TMC Reconfiguration to Accommodate Express Lanes

15th International Conference on Managed Lanes
Session No. 6
Bob Edelstein, ITS Practice Leader

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Agenda

With express lane projects transforming to regional express lanes networks, TMCs are being reconfigured to accommodate system operational needs.

- Partnerships
- Consoles, Video Walls
- Systems
- Operations
- Best Practices
- Summary

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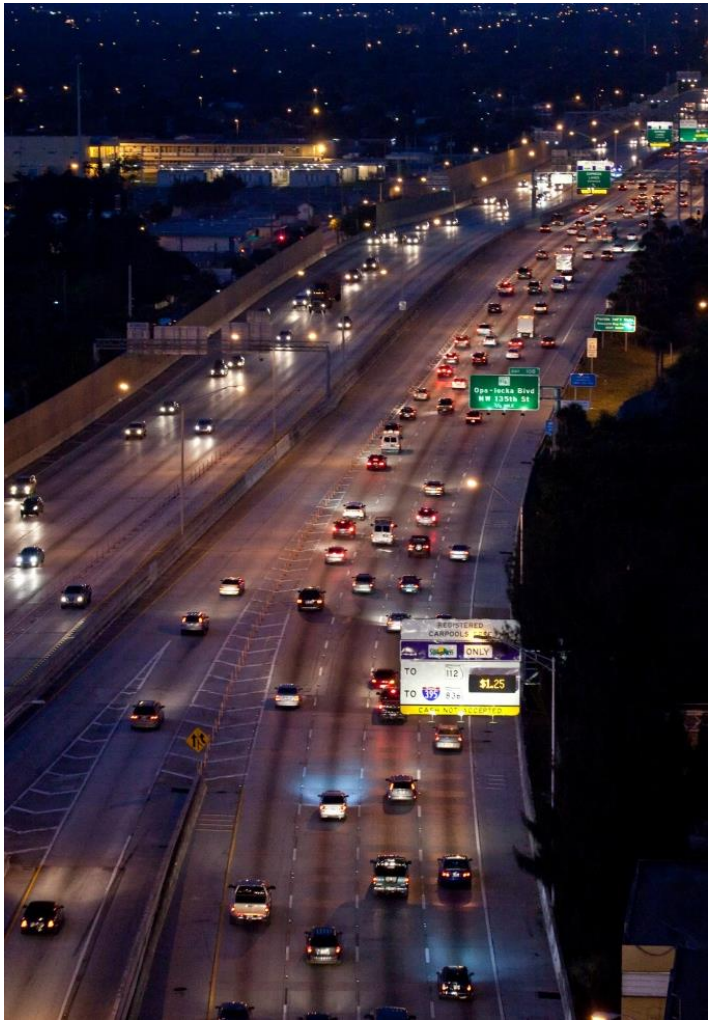
Overview – Case Examples



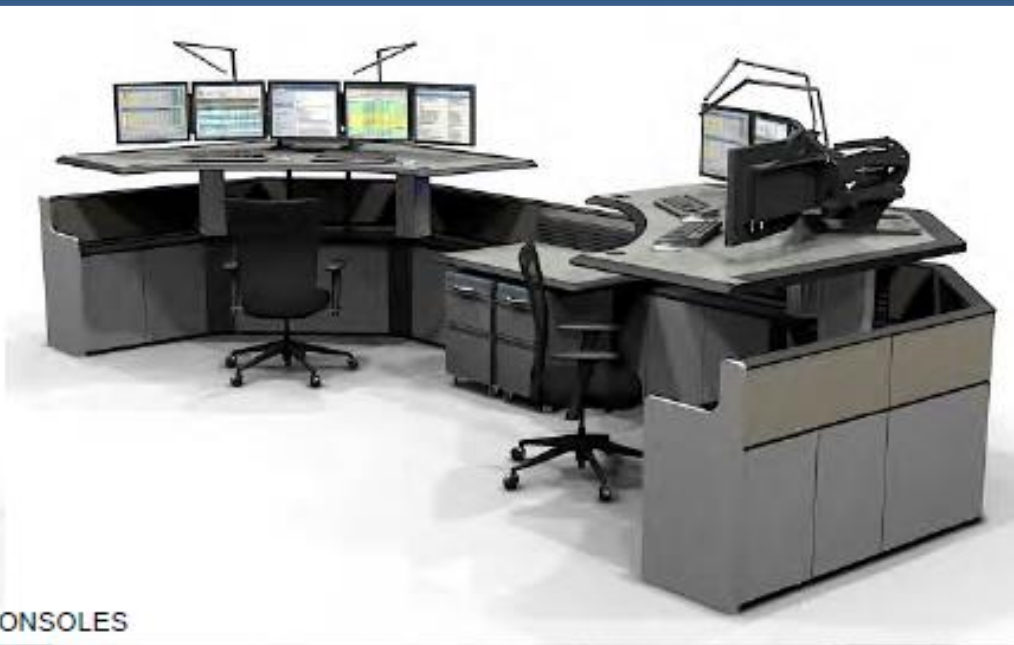
- GDOT Navigator TMC, Atlanta
- Caltrans D7 RTMC, Los Angeles
- FDOT D6 RTMC, Miami
- FDOT D4 RTMC, Fort Lauderdale

GDOT Navigator TMC, Atlanta, CA

Original layout of GDOT Navigator TMC.

