

# The ITS WAN SFD and Florida LambdaRail

**Frank Deasy**

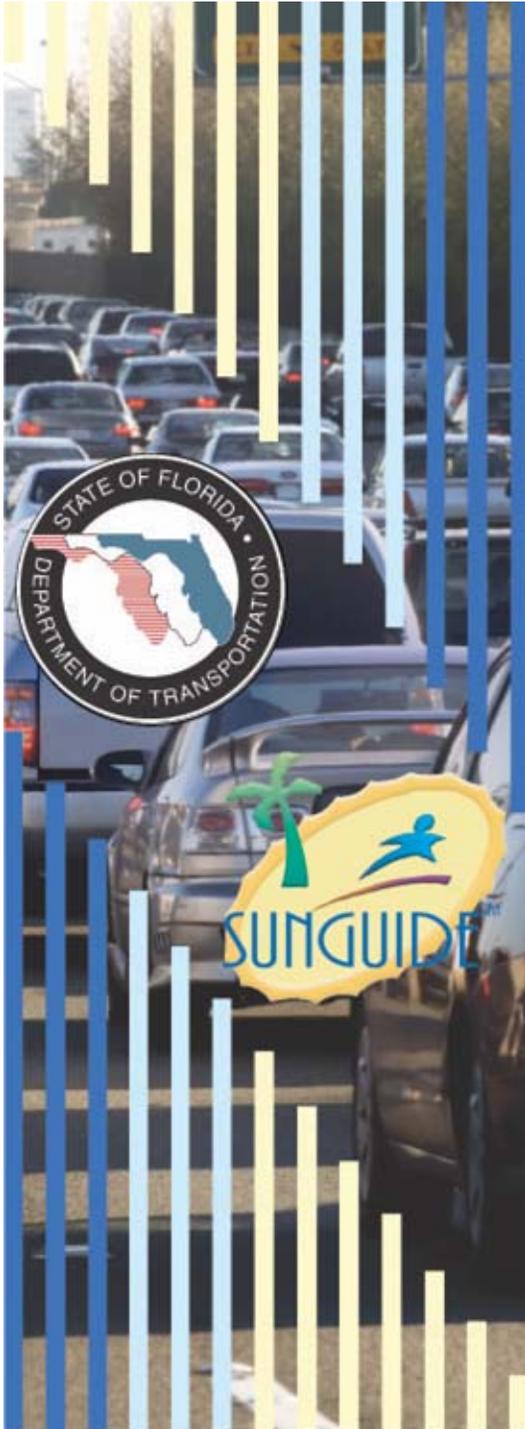
*Telvent Farradyne*

**William P. (Bill) Lueck**

*Telvent Farradyne*

**Ryan Vaughn**

*Florida LambdaRail*



FDOT's

# ITS WAN SFD

Intelligent Transportation Systems  
Wide-Area Network

for

Center-to-Center Communications

# South Florida Deployment

**William P. (Bill) Lueck**

**Senior Telecommunications Engineer**

**Telvent Farradyne**

**FDOT Traffic Engineering Research Lab**

# What is the ITS WAN SFD?

The ITS WAN South Florida Deployment (SFD) is both:

- A relatively small-scale proof-of-concept pilot project of the ITS WAN, and...
- The first phase of ITS WAN implementation.





## What sites will be connected by the ITS WAN SFD?

1. Traffic Engineering Research Laboratory, Tallahassee (TERL).
2. Tallahassee FHP SMS Microwave Site, Tallahassee (TFHP).
3. McArthur/Sunrise SMS Microwave Site, Plantation (MS).
4. District 4 RTMC, Ft. Lauderdale (D4).
5. District 6 RTMC, Miami (D6).
6. Turnpike Pompano TMC, Pompano Beach (TPEP).



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**When will the ITS WAN SFD be operational?**

**The ITS WAN SFD is expected to be operational...**

***Before the end of 2007.***

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# Important SFD Dates

- ❑ Opening: Tuesday, April 10, 2:30 PM.
- ❑ Approximate Installation Dates:
  - TERL: June/July.
  - TFHP: June/July.
  - MS: July/August.
  - D4: August/September.
  - D6: September/October.
  - TPEP: October/November.
- ❑ Testing: Per installation and...
- ❑ System-Wide: November/December.





