

# Pennsylvania Capitol Police Integrated Command Center

## Introduction

We are pleased to submit the recently completed Pennsylvania Capitol Police Integrated Command Center - also known as the IMCS, located at our glorious Commonwealth's State Capitol Complex, to the Philadelphia Engineers Club for consideration of merit or place award for engineering.

As designers of all things public safety, security, technology, command, control, communications and A/V, we as Engineers-of-Record and Prime Engineering Consultant to the State consider the end result at the Integrated Command Center a success, worthy of an engineering award. But it also took hard work by State employees such as Capitol Police, Commonwealth Safety and Security Personnel, maintenance and Department of General Services (DGS) design staff, portfolio management, outside project staff and of course- DGS Construction Management - that got the project on track, and finished with successful enhancements. And also those who derived needed funding from both legislative houses, who directly benefited with safety and security enhancements.

As contractors, the Philadelphia based prime, Schnieder the integrator and installer, took care to develop planning to implement the physical, the electronic, the networks, the connections to hundreds of miles of fiber stretched across the state, and to the many servers and switches that provide the eyes and ears of a modern command center. *What is called in military terminology C3 - Command, Control and Communications.*



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*Communications* includes “eyes” - over 1000 high Rez cameras watch inside and out of 5 million square feet while hundreds of Intelligent readers monitor traffic and stop intruders while the “ears” - phone, radio, call boxes and a highly integrated system give audible status.

*Command and Control* consists of stopping a 15 ton truck traveling at 35 mph and not penetrating more than 18 inches to meet spec. That and having industrial grade, embedded, weather resistant, GUI touch controls to lower the barriers for fire apparatus in 10 seconds.

WYSWYG is an old tech term the engineers employed. By producing BIM models, we were able to accommodate the Police Agency’s truest needs by tailoring the model for best efficiency, tactical operability and the multi-faceted operation each workstation assumes including police radio calls, phone, call station intercom, access alarm, barrier request, door access request, remote alarms from 4 cities, video surveillance alarms, fire alarms, and maintenance alarms.

### **HARD Stats**

Projected Budget Allocated by Legislature: \$9 million

Design Budget: Approx. \$8.1 million

Bid: Approx. \$8 million

Actual Cost: Near Budget with Enhancements

Employees Protected: Approx 30,000

Visitors and Civilian Contractors Protected: 500,000+/year

Security Cameras: 1200+

Card Readers: 500+

Badges Issued: Tens of Thousands

Intercoms: 100+

High Security Locking Devices: 1000+

K-Rated High Speed Physical Barriers: 12

Secured Parking Spaces: 1,500+

GUI Remote Touch Controls for Secure Vehicle Access with Traffic Signaling: 2

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Servers for Security, Access Control, Network Management, Video Walls, etc,: As required

Video Walls: 2

Integrated Command Console Positions: 6

Incident Management Space: 1

Custom Public Safety Operator Software: Includes Incident tracking, recording, management, surveillance, access control operations, remote barrier release and stop, parking access, remote call station response, radio integration, IP phone and voice record integration, and “software sandbox” workstation for test confirmation prior to roll-out.

Cities Served: 5

Buildings Served: Approx 32

Area Served: 5 million SF of State Owned, Leased and secured space

Renovated Command Center Size: Approx 1,500 SF

Renovated Electronic Equipment Rooms: 25

Duration: 4 years including 5 million SF of Physical, Electronic and Network Security Assessments and Master Planning, construction in 5 Cities, and New IMCS Fit-out/ Test/ Turn-over.

### **Cross-State Engineering Challenges and Innovative C3 Solutions**

Professional Systems Engineering was awarded this project using QBS or qualification based selection by the state. The firm was determined to be the most qualified for the work. The work started in 2015 with assessments of over 30 individual properties within the states purview which included high-rise towers, historic buildings, museums, financial services buildings, parking lots, underground parking areas of a secure nature and the entire Harrisburg based PA State government. Working with six

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foot long XL spreadsheets created for cataloging and verifying every door, every piece of hardware, every opening, every type of physical or electronic security and every aspect of physical security or needs of each of the properties to be managed within the tight budget that was constructed five years previous with the legislature.



Above is pictured a preliminary BIM model for console design.