- GDOT Operators
  - TMC Operators
  - HERO Dispatchers
  - RTOP Managers
  - Traffic Specialists
  - Express Lanes
  - Reversible Lanes
- SRTA Operators
- Georgia State Police

Console Alternatives



EVANS CONSOLES

Console Options

Console size accommodates the following monitor sizes:

8 – 19" monitors (stacked)
6 – 27" monitors (stacked)
4 – 32" monitors (stacked)

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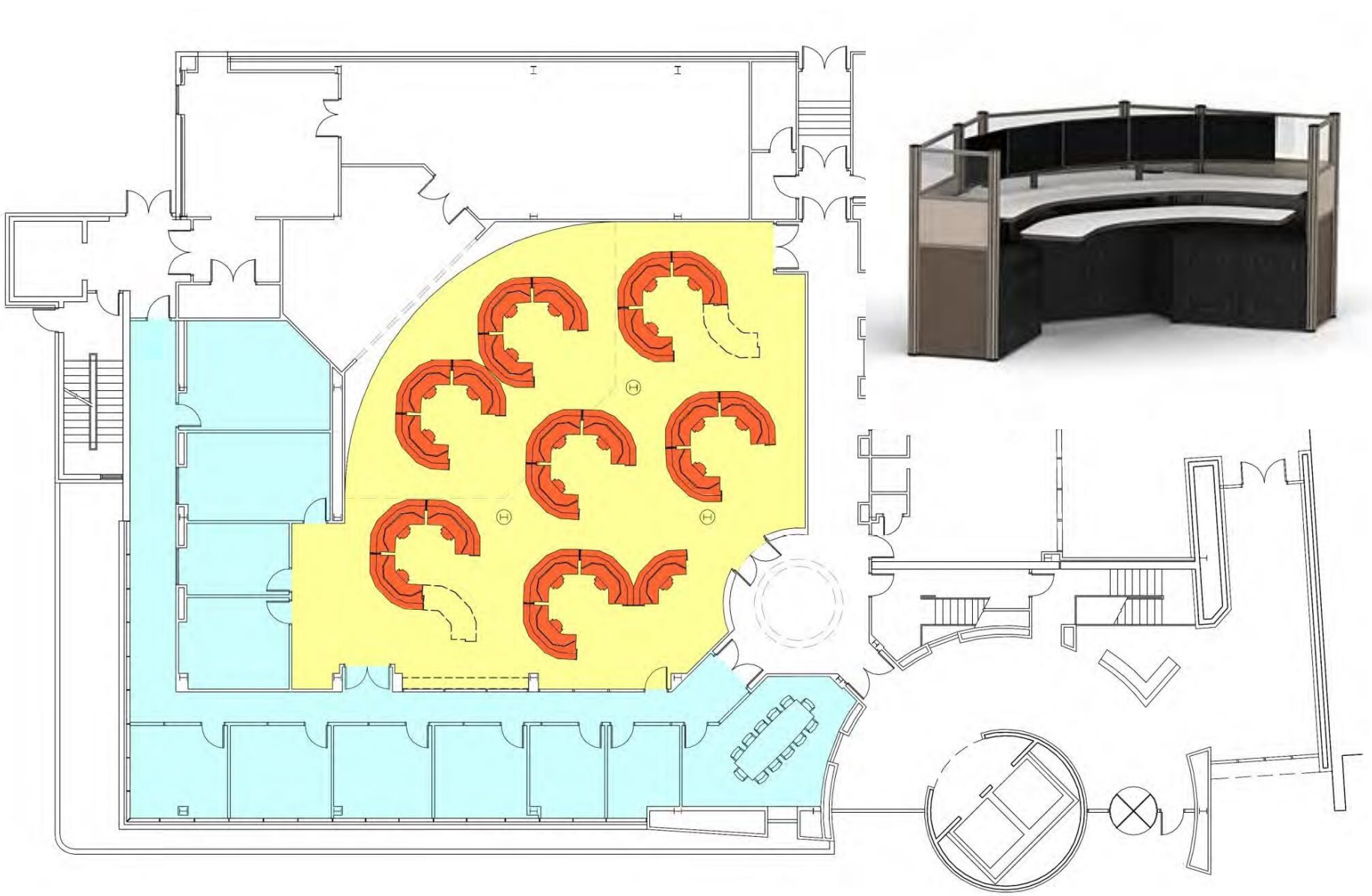
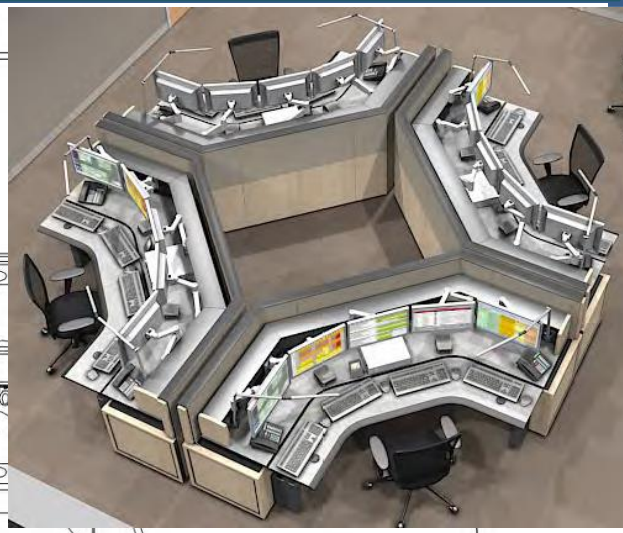
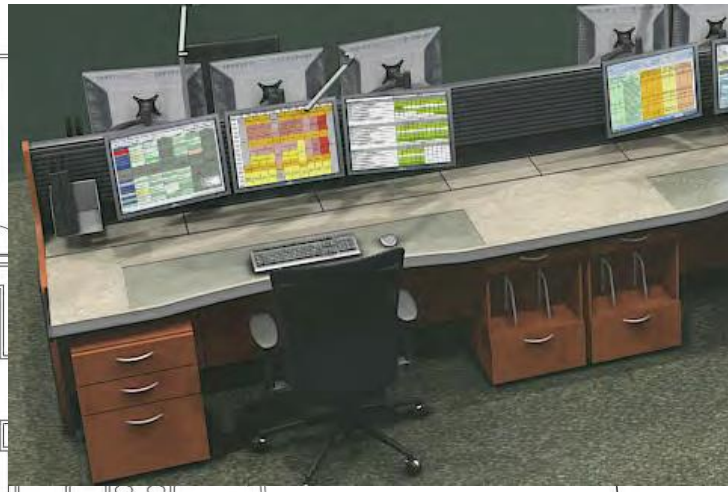
Console Layout (Alternative 1)