# Who are the FDOT contacts for the ITS WAN SFD project?

- ITS WAN Project Manager, responsible for overall project administration:

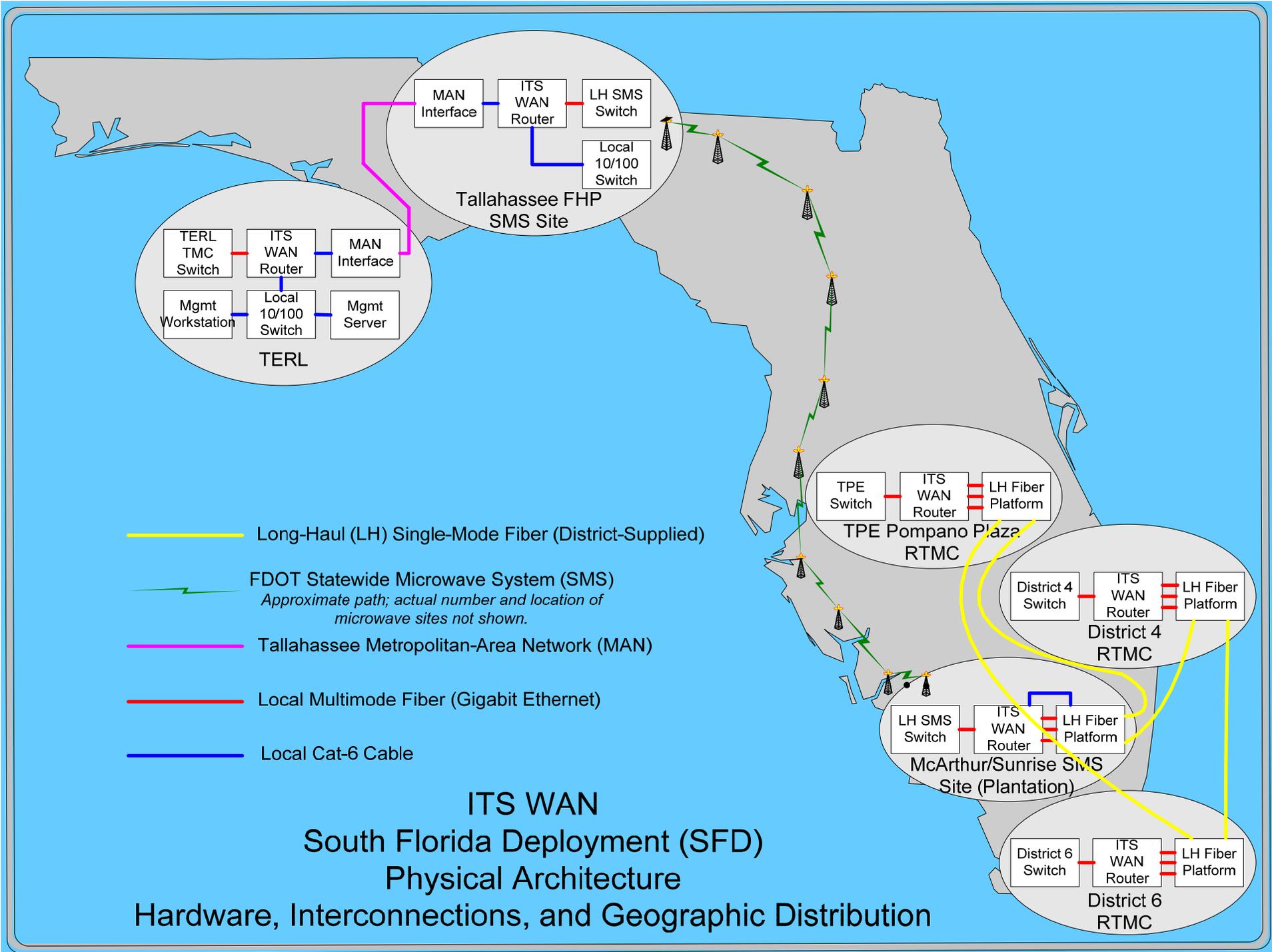
Randy Pierce

ITS Telecommunications Administrator, FDOT

- ITS WAN Project Consultant, responsible for project implementation and technical issues:

