Appendix B

Technical Memorandum: Traffic Analysis

Kentucky Transportation Cabinet
Division of Planning

Technical Memorandum: Traffic Analysis
FINAL REPORT

I-66 Planning Study

New Route from the William H. Natcher Parkway to the Louie B. Nunn (Cumberland) Parkway
Warren/Edmonson Counties
KYTC Item # 3-66.00

and

Bowling Green Outer Beltline Planning Study

New Route East of Bowling Green Connecting Scottsville Road (US 231) with I-65 North of Bowling Green
Warren County
KYTC Item # 3-103.00

Prepared by:

Bernardin, Lochmueller and Associates, Inc.

Engineering, Planning, Surveying, Environmental Studies, Water/Wastewater

October 2003

TABLE OF CONTENTS

CHAPTERS

LIST OF FIGURES

LIST OF FIGURES (CONTINUED)

LIST OF TABLES

LIST OF TABLES (CONTINUED)

A. Introduction

The purpose of this Technical Memorandum report is to document the assumptions, methodology, and results for the traffic analysis for planning studies on two proposed Kentucky Transportation Cabinet (KYTC) projects in the Bowling Green, Kentucky, area:

- KYTC Item # 3-66.00 - I-66, Warren/Edmonson Counties, a new route from the Louie B. Nunn Parkway (Cumberland) Parkway to the William H. Natcher (Green River) Parkway and
- KYTC Item # 3-103.00 - Bowling Green Outer Beltline, Warren County, a new route east of I-65 connecting Scottsville Road (US 231) with I-65 north of Bowling Green.

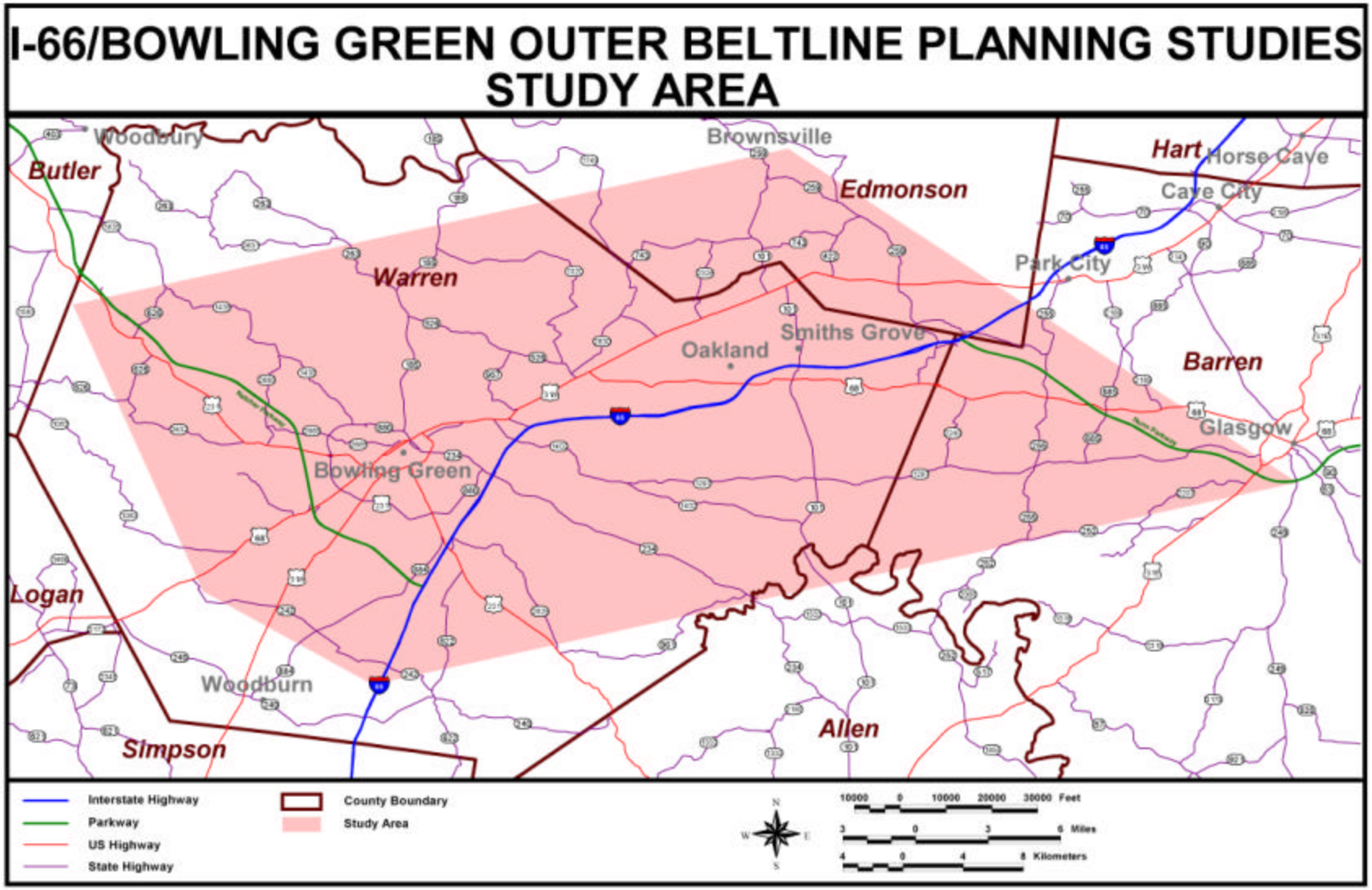
While each may be considered as a separate project, the two studies are being undertaken simultaneously because the two projects are in the same geographical area and because there may be an overlap or connection between them. The Study Area is located in Warren, Barren, and Edmonson counties, as shown in the map in Figure 1. The corners of the Study Area are the Nunn Parkway in the east near Glasgow, the Natcher Parkway in the west near the Warren-Butler County Line, I-65 in the south near KY 242, and KY 259 in the north near Brownsville and Mammoth Cave National Park.