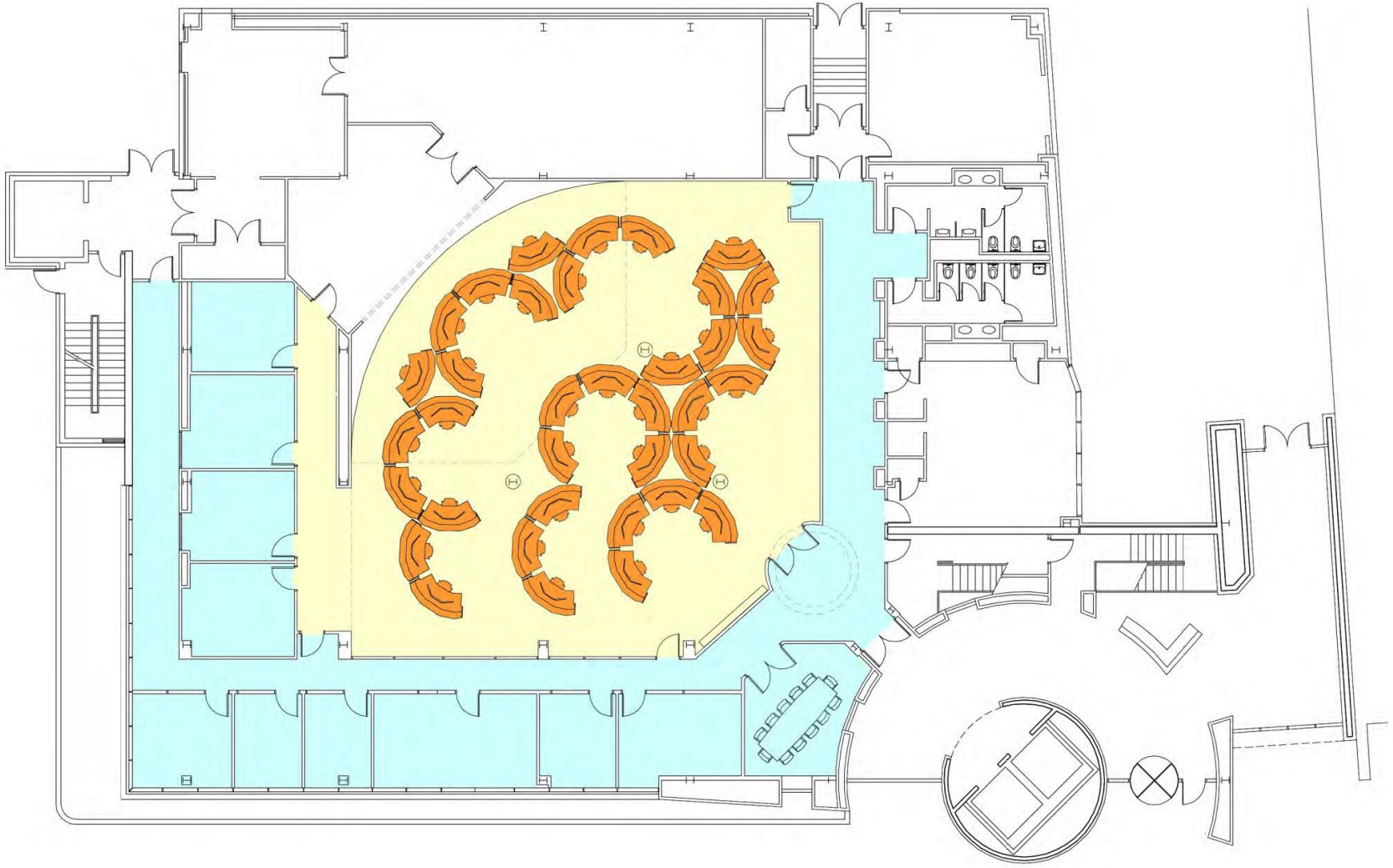
Console Layout (Alternative 2)



Console Layout (Alternative 3)



Console Layout (Selected Alternative)



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GDOT TMC (Under Construction)

GDOT TMC (Under Construction)

GDOT TMC (Completed)

Caltrans D7 RTMC, Los Angeles, CA

A Concept of Operations was prepared to evaluate the integration of express lanes into the Caltrans D7 RTMC.

