

Nation Western Complex

- 1) Introduction – Who is BCER!
- 2) Outside Plant Infrastructure
 - a) Conduit Pathways – Spare Conduits, Innerduct
 - i) Connectivity to Building, Light Poles, Traffic Lights
 - ii) Ring Design for Redundancy with building spurs
 - iii) Dual Building entrances
 - b) Single mode Fiber versus Multimode
 - i) Number of Strands
 - c) Blown Fiber
 - i) Infrastructure additional cost
 - ii) Start with needs – add as you go
 - iii) Future proof for new fiber technology
- 3) Building Technology
 - a) Traditional Structured Cabling System
 - i) Entrance Room – Share with MDF or Not
 - ii) 300' limit
 - iii) Cat 6 versus Cat 6a
 - b) Zone Boxes for areas with limited data needs
 - c) GPON
 - i) Fiber to the Desktop
 - ii) Applicable for long distances with limited connectivity
 - iii) Distribution boxes verses Telecom Rooms
- 4) Wireless
 - a) Indoor Wireless Coverage
 - i) New and emerging Standards – 802.11 AC
 - ii) Denver/NWS Network and Guest Network
 - b) Outdoor Coverage
 - i) Mesh Network
 - ii) Plan for localized power
 - (1) Light Poles, etc.
- 5) Public Address/Emergency Notification
 - a) New Intelligibility requirements for emergency notification
 - b) Possibility to combine emergency notification with fire alarm system
 - i) Emergency override of any PA announcement
 - c) Separate system from event announcements
 - d) Outdoor System
 - i) Giant Voice, etc.
- 6) Security Systems

- a) Industry trend is integration of Access Control and Video Surveillance
 - i) Same manufacturer/Integrated solution – common user interface
- b) Access Control System
 - i) Utilize cell phone instead of badge
 - ii) Integration with video surveillance
 - iii) Alerts on unusual behavior
 - (1) Multiple denials
 - (2) Not used for several months
 - iv) Programming for specific use profile
- c) NOC/SOC – Network/Security Operation Center
 - i) Combine functions and separate seats for operations – flex seating
- d) Video wall
 - i) Moving to software based from video matrix switch based systems
 - (1) Less expensive and more flexible
 - ii) Small bezel displays to create a large wall
 - (1) Commercial grade displays for 24/7 operation
- e) Video Surveillance
 - i) Analytics in camera detection
 - (1) License Plate Recognition
 - (2) Directional flow and line crossing
 - (3) Locate all instances of same image (person or object)
 - (4) Counting
 - (5) Heat maps of population concentration
 - (6) Pattern flow
- 7) Cellular Coverage
 - a) Outdoors – carriers responsibility
 - b) Indoors – Distributed Antenna System
 - i) Neutral Host
 - ii) Campus Head end
 - iii) WiFi
- 8) Audio Visual Systems
 - a) Displays
 - i) Inside moving from projectors to large flat panels – Cost and clarity
 - ii) Above 80” to 95” move to projectors and screens
 - iii) Outside – Direct view LED – lots of pixels
 - (1) Moving inside as cost and quality come into alignment for large displays, arenas, etc
 - iv) Overflow capabilities to broadcast to multiple rooms (Audio and video)
 - b) Audio
 - i) Increased requirement for multimedia, quality audio
 - c) Video Conferencing
 - i) Extensive use of Skype, GoToMeeting, WebEx for content display, slowly moving to video window
 - ii) Lighting is critical

- d) Digital Signage
 - i) Notification
 - ii) Way Finding
 - iii) Menu Boards
 - (1) Change Pricing/Items
- 9) Radio System
 - a) City of Denver – Public Safety – 800 MHz
 - i) Radio over IP (RoIP)
- 10) Cloud versus In-house
 - a) CAPEX vs. OPEX
 - b) Latest and greatest
 - i) Hardware and Software
- 11) Lighting
 - a) Indoors and out