Regional Intergovernmental Council

Long Range Transportation Plan and Travel Demand Model

Tuesday, October 26, 2010

Kimley-Horn and Associates, Inc.

LONG RANGE TRANSPORTATION PLAN
Regional Intergovernmental Council

Allison Fluitt, P.E., AICP

PLANNING PROCESS

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Changing Conditions

- 2005 Projection - $842 million ($32.4 million annually)
- 2008 Projection - $469 million ($14.7 million annually)
- Shift in mindset needed for future success

2009 Existing Deficiencies

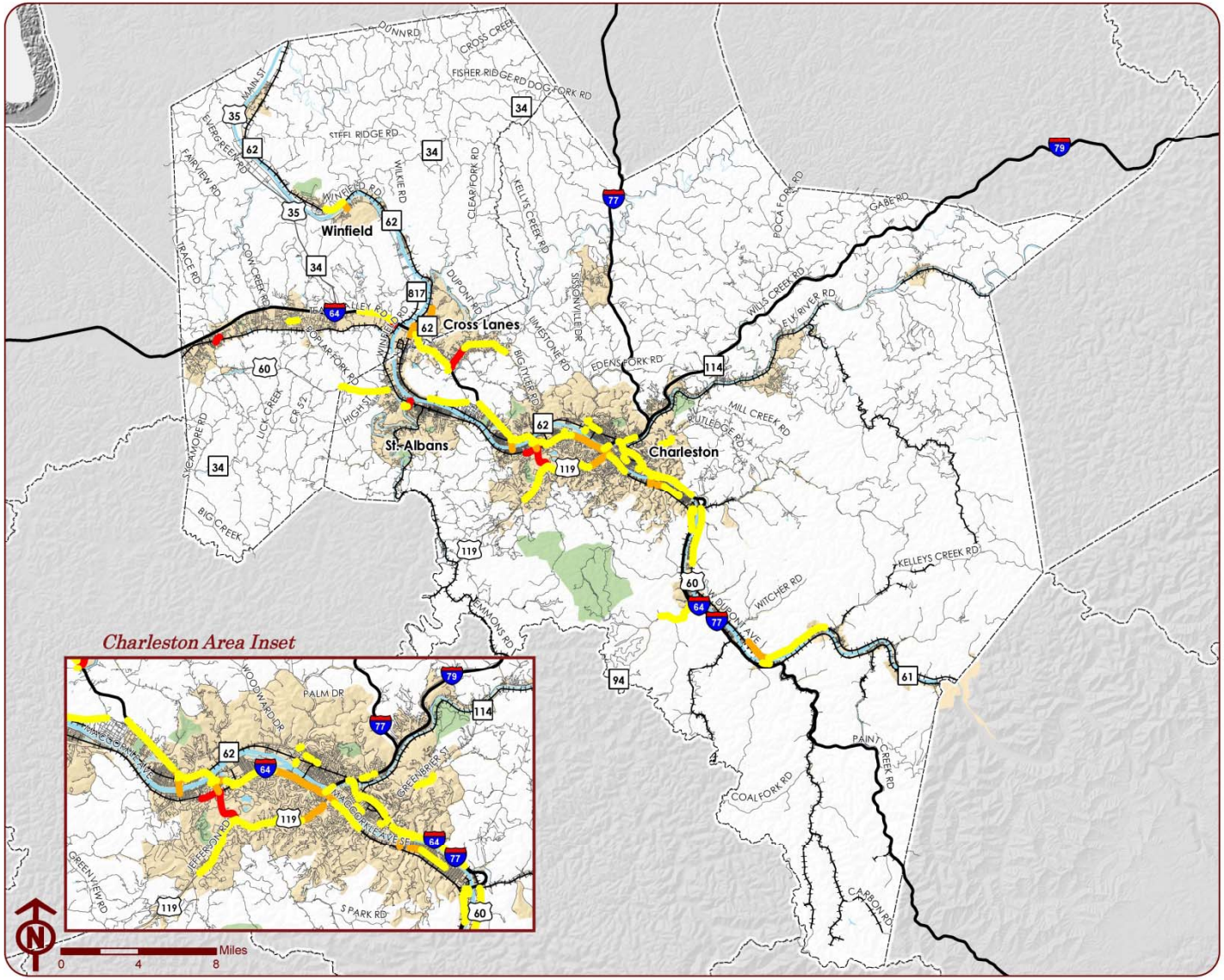

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Figure 4.2

2009 Corridor Congestion

- Interstate Highways
- Streets
- Railroads
- County Boundaries
- Bodies of Water
- Municipalities
- Parks