- Caltrans
- CHP
- *Express Lanes*

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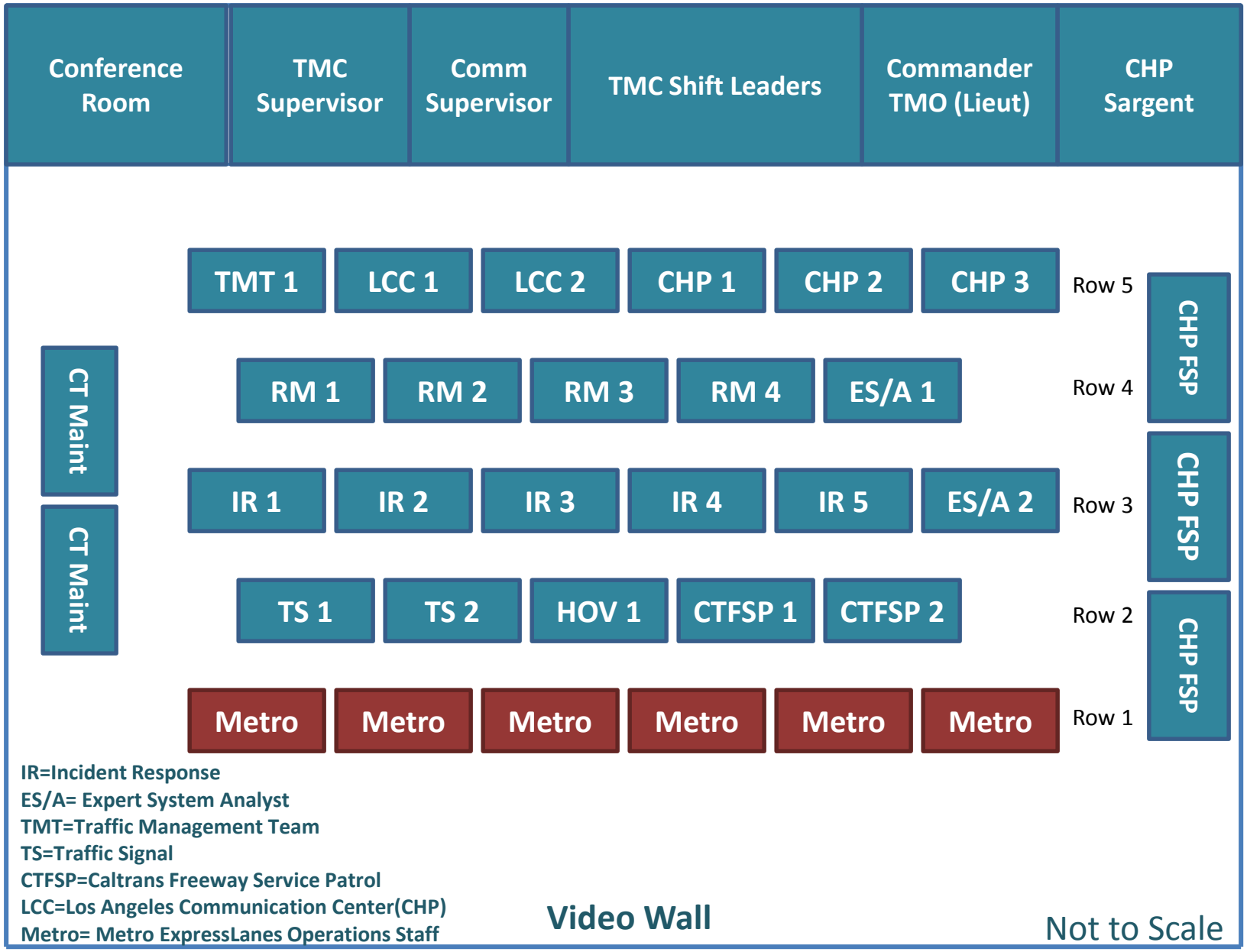
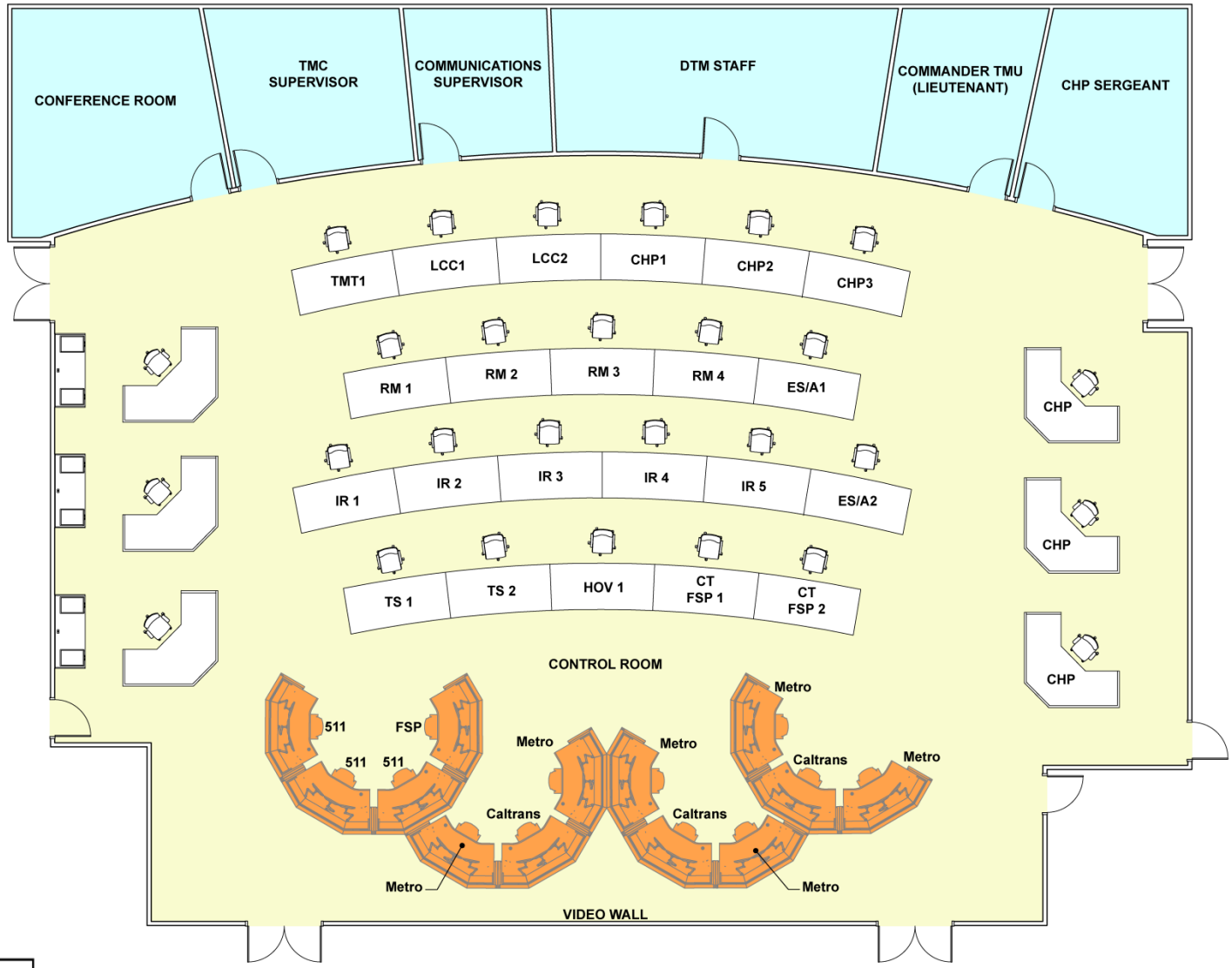
Caltrans D7 RTMC Layout (Option 1)



Caltrans D7 RTMC Layout (Option 2)