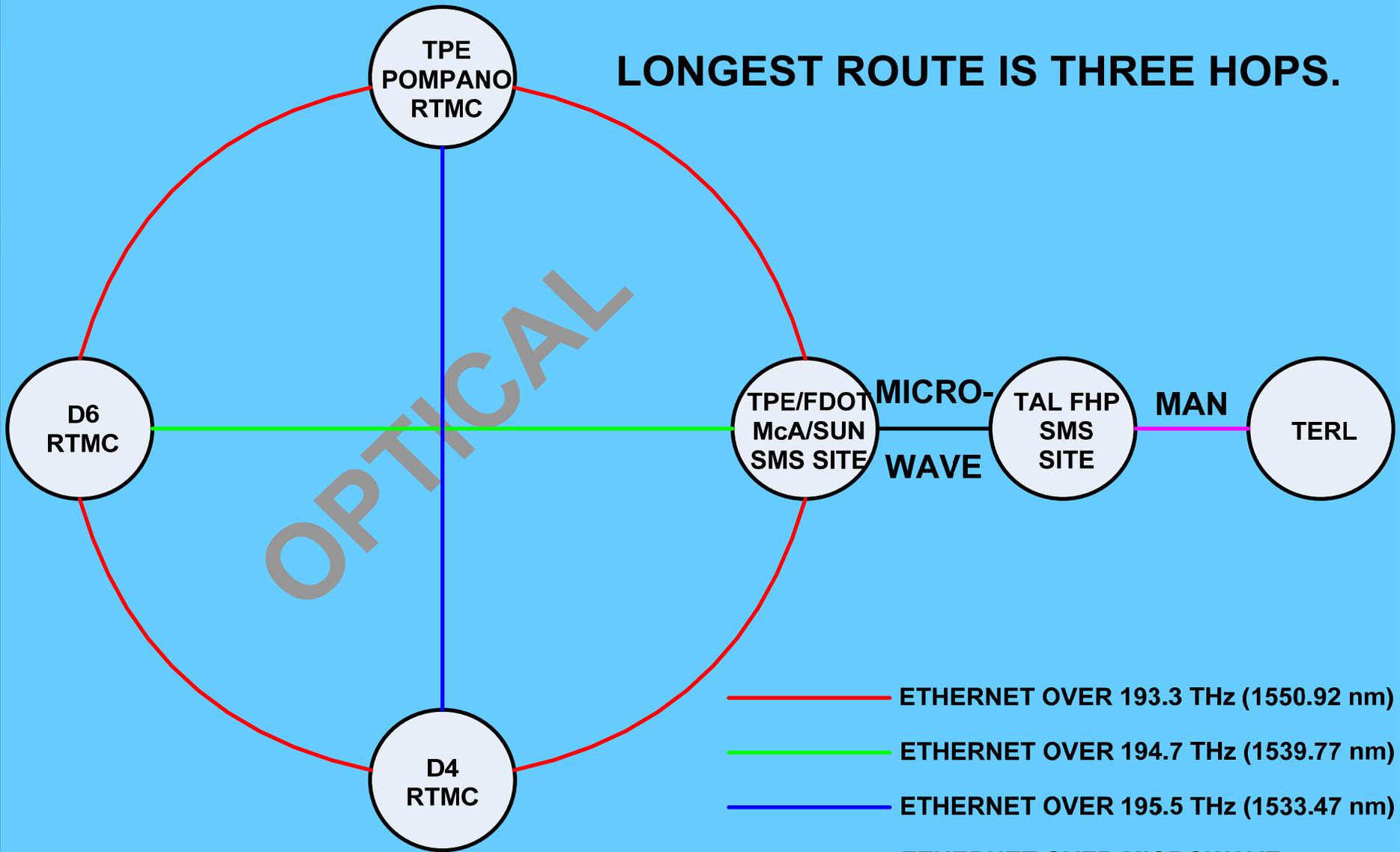
William P. (Bill) Lueck

Senior Telecommunications Engineer,  
Telvent Farradyne



# ITS WAN IP HOPS

LONGEST ROUTE IS THREE HOPS.



- ETHERNET OVER 193.3 THz (1550.92 nm)
- ETHERNET OVER 194.7 THz (1539.77 nm)
- ETHERNET OVER 195.5 THz (1533.47 nm)
- ETHERNET OVER MICROWAVE
- ETHERNET OVER MAN



# The Bottom Line

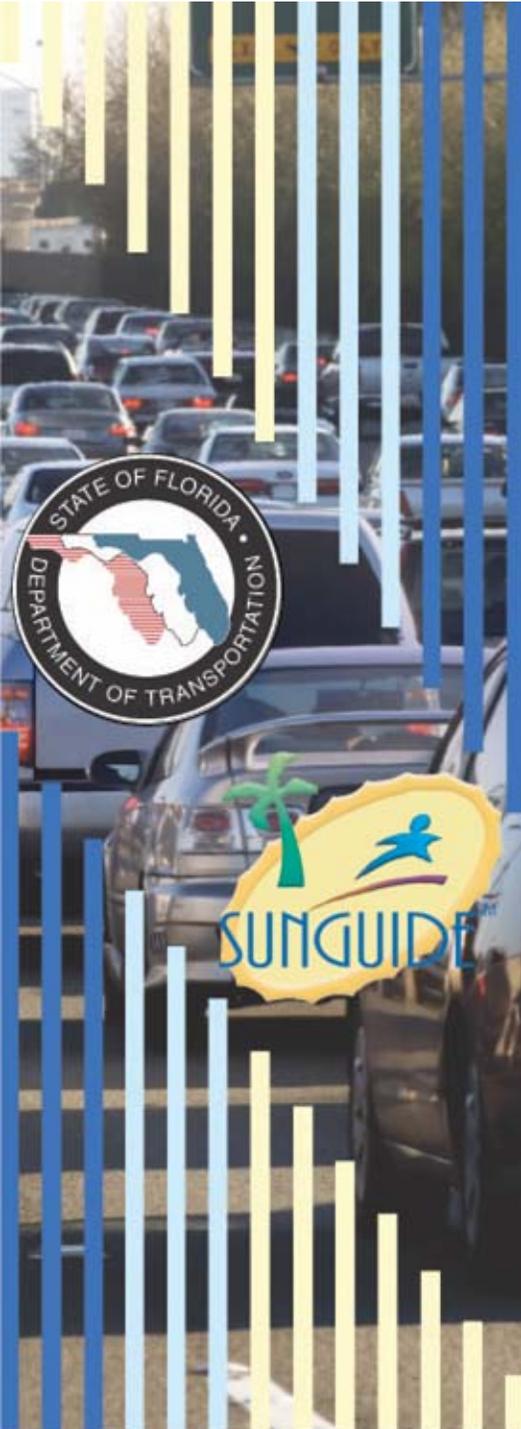
The completed ITS WAN SFD *will provide:*