The I-66 project is part of a new interstate High Priority Corridor originally proposed in the federal Intermodal Surface Transportation Act (ISTEA) of 1991 and subsequently continued in the 1995 National Highway System (NHS) Act and the Transportation Equity Act for the 21st Century (TEA-21). If built, I-66 would be located in southern Kentucky between the border with West Virginia in the east and the Illinois or Missouri border in the west. State planning and policy has determined that I-66 would use the existing state parkway system to the maximum extent possible, including the Nunn and Natcher Parkways. These two facilities are now connected by existing I-65 in the Bowling Green area. The I-66 planning study will consider whether a new segment of I-66 between the two Parkways should be routed along I-65 or along a new route. Further discussion is included in Section E of this Technical Memorandum report.

The concept of an Outer Beltline for Bowling Green was first proposed in the 1972 Urban Transportation Plan. The concept was continued and expanded in the 1983 Transportation Plan, the 1990 Warren County Comprehensive Plan and the 2000 Bowling Green Transportation Plan. Under the most recent plan, the Bowling Green Outer Beltline is proposed to begin at the Natcher Parkway/I-65 interchange south of Bowling Green, continue along the east side of the urban area to I-65 northeast of the city, skirt the north side of the urban area, and end at the Natcher Parkway north of the city. Further discussion of the Outer Beltline is included in Section F of this report.

The possibility that a portion of the I-66 freeway may be located along a segment of the proposed Bowling Green Outer Beltline is also being considered in the I-66 planning study. Further discussion of the potential combinations of I-66 and the Outer Beltline is included in Section G of this report.

To better compare the results of the traffic analysis, the data are presented in a set of tables at the end of this report for three project scenarios: I-66 as a stand-alone project, the Outer Beltline as a stand-alone project, and a project that would combine the two.



Source: Bernardin-Lochmueller & Associates, Inc.

Figure 1: Study Area

B. Existing Conditions

1. Existing Facilities

The Study Area is currently served by I-65, the Natcher Parkway, the Nunn Parkway, US 31W, US 68, US 231, and numerous state highways (see Figures 2 through 5). The existing roadway characteristics of routes functionally classified as arterials and collectors are shown in Table 1.

I-65. Interstate 65, which runs from Mobile to Chicago, is the only existing interstate facility in the Study Area. I-65 links Bowling Green to Nashville (TN) on the south and Louisville (KY) on the north where east-west interstate connections exist. From the Natcher Parkway to the Nunn Parkway, I-65 is presently being widened from a four-lane to a six-lane facility with bridge structures and right-of-way width to accommodate an eight-lane facility in the future.

Louie B. Nunn Parkway and William H. Natcher Parkway. These parkways are four-lane divided highways with full access control. They are classified as Urban Freeways within the Bowling Green and Glasgow areas and as Rural Principal Arterials elsewhere. They are on both the National Highway System and the National Truck Network.

The Natcher Parkway has been chosen to be part of the I-66 corridor from north of the Study Area to the Wendell H. Ford (Western Kentucky) Parkway. From there, I-66 would be routed westward along the Ford Parkway corridor and then along I-24 to near Paducah. The Nunn Parkway from Somerset to Glasgow was also chosen part of the I-66 corridor