2009 Congested Corridors

- LOS D (Approaching Capacity)
- LOS E (At Capacity)
- LOS F (Over Capacity)

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2040 Highway Deficiencies

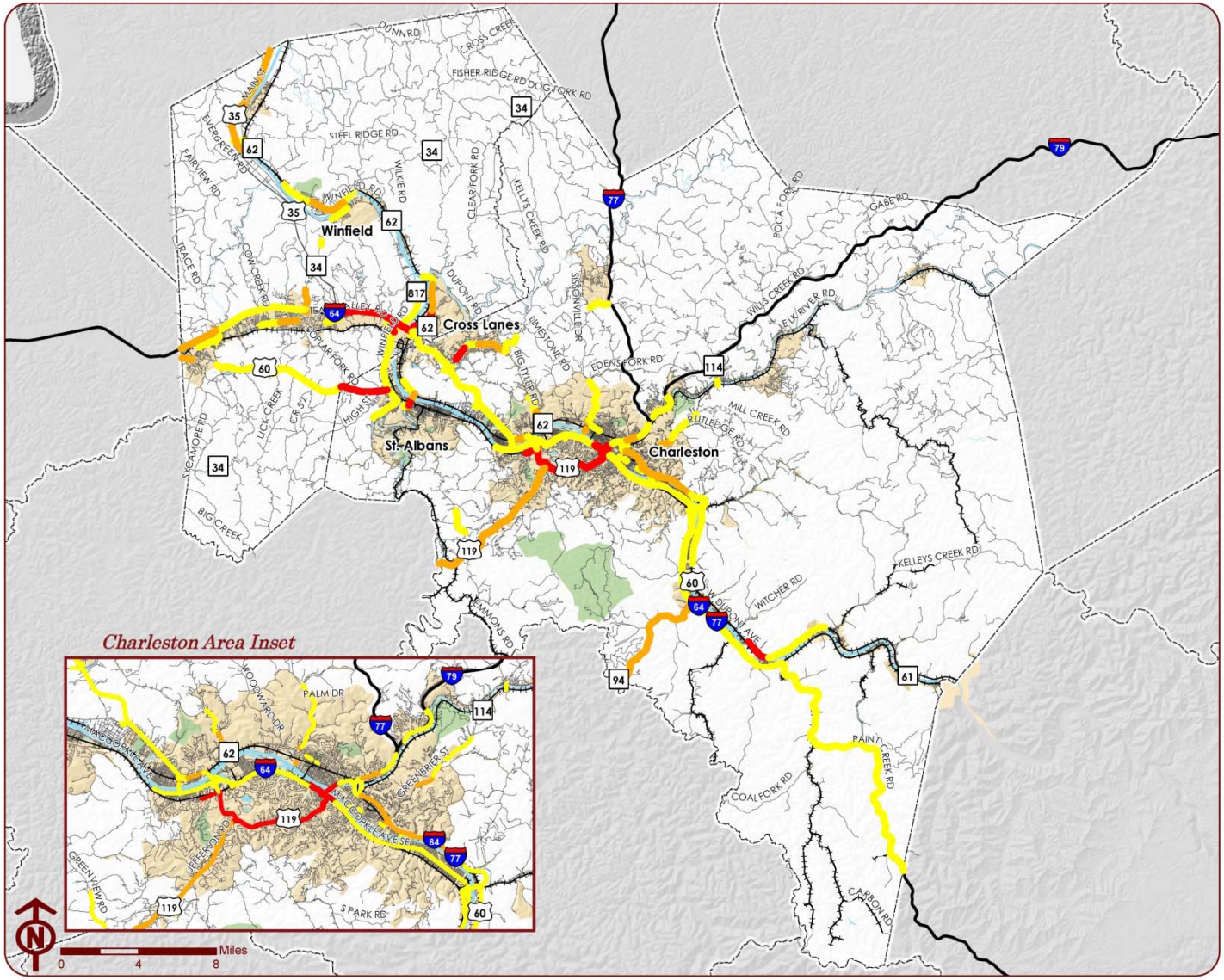

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Figure 4.3

2040 E+C Corridor Congestion

- Interstate Highways
- Streets
- Railroads
- County Boundaries
- Bodies of Water
- Municipalities
- Parks

2040 Congested Corridors

- LOS D (Approaching Capacity)
- LOS E (At Capacity)
- LOS F (Over Capacity)

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Planning Process

- Steering Committee
  - RIC, WVDOT, FHWA, and WVDEP
- Public Outreach
  - Workshops in July and October
  - Stakeholder Outreach
  - Online Public Questionnaire
- Conversion to new Model Platform
- Federal Highway Administration Compliant Process

