Highways England’s Regional Traffic Models
Challenges over the past year
Saturn User Group
2nd November 2016

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Background to RTMs

- 5 models covering England
- Overlapping areas to consider potential boundary issues
- A range of schemes proposed in RIS1
- 5 separate teams delivering the models in parallel
- Over 120 consultant staff involved
Background to RTMs

- Models represent average weekday in March 2015
- Three time periods (AM, IP, PM – average hour)
- Cover SRN, A & B road network including junction delays
- Car (business, commute, other), LGV, HGV segmentation
- Mobile phone data for development of car matrices
- Combination of datasets for matrix build
- Huge data collation process - reliance on existing available traffic count data as opposed to significant new data collection.
- Consistency a key theme
Main Challenges

but there were many more

- Developing matrices from mobile phone data
- Calibration and validation
- Forecasting fixed speeds
Use of Mobile Phone data in matrix development
Matrix Development TCG
Key Issues

Verification Process……

- The data we were provided with included bus and rail trips which had to be stripped out
- The data was biased towards long distance trips and missed a significant amount of short distance movements
- The data expansion resulted in a bias in trip rates and trip length distribution

- Matrix Adjustments
- Disaggregation
Calibration and Validation
The challenges

- **Scale**
- The need for consistency so that all areas treated the same / inter region consistency
- Relevance of WebTAG given model scale and end use
- Matrix build and limitations of mobile phone data
- How to focus on the SRN and treat other routes consistently
- Role of matrix estimation
- Consistent reporting
Acceptability

- What is an acceptable model?
- Role of TAG guidance
- RTM guidance developed to consider focus of model, i.e. the SRN.
- Key issues considered
  - Zone size v network coverage.
  - Needs of differentiate the SRN performance
  - Journey time considerations
  - Matrix change acceptability
Acceptability

- For non SRN flows we examined the implication of the model zone/networks

- For local authority roads looked at relationship between flows and Confidence Intervals

- Derived relaxed criteria for roads distant from SRN

- within +/-300 (for links with count below 2000)

- within 15% for links with a count between 2000 and 2700

- within +/-400 for links with counts in excess of 2700
Reporting Consistently

- Dashboard for analysis and reporting
- Shared between all teams
- Drew upon each teams experience

Note: A red cell in a table indicates that the total is not equal to the sum of the individual values. Errors in input data may cause this.

### Links GEH < 5

- Percentage: 47%

### Links 5 to 7.5

- Percentage: 15%

### Links 7.5 to 10

- Percentage: 38%

### Links >10

- Percentage: 5%

### Overall Statistics

- **PASS**
  - Links GEH < 5: 45
  - Links Flow Criterion: 49
  - Links GEH or Flow Criterion: 33
  - Screenlines Flow Diff. < 5%: 75%
  - Screenlines GEH < 4: 65%
  - Mini-Screenlines Flow Criterion: 68%
  - Mini-Screenlines GEH < 4: 62%
  - JT Routes Diff. < 15%: 70%
  - JT Groups Diff. < 15%: 64%

- **FAIL**
  - Links GEH < 5: 0
  - Links Flow Criterion: 0
  - Links GEH or Flow Criterion: 0
  - Screenlines Flow Diff. < 5%: 5%
  - Screenlines GEH < 4: 4
  - Mini-Screenlines Flow Criterion: 0
  - Mini-Screenlines GEH < 4: 4
  - JT Routes Diff. < 15%: 5%
  - JT Groups Diff. < 15%: 5%

- **Total**
  - Links GEH < 5: 94
  - Links Flow Criterion: 94
  - Links GEH or Flow Criterion: 94
  - Screenlines Flow Diff. < 5%: 594
  - Screenlines GEH < 4: 594
  - Mini-Screenlines Flow Criterion: 68
  - Mini-Screenlines GEH < 4: 68
  - JT Routes Diff. < 15%: 52
  - JT Groups Diff. < 15%: 52

### Links - All Vehicules

- **PASS**
  - Links GEH < 5: 152
  - Links Flow Criterion: 156
  - Links GEH or Flow Criterion: 318
  - Screenlines Flow Diff. < 5%: 594
  - Screenlines GEH < 4: 594
  - Mini-Screenlines Flow Criterion: 68
  - Mini-Screenlines GEH < 4: 68
  - JT Routes Diff. < 15%: 46
  - JT Groups Diff. < 15%: 46

- **FAIL**
  - Links GEH < 5: 70
  - Links Flow Criterion: 66
  - Links GEH or Flow Criterion: 136
  - Screenlines Flow Diff. < 5%: 195
  - Screenlines GEH < 4: 195
  - Mini-Screenlines Flow Criterion: 48
  - Mini-Screenlines GEH < 4: 48
  - JT Routes Diff. < 15%: 49
  - JT Groups Diff. < 15%: 49

- **Total**
  - Links GEH < 5: 222
  - Links Flow Criterion: 222
  - Links GEH or Flow Criterion: 444
  - Screenlines Flow Diff. < 5%: 1,004
  - Screenlines GEH < 4: 1,004
  - Mini-Screenlines Flow Criterion: 94
  - Mini-Screenlines GEH < 4: 94
  - JT Routes Diff. < 15%: 94
  - JT Groups Diff. < 15%: 94

### JOURNEY TIME ROUTE C305B - PM Period - RUN018

- **Top 10**
  - Diff % Mod vs. Obs
  - Links GEH < 5: -5.7%
  - Links Flow Criterion: -9.1%
  - Links GEH or Flow Criterion: -14.3%
  - Screenlines Flow Diff. < 5%: -17.1%
  - Screenlines GEH < 4: -20.3%
  - Mini-Screenlines Flow Criterion: -25.5%
  - Mini-Screenlines GEH < 4: -28.7%
  - JT Routes Diff. < 15%: -30.9%
  - JT Groups Diff. < 15%: -34.1%

- **Total**
  - Journey time route - C305B
  - PM Period - RUN018
  - Time (min): 120.59
  - Distance (m): 1,000
  - Diff % Mod vs. Obs: 113.77
  - Diff % Mod vs. Obs: -5.7%

- **Total Obs JT**
  - Time (min): 120.59
  - Distance (m): 1,000
  - Diff % Mod vs. Obs: 113.77
  - Diff % Mod vs. Obs: -5.7%

- **Total Mod JT**
  - Time (min): 113.77
  - Distance (m): 1,000
  - Diff % Mod vs. Obs: 120.59
  - Diff % Mod vs. Obs: -5.7%
The Challenge

- The RTMs have been developed with a focus on capturing the Strategic Road Network (SRN) movements.

- Urban areas developed with a skeletal network of “fixed speed” coding and dummy nodes which do not model junction delay.

- In the Base Year, the fixed speeds have been taken from TrafficMaster data including the effects of congestion on traffic speeds.

- Forecast speeds need to respond to forecast changes in demand
Methodology

Undertook pilot studies using existing models to look at a number of methods of forecasting fixed speeds.

1. Use speed factors derived from National Transport Model by road type
2. Derive future speeds from backwards engineering speed flow curves

National Transport Model approach adopted for transparency and simplicity
Where next for the RTMs

• Base model validation complete/nearing completion.
• Realism tests underway using enhanced DIADEM.
• Forecasting to follow during November/December.
• RTM guidance has been produced.
• Models are being shared with third parties for RIS1 scheme development and the strategic studies
• Future Policy Testing for RIS2.
• 5 Year maintenance plan being developed
The Next Steps
Thank You