

APTA CCTV standards for use in transit applications 'update'. Railway Interiors, Köln October 07



APTA Technical standards working group 1 (TSWG1) CCTV for transit.

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Vice Chair APTA Communications sub committee
Chair TSWG1 ,CCTV s



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CCTV standards in Transit

Mission

- Promote the appropriate use of 'baseline' CCTV technology in all aspects of transit applications
- Reduce risk in adopting new technologies in transit related projects that are not appropriate for transit use.
- Ensure that key communications and CCTV technologies are reviewed and evaluated
- Communicate findings of evaluations to wider APTA community
- Develop common baseline for CCTV systems in transit covering cameras, networks, recorders and testing.



Technical Standards Working Group1

- Technical standards working group required to review documents and comply with ANSI and other standards protocols for approval by industry.
- TSWG1 Formed from a balance of operators, consultants and vendors
- Established 'bye laws' allowing approval of documents as standards, s required of an SDO
- Held inaugural meeting in LA and established review groups for key 'sections' of CCTV standard.



Technical Standards Working Group1

Current status of CCTV standard for transit related applications.

- Draft guidelines issued for comment to industry and feedback incorporated to produce current baseline document.
- Baseline document allocated formal APTA standards number and now regarded as 'Draft Recommended Practice' awaiting approval.
 - Cameras, Recording systems and high speed Trainline/Networks
- Operators need guidelines in order to design, specify and procure CCTV, high speed digital networks and digital recording systems.
- Standard enables 'minimum' Quality of imagery and data recording
 - Ability to run advanced analysis software for post event evaluation
 - Introduces usable resolution requirements for playback systems
 - Enables interchange of data between agencies
 - Clarifies periods for data retention and use of data at judicial proceedings
- Provides DHS with baseline standard for grant applications



Technical Standards Working Group1

Main areas of standard

- Review of on-board and static solid state camera technology
 - Analogue Cameras (minimum frame rate and resolution)
 - Digital Encoded Cameras (bit rate capabilities and application)
- Review of Digital recording technologies
 - Capabilities (environmental)
 - Recording duration (resolution FPS / time)
 - Compression system architectures
- Review of Train line high speed digital networks
 - High speed digital coupler (connection method)
 - Minimum transmission capabilities (100Mb/sec)
 - Minimum BER requirements for QOS (1 in 10⁻⁷ mean)



Technical Standards Working Group 1

Main Requirements:

Cameras

- CCTV cameras will be colour 480TVL/4CIF or 704 x 576 pixel minimum resolution - *Reviewing issues related to interleaving of 2CIF and 4CIF formats to clarify benefits for fast moving targets wrt jitter.*
- Frame rates that are configurable must record at 5 FPS 'minimum' inside car, 15 FPS when PEI activated. Non configurable must record at 15 FPS.
- External facing cameras (forward / rear facing mobile cams) will run at 30 FPS (capture of external events, grade crossings, platform events etc)
- All camera locations must be designed for purpose and tested against a Rotakin, or similar, resolution test target. - *Design of Systems requirements wrt procedures being reviewed along with management and policy requirements*



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Recorders and Recording systems

- The use of VHS based systems are no longer recommended (low res) .
- All camera outputs must be recorded individually in high resolution.
- Compression systems must comply with MEG4 'profile 6' minimum, and ensure that latency is no more than 1.5sec average between I frames - *Additional formats of MPEG2 and MJPEG also included with end to end system testing being used to validate 'resolution compliance'*
- Recorded images must achieve a 'minimum' of 240 TVL of resolution , when tested against a ROTAKIN target or similar calibrated card, when observed in playback on a normal video monitor. - *Final resolution in playback being reviewed and may well be increased to 400TVL.*
- Static systems must retain recordings for 31 days, Mobile 7 days. - *Policy issues being reviewed with Policy Committee*



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Digital Train Lines and Networks

- Capable of carrying digital CCTV data throughout rail vehicles in real-time
- Comply with the 100BaseT Ethernet industry standard - *IEEE 1473 WG now incorporating these requirements into IEEE 1473E.*
- Allow for connection within the auto-coupler with minimum attenuation
- Provide a minimum of 1 in 10⁻⁷ average BER at 20c running at 100Mb/sec
- Wireless networks should not be used for primary CCTV transmission of data to recording medium (Must be locally recorded where possible) - *Review of alternative networks to allow for 'local' viewing of operational CCTV for incidents*



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Technical Standards Working Group 1

- CCTV , DVR and Digital Trainline standard for CCTV in transit related applications

Contributing & Supporting organisations



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Current TSWG1 members

- NYCT
- LA -Metro
- WMATA
- Lane Transit
- TTC
- LTK / Sound Transit (Seattle)
- Digital Grape (Chair)
- NICE
- Pelco
- March
- Orbital
- Intergian
- Bombardier



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Next Meeting scheduled for Phoenix on January 8/9th
(TBC).

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