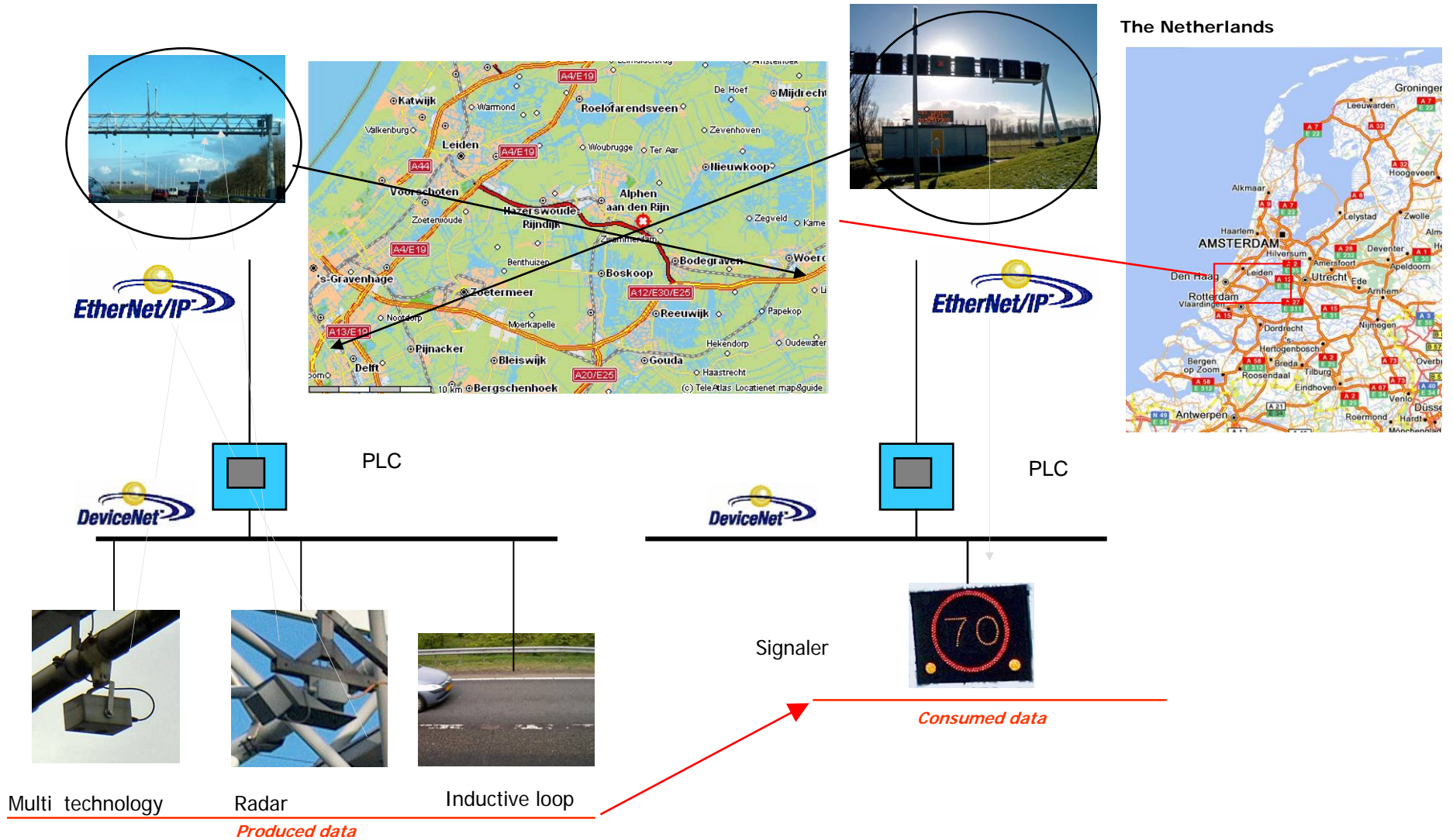
CIP Networks in Action Application (A)



CIP Networks in Action Application (B)

- ▶ RWS Pilot Project: Traffic density information from **MID Netherlands** to the West Coast-located RWS Test Center (Brimos and Imtech)
 - **Road:** (Inductive Loop, Radar and More complex Vehicle detection Technology) with DeviceNet interface
 - **Network:** EtherNet/IP connection between the Roadside system and de RWS Test Center
 - **Traffic Centre:** DeviceNet Traffic lane Signaler, showing the average traffic speed of traffic jam status