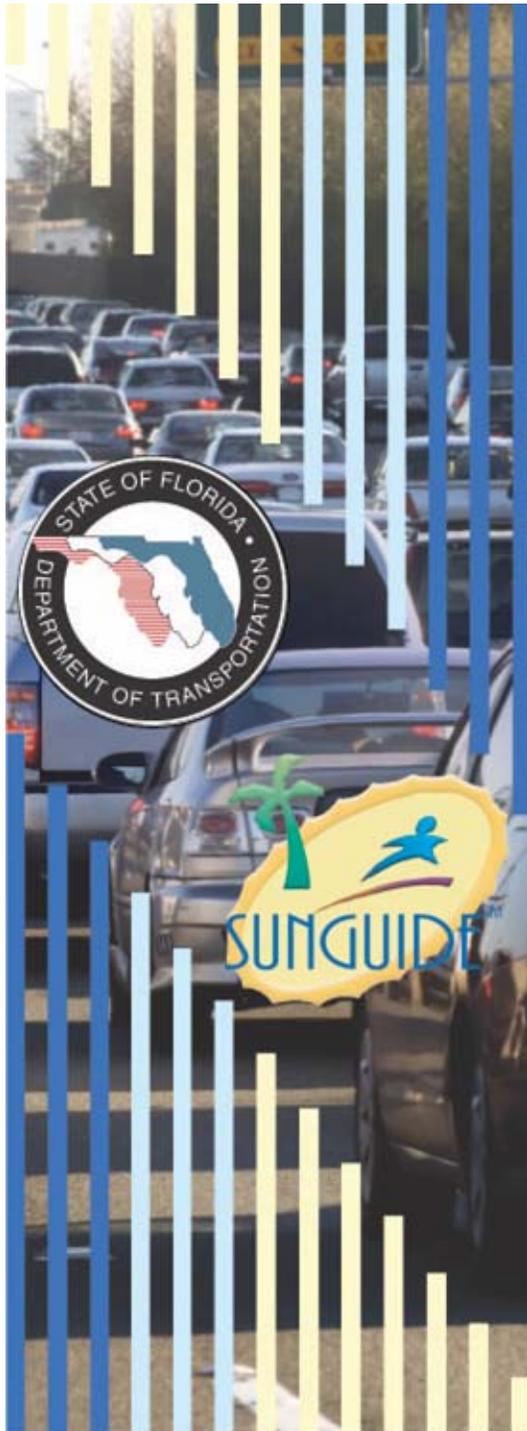
- ❑ *IP unicast* connectivity for all sites.
- ❑ *IP multicast* connectivity for all sites.
- ❑ *Network management* in place and operational.
- ❑ Sharing of *multiple video streams* simultaneously.
- ❑ *IP firewalling/filtering* operational.

***Contractor's full and final payment is dependent on these and other requirements being met.***

# Florida LambdaRail (FLR)

- FDOT is exploring options for expanding the ITS WAN optical backbone statewide...





# Overview of the Florida LambdaRail

Ryan Vaughn  
Senior Network Architect  
Florida LambdaRail  
[ryan.vaughn@flrnet.org](mailto:ryan.vaughn@flrnet.org)  
[www.flrnet.org](http://www.flrnet.org)

# What is FLR?

- ❑ FLR is a high-speed research and educational network.
- ❑ FLR is owned and operated by its 10 Equity Members:
  - 7 Public universities.
  - 3 Private universities.
- ❑ High-performance statewide optical network with over 1500 miles of fiber.
- ❑ High-performance and redundant IP (layer 3) backbone.