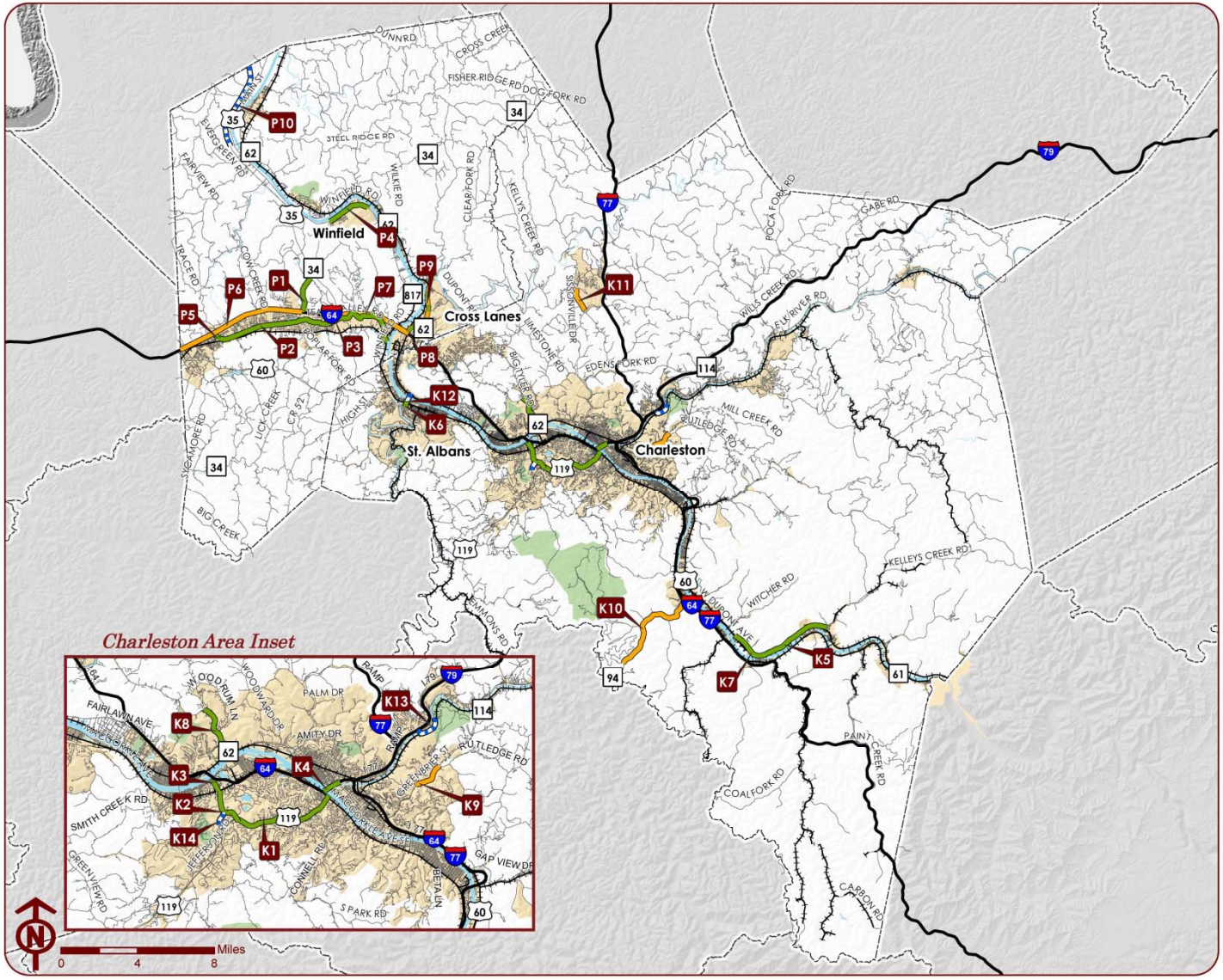
Planning Process

- Range of project types needed
  - Access management
  - Safety and intersection improvements
  - Large capacity projects
  - Multimodal integration

Phased Project Solutions

- Short-term: smaller, cost-effective projects
  - Relieve critical bottlenecks
  - Improve safety and reduce conflict points
  - Enhance intersection capacity
  - Rehabilitate key connections
- Long-term: larger, more costly projects
  - Larger scale improvements
  - Small area and regional congestion relief

Recommended Highway Plan



LONG RANGE TRANSPORTATION PLAN
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2010 Addendum
Figure 1

Proposed Projects

- Interstate Highways
- Streets
- Railroads
- County Boundaries
- Bodies of Water
- Municipalities
- Parks

Proposed Projects

- New Alignment
- Access Management
- Widening
- Widening & Access Management

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Tools for Implementation

- Best Practices Toolbox
  - Access management
  - Complete streets
  - ITS
- Visualization of improvements
- Model application
- Clear prioritization process

Access Management

- Protecting key corridors
- Safety & Mobility
- Small, cost-effective projects

Teays Valley Road today (near Lake Chadesa Drive)

