911.gov

Next Generation 911 GIS Checklist

About the National 911 Program

The National Highway Traffic Safety Administration (NHTSA) National 911 Program (Program), in the Office of Emergency Medical Services (OEMS) at the United States (U.S.) Department of Transportation (DOT), provides leadership and coordination of federal efforts that support 911 across the nation. A seamless interoperable 911 system-of-systems across the U.S. advances NHTSA's mission to eliminate fatalities, illness, and injuries from motor vehicle crashes and improve post-crash care.

The Program works with many stakeholders—including federal, state, local, tribal, and territorial (FSLTT) governments, technology vendors, public safety officials, and 911 professionals—toward a goal of advancing 911 that takes advantage of existing and emerging communications technologies, improving response times and information available to first responders prior to and during a 911 incident.

Background

Given the importance of geographic information system (GIS) data and staff to the Next Generation 911 (NG911) migration and the complexities associated with developing the same to support 911 operations, the Program has developed a GIS checklist for local, tribal, and federal public safety answering point (PSAP) leadership and another checklist for 911 authorities at the state, territorial and federal level.

Introduction

The Program respects the fact that 911 leaders across the country are overtaxed with requirements, understaffed in the 911 center, and being asked to venture into likely unknown or lesser understood technologies to support the migration to and ongoing operation of NG911 systems. The Program continues to seek advanced awareness of the GIS industry's capabilities to support NG911 through several initiatives. The GIS Assessment Project[1], started in 2020 and continuing through 2023, identified the current capabilities, or lack thereof, of the GIS industry to support NG911.

The GIS Assessment Project identified capability gaps in the geospatial industry and provided suggestions for resolving deficiencies. One such item is a checklist for creating and maintaining the GIS program (staff, data, partnerships) necessary to support the migration to and ongoing operation of an NG911 system at the FSLTT levels. The checklists provided herein are a supplement to the Geographic Information Systems Technology National Strategy for GIS in NG911[2] report available on 911.gov and are meant to assist 911 and technology leaders in assembling the components necessary for success. The checklists include recommendations made by partner agencies and organizations[3] with extensive expertise in NG911 and GIS technology.

One checklist is designed for local, regional, tribal jurisdiction, and federal installation, while the second checklist is designed for state, territorial, and federal 911 authorities.

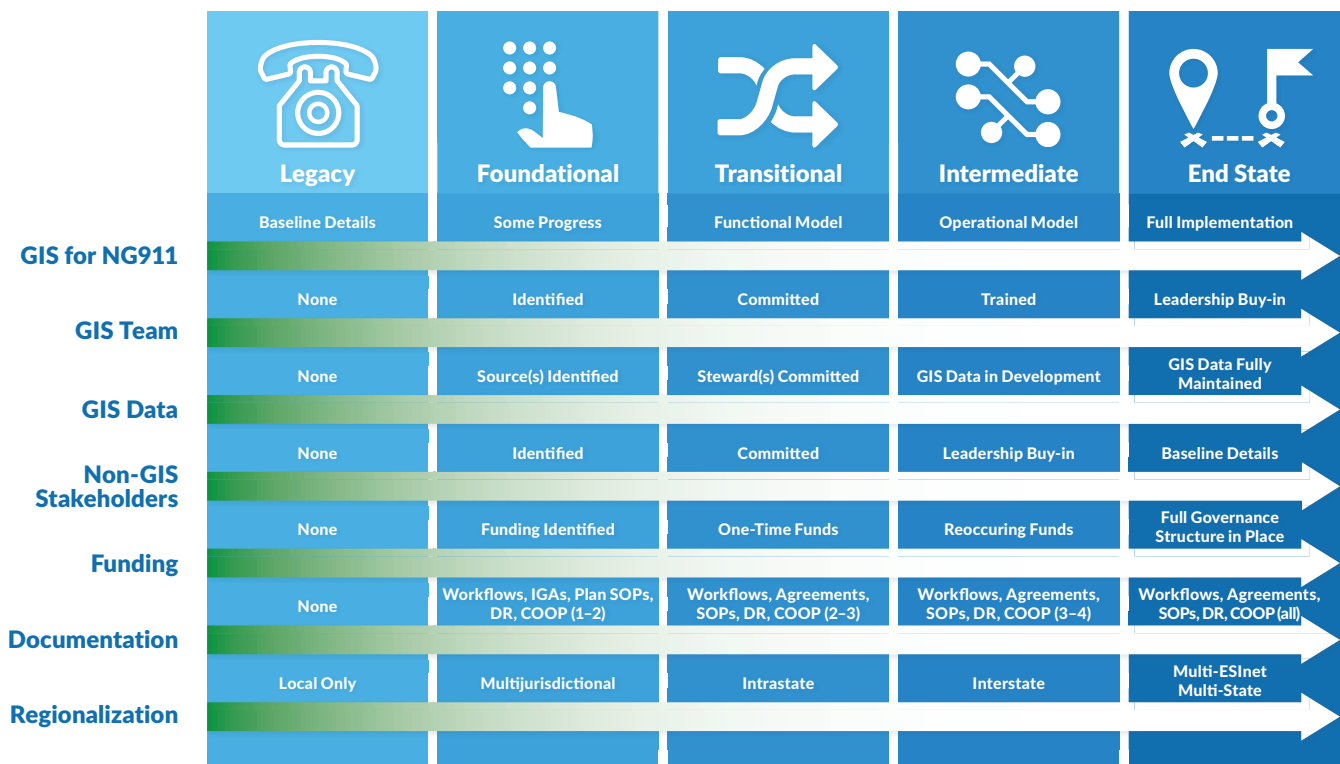1 https://www.911.gov/projects/gis-assessment-project/
2 https://www.911.gov/assets/NHTSA-GIS_GIS-Strategies_29MAR2023_Final.pdf
3 https://www.911.gov/assets/NHTSA-GIS_Project-Partner-Agency-Organizations_MAR2023_Final.pdf