Of course every engineering discipline has arts and sciences, applying new technologies each day. But in computers, systems can change within six months and networks can vary widely over even one year. And matching software to all these remote systems including programmable logic controller's, touchscreens, integrated access control and completely separate surveillance systems makes the integration that much more difficult.

Each part of the network had to be vetted for its reliability since this is a mission critical system so each of the fibers provided by other telecommunications contracts had to meet particular requirements for the system to work, connecting all five cities within the central node located in Harrisburg.

And controls are not simple. In some places programmable logic controller's were used as a more durable industrial grade control, while distributed I/O control - using more simplified IP addressing was used which incorporated RS-485 as a protocol to manage legacy serial Communications - which had been in place for over a decade, reducing unnecessary retrofit costs.

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Additionally, the State Capital is considered a historic landmark, so reviews with the Capitals Architect and Historic Preservation Commission was mandatory in meeting all of the infrastructure and finish changes.

It is not to be understated that working in a confined area with racks and consoles dating from 2001 makes for a difficult transition almost 15 years later with wiring and technologies that have marched many steps farther than that which was originally installed.

Requiring a complete hot-cut over so that loss of mission critical elements were minimal at best were stipulated at the beginning of the project. This meant critical planning and late nights even working during holiday weekends to get the bids out on time

It is rare such an elaborate transition from such old technology with so many physical and computer based 'moving parts' - spanning five cities, all now connected by secure fibers state-wide, renovated 'hot-in-the-same-spot' - have appreciably zero loss of Police continuity of activity throughout construction - PSE's phasing concepts and additional incident management/conference space working area suitably fit Police needs.

Certainly a testament to cooperative oversight by Capitol Police Superintendent Joseph Jacob and Staff.



Above pictured is the final BIM model for console design fit and operational check.

## Engineering Benefit to Public Safety and Community

The end result is positive deployment of public safety for the Capitol and Commonwealth Properties - much more than meets the eyes. Unseen are the initial design participants, before bidding, were able to develop program enhancements without affecting allocations - anticipating policing and incident management for the police professionals at the Capitol including Mr. Dill's participation. But the system developed also reflects a level of State Government Security that is unmatched by almost all states in the nation, even surpassing many enterprise level corporation security arrangements due to input from Mr. Shawn Bleacher.



## Delaware Valley Computer and Network Engineering Participation

This was a statewide Pennsylvania collaborative partnership project in every way. And not just a Montgomery County "design based project" nor just Harrisburg or Dauphin County. Contractors and consultants were from Philadelphia and Pittsburgh, Scranton, Berks, Bucks, Chester and Delaware and other counties.

While we are currently finishing the Security and Communications/ Public Safety Master Planning for the largest public safety project (\$12 Billion) ever launched in the nation, and the largest single public school being built (\$250 million), ones satisfaction - especially mine, comes from local response and recognition. From Philadelphia, my home town, and Pennsylvania, my home state.

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This is really an effort for me to give back, to recognize Commonwealth employees, public servants, sworn officers, contractors, manufacturers, and to those who are better protected each day, by identifying clear progress in public safety. And to show where good governance, mission critical expenditures and public safety meet at the legislative desk, and Governors desk.

In the Great Depression of 1929, my grandfather was deemed unemployable as an "engineer" by stereo-typification, as opposed to education (Spring Garden Institute, now Drexel). This did not stop him.

As Electrical Forman he was the engineer responsible for the first time in history lighting William Penn and Philadelphia City Hall (eating lunch on his hat) and lighting the entire span of the Benjamin Franklin Bridge for the first time. We take such pioneering efforts of architectural landscaping by electricity for granted today as "simple." The same complexity today involves networks, software, fiber connectivity and above all else - people willing to make sacrifices of comfort and time.

### **Engineering Participation Included:**

Professional Systems Engineering, LLC of Lansdale PA, Montgomery County PA. as Prime Consulting Electrical, Mechanical, and Public Safety and Computer Systems Engineering:

Thomas Pilson, IV, CSC, PSP - Project Manager

Daniel Broughton, EIT - Project Engineer

Tim Bergan, CCDP, CCNP, CTS-D - Mission Critical Communications Engineer

and, Jerry "Dutch" Forstater, PE, CTS, PSP - Engineer-of-Record

Burris Engineers, Inc. (Formally of Ambler PA.) for Electrical Engineering of power and UPS including James Burris, PE