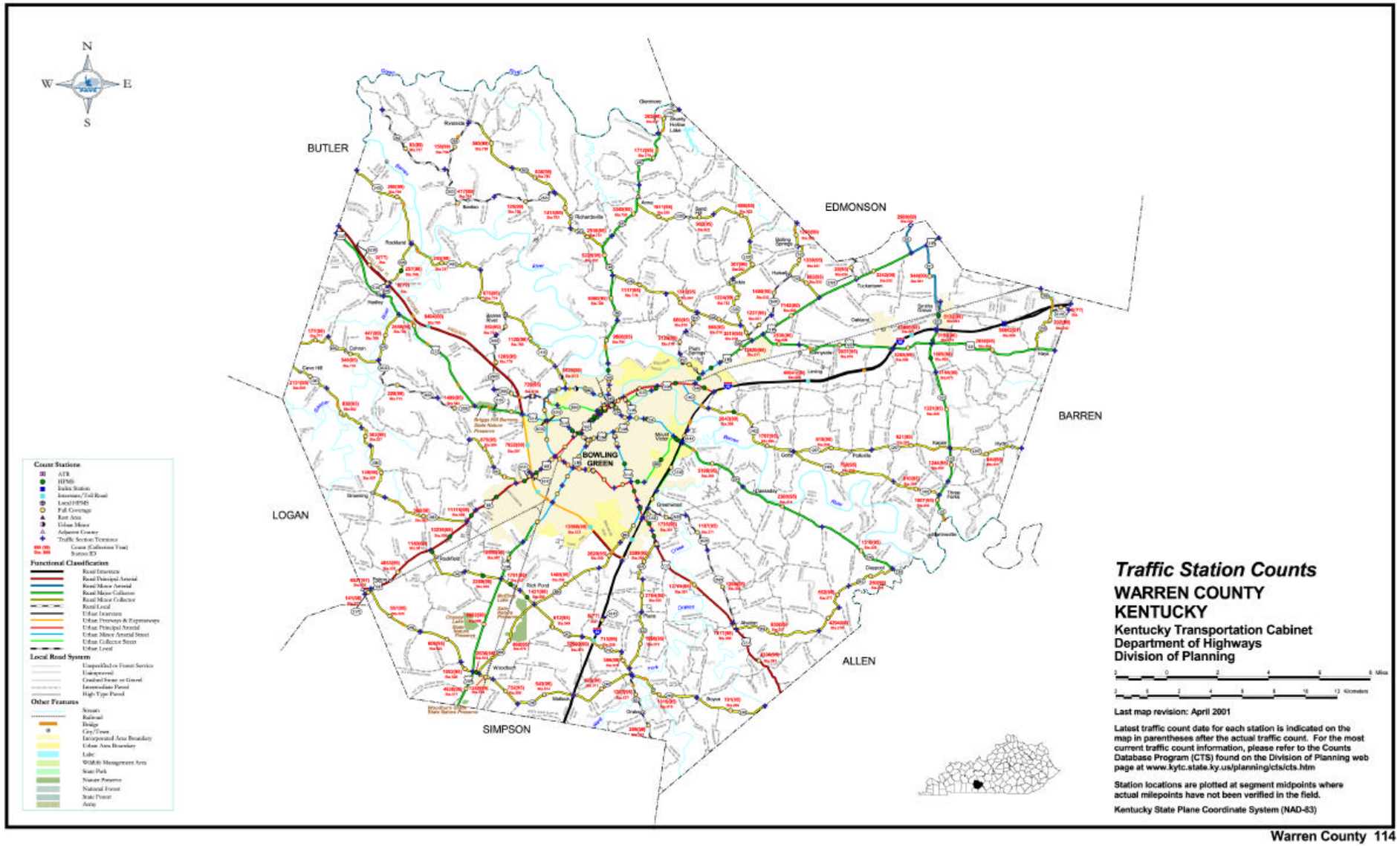
US 31W, US 68 and US 231. These United States (US) numbered routes vary in number of lanes (from two to four lanes) and functional class (from Rural Major Collector to Urban Principal Arterial) as they traverse the Study Area. When the routes do not parallel higher functional class roadways such as I-65 and the Natcher Parkway, they are generally classified as arterials. These routes carry significant traffic volumes and serve as important through routes across the Study Area.

KY 446, KY 234 and KY 880. These state highways are part of the arterial and collector road and street network of the City of Bowling Green and carry high daily traffic volumes. KY 446 connects I-65 to US 31W/US 68 entering the north side of Bowling Green. The new KY 234 (Cemetery Road) interchange with I-65 has recently opened to traffic, so KY 234 will become an even more important entry point to the Bowling Green urban area. KY 880 serves as the "Inner Beltline" for the Bowling Green urban area.

KY 101, KY 185 and KY 259. KY 101 is the major north-south route outside the urban area in eastern Warren County, in southern Edmonson County, and in the Study Area. From its intersection with KY 101, KY 259 continues as the primary north-south artery through Edmonson County to the Ford Parkway. KY 185 is the major north-south route in north central Warren County and the Study Area, running from KY 880 in Bowling Green and leaving the northern edge of the Study Area near the intersection of the Warren-Butler-Edmonson County Line.

Figure 2

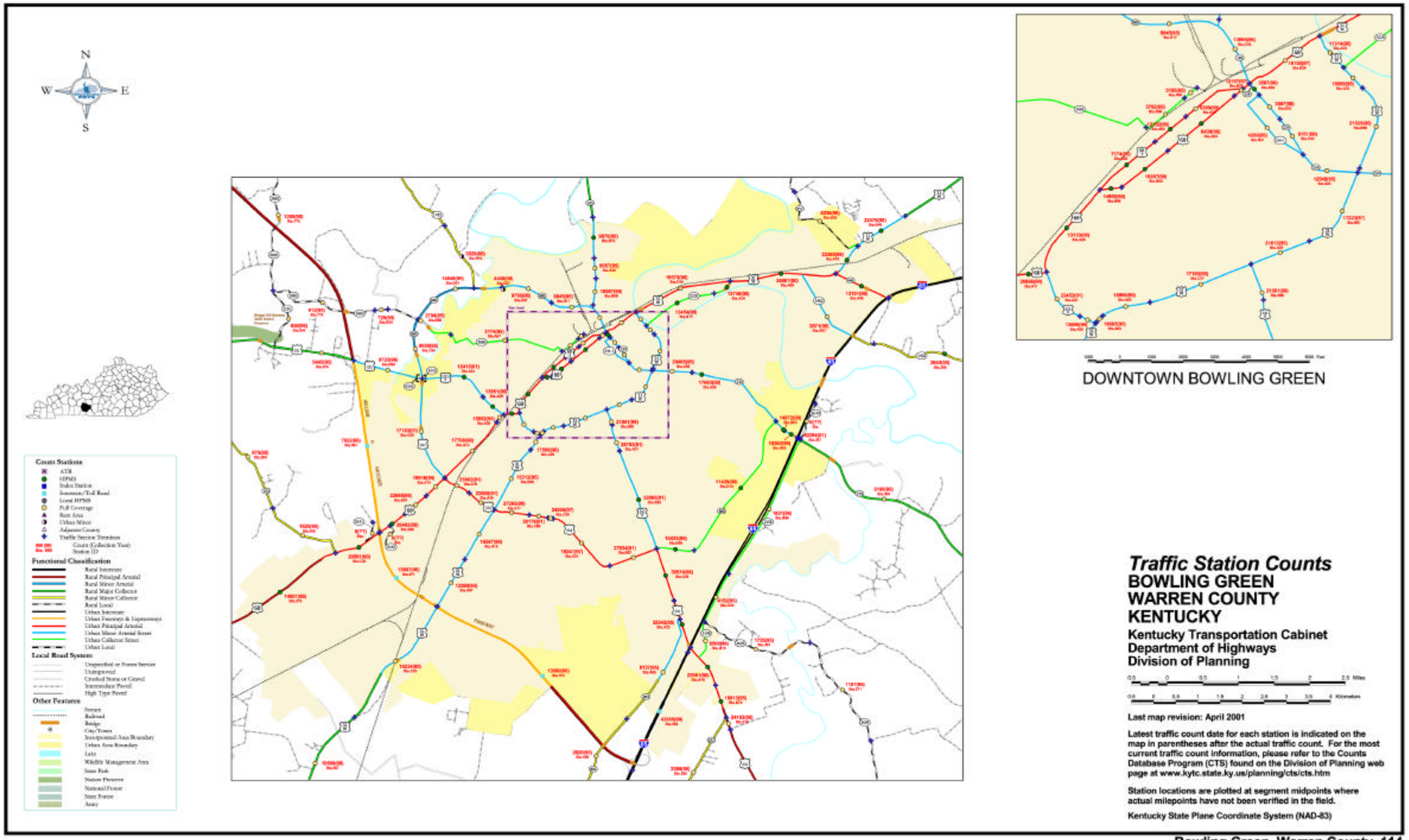
Roadway Functional Class and Traffic Volumes for Warren County