Teays Valley Road after implementation of median and left-over treatments

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Evaluation Matrix

Table 4.2 - Roadway Project Total Benefit and Impact Matrix

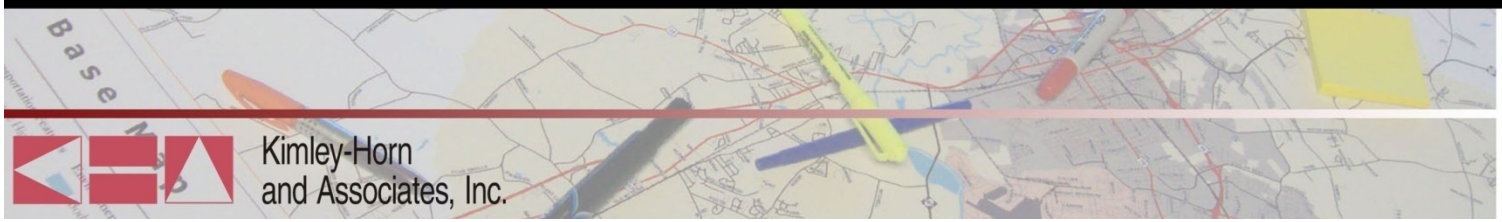
				Project Impacts										Mobility and Implementation							
				Environmental/Natural Features (0-10 Points)			Cultural/Economic Impacts (0-20 Points)				Environmental Justice (0-10 Points)		Constructability (0-15 Points)		Travel Benefits (0-45 Points)					
ID	2030 LRTP Project ID	Facility	Description	Wetlands/ 401 Certification Sites	Voluntary Remediation Sites	Hazardous Waste/ Superfund Sites	School/ Emergency Services	Churches/ Cemeteries	Park/Historic Resources/ Protected Land	Land Use/ Economic Impact	Minority	Low Income	Feasibility	Public Support	Safety	Intermodal Use	Relief of Congestion	Total Volume	Economic Connectivity	Connectivity
Operational/Design Improvements																				
K1	KC-4*	US 119 (Corridor G)	From US 60 (MacCorkle Avenue) to WV 601 (Jefferson Road): Use access management to improve mobility and safety	○	○	●	◒	○	○	○	○	○	○	○	◒	○	◒	◒	○	○
K2	KC-2*	WV 601 (Jefferson Road)	From US 119 (Corridor G) to CR 21 (Kanawha Turnpike): Use access management to improve mobility and safety	○	○	○	○	○	○	○	○	○	○	○	●	◒	◒	◒	○	○
K3	KC-2*	WV 601 (Jefferson Road)	From CR 21 (Kanawha Turnpike) to US 60 (MacCorkle Avenue): Use access management to improve mobility and safety	○	○	○	◒	○	○	○	○	○	○	○	◒	◒	◒	◒	○	○
P1		WV 34	From Interstate 64 to Crooked Creek Road: Use access management to improve mobility and safety	○	○	○	○	○	○	◒	○	○	○	●	○	○	●	○	●	○
K4	KC-9	Interstate 64 at Oakwood Road Interchange	From US 60 (Washington Street) to WV 61 (MacCorkle Avenue): Improve weave section of interchange	●	○	●	○	○	○	○	○	●	○	●	○	●	◒	○	○	○
