Vehicle Miles of Travel (VMT)

Local VMT Estimates

What is VMT?
- VMT = Vehicle Miles of Travel
  = AADT x segment length
- It is an additive measure of cumulative travel
VMT Estimation

- Can be calculated for State System where traffic counts are relatively comprehensive
- Also have substantial counts on Federal Aid eligible roads
- Local VMT not as comprehensive - Rural Minor Collectors, Local Roads & Streets

New York State VMT Estimation

- Traffic counts “required” on all Federal Aid eligible roads
  - VMT estimation is straight calculation
- Until 2015, local VMT was an off-line estimate based on adjustment of prior year
  - Origin of non-Fed Aid VMT estimate?
Estimating Local VMT*

☐ Local VMT is challenging given the difficulty of measuring both baseline traffic and growth

☐ Currently use “growth rate” from local data that is collected (bridges, RR crossings, local & county counts)

* Rural Minor Collectors, Urban & Rural Local

---

Estimating Local VMT

☐ Have experimented with “normalizing” existing VMT where counts are available
  ■ Stratified by DOT Region and by county
    Within those ranges:
    ☐ In total and stratified by FC

☐ Found 50-100% variance based on approach taken
Options to Estimate Local VMT

- Use parametric variables
  - Population
  - Mileage
  - Land Use
  - Economic activity
  - Modeling

...but why not just collect more counts?
Improving Local VMT estimation

- Rural Minor Collector now close to 70%, of the mileage counted but …
- Counts on Rural Local and Urban Local not comprehensive and widely variable
  - Least coverage (by mileage)
  - Urban Local most lacking, particularly in the larger urban areas

Partnership with counties for counting greatly enhanced Rural Minor Collector count coverage.

Improving Local VMT estimation

- Non-Federal Aid traffic count project
  - Goal of 10% coverage of mileage by FC and Municipality
- Approach
  - Determine mileage needed to make 10%
  - Randomly sort inventory segments
  - Select segments in order to meet deficit
  - Contract for counts (8,000 counts taken)
Completed supplemental count program:

- Rural Minor Collectors – counts on 70% of mileage
- Rural Local Roads – 21% of mileage
- Urban Local Streets – 11% of mileage

Calculating VMT per segment where counts available (current AADT x length)

- Stratified and summed by county, urban area, functional classification
- Expanded calculated VMT by ratio of total miles to miles counted
More specifically ….

- Start with roadway inventory
  - Remove all overlaps (duplicate portions), private roads, ramps
- Multiply AADT by segment length for all rows in the roadway inventory
- Sum VMT by FC, urban area, county
- Sum counted and uncounted lengths by FC, urban area, county

More specifically ….

- Divide calculated VMT by counted length to get a “rate” by stratification
- Multiply rate by total mileage for each stratification (FC/UA/county)
- Sum VMT by county
- Adjust to match HPMS VMT estimates
  - HPMS has internal VMT calculations for Fed Aid
Why HPMS adjustment?

- HPMS has internal VMT calculations for Fed Aid roadways which may not match the sum of the county level estimates due to rounding and other differing assumptions between the two approaches.
- Adjustments to match makes published estimates consistent.

“Current” AADT

- Non-current counts adjusted to current year using “Matrix” process:
  - 15 year table of actual traffic counts
  - Regression analysis to develop growth rates by FC by DOT Region
  - Rates applied to last actual counts to get a “current year estimate”
Results

- VMT estimate for urban and rural local increased by about 6 to 9% overall
- Rural Minor Collector VMT estimate dropped from approximately 25,000,000 in 2015 to 7,000,000 in 2016
- A 72% drop in estimated RMnC VMT and a 4% drop in total VMT when actual VMT was known to be increasing

Impact

- Air quality trend line forecasts affected
- Performance measures based on trend lines impacted
- Greenhouse gas and energy plan projections out-of-whack
- Affected any effort based on trend line analysis of traffic growth/decline
Unanticipated Impact

- High Risk Rural Road fatality rate over last five years skyrocketed
- $6 million in annual Highway Safety Improvement Program automatically diverted to HRRR
- “Penalty” resulting from better VMT estimate as opposed to real change

Still in discussions with the FHWA regarding this impact from a more accurate estimate.

“Back-casting” VMT

- Began an effort to re-estimate VMT for prior years, back to 2011 to match TPM efforts by MPOs
- Also to be used for HRRR, air quality, greenhouse gases, energy planning, and whatever other effort depends on VMT trend line
Matrix

- NYSDOT maintains a 15 year Matrix of traffic counts for all traffic count stations (45,000+ locations)
- Regression analysis used to project to current year and fill in all gaps in intervening and prior years
- Applying appropriate year’s estimates of AADT to year’s inventory yields new VMT

2011-2017 VMT Estimates

- Initial estimates produced stratified by functional class, urban area, and county
- Used to address HRRR (result not yet determined, but fatality rate is actually down)
- Initial estimates to be refined and finalized
- Process will be built into a repeatable, automated routine
In Closing

- Much better local VMT estimates now available
- Prior year estimates available (although not yet final) for trend line forecasting
- Routine being established to develop in future years in a consistent manner