Warren County 114

Figure 3

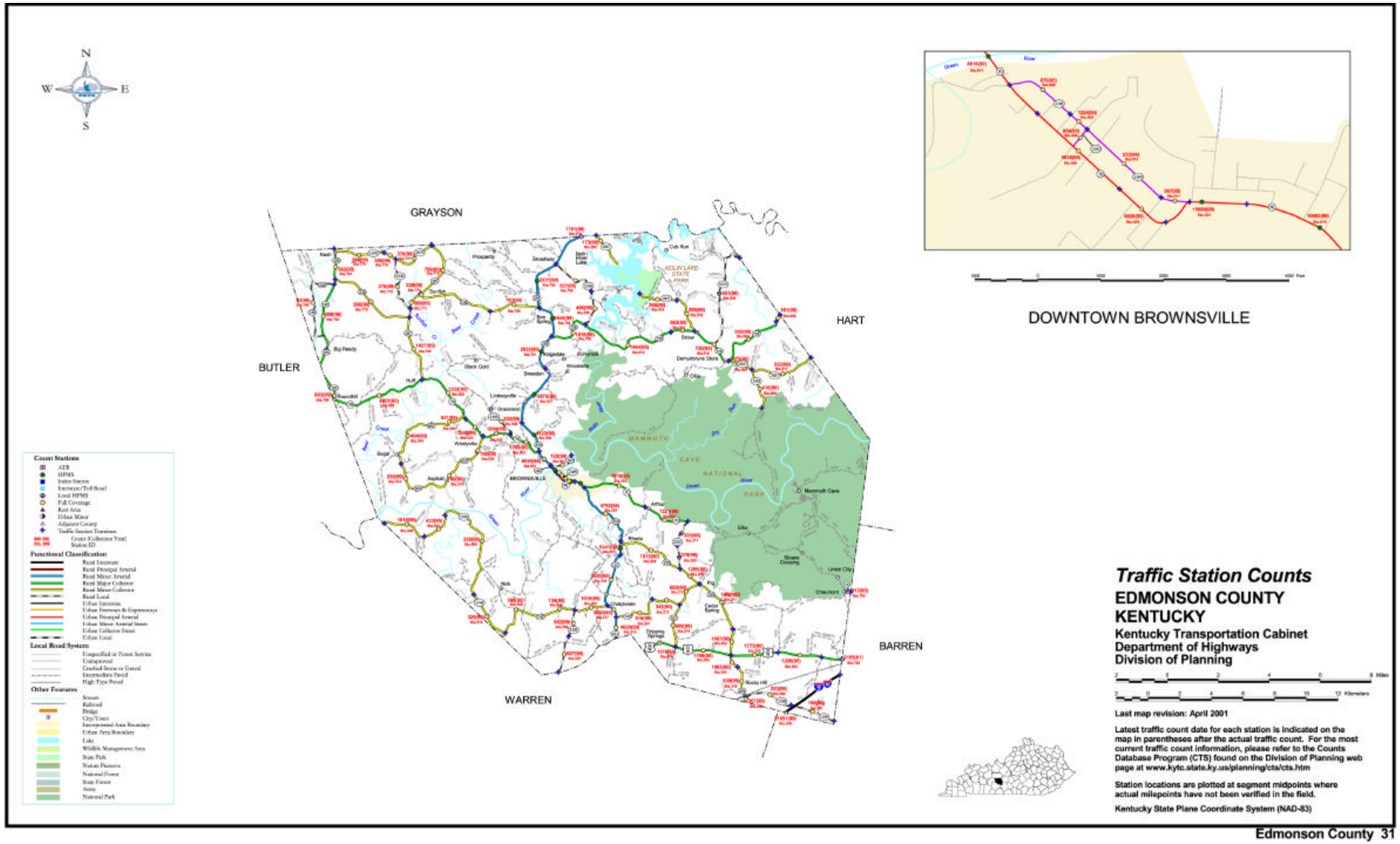
Roadway Functional Class and Traffic Volumes for Bowling Green



