Certified Design Traffic Task Force
Findings & Solutions

Presented to the Ohio Transportation Engineering Conference

October 25, 2016
Design Traffic Task Force

- Identified many improvements to how design traffic are used
- All are listed here briefly with a few points of interest highlighted in blue
- This presentation will focus on improvement #3 related to forecast uncertainty
1. The Modeling & Forecasting section accepts all project requests regardless of project size/sponsor

▪ **Adopted Solutions**
  - Expand the capabilities of SHIFT; require districts to complete forecasts for Path 1, 2 & non-capacity adding 3 projects
  - M&F forecasts capacity adding Path 3, plus 4 & 5
2. The Modeling & Forecasting section functions as a service provider, not process owner

- **Adopted Solutions**
  - Standardize traffic forecasting process into staged approach
  - Create new manuals & new training programs
  - Empower the districts by expanding the role of traffic forecast requestor
  - Expand the number of consultant contracts ODOT issues
  - Partner with Ohio universities to develop programs
3. Traffic forecasts provide a single ADT or peak hour value for each location within the project area

- **Impact**
  - Traffic forecasts are treated as highly precise values
  - Designers run their design calculations to a relatively high number of significant digits

- **Adopted Solutions**
  - Create a new training for both ODOT & consultant roadway design staff on how to use traffic forecasts
  - Update ODOT design manuals to empower design staff
  - Provide notes on plates when input uncertainty is high
  - Add more ATR’s to reduce uncertainty in traffic counts
3. Traffic forecasts provide a single ADT or peak hour value for each location within the project area

- More on forecast uncertainty
  - Two main sources identified:
    1. Uncertainty in counts
    2. Uncertainty in future development
3. Traffic forecasts provide a single ADT or peak hour value for each location within the project area

- Uncertainty in counts is largely related to lack of long term count data at projects sites for establishing AADT and 30th highest hour
- This will be addressed in 2 ways:
  1. Get more counts
  2. Indicate forecasts not benefiting from long term count data
3. Traffic forecasts provide a single ADT or peak hour value for each location within the project area

- **Get more counts**
  - During preliminary coordination on large projects (Path 4-5), permanent ATR’s will be placed near upcoming major projects
  - Traffic counts guidance is being published requiring a certain minimum of traffic counts including 48 hour tube counts to supplement all partial day turning movement counts
3. Traffic forecasts provide a single ADT or peak hour value for each location within the project area.

- **Indicate forecasts not benefiting from long term count data**
  - Such forecasts will carry the following note:
    “Design Traffic conducted without the benefit of long term counts, numbers should be considered within $\pm 15\%$”
  - Designs still must use the actual design traffic, not the 85% value, however, designers can test the 85% value at problem locations.
  - Longer term count data can then be collected to verify the design traffic if lower volumes alleviate design concerns.
3. Traffic forecasts provide a single ADT or peak hour value for each location within the project area

- **Why 15%?**
- **Selected as the closest round number to the expected count error at a volume of 10,000 (the lowest volume at which multi-lane roads become feasible)**

<table>
<thead>
<tr>
<th>Volume</th>
<th>Expected Count Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>54%</td>
</tr>
<tr>
<td>1000</td>
<td>27%</td>
</tr>
<tr>
<td>5000</td>
<td>17%</td>
</tr>
<tr>
<td>10000</td>
<td>14%</td>
</tr>
<tr>
<td>25000</td>
<td>10%</td>
</tr>
<tr>
<td>50000</td>
<td>8%</td>
</tr>
<tr>
<td>75000</td>
<td>7%</td>
</tr>
<tr>
<td>100000</td>
<td>6%</td>
</tr>
</tbody>
</table>
3. Traffic forecasts provide a single ADT or peak hour value for each location within the project area

- Uncertainty in future development will be addressed by adding the following note on projects with high growth rates:

  “Design Traffic in high growth area, includes growth exceeding 3% per year on some links”

