

Building Transportation for the Nation: Federal Roads Transportation Requirements

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**GIS-T
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Federal Roads Data Requirements

In October 2009 the USDOT, USGS, and US Census Bureau convened a meeting of Federal Agencies

- to define core Federal Roads geospatial data requirements and business needs
- to feed into the TFTN requirements gathering process
- to see how to leverage our resources and create a common core dataset for roads upon which agencies can add information to meet their needs

Federal Participants

US Census Bureau

US DOT-RITA

US Geological Survey

USDA Farm Service Agency

DOT- Federal Highway Administration

Environmental Protection Agency

DOE-Oak Ridge National Laboratory

DOI –Bureau of Land Management

DOI- Fish and Wildlife Service

USDA Natural Resources Conservation Service

DOD – Office of the Secretary of Defense

DOD- National Geospatial Intelligence Agency

HUD

Library of Congress

FGDC

Forest Service

U S C E N S U S B U R E A U

Agency Responses

	REQUIRED
	DESIRED
	NOT NEEDED
	7+ AGENCIES REQUIRED

FEATURES	
Secondary highways	REQUIRED
Interstates	REQUIRED
Major highways (non-interstates)	REQUIRED, DESIRED
Local streets and roads	REQUIRED, DESIRED
Rail	REQUIRED, DESIRED
Other Fed Lands Roads	REQUIRED, DESIRED, NOT NEEDED
Road Bridges/Culverts	REQUIRED, DESIRED, NOT NEEDED
Waterways	REQUIRED, DESIRED, NOT NEEDED
Unpaved Roads	REQUIRED, DESIRED, NOT NEEDED
Entry/Exit Ramps	REQUIRED, DESIRED, NOT NEEDED
Runways/Airports	REQUIRED, DESIRED, NOT NEEDED
Road Tunnels	REQUIRED, DESIRED, NOT NEEDED
Under/Overpasses	REQUIRED, DESIRED, NOT NEEDED
Mileposts	REQUIRED, DESIRED, NOT NEEDED

Agency Responses

(features cont'd)

Trails & Bicycle paths			
Exits			
Mass Transit Station/Stop			
Recreation Site			
Private Streets and alleys			
Other Private land roads			
Rest Areas			
Toll Plazas			
Cul-de-sacs			
Weigh Stations			
Truck Stops			
Park and Ride			
All Signed Routes			
Road Medians			
Road Condition			
Safety Index			
Bridge Condition			
Interchange Types			

Attribute Requirements

<i>ATTRIBUTES</i>			
Names			
Functional Classification (HPMS schema)			
Administrative Classification			
Address Ranges			
Directional Routing Info			
Linear Referencing			
Address Points			
Pavement Types			
Speed Limits			

Federal Requirements Gathering

- Required/Desired/Not Required
- Public Domain Requirements
 - Legally Mandated
 - Agency Mission Critical
 - Intrinsically Beneficial
- Funding Availability
- Business needs
- Data characteristics

Getting Started

- Roads likely are the most desired transportation layer
- Non-Fed stakeholders have the best data and want to contribute to the National Roads Dataset
- We must identify the national core features and attributes
- Data must be aggregated into a seamless dataset

TIGER is a logical place to start

TIGER maintenance meets criteria of the “Transportation for the Nation” program

Vision for the Future:

- ✓ The federal government will coordinate development of a seamless nationwide dataset of addressable roads that is built in a collaborative and shared environment.
- ✓ It will be comprised of local roads data containing current and accurate address information utilized for 911, statewide road centerline data managed by state GIS organizations, state highway data managed by state DOTs that meets linear referencing needs, and other roads data from regional (Metropolitan Planning Organizations), tribal, Federal, and other sources.

TIGER Modernization: MAF/TIGER Accuracy Improvement Project

- \$271 million program to align features for use with GPS housing unit data
- Production February, 2003 - March 31, 2008
Included Puerto Rico, US Virgin Islands, Guam, Commonwealth of Northern Mariana Islands, American Samoa