Bowling Green, Warren County 114

Figure 4

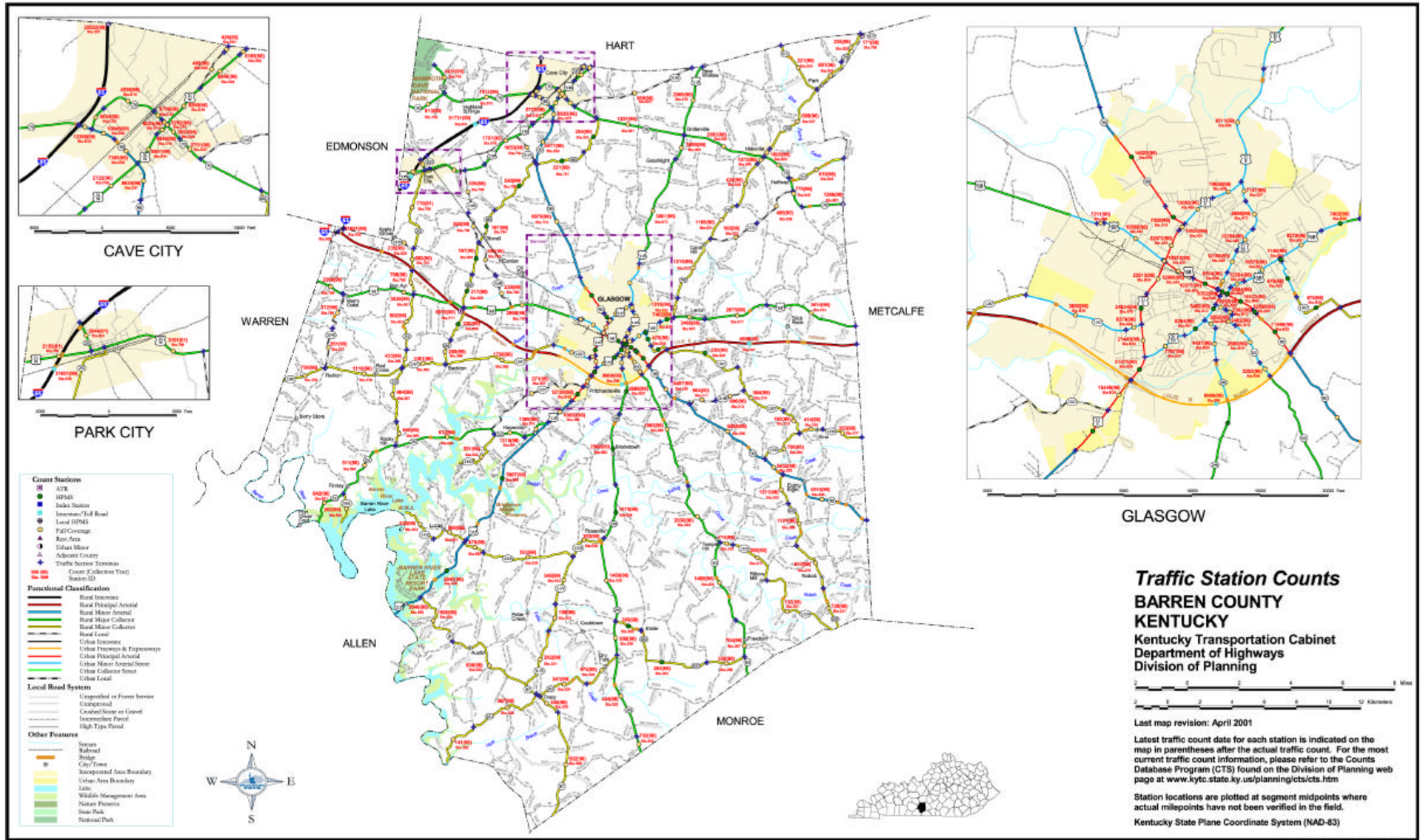
Roadway Functional Class and Traffic Volumes for Edmonson County



Edmonson County 31

Figure 5

Roadway Functional Class and Traffic Volumes for Barren County



Barren County 5

2. Existing Traffic Volumes and Level-of-Service

Base year 2000 average daily traffic (ADT) and level-of-service (LOS) appear in Table 2. Traffic operating conditions are described by alphabetic level-of-service (LOS) ratings (similar to the school grading system) of A through F:

- LOS F represents a breakdown in traffic flow (or failure) and is unacceptable.
- LOS E equates to the maximum traffic flow or capacity (i.e., "saturation) and is also undesirable.
- LOS D indicates very slow traffic and is the minimum acceptable LOS in urban areas.[1]
- LOS C allows for a little more freedom of movement and is the minimum acceptable LOS for rural areas (and desirable for urban areas).[2]
- LOS A and B represent relatively free-flow conditions with little interference from other traffic.

The LOS for roadway segments is determined by dividing the ADT by the existing capacity (equivalent to the volume-to-capacity or V/C ratio) for the type of facility (i.e., the functional classification and number of lanes) during peak periods. For this analysis, a volume-to-capacity (V/C) ratio of 1.00 correlates to a LOS of E.

According to the KYTC Highway Information System (HIS) database for the year 2000, I-65 is a four-lane facility with unacceptable operating conditions in both urban and rural areas. In fact, segments of I-65 from the Natcher Parkway to SR 101 operated at capacity (LOS E) in the year 2000. At present, I-65 is being widened from the Natcher Parkway to the Nunn Parkway and farther north to address traffic flow concerns. Existing traffic flow conditions on the Natcher Parkway and Nunn Parkway exhibit the highest level-of-service (i.e., LOS A).

In the year 2000, the two-lane sections of US 31W were operating at capacity (LOS E) from KY 242 to the Natcher Parkway (southwest of Bowling Green) and at failure (LOS F) from the Natcher Parkway to University Drive. The remainder of US 31W has an acceptable LOS in the Study Area. US 31W is programmed for widening to four-lanes from north of KY 242 to US 231.