### **Contracting Staff included:**

Schnieder Electric, Inc. of Philadelphia, PA

G. R. Sponaugle and Sons Electric, Inc.

Reynolds Construction Management

### **Related DGS Participation:**

Others associated in the Commonwealth provided experience with positive attributes of DGS portfolio management/design/CM department and Using Agency collaboration and participation including but not all inclusive:

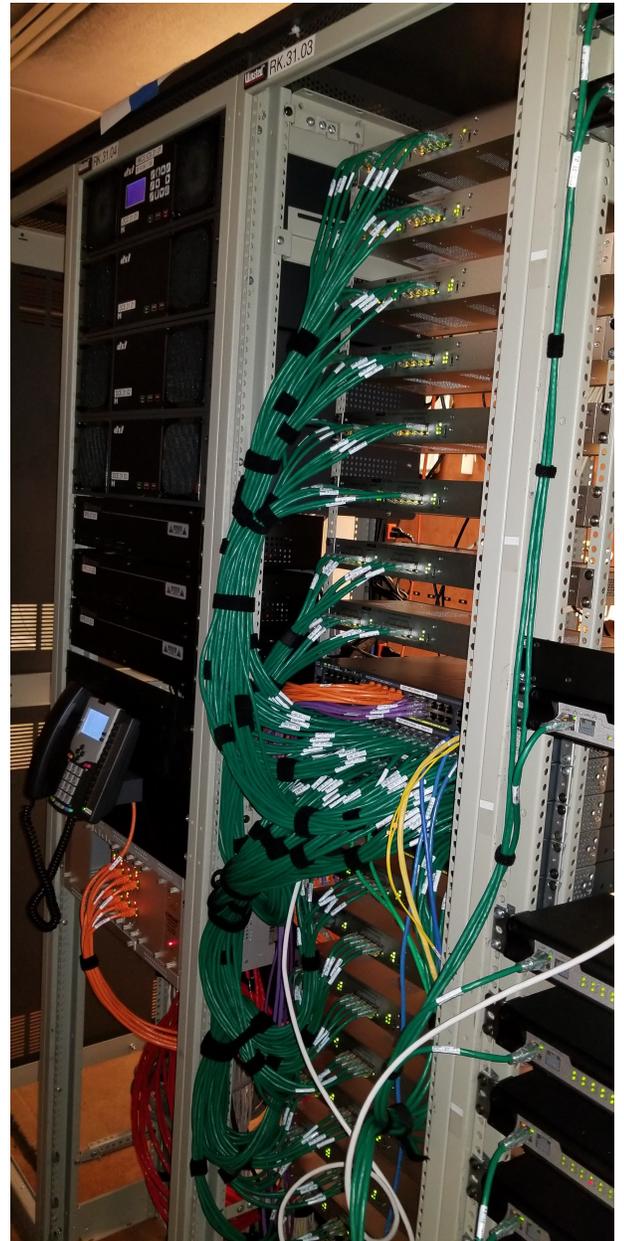
Gary Taylor, PE and David Goodling, PE in Design.

Michael Hudzik, Nicole Bamberger and Richard Sariano of DGS Projects Construction.

James Dill (Consultant) and Shawn Bleacher representing Capitol Police

Liz O'Reilly, Deputy Secretary Department of General Services

And with humble gratitude of service to the Agency, Superintendent Joseph Jacob and Staff of the Capitol Police.



### **Known Outside Your Home**

*You're "always an expert outside your home,"* as it were, and as directly applies to us, PSE. Even though we have a 33 year track record, for the first 28 years 95% of our revenue was derived from other states.

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For decades PSE's vast government experience was outside our own state, designing Life Safety and Public Safety in Austin, Texas to Juvenile facilities in Alameda, California, safe housing and therapeutic program spaces on Montana Indian Reservations and preparing the next level of psychiatric and civil/forensic facilities on an award winning team for the New St. Elizebeths Hospital in District of Columbia.

And for Pennsylvania, it meant PSE bringing in tens of millions of dollars in revenue to the State. And we loved it. But not working in PA.

While being on this years 1st Place Award LEED-GOLD team for a world class \$175 million Digital High School for Performing Arts and Trade Sciences in New Jersey State, and responsible for the Engineer-of-Record Technology to develop progressive IT/AV, performing arts, security and safety solutions to bring education to the nation, again outside Pennsylvania, *our passion for success rested daily with this Capitol Police Project.*

