PROVISIONAL

Homeland Security

Office of Emergency Communications

ROUTE DIVERSITY PROJECT

Government and public safety entities rely on voice and data communications networks to fulfill their missions, yet communications continuity planning often overlooks one of the most critical and vulnerable parts of these networks: the local access network. The local access network is the "last mile" connection between an agency's on-site communications infrastructure and the service provider's network. An incident such as a cable cut, flood, or damage to the service provider's facility can completely disrupt the local access network, leaving an organization unable to perform critical functions.

The Department of Homeland Security Office of Emergency Communications (OEC) Route Diversity Project (RDP) helps organizations mitigate threats to communications continuity and supports resilient, "always available" communications. RDP focuses primarily local access because this area of the network typically has the least diversity, in contrast to metro and national networks, which tend to have much greater diversity. However, RDP's capabilities extend beyond local access to address risks associated with infrastructure architecture, emerging technologies, and cybersecurity.

Route Diversity Resources

RDP publishes *Route Diversity Best Practices: Improving the Resiliency of Public Safety Communications* and *Ten Keys to Obtaining a Resilient and Route Diverse Local Access Network*. These resources establish a process to assess threats and vulnerabilities to communications networks, enabling organizations to conduct self-assessments and identify ideal mitigation solutions.

Alternatively, RDP can conduct a route diversity assessment on a fee-for-service basis for any federal, state, local, tribal, or territorial organization. The service is available for single building environments or multi-building environments operating on a shared network.

RDP has been performing route diversity assessments since 2002. Numerous public safety answering points, emergency operations centers, and federal departments and agencies have benefited from these assessments. Most recently, in 2015 and 2016, RDP conducted five public safety assessments in the Mid-Atlantic Region and for various federal departments and agencies.

Please contact OEC-RouteDiversity@hq.dhs.gov to obtain copies of the RDP publications or to request a fee-for-service assessment.

Benefits

RDP maintains technical expertise and shared experience from previous assessments to ensure that requesting organizations benefit from the most up-to-date information and best practices.

UNDERSTANDING COMMUNICATIONS CONTINUITY

Communications continuity is a network's ability to withstand damages, thereby minimizing the likelihood of a service outage.

Three key elements ensure continuity:

- **Route Diversity**—Communications routing between two points over more than one geographic or physical path with no common points.
- **Redundancy**—Additional or duplicate communications assets share the load or provide back-up to the primary asset.
- **Protective/Restorative Measures**—Protective measures decrease the likelihood that a threat will affect the network, while restorative measures, such as OEC's Telecommunications Service Priority, enable rapid restoration if services are damaged or destroyed.

RDP supports mission-critical services and ensures:

- Continuity of service in the event of an emergency
- Improved network resiliency
- Increased organizational control
- Prioritization of areas for network improvement
- Fulfillment of organizational diversity assessment requirements