CIP Networks in Action Application (B)



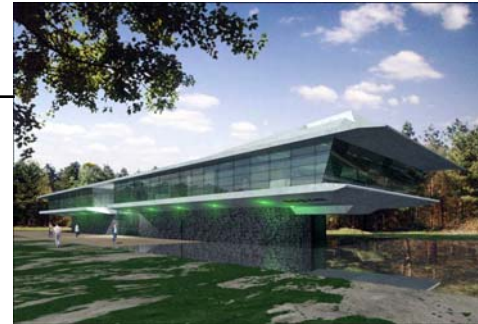
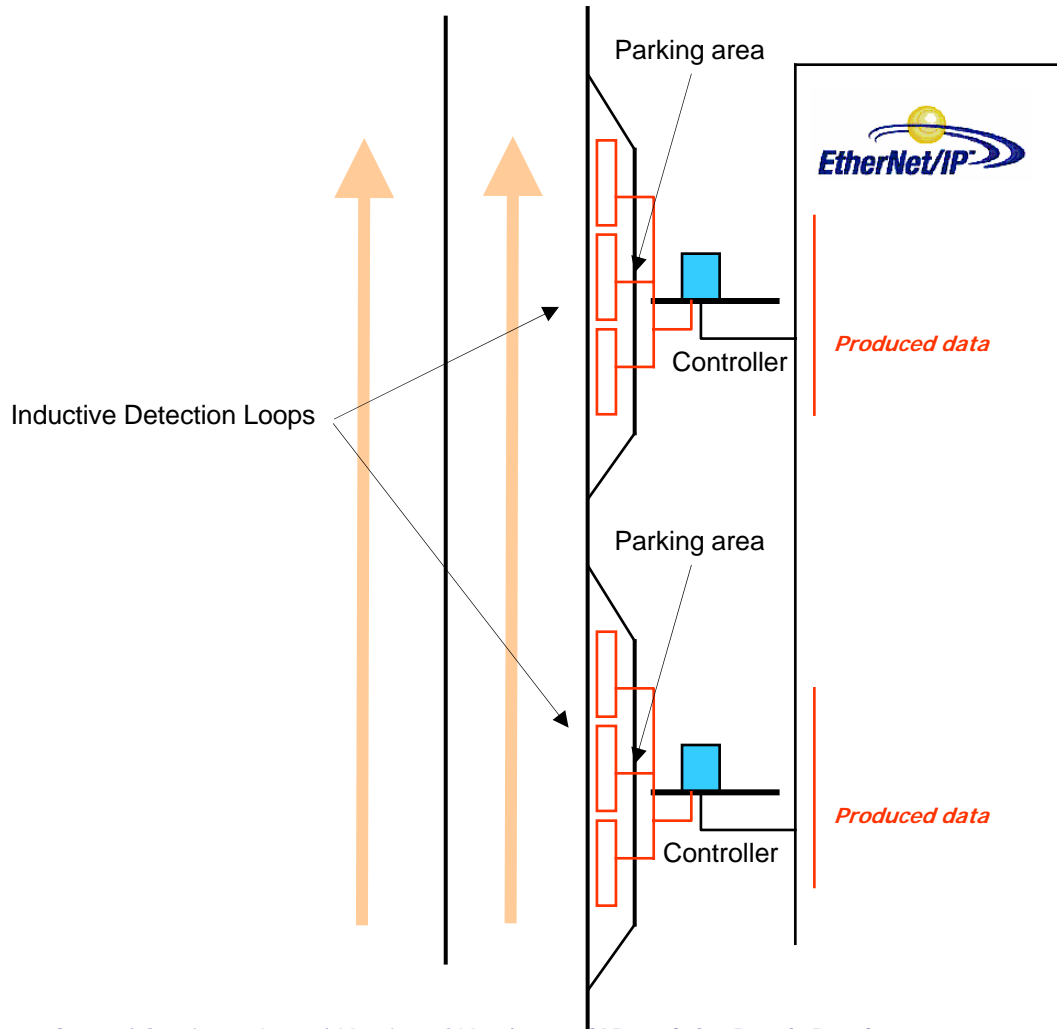