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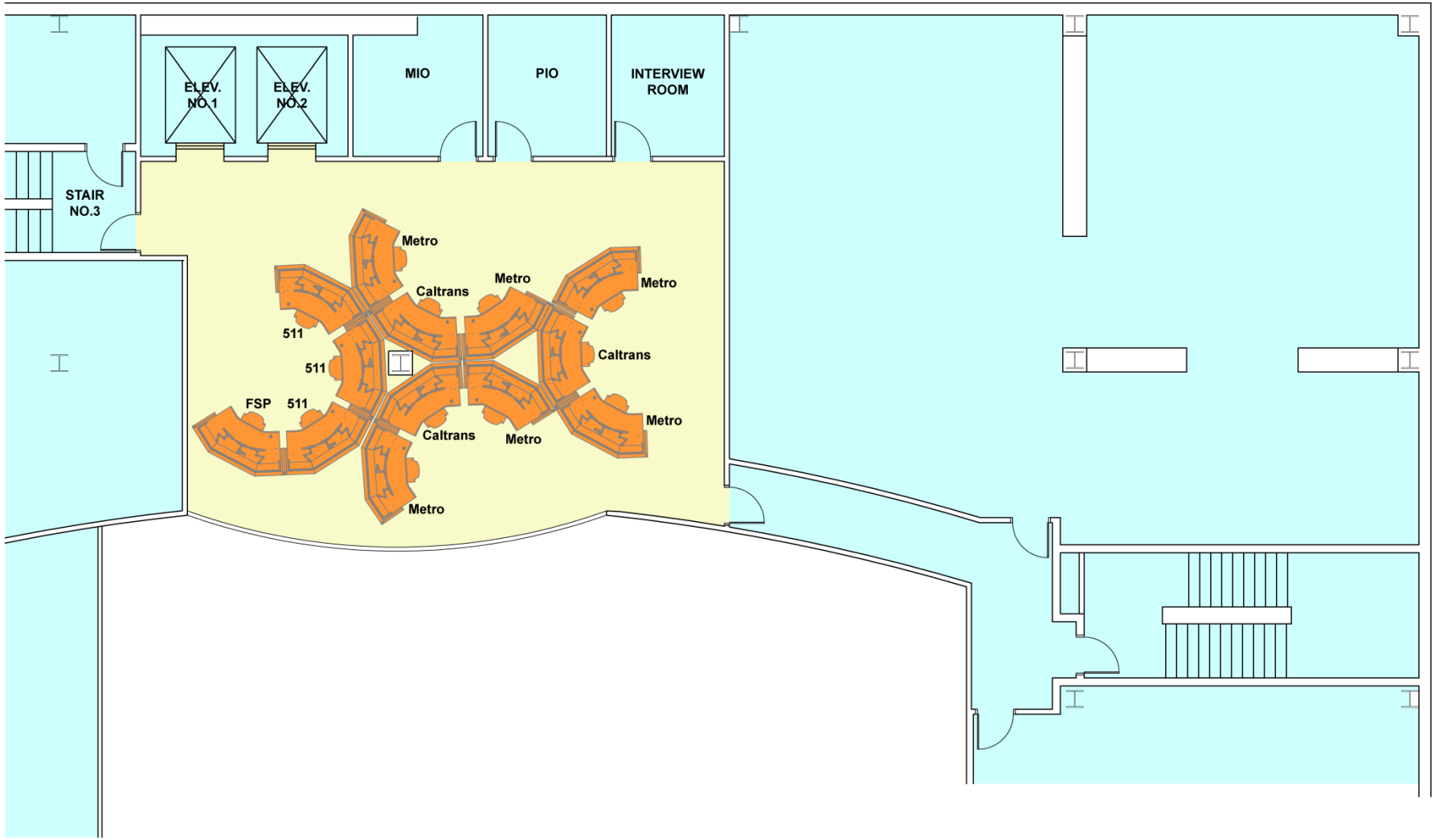
Caltrans D7 RTMC Layout (Option 3a)



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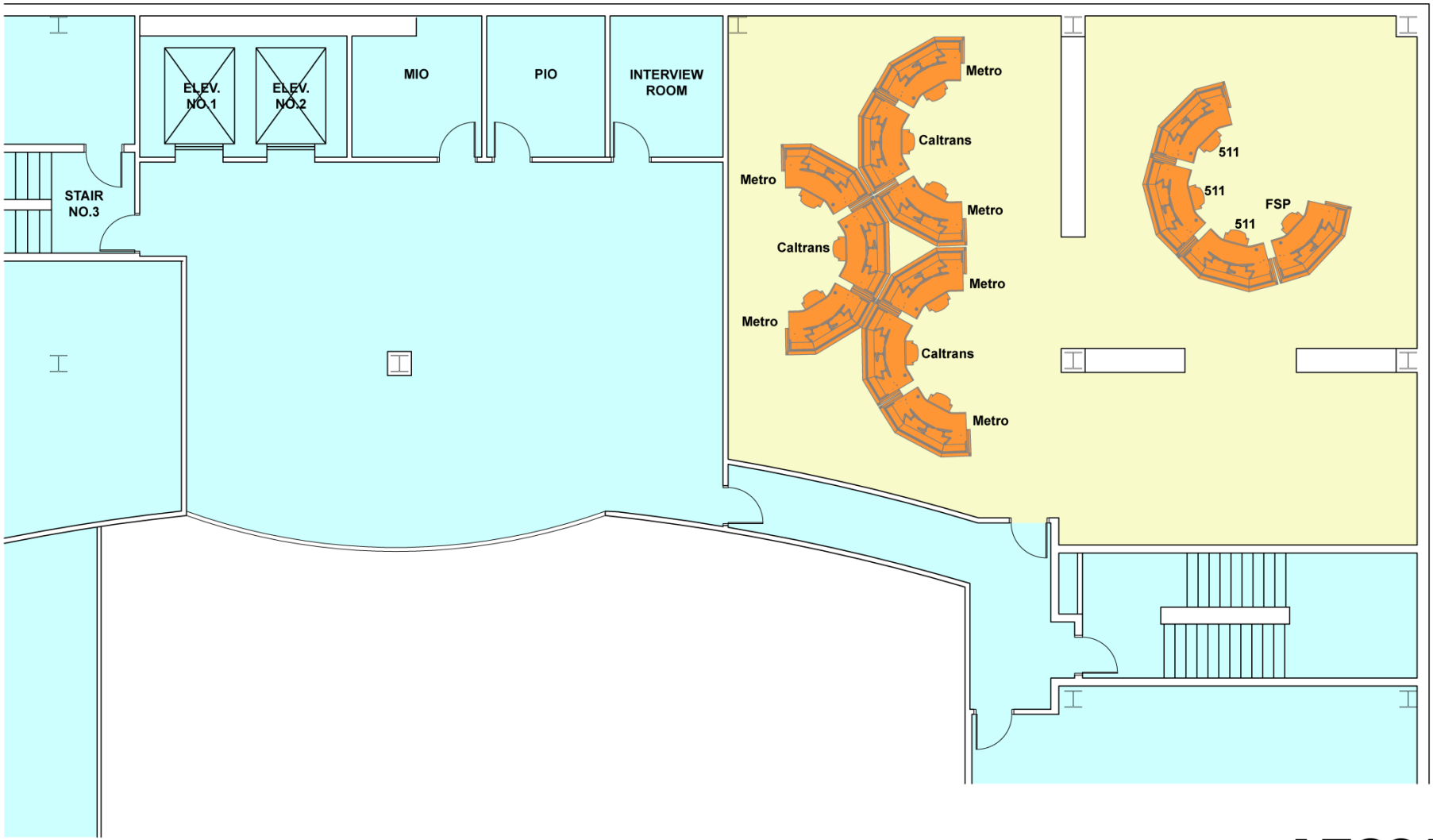
Caltrans D7 RTMC Layout (Option 3b)