Using the Checklists

The checklists are purposely high level to serve the broadest audience. While the Program strives to provide thorough guidance to every stakeholder, some knowledge of the local technology and capabilities landscape will influence the items in the checklists.

Pairing a checklist with the Task Force on Optimal Public Safety Answering Point Architecture (TFOPA) Next Generation 911 Self-Assessment Tool[4] (scorecard), for example, allows progress toward full capabilities to be measured along the continuum to show incremental progress as minor milestones are met. A sample TFOPA scorecard with suggested metrics is shown below.

	Legacy — Baseline Details	Foundational — Some Progress	Transitional — Functional Model	Intermediate — Operational Model	End State — Full Implementation
GIS for NG911					
GIS Team	None	Identified	Committed	Trained	Leadership Buy-in
GIS Data	None	Source(s) Identified	Steward(s) Committed	GIS Data in Development	GIS Data Fully Maintained
Non-GIS Stakeholders	None	Identified	Committed	Leadership Buy-in	Baseline Details
Funding	None	Funding Identified	One-Time Funds	Reoccuring Funds	Full Governance Structure in Place
Documentation	None	Workflows, IGAs, Plan SOPs, DR, COOP (1–2)	Workflows, Agreements, SOPs, DR, COOP (2–3)	Workflows, Agreements, SOPs, DR, COOP (3–4)	Workflows, Agreements, SOPs, DR, COOP (all)
Regionalization	Local Only	Multijurisdictional	Intrastate	Interstate	Multi-ESInet Multi-State

Supplemental Resources

SAFECOM[5], managed by the Cybersecurity and Infrastructure Security Agency (CISA) and its partner organization, the National Council of Statewide Interoperability Coordinators (NCSWIC), released a GIS lifecycle best practices guide[6] in 2020. While there is some overlap between the work done by SAFECOM and NCSWIC and the Program's checklists (CISA participated in the GIS Assessment Project), the guide breaks down the creation of GIS operations into manageable phases.

---

4 https://www.fcc.gov/about-fcc/advisory-committees/general/task-force-optimal-public-safety-answering-point
5 https://www.cisa.gov/sites/default/files/2023-03/SAFECOM%20Governance%20Charter%20FINAL%20508c%20June%202022.pdf
6 https://www.cisa.gov/sites/default/files/publications/SAFECOM-NCSWIC_GIS%20Lifecycle%20Best%20Practices%20Guide_9.22.20%20-%20FINAL_%28508c%29.pdf

Local, Regional, Tribal Jurisdiction, and Federal Installation Next Generation 911 GIS Checklist

Build the Right Team

- ☐ A project champion
- ☐ Data stewards from every jurisdiction maintaining 911-related GIS data[7]:
  - ☐ Road Centerline (RCL)
  - ☐ Site Structure Address Point (SSAP)
  - ☐ Emergency Service Boundary (ESB)
    - ☐ Police
    - ☐ Fire
    - ☐ Emergency Medical Services (EMS)
- ☐ Non-GIS leadership: 911, administration, elected official(s)
- ☐ GIS contacts at all neighboring jurisdictions
- ☐ Address coordinator from every addressing authority—with 911 knowledge
- ☐ An experienced *trusted partner*[8] to provide guidance, expertise, and control vendor noise distracting from achieving success metrics

GIS Team Structure

---

7 GIS Data Supply Chain – Section 4.2 – https://www.911.gov/assets/NHTSA-GIS_Project-Current-Status-of-911-GIS-Technologies_MAR2023_Final.pdf

8 Qualified consulting firms and GIS service providers can be found through industry organizations such as URISA and NSGIC or in the National 911 Program GIS Partner Agency and Organizations Report

Prepare GIS Data

☐ [Acquire or develop requisite GIS datasets](#)[9]