US 68/80 shows operational failure for the two-lane segment between KY 880 (Campbell Lane) and Business US 231 (Morgantown Road), but other segments operate at an acceptable LOS.

US 231 (Scottsville Road) shows operational failure for the two-lane segment from KY 2629 (Old Scottsville Road) to KY 622 (Plano Road). The four-lane segments of US 231 from KY 622 through the I-65 interchange to KY 880 (Campbell Lane/Lovers Lane) are presently operating at LOS D and E. Other segments are at an acceptable LOS. US 231 is currently being widened to four lanes from KY 622 southeast into Allen County.

The two-lane segment of KY 185 (Veterans Memorial Lane) from US 68 (Kentucky Street) to KY 880 (Gordon Avenue) is operating at LOS E. This segment is programmed for future widening.

[1] KYTC's *Highway Design Policy* – "Geometric Design Guidelines" (p. 13) cites Chapter 2 in AASHTO's *A Policy on Geometric Design of Highways and Streets* -- see pages 84 and 85 (2000 edition).
[2] AASHTO's *A Policy on Geometric Design of Highways and Streets* (2000 edition), pages 84 and 85.

The rural portion of KY 185 from Garvin Lane (Old Richardsville Road) to the Butler County Line is also operating at LOS E.

The two-lane segment of KY 234 (Cemetery Road/Fairview Avenue) from I-65 to Hayes Lane shows operational failure, but is currently being widened to four lanes.

Finally, the two-lane segment of KY 880 (Veterans Memorial Lane) from KY 1435 (Barren River Road) to US 231 (Morgantown Road) is operating at LOS E; and the two-lane segment of KY 880 (Lovers Lane) from US 231 (Scottsville Road) to US 234 (Cemetery Road) shows operational failure. Only the four-lane segment of KY 880 (Veterans Memorial Lane) from KY 185 (Gordon Avenue) to KY 1435 (Barren River Road) shows acceptable operating conditions.

Table 1: Existing Roadway Characteristics

Route	Begin MP	End MP	Segment	Functional Class (a)	Number of Lanes	Lane Width	Shoulder Width
I-65	0.000	20.539	Simpson Co. Line to Natcher Pkwy	Rural Interstate	4	12	3
	20.539	28.006	Natcher Parkway to KY 446	Urban Interstate	4	12	3
	28.006	53.956	KY 446 to Hart Co. Line	Rural Interstate	4	12	3
Natcher Parkway	0.000	7.422	I-65 to US 231	Urban Other Freeway	4	12	6
	7.422	26.419	US 231 to KY 79	Rural Principal Arterial	4	12	6
Nunn Parkway	0.000	11.445	I-65 to US 31E	Urban Other Freeway	4	12	10
	11.445	13.990	US 31E to KY 90	Rural Principal Arterial	4	12	4
US 31W	0.000	8.788	Simpson Co. Line to Memphis Jct. Rd.	Rural Major Collector	2	10	2
	8.788	18.866	Memphis Jct. Rd to Jackson Grove Church Rd	Urban Minor Arterial	2-4	9-13	0-4
	18.866	20.905	Jackson Church Grove Rd. to US 68	Rural Major Collector	4	11	2
	20.905	29.114	US 68 to Edmonson Co. Line	Rural Major Collector	2	10	2-4
	0.000	7.996	Warren Co. Line to Barren Co. Line	Rural Major Collector	2	10	2-4
US 68/ KY 80	0.000	5.021	Logan Co. Line to KY 1083	Rural Principal Arterial	2	12	2-4
	5.021	7.514	KY 1083 to KY 432	Rural Principal Arterial	4	12	10
	7.514	9.407	KY 432 to KY 880	Urban Principal Arterial	4	12	2
	9.407	10.623	KY 880 to Business US 231	Urban Principal Arterial	2-3	11	2
	10.623	13.060	Business US 231 to US 31W (then over US 31W)	Urban Principal Arterial	4	10-12	0
	13.060	25.027	US 31W to Barren Co. Line	Rural Major Collector	2	9	2-3
US 231	0.000	7.988	Allen Co. Line to KY 622	Rural Principal Arterial	2	10	2
	7.988	14.028	KY 622 to KY 880 via Campbell Lane to US 68	Urban Principal Arterial	4	11-12	0-10
	14.028	16.445	US 68 to KY 880 to Natcher Parkway	Urban Minor Arterial	2	10-11	2-10
	16.445	27.581	Natcher Parkway to Butler Co. Line	Rural Major Collector	2	9	3
KY 101	0.000	7.865	Allen Co. Line to I-65	Rural Major Collector	2	9	3
	7.865	12.850	I-65 to Edmonson Co. Line	Rural Minor Arterial	2	10	0-10
	0.000	4.131	Warren Co. Line to KY 259	Rural Minor Arterial	2	10	0-10
KY 185	0.000	0.309	US 68 to Garvin Lane	Urban Minor Arterial	2-4	10-11	0-4
	0.309	12.222	Garvin Lane to Butler Co. Line	Rural Major Collector	2	9-12	4-10
KY 234	0.365	10.333	KY 961 to I-65	Rural Major Collector	2	10	4
	10.333	13.552	I-65 to US 68	Urban Minor Arterial	2-4	10-12	1-2
KY 242	0.000	10.275	US 68 to KY 622	Rural Minor Collector	2	9	2
KY 255	0.000	11.767	KY 252 to US 31W	Rural Minor Collector	2	7-9	3-4
KY 259	0.000	3.087	US 68 to Edmonson Co. Line	Rural Minor Collector	2	7-8	3-4
	0.000	9.242	Warren Co. Line to KY 101	Rural Minor Collector	2	7-8	3-4
	9.242	12.096	KY 101 to KY 70	Rural Minor Arterial	2	8	4
KY 263	0.000	7.451	KY 185 to Harry Cherry Road	Rural Minor Collector	2	9	3
KY 422	0.000	2.909	US 31W to KY 259	Rural Minor Collector	2	8	4
KY 432	0.000	2.809	US 68 to White Stone Quarry Road	Rural Minor Collector	2	9	3
KY 446	0.000	0.970	I-65 to US 31W	Urban Principal Arterial	4	12	10
KY 526	0.000	6.383	KY 185 to US 31W	Rural Minor Collector	2	9	3
KY 622	2.654	8.332	KY 240 to US 231	Rural Minor Collector	2	9	3
KY 626	0.000	5.882	KY 2632 to US 231	Rural Minor Collector	2	9	3
	5.882	8.298	US 231 to KY 1435	Rural Minor Collector	2	9	3
KY 685	0.000	9.367	KY 1297 to KY 90	Rural Minor Collector	2	8-9	3
KY 743	0.000	8.203	US 31W to KY 422	Rural Minor Collector	2	9	3-4
KY 880	0.000	1.866	KY 185 to KY 1435	Urban Minor Arterial	4	12	10
	1.866	3.292	KY 1435 to Jennings Creek Bridge	Rural Minor Arterial	2	12	10
	3.292	3.646	Jennings Creek Bridge to US 231 (Morgantown Road)	Urban Minor Arterial	2	12	10
	3.646	6.426	US 231 (Scottsville Road) to KY 234 (Cemetery Road)	Urban Collector	2	10	3
KY 884	0.000	9.631	KY 240 to US 231	Rural Minor Collector	2	9	3
KY 1083	0.000	10.982	US 68 to Butler Co. Line	Rural Minor Collector	2	9	3
KY 1297	0.000	9.264	KY 1402 to Barren Co. Line	Rural Minor Collector	2	9	3-4
	0.000	12.799	Warren Co. Line to US 31E	Rural Minor Collector	2	9	3-4
KY 1320	0.000	10.215	KY 526 to KY 185	Rural Minor Collector	2	9	3
KY 1402	0.000	1.514	US 31W to I-65	Urban Minor Arterial	2	11	2
	1.514	11.913	I-65 to KY 101	Rural Minor Collector	2	9	2
KY1435	0.000	14.039	KY 880 to Butler Co. Line	Rural Minor Collector	2	8-12	2-8
KY 2158	0.000	3.441	US 231 to KY 234	Urban Collector Street	2	10	3
KY 2665	0.000	5.635	KY 1435 to Jennings Creek Bridge	Local Road	2	8	2
	5.635	8.123	Glen Lilly Road to Clay Road	Urban Collector Street	2	8	3
KY 3225	0.000	1.409	US 31W to US 31W	Urban Collector Street	2-4	10-12	1-8