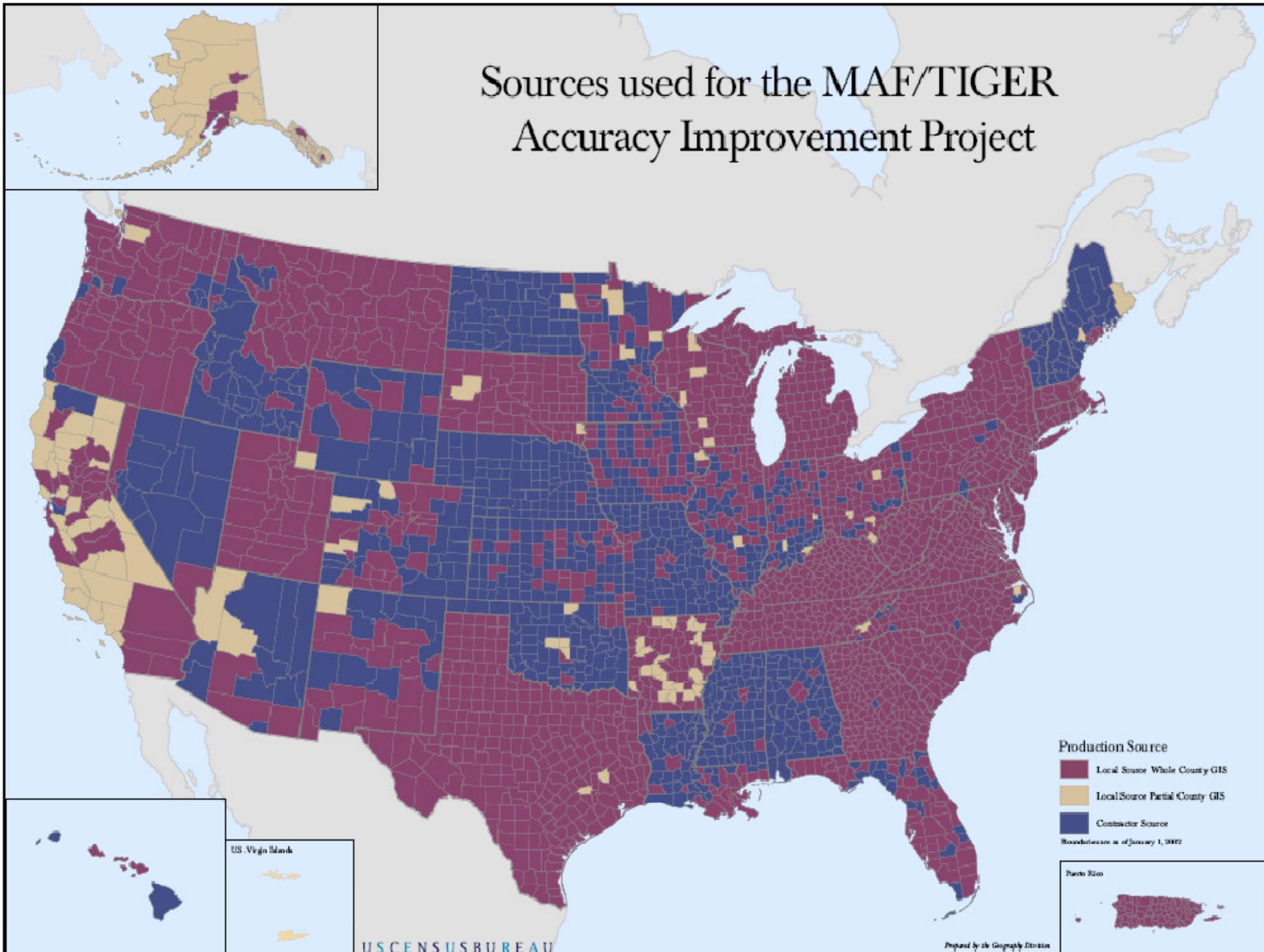
TIGER Modernization

TIGER: Circular Error 95% 7.6 m.

Sources Used

- **2,096** Tribal, State, County, & Local GIS Files
- Road Centerline Collected via GPS
- Road Centerline vectors extracted from imagery
- Commercial GIS Files Purchased
- NHD or Local Hydro

