

Intelligent Rail Security...more than just CCTV



November 7, 2007

Christopher L. Crawford
Director, Transit Security Solutions

BOMBARDIER

Agenda



- **Security challenges facing the transit operator**
- **Intelligence moving to the edge**
- **Integrated Security Event Management (ISEM)**
- **Example scenarios**
- **Conclusion**
- **Questions/Discussion?**

Security challenges facing the transit operator



How to:

- Protect passengers and staff, property and assets
- Secure large, geographically dispersed facilities and infrastructure
- Secure thousands of passenger vehicles
- Ensure smooth operation of an inherently vulnerable public system

Additionally:

- Litigation claims
- Vandalism
- Casualty and liability expense

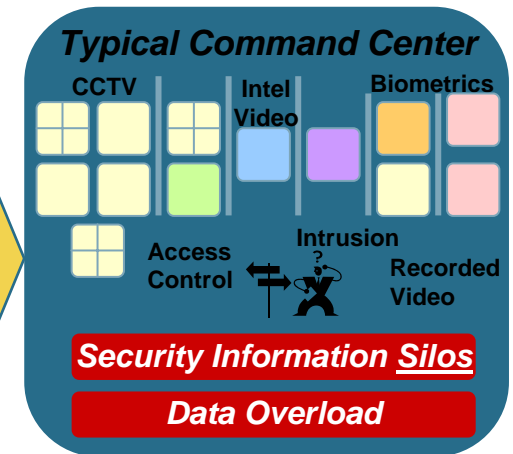
Security challenges facing the transit operator

Today, various subsystems act independently and though independent data may be collected, it is not coordinated and correlated.