Source: Kentucky Transportation Cabinet Highway Information System (HIS)

Table 2: Existing Traffic Volumes and Level-of-Service [(a)]

Route	Begin MP	End MP	Segment	Functional Class (b)	Existing Lanes	Existing Hourly Capacity (c)	2000 ADT	V/C Ratio (d)	Existing LOS (f)
I-65	0.000	20.539	Simpson Co. Line to Natcher Pkwy	1	4	2,985	36,800	0.758	D
	20.539	25.664	Natcher Pkwy to US 231	11	4	2,940 (e)	44,800	0.919	E
	25.664	28.006	US 231 to KY 446	11	4	2,940 (e)	44,500	0.913	E
	28.006	35.562	KY 446 to US 68	1	4	2,943	42,400	0.886	E
	35.562	37.551	US 68 to KY 101	1	4	2,943	44,500	0.930	E
	37.551	43.135	KY 101 to Nunn Pkwy	1	4	2,943	36,500	0.762	D
	43.135	47.696	Nunn Pkwy to KY 255	1	4	2,550	29,800	0.718	D
	47.696	52.523	KY 255 to KY 70	1	4	2,550	30,700	0.740	D
	52.523	53.956	KY 70 to Hart Co. Line	1	4	2,550	32,200	0.776	D
Natcher Parkway	0.000	3.576	I-65 to US 31W	12	4	3,991	13,600	0.215	A
	3.576	4.969	US 31W to US 68	12	4	3,991	13,800	0.218	A
	4.969	7.422	US 68 to US 231	12	4	3,991	7,820	0,124	A
	7.422	26.419	US 231 to KY 79	2	4	3,603	8,490	0.148	A
Nunn Parkway	0.000	11.445	I-65 to US 31E	12	4	3,603	6,920	0.121	A
	11.445	13.990	US 31E to KY 90	2	4	3,265	8,670	0.166	A
US 31W	0.000	1.464	Simpson Co. Line to KY 242	7	2	1,837	5,420	0.339	A
	1.464	5.283	KY 240 to KY 242	7	2	1,837	8,230	0.515	B
	5.283	8.788	KY 242 to Memphis Junction Road	7	2	1,349	10,700	0.912	E
	8.788	8.986	Memphis Junction Rd. to Natcher Pkwy	16	2	1,349	11,600	0.989	E
	8.986	10.567	Natcher Pkwy to US 231 (Campbell Lane)	16	2	1,010	17,300	1.747	F
	10.567	11.805	US 231 to Business US 231 (University)	16	2	1,446	17,300	1.220	F
	11.805	12.812	Bus. US 231 (University) to Bus. US 231	16	4	2,828	19,400	0.399	B
	12.812	13.699	Bus. US 231 (Scottsville Rd.) to KY 234	16	4	2,828	20,600	0.307	B
	13.699	14.670	KY 234 to US 68 (Louisville Rd.)	16	4	2,828	22,000	0.328	B
	14.670	17.371	US 68 (Riverview Dr.) to KY 446	14	4	2,828	30,800	0.668	C
	17.371	18.866	KY 446 to Jackson Grove Church Rd.	16	4	2,461	22,500	0.532	C
	18.866	20.905	Jackson Church Grove Rd. to US 68	7	4	2,649	12,200	0.318	A
	20.905	23.538	US 68 to KY 743	7	2	1,361	7,140	0.603	C
	23.538	29.114	KY 743 to Edmonson Co. Line	7	2	1,346	3,240	0.277	A
	0.000	3.565	Warren Co. Line to KY 259	7	2	1,361	1,790	0.151	A
	3.565	7.996	KY 259 to Barren Co. Line	7	2	1,332	1,950	0.168	A
	0.000	0.894	Edmonson Co. Line to KY 255	7	2	1,797	2,100	0.134	A
	0.894	6.823	KY 255 to KY 90	7	2	1,817	3,130	0.198	A
US 68/ KY 80	0.000	0.319	Logan Co. Line to KY 240	2	2	1,509	8,580	0.625	C
	0.319	3.201	KY 240 to KY 242	2	2	1,608	4,560	0.312	B
	3.201	5.021	KY 242 to KY 1083	2	2	1,608	9,870	0.675	C
	5.021	7.514	KY 1083 to KY 432	2	4	2,526	14,400	0.357	B
	7.514	8.196	KY 432 to Natcher Pkwy	14	4	2,526	20,600	0.500	B
	8.196	9.407	Natcher Pkwy to KY 880/US 231	14	4	2.534	26,400	0.540	C
	9.407	10.550	KY 880 W to Business US 231	14	2	1,305	19,000	1.514	F
	10.550	13.060	Business US 231 to US 31W	14	4	1,538	17,000	0.678	C
	13.060	18.452	US 31W to I-65	7	2	1,754	2,820	0.185	A
	18.452	20.059	I-65 to KY 101	7	2	1,461	3,090	0.243	A
	20.059	25.027	KY 101 to Barren Co. Line	7	2	1,445	2,810	0.224	A
	0.000	6.026	Warren Co. Line to KY 685	7	2	1,397	2,980	0.245	A