- Designs still must use the actual design traffic, however when present, designers can test whether lesser growth would alleviate design concerns
- If so, additional coordination with stakeholders on future development could be initiated
- Note that on Path 4-5 Projects, it is anticipated this coordination will occur automatically, in which case the above note will not appear
3. Traffic forecasts provide a single ADT or peak hour value for each location within the project area

- Why 3% per year?
- Most roads maintained at LOS C or better and are not currently in need of upgrades, this is about 70% of capacity, 20 years of 2% growth can be accommodated by this (0.7*(1+20*.02)=.98), but not 3%
- Roads actually worse than LOS C are likely to be in need of upgrades regardless of forecast growth rate
3. Traffic forecasts provide a single ADT or peak hour value for each location within the project area

- Benefit of this approach is it will only trigger additional data collection or meetings when necessary based on design constraints
- Cost of this approach is it will cause project delays when it is used, and in some cases it may not change the design forecast, however in others significant savings could be achieved
4. Travel demand models can assign more traffic to a roadway than physically possible, leading to “unconstrained” traffic forecasts

- **Adopted Solutions**
  - Alter the PDP to require early engagement of Modeling & Forecasting staff on capacity adding Path 3, plus 4 & 5 projects
  - “Constrained” situations will be part of the standard agenda to be discussed at these meetings
5. MPOs “own” the land use forecast development for their region

- **Adopted Solutions**
  - Alter the PDP to require early engagement of M&F staff on capacity adding Path 3, plus 4 & 5 projects
  - Review of MPO land use forecast will be part of the standard agenda to be discussed at these meetings
6. Traffic forecasts in urban areas require using local MPO models; the MPOs vary greatly with levels of support they provide ODOT in running the model

- **Adopted Solutions**
  - Standardize small, medium, and large MPO models to facilitate support
  - Require MPOs support their models or participate in a task order contract
7. Traffic Monitoring Section has no ability to determine how many special traffic count requests will be submitted yearly

- **Adopted Solutions**
  - Require project managers to submit requests for traffic counts earlier
  - M & F will no longer accept design traffic requests that don’t already have all necessary traffic counts
  - Traffic count guidance for design traffic being published
8. Modeling & Forecasting Section has no ability to determine how many traffic forecast requests will be submitted yearly

- **Adopted Solutions**
  - Create a milestone date in Ellis for forecast completion
  - Modify the M&F “Tracker” tool to track future requests
9. Modeling & Forecasting Section uses traffic counts from disparate methods, sources, years and locations when completing requests

- Adopted Solutions
  - Requests should include a plate indicating the count location, year, type, and number of hours to expedite completion of the forecast
  - M & F will no longer accept design traffic requests that don’t already have all necessary traffic counts
  - Traffic count guidance for design traffic being published
10. Modeling & Forecasting Section does hold some task order contracts to perform traffic forecasting

- **Adopted Solutions**
  - Create new manuals and new training programs
  - Develop consultant pre-qual. based on new training
  - Design contracts must include pre-qual. prime/sub
11. Districts differ widely in the level of experience possessed by their traffic forecast coordinator

- **Adopted Solutions**
  - Expand the capabilities of SHIFT
  - Develop new training for District coordinators
  - Identify a backup coordinator in each District
12. Districts do not track when and where previous traffic forecasts have been performed

- **Adopted Solutions**
  - Publish the locations & plates for previous traffic forecasts on platforms like Google Earth or TIMS
  - Train districts to review previous forecast locations before submitting new requests
13. The increasing use of consultants to develop traffic forecasts will increase the funding necessary to complete project development

- **Adopted Solutions**
  - Capital Program managers have been notified and engaged, project budgets should include this item now rather than relying on ODOT staff
  - Develop consultant pre-qual based on the new training
14. There is a general shortage of transportation modeling and forecasting staff at Ohio MPOs, consultants, and ODOT

- **Adopted Solutions**
  - Slowly ramp up amount of work ODOT outsources
  - Work with Ohio universities to develop transportation modeling/forecasting
  - Continuously analyze the workload and adjust staff