GIS and Changes to the Local Highway Inventory
GIS and Changes to the Local Highway Inventory

- **Background**
  - Local Highway Inventory
  - CHIPS
- **GIS project**
  - FHWA & purpose
  - Sources
  - Process
  - Edits
  - Follow-up
  - Tools

- **Issues & Details**
  - Open to Public Roads
  - Roads by Use
  - Elevation changes
  - Measures
    - Centerline to centerline
    - Dead ends & cul de sacs
  - Public vs. Private Use
  - Resolutions
Local Highway Inventory

Listing of roads & streets under the responsibility of the towns, cities, villages, and counties of New York State

Used as input to CHIPS funding distribution formulas

Note: GIS Project changes will not be incorporated into CHIPS until the project is completed statewide.
Annual LHI update will continue to be distributed
- annual update is still required to capture newer road changes.
Distribution formula
- total dollars is not driven by the mileage
- accurate mileage measures ensures equitable distribution of CHIPS funds

Inputs
- Centerline mileage of roadways maintained
- Lane-mileage of roadways maintained
- Motor vehicle registrations
- Amount of total funding made available
The Highway Performance Monitoring System (HPMS) Field Manual includes the requirement for States to submit their linear referencing system (LRS) network for all roads eligible for Federal Aid. The purpose of this memorandum is to announce that this requirement will be expanded to cover all public roads including dual carriageways on divided highways for the HPMS submittal of 2013 data due June 15, 2014. This is consistent with the updated HPMS.
Purposes

**Federal**
- Federal Highway Aid
- Census Bureau
- Dept of Interior (Nat Pks, Land Mgmnt)
- Truck routing / freight management

**State**
- Funding allocations & distribution
- Transportation planning
- Highway safety engineering analyses
- Truck routing / freight management

**Local**
- Emergency services / 911
Impact

FHWA accuracy requirement is rigid
Lengths that were “good enough” in the past no longer acceptable
Need for consistent, verifiable, and accurate means of measurement
Past problems must be “cleaned up” – duplicates, overlapping, rounding, boundary roads, “private”, missing, inconsistency
Sources

Statewide “Streets” from GIS Program Office
- System used for E-911, address ranges
- Often used in county tax mapping

Local Highway Inventory

Aerial photography and Geographic Information System (GIS) for editing
Process

Match appropriate arcs from “Streets” to roads from Local Highway Inventory (LHI)

“Build” GIS route

Use aerial photography to measure road lengths

Edit GIS Street and/or LHI record to match measured length
Edits

Name - try to match common names, particularly those which can be seen on road signs such as on Google Street View

From/To descriptions – preferably reflect visible features primarily using cross streets

Posted Speed Limits – may cite areawide limit noting where there are exceptions; ignore time-limited school speeds

Length changes – aerial photography used to validate
Follow-up

Note major length changes versus LHI

Note roads that could not be found

Note roads found (exist in photos) but not in LHI

Begin outreach to county & local governments
  - Started with NYSDOT Region 1
  - Regions 2, 6, 7 in Fall 2015
  - Remainder to begin in Spring 2016
Tools

County highway & other published maps

Commercial Internet-based mapping tools
- Google Earth, Maps, and Street View
- Bing Maps, Birds Eye View

NYS aerial photography

Online county tax mapping

NYS planimetric quadrangle mapping
Issues & Details

“Public” roadways

Roads by use

Elevation changes

Measurements

Public versus private

Resolutions
Public Road

Federal Highway Administration
Highway Performance Monitoring System

... any road or street owned and maintained by a public authority ... open to public travel ... available, except during scheduled periods, extreme weather or emergency conditions, passable by four-wheel standard passenger cars, and open to the general public for use without restrictive gates, prohibitive signs ...
Town Roads

Typically acquired with defined boundaries and unambiguous rights of ownership:
- Purchase of lands
- Eminent domain
- Dedication

Roads by Use – “continuous use and public maintenance for a period of 10 years”
- Section 189 of NYS Highway Law*

Cornell Local Roads Program, New York LTAP Center
Elevation Changes

- An evaluation of the impact of elevation changes on road length indicated virtually no impact on overall length when measured to precision of 0.01 miles (52.8 feet).
- Comparison of 2 & 3 dimensional approaches at several locations confirmed this result.
Elevation Changes

One mile at a continuous 10% climb yields a total length change of "zero" when using a precision level of 0.01 miles.

- actual "increase" in length is 0.0049 miles
Elevation Changes

The NYSDOT Profiler vehicle with Distance Measuring Instrument (DMI) accurate to 0.001 mile was compared to aerial photograph/GIS and found no measurable difference for:

- NY 23A in Greene County
- NY 73 near Lake Placid
- Kelly Station Road near Schenectady
- NY 431 Whiteface Mountain
Details

Measurements
- centerline to centerline
- dead ends & cul de sacs
- boundary roads

Public versus private
- appears to be driveway (public or private)
- tax parcels do not indicate right-of-way

Resolutions
- to verify old roads, claim new roads
Measurements

Centerline to centerline

Ellsworth Jones Place From Maple Ave to Broadway

-0.05 curb to curb
-0.06 cl to cl
Measure to the end of dead ends

“Bulb” at the end of a non-loop cul de sac is not part of measured length
Measurements

Around the loop where center median
Measurements

Boundary roads
Measurements

Boundary roads

Preferably split at a cross street or other landmark
“Private” roads

Public road?
“Private” roads

Maintained by municipality for utility access, but not a “public road”

This is a common situation on waterfront properties.
“Private” roads

Public-owned does not equal “public road”. Roads typically not “open to the public”*: 
- park roads 
- cemetery roads 
- driveways such as at 
  - town offices 
  - town garages 
  - landfills/brush landfills 
  - transfer stations

*without restriction
“Private” roads

County tax maps as an indicator of public versus private
“Private” roads

Green clearly shown as within a public R.O.W.
“Private” roads

Yellow clearly shown as within private property
“Private” roads

Tax maps may not always be “accurate” with respect to R.O.W. [it’s not their primary purpose]

But we often only have tax maps as “official” documentation

Can “correct” with a Town Board resolution
Resolutions

Required to:
- accept new roads
- to add old roads not in inventory
- as acknowledgement that roads that appear to be private are actually public
- to accept more than minor length changes

Roads must exist and currently be open to the public (except for limited construction periods)
Resolutions

Must include local governing body (Town Board) acceptance of all legal and maintenance & repair responsibility for the roadway

Must include an indication that the resolution has been voted upon and passed

Must mentioned each road specifically (may do so in an attachment)
Resolutions

May issue a new resolution for an old road

May use a “blanket” resolution if there is more than one road being added, although all roads must be listed

Original resolutions when the roads were first accepted are not necessary
Resolutions

Even "obvious" roads need a resolution as we don’t know the circumstances (not finished, never approved, disputes with contractors, etc)
Current Status

- Local Outreach Conducted
- Build & QC/QA Reviews Completed
- Build & QC Review Completed
- Initial Build Completed
Highway Data Services Bureau
New York State Department of Transportation

50 WOLF ROAD, 4-2
ALBANY, NY 12232
518 457-1965
CAITLIN.CLARK@DOT.NY.GOV
Kelsey.Pianka@dot.ny.gov
Allison.Weber@dot.ny.gov