K5	KC-11*	US 60 (Dupont Avenue)	From CR 81 (Kellys Creek Road) to start of 4-lane section (by Admiral TJ Lopez Bridge): Use access management to improve mobility and safety	○	○	○	○	○	○	◒	○	◒	○	●	●	○	●	◒	○	○
P2		CR 33 (Teays Valley Road)	From WV 34 split to Hurricane Creek Road: Use access management to improve mobility and safety	○	●	○	●	◒	◒	○	○	○	○	○	◒	○	●	◒	●	○
K6	KC-10	3rd Street	From Kanawha Terrace to US 60 (MacCorkle Avenue): Grade separated railroad crossing improvements	○	○	○	○	○	●	○	○	○	○	●	◒	◒	●	◒	○	○
P3	PC-6*	CR 33 (Teays Valley Road)	From St. Albans Interchange to WV 34: Use access management to improve mobility and safety	○	○	○	◒	●	○	○	○	○	○	○	●	◒	●	●	●	○
K7		US 60 (Dupont Avenue)	From end of 2-lane section (by Admiral TJ Lopez Bridge) to Fairview Drive: Use access management to improve mobility and safety	○	○	●	●	◒	○	○	○	◒	○	●	●	○	●	◒	○	○
P4	PC-6	WV 817 (Winfield Road - Old US 35)	From Planters Road to Winfield Bridge (WV 34): Use access management to improve mobility and safety	○	○	○	◒	○	◒	○	○	○	○	●	○	◒	●	◒	●	●
K8	KC-6*	WV 62 (West Washington Street)	From WV 25 (Dunbar Avenue) to WV 501 (Big Tyler Road): Use access management to improve mobility and safety	○	○	○	●	◒	○	○	○	●	○	●	●	○	◒	◒	●	○
P5		CR 19 (Hurricane Creek Road)	From Teays Valley Road to Interstate 64: Use access management to improve mobility and safety	○	●	○	○	○	○	○	○	○	○	●	●	●	●	◒	●	●
Expand Existing																				
P6	PC-7*	Interstate 64	From WV 34 to Cabell County line: Widen to 6-lanes	○	○	○	○	○	○	○	○	○	◒	○	●	●	○	◒	○	○
K1A	KC-4*	US 119 (Corridor G)	From US 60 (MacCorkle Avenue) to WV 601 (Jefferson Road): Widen to 6-lanes and implement mid and long-term recommendations for the facility	●	○	●	◒	○	○	○	○	○	◒	○	◒	○	○	◒	○	○
K3A	KC-2*	WV 601 (Jefferson Road)	From CR 21 (Kanawha Turnpike) to US 60 (MacCorkle Avenue): Widen to 4-lanes with a median	◒	○	○	◒	○	○	○	○	○	●	○	◒	◒	○	◒	○	○