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Caltrans D7 RTMC Layout: Pros / Cons

Virtual Integration

Pros	Cons
Least cost improvement as no building modifications are required	Less effective in improving operational "people" and "agency" synergy
Retains collocation of Metro Customer Service Center and EL operations	Less reliable in sharing video, voice and data communications in real-time
No relocation of staff or cut over of systems for operations is required	May need to relocate Metro staff to another facility as EL network grows

Option No. 1: Integration in the LARTMC Theater with Minimal Changes to the Workstations

Pros	Cons
Minimal costs , minor upgrades to existing workstations required	Separates Metro Customer Service Center from EL operations
Minimal impact from noise / chatter by others as Metro staff in 1st row	Less effective in improving operational synergy vs shared pods
Metro staff would have an excellent view of video wall in 1st row	Less effective in grouping like functions together vs shared pods

Option No. 2: Integration in the LARTMC Theater with Changes to the Workstation Layout

Pros	Cons
Provides dedicated space to each partner (privacy and noise issues)	Capital costs required for pod furniture and workstation systems
Provides opportunity for shared pods to improve EL operations	Reduces amount of contingency space in theater for other future functions
Provides flexibility to accommodate operations for added EL corridors	Some disruption of operations during the transition phase

Option No. 3: Integration of Metro Programs on the LARTMC 5th Floor

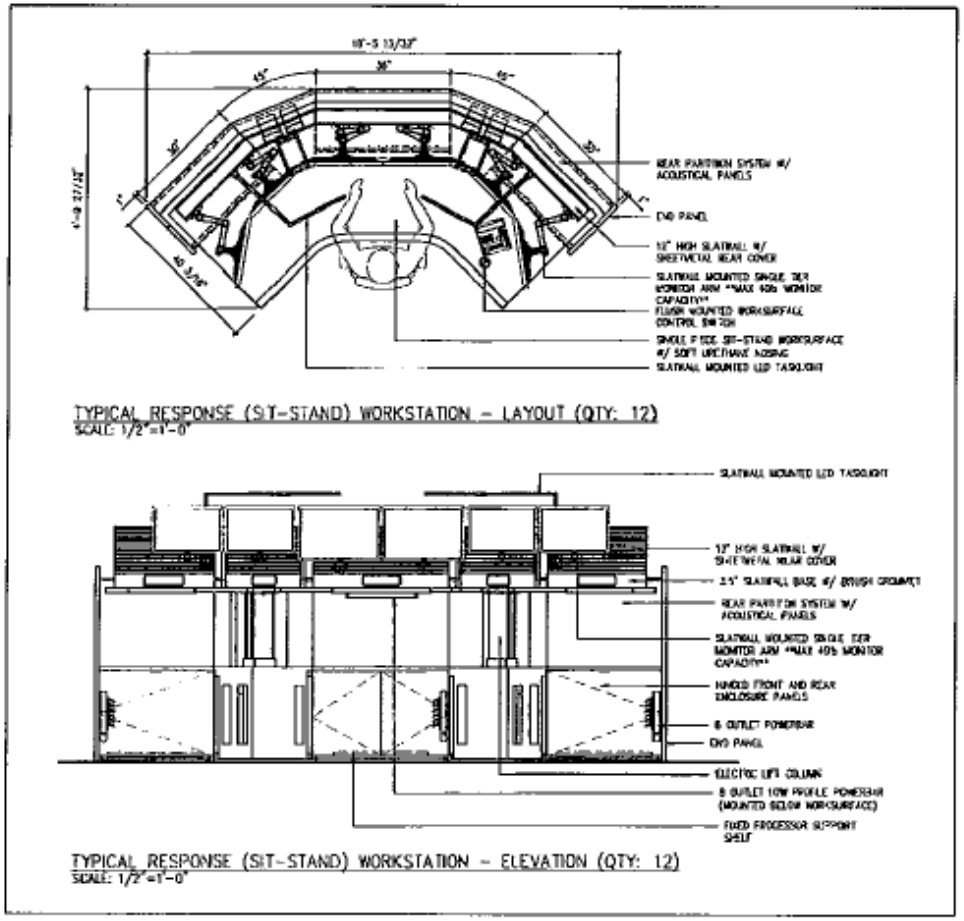
Pros	Cons
Flexible space to accommodate Metro's existing and future needs	Reduces space currently used for the Multimedia room
Metro's staff would be grouped together, no impact on Caltrans or CHP	Less effective in promoting operational synergy
Provides Metro staff a view of video wall if in the Multimedia area	Requires upgrades to obtain Fire Marshall approval