Complex, interdependent security systems



Generating extensive data



Continued growth of interrelated systems *In the Transit Environment*

Help Point



**CCTV
Surveillance**



**Access
Control**



**Fire Alarm
System**



**Audio
Warning**



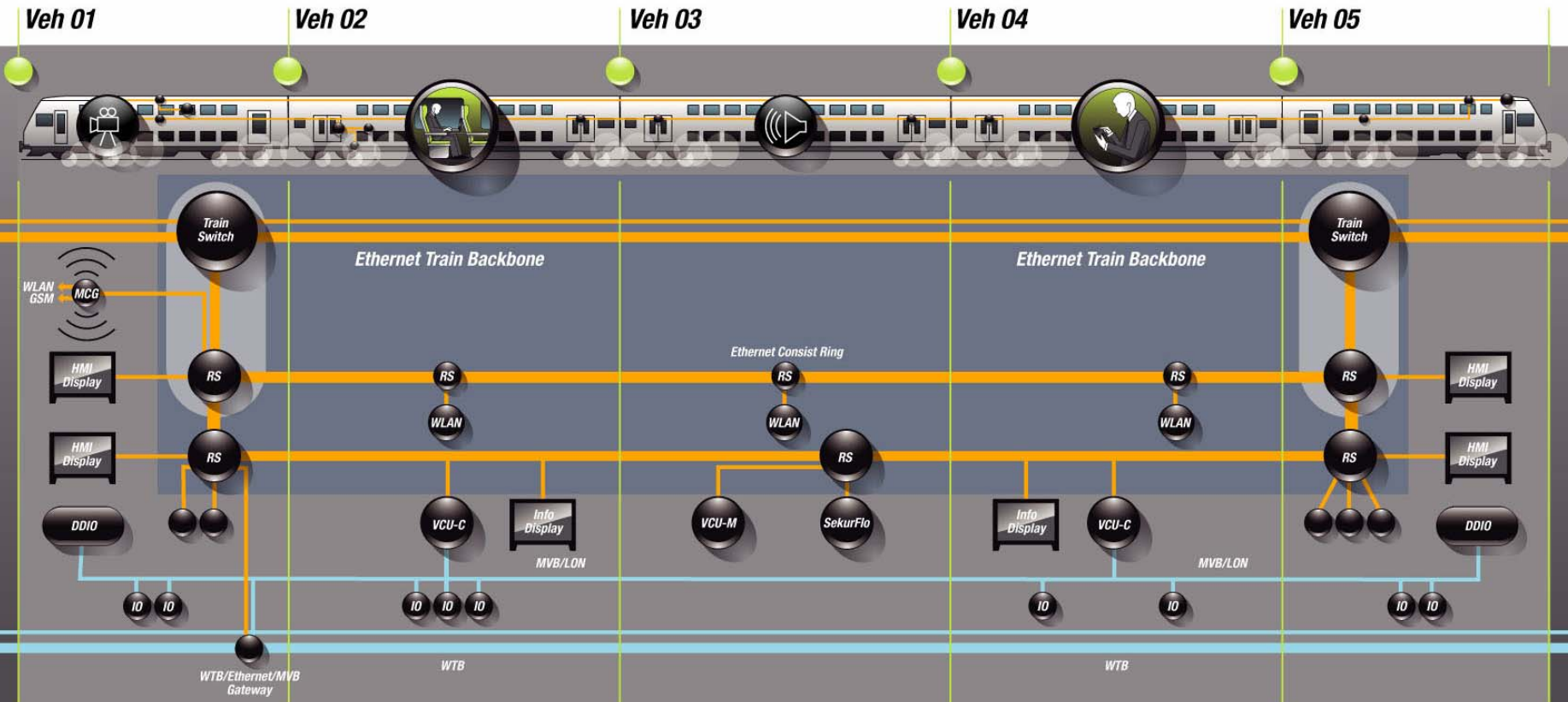
**Local
Intercom**



**Public
Address**



Intelligence is moving to the edge... *This includes the train*



The growing need for the transit operator



- **This influx of new technologies and sensors creates many new challenges for the transit operator including:**
 1. How can I leverage my security investments that are already made?
 2. How can I ensure that my new investment will not generate problems for future investments?
 3. How can I make sure that this investment will take into account my specific operating needs?

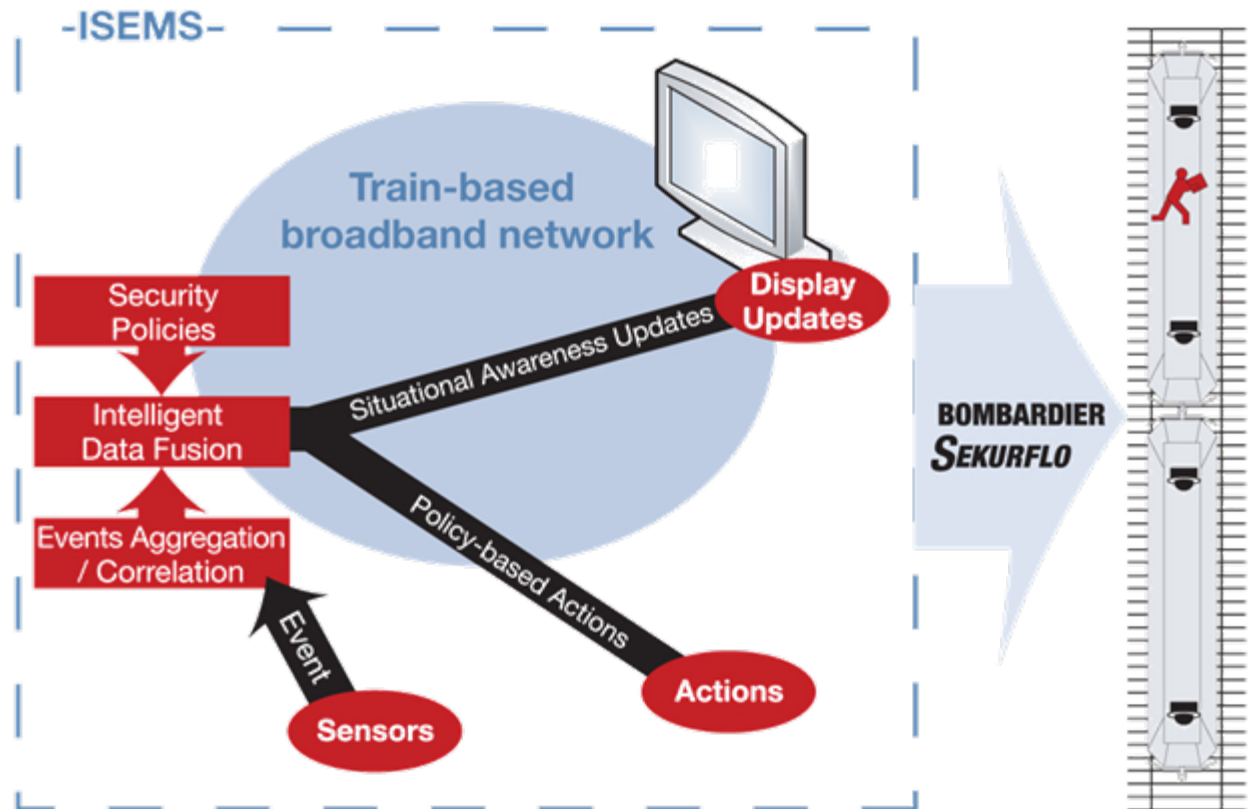
The right approach....The Security Platform approach