K2A	KC-2*	WV 601 (Jefferson Road)	From US 119 (Corridor G) to CR 21 (Kanawha Turnpike): Widen to 4-lanes with a median	●	○	○	○	○	○	○	○	○	●	○	●	◒	○	◒	○	○
P7	PC-4	Interstate 64	From WV 25 (1st Avenue) to New US 35: Widen to 6-lanes, Replace Nitro Bridge	●	○	●	○	○	○	○	○	○	●	○	●	●	○	○	○	○
K9	KC-12	WV 114 (Greenbrier Street)	From Airport Road to CR 46 (Rutledge Road): Widen to 3-lanes with a two-way left-turn lane	○	○	○	○	○	○	○	○	◒	◒	●	●	○	◒	◒	●	○
K10	KC-6	WV 94 (Lens Creek Road)	From Six Mile Hollow Road to Interstate 64: Widen to 3-lanes on steep grades to provide truck passing lanes	○	○	○	○	◒	○	●	○	◒	◒	●	●	○	◒	◒	○	○
P8	PC-10	WV 25 (1st Avenue)	From Interstate 64 to WV 62: Widen to 3-lanes with a two-way left-turn lane, and use access management to increase mobility and safety	●	○	●	●	○	○	○	○	◒	◒	●	◒	○	◒	◒	○	○
K5A	KC-11*	US 60 (Dupont Avenue)	From CR 81 (Kellys Creek Road) to start of 4-lane section (by Admiral TJ Lopez Bridge): Widen to 4-lanes divided	●	○	○	○	○	○	◒	○	◒	●	●	●	○	◒	◒	○	○
K8A	KC-6*	WV 62 (West Washington Street)	From WV 25 (Dunbar Avenue) to WV 501 (Big Tyler Road): Widen to 3-lanes with a two-way left turn lane	●	○	○	●	◒	○	○	○	●	◒	●	●	○	○	◒	●	○
P9	PC-9	WV 62	From WV 25 (1st Avenue) to Heizer Creek Road: Widen to 3-lanes with a two-way left-turn lane, and use access management to increase mobility and safety	◒	○	●	●	○	○	◒	○	◒	◒	●	◒	○	◒	◒	●	○
P10	PC-3	WV 62 (Roosevelt Boulevard)	From East Fir Street to Nutmeg Street (Town of Eleanor): Widen to 3-lanes with a two-way left-turn lane	◒	●	○	●	◒	◒	◒	○	○	◒	●	●	◒	◒	●	●	○
New Location																				
K12	KC-15	St. Albans Bridge (Henderson Bridge - Center Street)	From WV 25 (1st Avenue S.) to US 60 (MacCorkle Avenue): Construct a 4-lane bridge	●	○	●	○	○	○	○	○	◒	●	○	●	○	○	◒	○	○
P11	PC-5	New US 35	From WV 34 to the Mason County line: Construct 4-lane, median divided highway	●	○	○	○	○	○	○	○	◒	●	○	●	●	○	◒	○	○