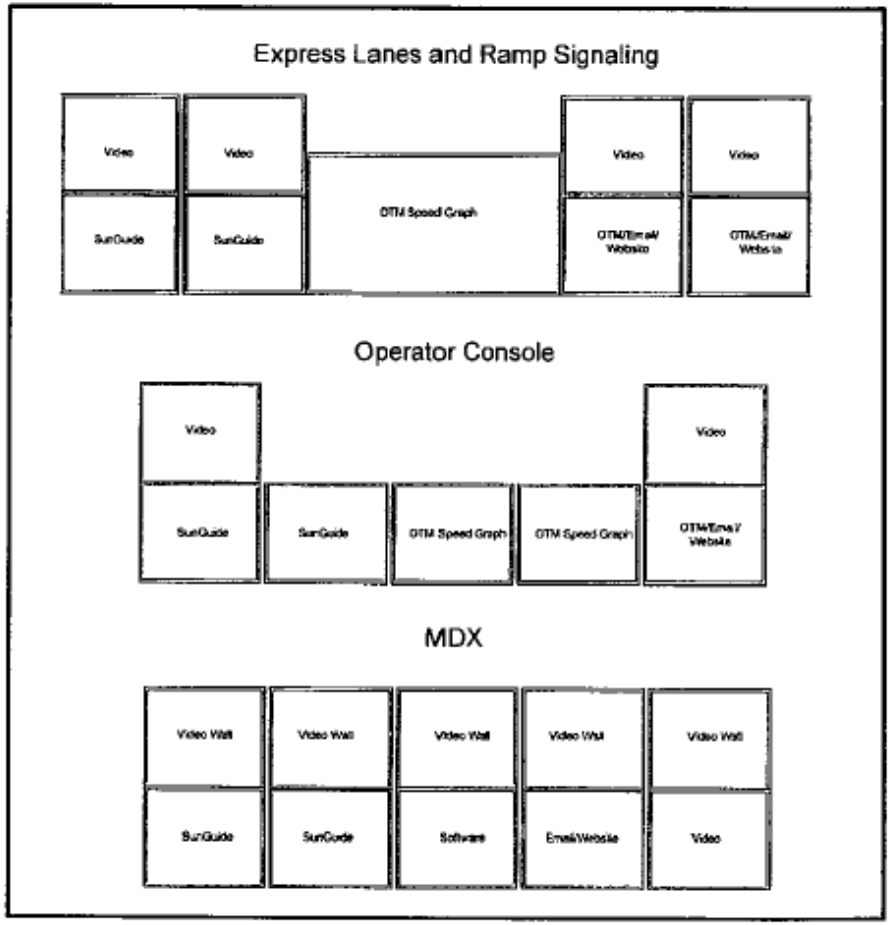
FDOT D6 RTMC, Miami, FL

Original layout of the FDOT D6 RTMC.

- FDOT District 6
  - Incident Management
  - Express Lanes
  - Ramp Signaling
  - Arterial Operations
- MDX Toll Road Operations
- Florida Highway Patrol
- Florida Fish & Wildlife

FDOT D6 RTMC – Workstation Design





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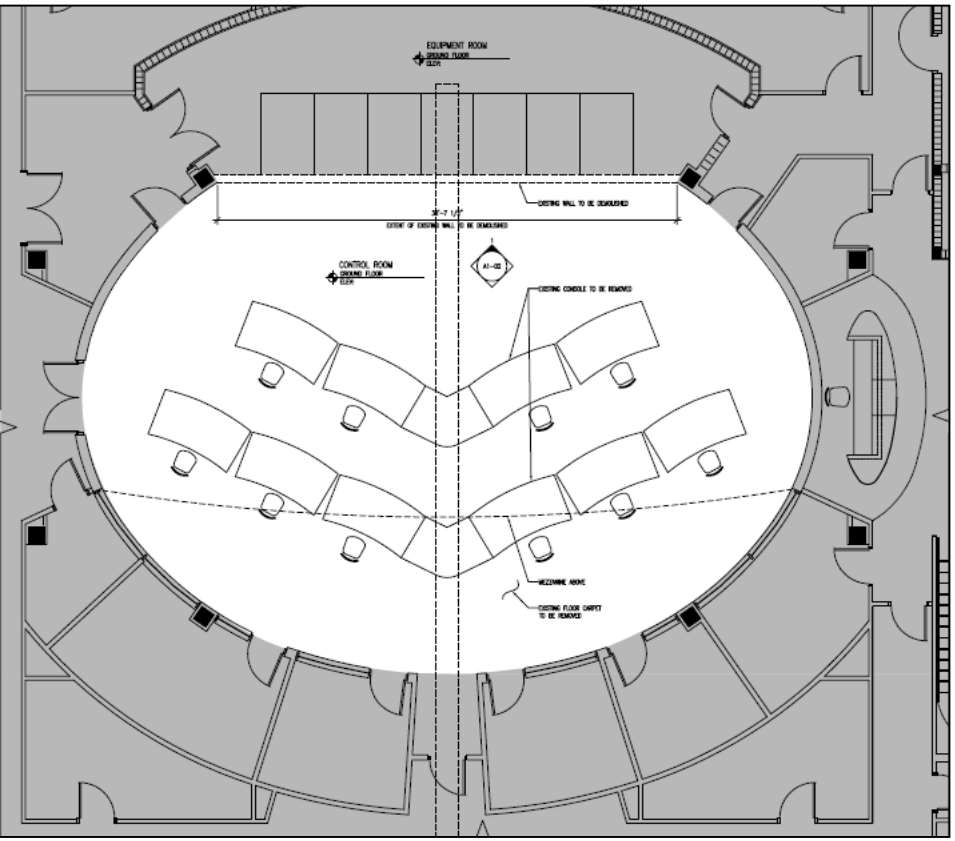
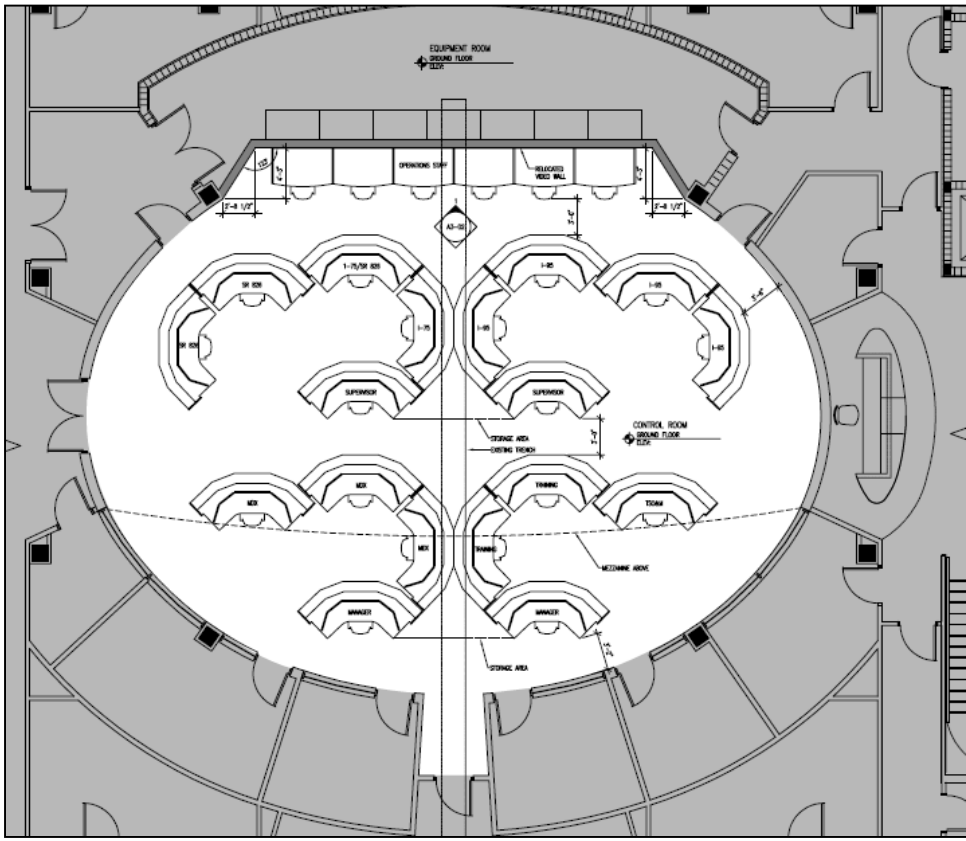
FDOT D6 RTMC – Console Layout