☐ Acquire legacy tables:

    ☐ Master Street Address Guide (MSAG)

    ☐ Automatic location identification (ALI) tables

☐ GIS data in regional, state, [NENA NG911](#)[10] schema

☐ Complete attribution according to the [NENA GIS data model](#)[11]

☐ Validate legacy and GIS data and improve to at least a 98% match rate

    ☐ MSAG to GIS SSAP   ☐ MSAG to GIS RCL

    ☐ ALI to GIS SSAP   ☐ ALI to GIS RCL

☐ Develop PSAP, Provisioning, and Service Boundary polygons

☐ Maintain GIS data daily in sync with real-world changes

☐ Achieve and maintain topological integrity

☐ Internal to jurisdiction

☐ With neighboring jurisdictions

Public Sector Stakeholders

- Adressing Authority (Local, Tribal)
- GIS Data Steward (Local, Tribal)
- State Geographic Information Office (GIO)
- Governance Bodies (Tribal, GIS, 911)
- Consortiums (Tribal, GIS, 911)

GIS for NG911

Private Sector Stakeholders

- GIS Service Providers
- Industry Organizations
- Legacy 911 Providers

---

9 https://www.911.gov/assets/Whitepaper---Don_t-Take-Shortcuts-When-Developing-GIS-Data-for-NG911.pdf
10 https://github.com/NENA911/NG911GISDataModel
11 https://www.nena.org/page/ng911gisdatamodel

Training, Education and Outreach

- ☐ Train GIS data stewards on NG911 GIS requirements and standards
- ☐ Educate leadership on the importance of GIS to NG911
- ☐ Train non-911 GIS personnel on the use of GIS data within the PSAP
- ☐ Outreach to and coordination with key 911 stakeholders
- ☐ Maintain awareness of NENA standards development and implement new standards as they are released – Join NENA workgroups and influence standards

Document Everything

- ☐ Add GIS to 911 continuity of operations (COOP) plan
- ☐ Add GIS to 911 disaster recovery (DR) plan
- ☐ Build / update existing GIS strategic plan for NG911 support
- ☐ Record and maintain workflows and standard operating procedures (SOPs) for data acquisition and maintenance processes
  - ☐ Document and share quality assurance checks to ensure data completeness
  - ☐ Document internal and external data stewards and their respective roles in the overall workflow for GIS data maintenance including:
    - ☐ Addressing authorities
    - ☐ Planning and Zoning for new and existing developments
    - ☐ PSAP personnel – internal and neighboring jurisdictions
    - ☐ GIS personnel – internal and neighboring jurisdictions
    - ☐ Public safety personnel
- ☐ Formalize and document the governance structure for GIS
- ☐ Secure GIS data steward, information technology (IT), regional responsibilities with memorandum of agreement (MOA) and/or service level agreement (SLA)

State, Territorial, and Federal 911 Authorities
Next Generation 911 GIS Checklist

Build the Right Team

☐ A project champion

☐ Non-GIS leadership: 911, administration, elected official(s)

☐ GIS contacts at every 911 authority

☐ State GIS technical resources

☐ An experienced *trusted partner*[12] to provide guidance, expertise, and control vendor noise distracting from achieving success metrics

GIS Team Structure

Training, Education and Outreach

☐ Provide NG911 GIS requirements training for local, tribal, and territorial 911 authorities

☐ Educate state, local, tribal, and territorial leadership on the importance of GIS to NG911

☐ Outreach to local, tribal, and territorial GIS data stewards

☐ Support state, regional, and national participation in GIS groups

---

12 Qualified consulting firms and GIS service providers can be found through industry organizations such as URISA and NSGIC or in the National 911 Program GIS Partner Agency and Organizations Report

Prepare GIS Data

- ☐ Offer statewide GIS purchasing contract
- ☐ Add GIS to the list of 911 funding eligible purchases
- ☐ Sponsor GIS data validation tools
- ☐ Establish a statewide NG911 schema or adopt NENA standard[13] outright
- ☐ Coordinate collaborative intra- and inter-state GIS data development
- ☐ Provide aggregated, validated statewide NG911 GIS datasets

Document Everything

- ☐ Build and/or update existing statewide GIS strategic plan for NG911
- ☐ Formalize and document the state's governance structure for GIS

Provide templates for:

- ☐ Continuity of Operations (COOP) Plan
- ☐ Disaster Recovery (DR) Plan
- ☐ Service Level Agreement (SLA)
- ☐ Memorandum of Agreement (MOA)
- ☐ Intergovernmental Agreement (IGA)
- ☐ Memorandum of Understanding (MOU)
- ☐ Standard Operating Procedure (SOP)
- ☐ Local, Regional, and/or Tribal Strategic Plan

---

13 https://www.nena.org/resource/resmgr/standards/nena-sta-006.2a_ng9-1-1_gis_.pdf