What's Next

- Exploring alternative funding sources
  - Tolling
  - Grant initiatives
  - CMAQ
- Moving key recommendations forward
  - Teays Valley area
  - St. Albans bridge and underpass
  - US 35

Tim Padgett, P.E.

TRAVEL DEMAND MODELING



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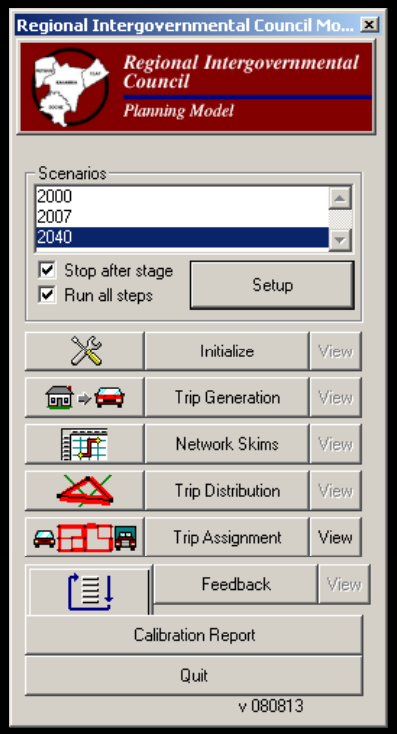
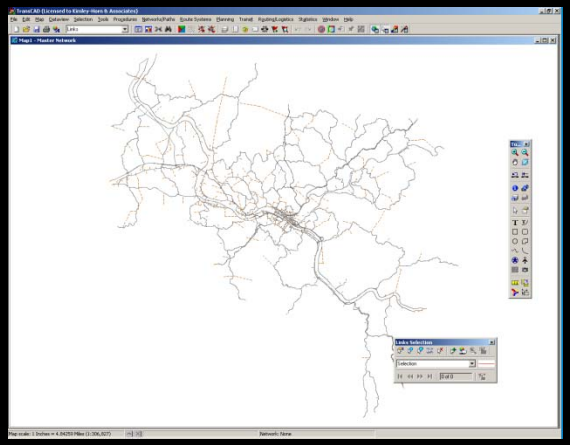
Model Background

- EMME/2 Model with various upgrades and updates over time for planning work
- In 2008, Caliper Corporation converted the existing model to the TransCAD platform
- Caliper delivered a fully functional model, however it was not calibrated/validated therefore it couldn't be used for LRTP update work
- KHA, with assistance from RIC, performed calibration/validation, data updates, added additional model analysis years and updated the model interface

TransCAD Update Process

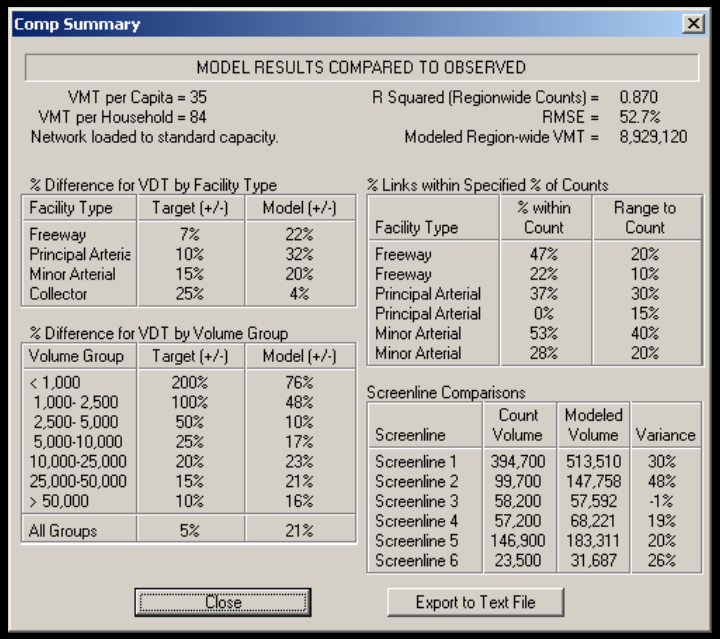
- Consistency check of parameters and input data from existing EMME/2 model to new TransCAD model
  - Model Network
  - SE Data Inputs
  - Traffic Counts
- Baseline 2000 model run
- Model calibration





Baseline 2000 Model Run

- As compared to counts, the baseline 2000 model run loading was high
- Overall loading – 21% high
  - Freeways – 22% high
  - Principal Arterials – 32% high
  - Minor Arterials – 20% high
  - Collectors – 4% high



Comp Summary

MODEL RESULTS COMPARED TO OBSERVED

VMT per Capita = 35
VMT per Household = 84
Network loaded to standard capacity.