Sources used for the MAF/TIGER Accuracy Improvement Project



Arlington-Fairfax County Line: TIGER



U S C E N S U S B U R E A U

Fairfax Co Road Attributes

ST_ID_CODE

ALT_NAME

L_F_ADD

R_T_ADD

FX_SOURCE

ROAD_LINK

BAKER_CHNG

STREETSYM

SEGID

ZIP4L

STATUS

REG_JURIS

SECONDS

STPFX

STTYPE

L_T_ADD

ZIPL

ROUTE

START_NODE

SECTION_N

PROC_

FIPS

ZIP4R

SPEED

POL_JURIS

STTYPE_USPS

STNAME

STSFX

R_F_ADD

ZIPR

LINK_CODE

END_NODE

ALT_ROUTES

ALTERISCL

ROAD_CLASS

MAINT_RES

SURF_TYPE

EFFECTIVE_DATE

FFX_CLASS_LEN

Fairfax County, VA GIS Data Layers

Radon Gas	Polygons	GISMGR.RADON_GAS_POLY
Railroad	Arcs	GISMGR.RAILROAD_LINE_4000
Refuse Area	Polygons	GISMGR.REFUSE_AREA_POLY
Refuse Day	Polygons	GISMGR.REFUSE_DAY_POLY
Refuse Type	Polygons	GISMGR.REFUSE_TYPE_POLY
School Cluster	Polygons	GISMGR.SCHOOL_CLSTR_POLY
School Location	Points	GISMGR.SCHOOL_LOCATION_POINT
School Planning Units	Polygons	GISMGR.SCHOOL_PLANUNITS_POLY
Senate Districts	Polygons	GISMGR.VOTE_SENATE_POLY
Soils	Polygons	GISMGR.SOILS
Solid Waste Facility	Points	GISMGR.REFUSE_FACILITY_POINT
Street Centerlines	Arcs	GISMGR.STREET_CENTERLINES_FAIRFAX
Supervisor Office	Points	GISMGR.SUPERVISOR_OFFICE_POINT
Supervisor Districts	Polygons	GISMGR.SUPERVISOR_DISTRICT_POLY
Tax Map	Polygons	GISMGR.TAX_MAP_POLY
USGS Grid	Polygons	GISMGR.GRID_USGS_POLY
Volunteer Group	Polygons	GISMGR.VOLUNTEER_GROUP_POLY
Watershed	Polygons	GISMGR.WATERSHED_POLY
Zipcode	Polygons	GISMGR.ZIPCODE_ZIP_POLY

Airport	Polygons	GISMGR.AIRPORT_POLY_4000
Census Polygons fro Fairfax Co	Polygons	GISMGR.CENSUS_SUBCENSUS_POLY
Chesapeake	Polygons	STWMGR.CHESAPEAKE_BAY_AREAS
Comprehensive Affordability Study	Points	GISMGR.CHAS_POINT
Congressional Districts	Polygons	GISMGR.VOTE_CONGRESSIONAL_POLY
County Border	Polygons	GISMGR.COUNTY_BORDER_POLY
Elementary School Attendance	Polygons	GISMGR.SCHOOL_ES_POLY
Fastran Zones	Polygons	GISMGR.FASTRAN_ZONE_POLY
Fire Battalion	Polygons	GISMGR.FIRE_BATTALION_POLY
Fire Box	Polygons	GISMGR.FIRE_BOX_POLY
High School Attendance	Polygons	GISMGR.SCHOOL_HS_POLY
Historic Areas	Polygons	GISMGR.HISTORIC_AREAS_POLY
House of Delegate Districts	Polygons	GISMGR.VOTE_DELEGATE_POLY
Human Services Region	Polygons	GISMGR.HUMAN_SVCS_REGION_POLY
Hydro Linear	Arcs	GISMGR.HYDRO_LINE_4000
Hydro Polygons	Polygons	GISMGR.HYDRO_POLY_4000
Major Roads	Arcs	GISMGR.MAJOR_ROAD_LINE
Major Utility	Arcs	GISMGR.UTILITY_MAJOR_LINE
Middle School Attendance	Polygons	GISMGR.SCHOOL_MS_POLY
Park Maintenance	Polygons	GISMGR.PARK_MAINTENANCE_POLY
Parks FCPA	Polygons	GISMGR.PARKS_FAIRFAX_POLY
Parks Other Fairfax Land	Polygons	GISMGR.PARKS_OTHER_POLY
Planning Area	Polygons	GISMGR.PLANNING_AREA_POLY_4000
Planning District	Polygons	GISMGR.PLANNING_DISTRICT_POLY
Political Jurisdiction	Polygons	GATE.POLITICAL_JURIS_POLY
Precinct	Polygons	GISMGR.VOTE_PRECINCT_POLY

VIRGINIA STATE GIS AND VDOT

Attributes (STATE)

Attributes (DOT)