Before



After



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FDOT D6 RTMC Retrofit – Costs

Description of Work	Contract Amount
Design, Permitting and As-Built Plans	$159,641
Removal and Disposal of all Equipment in Control Room	$50,569
Work Stations (Furnish & Install)	$298,368
New Computer Monitors (Furnish & Install)	$262,134
Wall Mount Monitors (Furnish & Install)	$16,624
Carpet Tiles (Furnish & Install)	$71,026
Lighting Fixtures (Furnish & Install)	$60,181
Sprinklers (Furnish & Install)	$16,046
Electrical Upgrades (Furnish & Install)	$109,860
Disassemble and Reassemble Video Wall Structure and Cubes	$116,546
Video Wall Display Cubes (Furnish & Install)	$345,053
Integrate & Configure New Video Wall Display	$86,263
Final Fit and Finish of Control Room	$41,843
Training, Documentation, Testing, Warranty, Spare Parts	$116,451
Other Costs	$195,364
TOTAL COST	**$1,945,969**

FDOT D6 RTMC Retrofit (Completed)

FDOT D6 RTMC Retrofit (Completed)

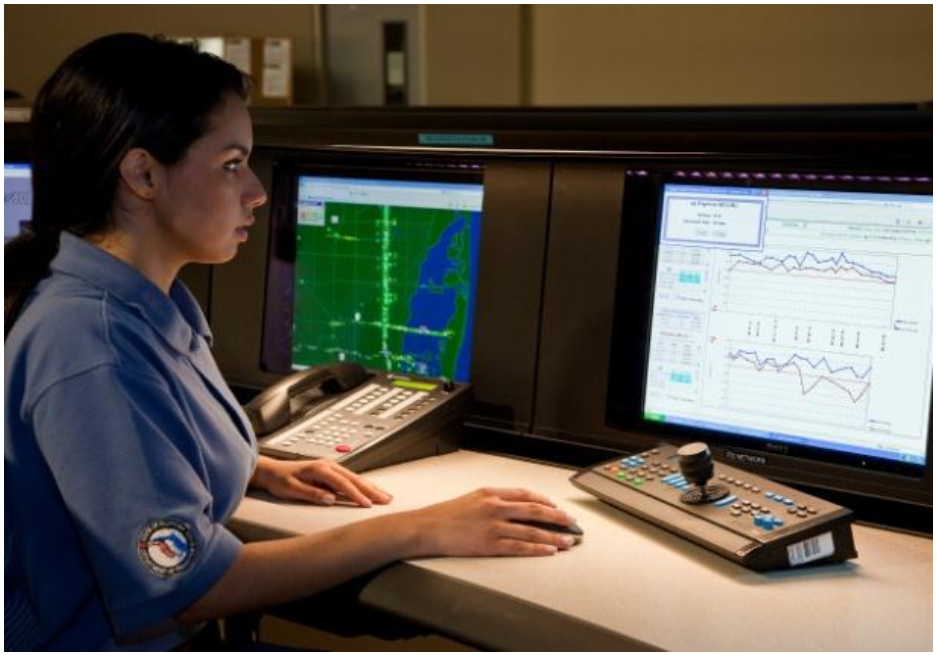
FDOT D4 RTMC, Ft Lauderdale, FL

FDOT D4 RTMC Retrofit (Completed)

Best Practices

- Systems Engineering Process (ConOps, Functional Rqmts)
- Workshops Build Consensus with Partners
- Temporary Control Room During Construction (2-4 mo.)
- Video Wall > Information Wall (Real Time KPIs, GIS Maps)
- Operational Synergy Among Supporting Functions
- Linear vs. Pods vs. Hybrid Console Layout
- Accommodate Growth in Managed Lanes Network

Summary



TMCs should be designed to align with the functional needs of the evolving ITS program including express lanes.

- Operational Partnerships
- Dynamic Pricing
- Performance Management
- Bottleneck Management
- System Optimization

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