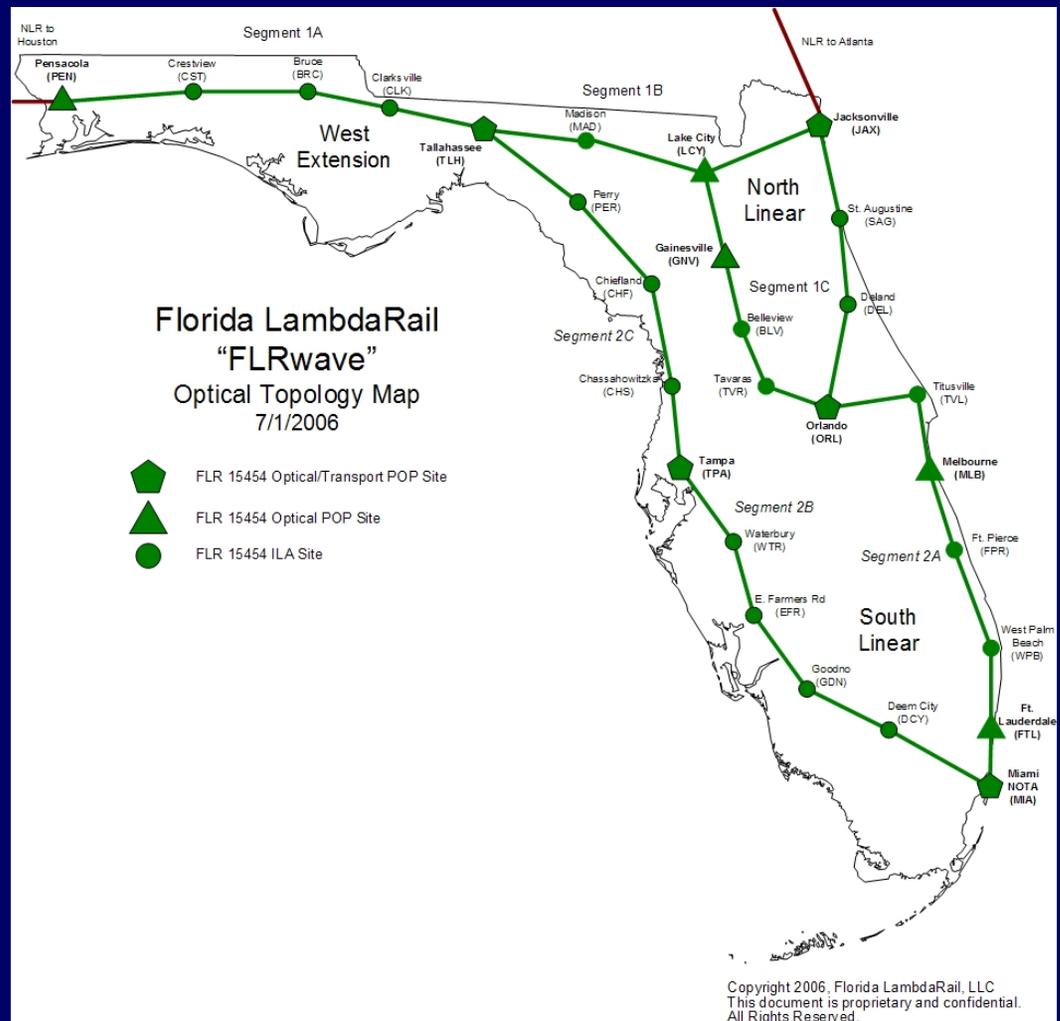
# What is FLR?

- Provides connectivity to:
  - National Research and Education Networks (RENs).
  - Regional Optical Networks (RONs).
  - Peering between members and settlement-free IX.
  - International peering.
  - ISP service and low-cost IX.
  - Dedicated waves or point-to-point circuits.
  - IP (Layer 3) VPNs.