- **Systems engineering applied to transit security systems design...**
combined with
An ISEMS design model
- **ISEMS is a systems design model that incorporates a set of applied standards and communication protocols aimed at meeting the security challenges faced by transit agencies today**

Integrated Security Event Management System

Combines security policies with the aggregation of events via a broadband network and video display to generate policy based actions.



From a technological point of view



Transit oriented ISEMS is based on a security systems framework that incorporates:

- Standards-based protocols and interfaces
- Service oriented architecture
- An IP network-centric design
- “Plug & Play” and automatic discovery
- Abstraction of functional elements
- Modularity of hardware and software
- Distributed design with inherent scalability
- Unified messaging
- Device management
- Event management

From a technological point of view



The ISEMS framework seeks to:

- Reduce cost of ownership of an electronic security system
- Reduce overall software life-cycle costs
- Increase ease of scalability and enhancement
- Reduce risk associated with “single vendor” solutions
- Increase flexibility in the number of functional options available
- Increase effectiveness of supply chain and procurement management

Increased Situational Awareness with ISEMS

- Response to security related issues are triggered by the integrated devices and transferred to the selected video screen.
- The attendant will be alerted to a security issue by the appropriate video display



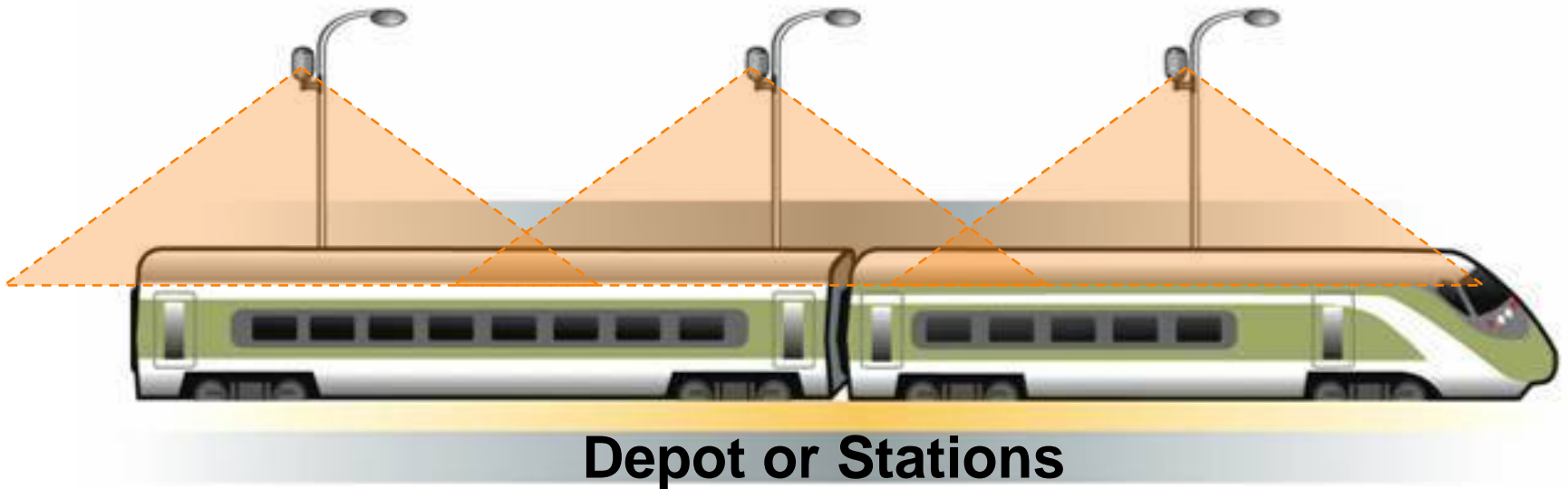
ISEMS enables better evidence management

- Utilizing an onboard ISEMS allows various data inputs to be collected and simultaneously recorded for playback
- Audio, multiple cameras, speed, GPS data, last stop, etc.