R Squared (Regionwide Counts) = 0.870
RMSE = 52.7%
Modeled Region-wide VMT = 8,929,120

% Difference for VDT by Facility Type

Facility Type	Target (+/-)	Model (+/-)
Freeway	7%	22%
Principal Arteria	10%	32%
Minor Arterial	15%	20%
Collector	25%	4%

% Difference for VDT by Volume Group

Volume Group	Target (+/-)	Model (+/-)
< 1,000	200%	76%
1,000- 2,500	100%	48%
2,500- 5,000	50%	10%
5,000-10,000	25%	17%
10,000-25,000	20%	23%
25,000-50,000	15%	21%
> 50,000	10%	16%
All Groups	5%	21%

% Links within Specified % of Counts

Facility Type	% within Count	Range to Count
Freeway	47%	20%
Freeway	22%	10%
Principal Arterial	37%	30%
Principal Arterial	0%	15%
Minor Arterial	53%	40%
Minor Arterial	28%	20%

Screenline Comparisons

Screenline	Count Volume	Modeled Volume	Variance
Screenline 1	394,700	513,510	30%
Screenline 2	99,700	147,758	48%
Screenline 3	58,200	57,592	-1%
Screenline 4	57,200	68,221	19%
Screenline 5	146,900	183,311	20%
Screenline 6	23,500	31,687	26%

Close | Export to Text File

Model Calibration

- Trip Generation, Trip Distribution and Assignment checks and comparisons
  - Trip Generation
    - IE/EI trips were getting doubled in the time-of-day step
    - External station calculation was incorrect (model loading 34,000 – traffic count 28,000)
  - Trip Distribution
    - Trip lengths were no longer calibrated to observed information
  - Assignment
    - Link level calibration

Final Calibration Table

Model Calibration/Validation Summary

Assigned Volumes by Facility Classification			
Category	FHWA Target	EMME/2 Calibration	TransCAD Validation
Freeway/Interstate	+/- 7%	4.5%	1.0%
Major Arterial	+/- 10%	-1.6%	0.0%
Minor Arterial	+/- 15%	-15.6%	-10.0%
Collector/Local	+/- 25%	-10.7%	-3.0%
Assigned Volumes by Volume Group			
Category	FHWA Target	EMME/2 Calibration	TransCAD Validation
<1000	+/- 200%	15.2%	33.0%
1000-2500	+/- 100%	-14.9%	10.0%
2501-5000	+/- 50%	-19.0%	-10.0%
5001-10000	+/- 25%	-6.4%	-8.0%
1001-25000	+/- 20%	-1.8%	-3.0%
25001-50000	+/- 15%	4.5%	1.0%
>50000	+/- 10%	-7.2%	-8.0%
Total	+/- 5%	-3.6%	-2.0%
Screenline Summary			
Screenline	FHWA Target	EMME/2 Calibration	TransCAD Validation
Kanawah River	+/- 5%	2.3%	1.0%
Putnam/Kanawha County Line	+/- 5%	1.7%	11.0%
Kanawha East	+/- 5%	-4.4%	-6.0%
North Kanawha	+/- 5%	11.5%	-5.0%
Kanawha West	+/- 5%	-5.3%	-3.0%
Kanawha Southwest	+/- 5%	7.7%	9.0%
Other Summaries			
Category	FHWA Target	EMME/2 Calibration	TransCAD Validation
RMSE Summary	35%	30.1%	22.6%
R2 Summary	0.8	0.955	0.949

Final Model

- Model years of 2000, 2002, 2007, 2009, 2010, 2013, 2015, 2018, 2020, 2025, 2030, 2035, and 2040
- Revised model interface
  - More easily set-up the model
  - More easily manage scenarios
  - View all model input/output files on one screen
- Provided RIC with model files, model documentation and model training

Final Model Interface

Model Training

- Morning (9:00-11:30) – Model Overview
  - Installing the RIC Model
  - Introduction to the RIC Model Interface
  - Scenario Settings
  - Input and Output Files
  - Additional Interface Tools

- Afternoon (1:00-4:00) – Applying the RIC Model
  - Editing Data
  - Scenario Management and Alternatives Analysis

Model Update Benefits

- Ease of use for day-to-day applications
- Interface providing tools for quick editing and results
- Documentation with background, tools, and tips
- On-site model training, explaining setup and everyday uses
- Easier integration with other statewide modeling and planning efforts

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