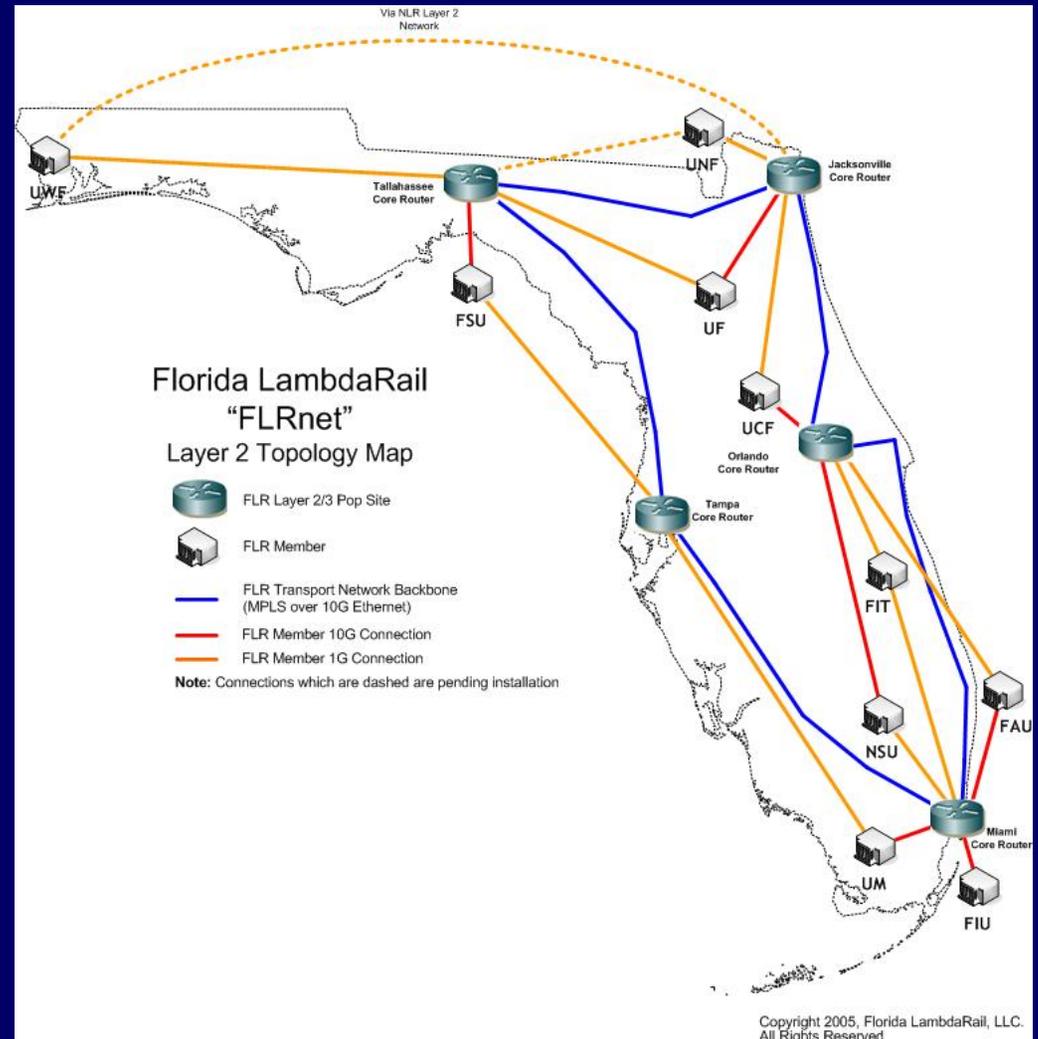
# The FLR Optical Network

- Over 1500 Miles of Fiber
- Cisco Optical Platform
- DWDM Backbone
- 32 waves
- 10Gig and 1 Gig waves
- 28 sites
  - 10 Optical PoP
  - 18 Optical Amplifiers



# The FLR Transport Network

- 5 Core Cisco Routers
- Backbone is IP over 10G Ethernet
- Multiple VRFs for dedicated partitioned IP networks
- Redundant IP (Layer 3) design
- Out of Band management to all equipment





# The FLR NOC

- 24x7 staffed operations center
- The NOC provides
  - Network Monitoring and Management
  - Problem/Request ticket Dispatching
- Engineering
- Equipment Sparing
  - Spare most equipment.
  - Set of optical hardware for channels not in use on the network for disaster recovery.
  - All equipment is under Cisco Smartnet.
- The NOC is re-locatable in case of a disaster recovery scenario.

# FLR Services

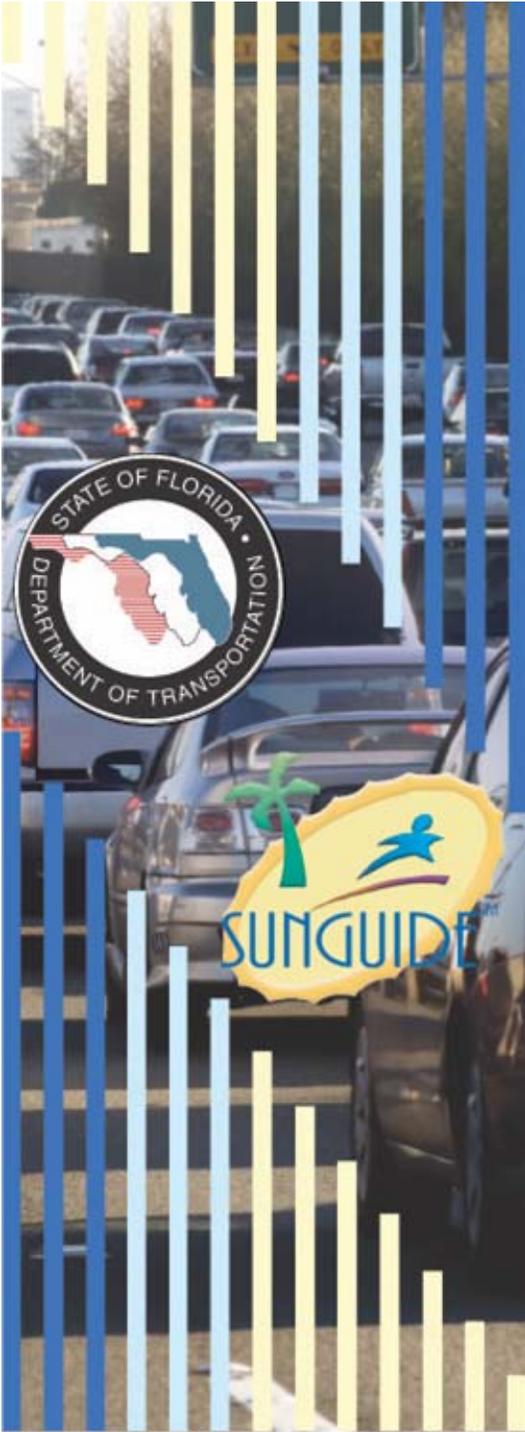
- ❑ Gigabit Ethernet (Layer 2) VPN for point-to-point connectivity
- ❑ Dedicated Waves for point to point circuits
  - 1 Gigabit Ethernet
  - 1 Gigabit Ethernet
- ❑ IP (Layer 3) VPNs
- ❑ ISP Service
- ❑ Connectivity to DR storage facilities
  - NOTA in Miami, FL
  - Telx in Atlanta, Ga