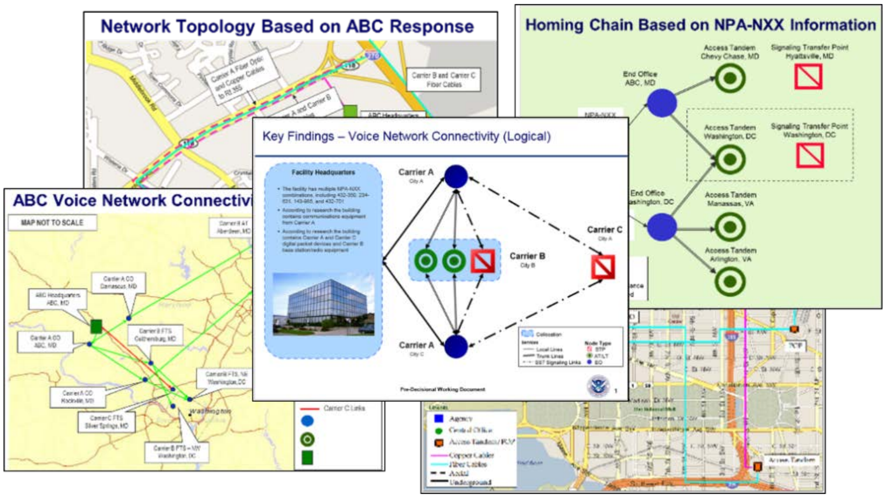
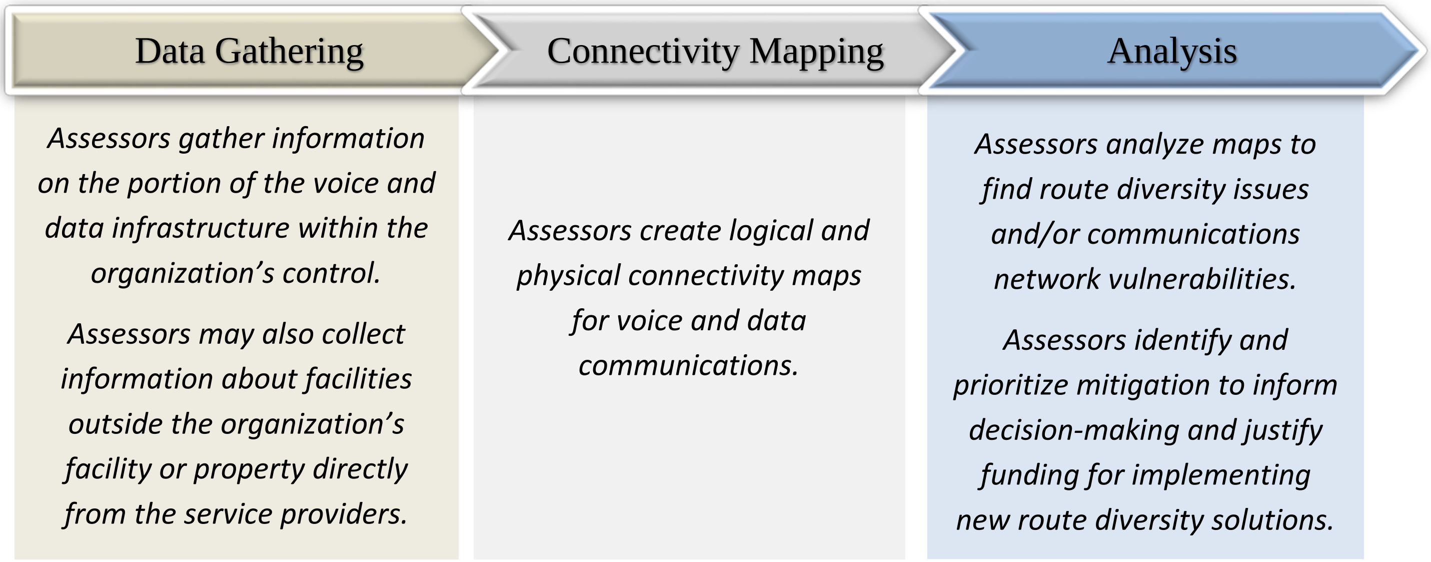

Network Topology Based on ABC Response
Homing Chain Based on NPA-NXX Information
Key Findings – Voice Network Connectivity (Logical)
ABC Voice Network Connectivi
MAP NOT TO SCALE
Facility Headquarters
Carrier A
Carrier B
Carrier C
End Office ABC, MD
Access Tandem Chevy Chase, MD
Signaling Transfer Point Hyattsville, MD
Access Tandem Washington, DC
Signaling Transfer Point Washington, DC
End Office Washington, DC
Access Tandem Manassas, VA
Access Tandem Arlington, VA
Pre-Decisional Working Document

Figure 1: Sample fee-for-service Route Diversity results for illustration purposes only

Methodology

RDP supports communications system connectivity, guides evaluation of connectivity data, and presents suggestions to increase route diversity.



Data Gathering

Assessors gather information on the portion of the voice and data infrastructure within the organization's control.

Assessors may also collect information about facilities outside the organization's facility or property directly from the service providers.

Connectivity Mapping

Assessors create logical and physical connectivity maps for voice and data communications.

Analysis

Assessors analyze maps to find route diversity issues and/or communications network vulnerabilities.

Assessors identify and prioritize mitigation to inform decision-making and justify funding for implementing new route diversity solutions.

FOR ADDITIONAL INFORMATION

Please contact OEC@dhs.gov or visit www.dhs.gov/oec.