Over the Edge

Forecasting beyond the Boundaries of the Regional Model

2017 ITE Western District Annual Meeting Made Possible Using Data Courtesy of NDOT
Topics Covered

- The difficulties with forecasting at or beyond a model’s boundaries
- Example: Garnet Interchange
- Conclusions & Suggested Approaches
- Questions & Answers

The Garnet Interchange Today
The Problems with Life on the Edge

- Models tend to be most accurate in the regional center (most detailed networks, most traffic counts, smallest TAZs, etc.)
- But most development occurs towards the urban fringe. Mis-match between the forecasting needs and the forecasting tool
- Problem not unique to Las Vegas; happens everywhere
The Problems with Life on the Edge

• The problems are even worse when going beyond the boundaries of the modeled area:
  • Developers land bank large areas without detailed plans
  • Timeline dependent on market conditions; hard to predict
  • Through traffic is a high percentage of total traffic, but it is dependent on global factors you may not know much about

But work must go forward, even in the face of uncertainty
Example: Garnet Interchange

- Located at the edge of the RTC model region (20 miles from downtown)
- Being considered for a major upgrade in support of development at Apex Industrial Park
- Traffic forecasts needed as input for civil design
Garnet Interchange: Traffic Flows

- Through Traffic
- Outlying Communities
- Apex Traffic
- All handled somewhat abstractly in the regional model
The Great Recession was **deeper and much, much longer** than any previous post-WWII recessions

- **Structural changes** are taking place in the U.S. economy. Some of these changes are permanent. Things will not “go back to normal”; there is a **new normal**

- This will have long-lasting effects on development. Growth assumptions made before the recession must be re-examined and revised

---

**Change in U.S. Employment during Post WWII Recessions**

*Graph shows the percent change from start of recession over months from start of recession.*
Forecasting Through Traffic on I-15

- Pre-recession forecasts predicted rapid growth
- Instead, traffic declined by 20%
- The post-recession trendline may also be misleading since it includes a major one-off event
- Shows the need to base the forecast on changes in the underlying demand (GRP)
Technique #1: Use Growth of Underlying Demand Forecasting Through Traffic on I-15

Regression analysis found that 87% of the variation in I-15 traffic could be explained by changes in Las Vegas GRP.

Derived a fitted curve formula to match the data.
Forecasting Through Traffic on I-15

Used the forecasts for future GRP from *Population Forecasts: Long-Term Projections for Clark County, Nevada 2015-2050* to forecast the traffic going forward.

Lower than pre-recession forecasts, but consistent with recent trends.
Technique #2: Trip-Gen Rate * Population
Forecasting Traffic from Outlying Communities

- Checked various variable to see how closely they track actual traffic between towns & Las Vegas; None worked well
- Computed the population growth rate based on long-term average
- Computed the actual per-capita trip-gen rate for trips to/from Las Vegas (from ramp counts). Multiplied this by future population to estimate future trips
Forecasting Traffic from Coyote Springs

- Land banking for possible new town sometime in the future
- Local jobs, % retirees, etc. are unknowable
- Lacking better data, but distance & market similar to Mesquite, so assumed same rate of trip-making to Las Vegas as Mesquite
- Multiplied Mesquite trip-gen rate by population forecast for Coyote Springs to arrive at forecast. Forecast assumed a delayed build-out for Coyote Springs
Technique #3: Site Details
Apex Industrial Park

- Location within site determines the traffic using Garnet Interchange
- Type of jobs, density within each site, sequence of development, etc. are unknown
- Faraday Future developing a factory and bringing in utilities
- Utilities installed to serve one site could spur developments on neighboring sites that could connect up
**Forecasting Traffic for Apex Industrial Park**

- Forecasts from *Population Forecasts: Long-Term Projections for Clark County, Nevada 2015-2050* suggest anemic growth in transportation and warehousing jobs and actual reductions in manufacturing and utilities jobs over the study period.

- Suggests that Apex is unlikely to build out during the study period (at least not with manufacturing jobs).

- Market trends suggest that warehousing may be a good fit for this site.

- If significant employment develops, then some retail is likely to follow.
Forecasting Traffic for Apex Industrial Park

- Assumed that Faraday Future would create 4,500 industrial jobs as planned
- Assumed that blue triangle would take advantage of utilities to build warehousing (719 jobs) and retail (100 jobs)
- Trip-generation rates taken from ITE
- Concentrating development off US-93 is the worse case for Garnet Interchange design purposes
Putting it All Together – Traffic at Garnet IC

- After the growth of each component of traffic had been forecast individually, they were added together to produce the forecasts used for design purposes.
- Forecasts were considerably lower than a pre-recession study, but seem more reasonable in light of current traffic and growth expectations.
Conclusions & Suggested Approaches

• When forecasting for developments at or near the edge, you are forced to rely on data sources other than the regional model.

• Depending on the situation and available data, more than one technique may be needed.

• Large disruptive events (e.g. Great Recession) break previous patterns and force a re-evaluation of previous assumptions. May need to let go of earlier assumptions.

• To the extent possible, base your forecasts on changes in the underlying demand (GRP & population) rather than on plans. Remember: Approved plans show what is permissible, but the markets determine what will actually happen.
Questions & Answers

Don Hubbard, TE, AICP
Senior Technical Principal in Transportation Planning/Modeling
WSP, Sacramento
(916) 567-2555
Don.Hubbard@wsp.com