The screenshot displays the 'Investigator Professional' software interface for 'SEKURFLO BOMBARDIER'. The interface is divided into several sections:

- My Sites:** A list of sites including VC-1033, VC-1039, VC-1039, and VC-1100.
- Camera Selector:** A dropdown menu showing 'Camera Inputs' with 'Front Dash' and 'Rear Window' selected.
- Media Viewer:** A central area for viewing recorded data. It includes a 'Time Period Selector and Preview Area' with a calendar for May 2006 and a timeline for May 17, 2006 (EDT). The 'Recorded Data' section shows a video activity window for the period 1:00:35 AM to 2:00:19 AM.
- Evidence Notes:** A list of notes on the left side of the interface. Two notes are visible:
 - Car ahead has stopped at the light. Saved Clip: clip_1 Duration: 00:55. Camera: Camera 3.
 - Car ahead reverses and hits patrol car. Saved Clip: clip_1 Duration: 00:55. Camera: Camera 3.
- Map:** A map of Ottawa showing the location of the train. A yellow marker indicates the location at 1:30:27 AM on May 17, 2006.
- Video Preview:** A large video window on the right side of the interface showing the interior of a train car with passengers.

A brief word on wireless....



Operational and Security benefits can be realized even without the need for 100% wireless coverage

Example Scenario

Litigation Claim



- The onboard signaling detects that a door has trouble closing
- Video is tagged by onboard train control management system
- Video is queued for wireless transmission to wayside
- Litigant files suite claiming door broke her arm
- Video is pulled from archive which shows claim to be false and the doors functioned properly

Example Scenario

Vandalism Detection



- A maintenance video analytic detects that camera #2 on car #3 of train X19B4 has been obscured
- The obstruction has caused the camera Field of View to be obscured by more than 30%, the pre-set threshold
- The maintenance alert is queued for wireless transmission to wayside maintenance scheduling
- The camera's video is run through a post-event analysis to help capture the vandalism event
- The video clip of the vandal scratching the protective plate in front camera is handed over to authorities

Example Scenario

Audio Analytics



- A gunshot is detected by an audio analytic in car # 3 of metro 1201 traveling west-bound on line 4
- Immediately the video frame rates of the cameras are increased
- The video is tagged and pre and post video are queued for wireless transmission to wayside
- An alert is sent to the driver of the train
- A pre-recorded message is sent to the passenger information screens instructing passengers what to do

Example Scenario

Empty Vehicle Detection



- An airport Automated People Mover (APM) is scheduled to go out of service for maintenance
- The signaling system sends a message to the onboard security system to conduct a vehicle scan
- The onboard security system runs an empty vehicle analytic checking to see if vehicle is “empty”
- A bag has been left behind, and an alert is sent to operations to physically send personnel to investigate

Benefits of incorporating ISEMS into *SEKURFLO*



- A platform of operational growth **that allows ease of future security technology integration**
- Reduced overall software life-cycle costs **for BT and BT's customers, primarily by eliminating the need for computer programming modifications to core software when adding new security devices**
- A standards-based, **Service Oriented Architecture systems model in fulfilling the functional requirements of a transit security solution that allows security product suppliers to deliver solutions that can readily be integrated**

Benefits of incorporating ISEMS into *SEKURFLO*



- **Creates more consistency in BT's delivery of security related functions to transit agencies, enabling greater interoperability with existing assets**
- **Enables a policy-based, event-driven system in the mobile asset that allows for a more proactive role of transit security**
- **Reduces the overall time required to detect and respond to events, by moving more intelligence onto the train**

In conclusion



- Transportation Security Systems need more thought in their upfront design due to increase in customer demands and number of intelligent devices/sensors
- Transit security design requires a systems engineering approach combined with a systems design model such as an Integrated Security Event Management System (ISEMS)
- Enables systems to be more readily integrated, increasing overall situational awareness, and improves the overall effectiveness of the security system
- Incorporating this approach into the transportation security buying decisions of the operator will have a positive technological and business impact

BOMBARDIER
SEKURFLO

SEKURFLO

Wins/in-process deployments



- London Underground Subsurface Lines (UK)
- North London Railway (UK)
- East London Line (UK)
- Gautrain Rapid Rail Link (South Africa)
- Ile-de-France SNCF Commuter (France)
- Toronto Transit Commission (Canada)
- Vancouver (Canada)

3200+ passenger rail vehicles under contract and approved by customer to deploy SEKURFLO

Bombardier Transportation's answer to Passenger Rail Security needs

SEKURFLO....because Transit Security is more than just CCTV



Thank you....

BOMBARDIER
SEKURFLO