CIP Networks in Action Application (C)

- ▶ Highway emergency parking “hard shoulder” **vehicle presence detection.**

CIP Networks in Action Application (C)

Hard shoulder used as traffic lane
(increased traffic throughput)

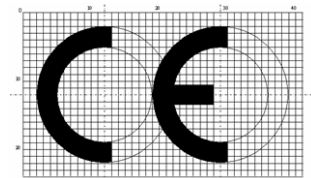
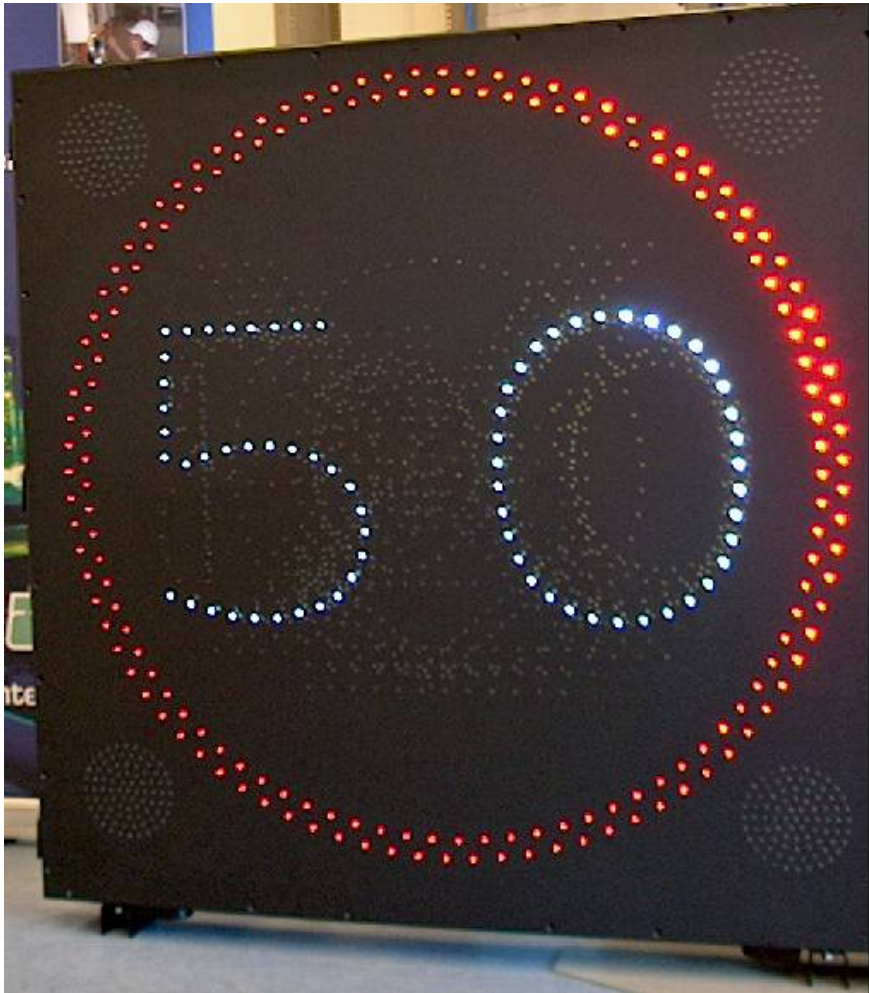




CIP Networks in Action Application (D)

- ▶ Traffic lane Signaler with **DeviceNet** and **EtherNet/IP**

CIP Networks in Action Application (D)



CIP Networks in Action

Future plans for Traffic Industries & Brimos

- ▶ **Step 1 2006.12.21** RWS choice for EtherNet/IP
- ▶ **Step 2 2007.03.01** ASTRIN Proposed a project plan for defining and maintaining CIP objects
 - For communication between Actuators (LED signalers), Sensors (Vehicle detection) and Road Side controllers / Roadside platforms
 - Later communication between Road Site controllers and Traffic Control Centers
 - For communication between Sensors, Road Side controllers to Traffic Data Warehouse (Datex 2) data base?
- ▶ **Step 3 2007.03.01 +** Wait for RWS to agree with the ASTIN proposal
 - Several meetings took place,
 - Special Interest Group for Traffic equipment Device Profiles to be organized?

Questions?