Descriptions

Road Name	V_LOCALID	Local ID Used By The Locality
Road Hierarchy	ROUTESYSIDSHORT	Route Designation from VDOT MainFrame
US & VA Highways	V_FIPS	Unique ID For Each Locality
Secondary Highways	TRANSPORTEDEGEID	Unique Segment ID for VDOT RNS
Urban Rd (Locality Rds)	V_ENABLED	Built Road or Planned Road
Interstate Ramps	V_POSDIR	Locality Assigned Post Road Direction
Frontage Roads	VSP_Link	For Virginia State Police Dataset External SQL Table
V_PREDIR	NT_LINKID	Navteq Unique ID
FROMJUNCTIONID	NT_FC	Navteq Functional Class
TOJUNCTIONID	NT_SPEEDCAT	Navteq Speed Classification
MEASUREDFEET	NT_DIRTRAV	Navteq direction of Travel
MEASUREDMILES	NT_MANOEUVRE	Navteq Manouver field
ROUTENUMBER	NT_ROUTE	Navteq Route Field
LASTUPDATE	NT_ZLEVEL	Navteq Z Level

ARLINGTON COUNTY GIS DATA GUIDE

L_T_ADD	Integer	4	High (ending) left-side address number
R_F_ADD	Integer	4	Low (beginning) right-side address number
R_T_ADD	Integer	4	High (ending) right-side address number
PLOWTYPE	SmallInt	2	Priority listing for snow plowing. 0 = None, 1 = Primary County, 2 = Secondary County, 3 = State Maintained,
SPEEDLIMIT	Double	8	Posted speed limit (updates in progress)
STRID	Integer	4	Unique ID number between intersections
STRTO	String	8	Intersecting street at end of block
STRFROM	String	8	Intersecting street at beginning of block
MAJORROAD	SmallInt	2	Major Road
STRDIRP	String	1	Street direction PREFIX where direction prefixes street name
STRNAME	String	20	Street name element
STRTYPE	String	4	Street type designator element (ST, BLVD, RD, CT etc.)
STRDIRS	String	1	Street direction SUFFIX where direction suffixes street name
STNAME	String	35	Full concatenated street name
DIVIDED	SmallInt	2	Flag indicating whether the street segment is divided or not. NO or YES

Data Attributes:

Item Name	Item Definition		Description
ROAD_FLAG	Integer	2	Flag indicating that bridge is for vehicle use. 1 = yes, 0 = no
PED_FLAG	Integer	2	Flag indicating that bridge is for pedestrian use. 1 = yes, 0 = no
RAIL_FLAG	Integer	2	Flag indicating that bridge is for railroad use. 1 = yes, 0 = no
METRO_FLAG	Integer	2	Flag indicating that bridge is for Metro Rail use. 1 = yes, 0 = no
LEVEL_1	Integer	2	Flag indicating that bridge is a first level bridge (lowest level). 1 = yes, 0 = no
LEVEL_2	Integer	2	Flag indicating that bridge is a second level bridge. 1 = yes, 0 = no
LEVEL_3	Integer	2	Flag indicating that bridge is a third level bridge. 1 = yes, 0 = no

Data Attributes:

Item Name	Item Definition		Description
EVACROUTE	SmallInt	2	Evacuation Route
DATESTAMP	Date	8	Date of most recent edit
STCODE	String	12	Stoode Relate item for STCODE file
STBLOCK	SmallInt	2	Street address hundred block number
STTYPE	SmallInt	2	Street type code (values subject to change). 1 = vehicular access.
STCLASS	SmallInt	2	Street functional classification. Please refer to the STREET_CLASS_LUT.
L_F_ADD	Integer	4	Low (beginning) left-side address number

The Census Bureau is a willing partner with a wealth of experience

- Feature and boundary maintenance
- Spatial updates
- Data integration

Proposed Geographic Support System Initiative

A budget increase over our base funding for Geographic Support System for:

- Address coverage and source improvement
- Feature maintenance (roads and attributes)
- Quality Improvements

For the 2020 Census, the proposed GSS Initiative supports the goal of a **targeted** (vs. nationwide) **address canvassing**

GSS Initiative - Features

Continuous update of street network and attributes

Sources will focus on best available data from partnership and commercial files

Extensive use of imagery

- Data acquisition
- Data verification
- Data quality assurance

GSS Initiative - Quality

Quality improvements apply to:

- Address and Spatial Data
- IT Processes
- Geographic Products

Quantitative measures of address and spatial data quality are needed

Where are we now?

Our FY 2011 budget is waiting for approval by Congress
Geography Division management devoted a 2 day session to
begin planning for the FY2011 proposed initiative
Census Bureau is forming teams to address specific topics
such as:

- Address coverage
- Address and spatial data sources
- Policy
- Partnerships
- Quality assessment and evaluation
- Research and Development
- Technology

**We can leverage TIGER to be the
foundation for the roads data for
Transportation for the Nation**

QUESTIONS?

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