# FLR Services

- FLRnet Peering Service
  - Between Members
  - International Exchange Points (Ampath)
  - Other RONS (such as SoX and LONI)
  - Internet Exchange Points
  - Peering Fabrics (Awave)
- Connectivity to National RENs
  - National LambdaRail
  - Internet2



**The  
ITS WAN SFD  
and  
Florida LambdaRail**

***Questions?***

***Frank Deasy***

***Bill Lueck***

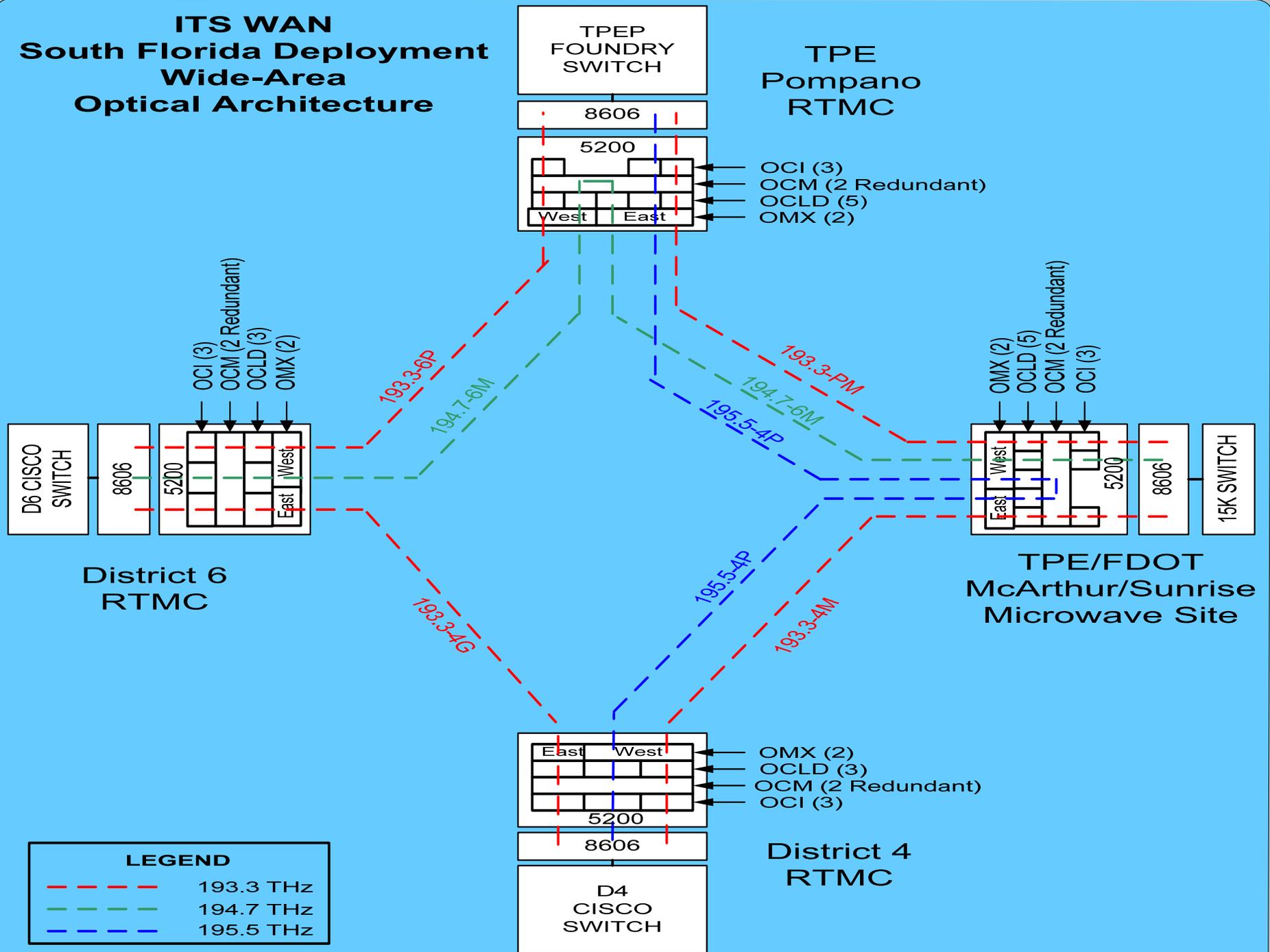
***Ryan Vaughan***



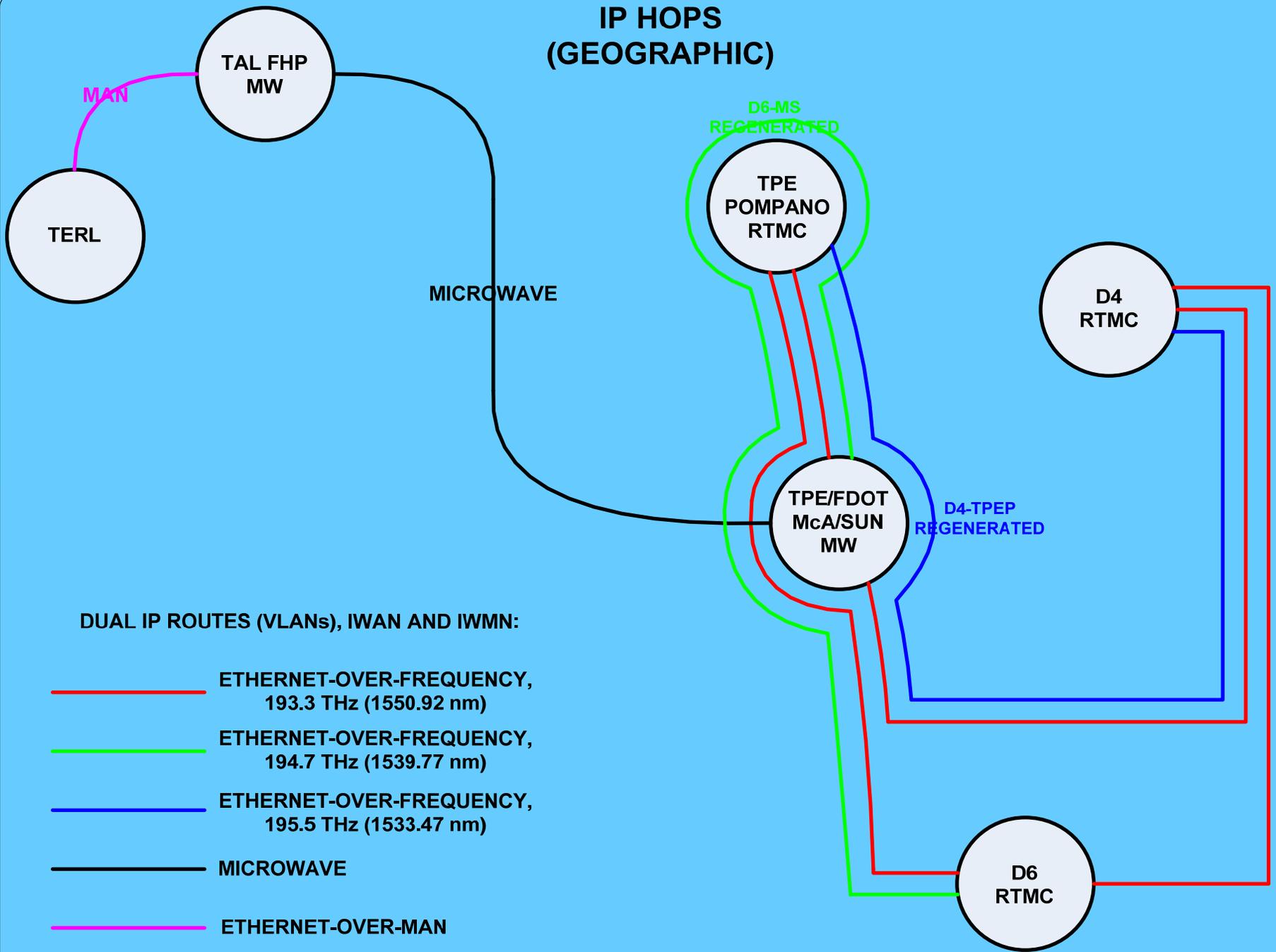
# Additional Slides

- ❑ Not part of planned presentation.
- ❑ To be used only to answer specific questions, should they arise.

# ITS WAN South Florida Deployment Wide-Area Optical Architecture



# IP HOPS (GEOGRAPHIC)



## DUAL IP ROUTES (VLANs), IWAN AND IWMN:

-  ETHERNET-OVER-FREQUENCY, 193.3 THz (1550.92 nm)
-  ETHERNET-OVER-FREQUENCY, 194.7 THz (1539.77 nm)
-  ETHERNET-OVER-FREQUENCY, 195.5 THz (1533.47 nm)
-  MICROWAVE
-  ETHERNET-OVER-MAN

# ITS WAN Statewide Deployment