Note: (a) The highest average daily traffic (ADT) volume and worst LOS are shown for a segment when multiple values are available from the KYTC HIS. Shaded values fail to meet minimum acceptable LOS C for rural areas and LOS D for urban areas. KYTC's *Highway Design Policy* – "Geometric Design Guidelines" (p. 13) cites Chapter 2 in AASHTO's *A Policy on Geometric Design of Highways and Streets* -- see pages 84 and 85 (2000 edition).

Table 2: Existing Traffic Volumes and Level-of-Service (continued) [(a)]

Route	Begin MP	End MP	Segment	Functional Class (b)	Existing Lanes	Existing Hourly Capacity (c)	2000 ADT	V/C Ratio (d)	Existing LOS (f)
US 231	0.000	3.236	Allen Co. Line to KY 961	2	2	1,546	4,710	0.335	B
	3.236	3.500	KY 961to KY 2629	2	2	1,546	7,880	0.561	C
	3.500	7.988	KY 2629 to KY 622	2	2	1,310	24,400	2.049	F
	7.988	9.106	KY 622 to I-65	14	4	2,220	26,400	0.730	D
	9.106	10.601	I-65 to KY 880 (Lovers Lane)	14	4	2,732	39,600	0.889	E
	10.601	13.188	KY 880 over Campbell to US 31W	14	4	2,636	27,700	0.645	C
	13.188	14.028	US 31W over Campbell to US 68	14	4	2,636	20,200	0.470	B
	14.028	15.510	US 68 to KY 880	16	2	1,618	10,400	0.656	C
	15.510	16.445	KY 880 to Natcher Pkwy	16	2	1,618	10,100	0.175	A
	16.445	18.406	Natcher Pkwy to KY 2632	7	2	1,445	5,920	0.471	B
	18.406	27.851	KY 2632 to Butler Co. Line	7	2	1,445	2,350	0.187	A
Business US 231	0.000	2.066	KY 880 (Lovers Ln.) to US 31W	16	4	3,115	34,600	0.646	C
	2.066	2.507	US 31W to US 68 (University Dr.)	16	4	3,018	19,600	0.378	B
	2.507	3.899	US 68 (Russellville Rd.) to KY 880	16	2	1,554	10,900	0.715	D
KY 101	0.000	3.082	Allen Co. Line to KY 1297	7	2	1,531	1,240	0.093	A
	3.082	7.277	KY 1297 to US 68	7	2	1,421	1,810	0.146	A
	7.277	7.865	US 68 to I-65	7	2	1,503	3,160	0.242	A
	7.865	11.641	I-65 to US 31W	6	2	1,412	5,010	0.408	B
	11.641	12.850	US 31W to Edmonson Co. Line	6	2	1,616	3,290	0.234	A
	0.000	4.131	Edmonson Co. Line to KY 259	6	2	1,381	5,340	0.445	B
KY 185	0.000	0.309	US 68 to KY 880/Gordon Ave.	16	2	1,569	14,800	0.910	E
	0.309	0.737	KY 880 to Double Springs Road	16	4	2,995	10,300	0.200	A
	0.737	1.569	Double Springs Rd. to Garvin Lane	16	2	1,569	10,100	0.657	C
	1.569	12.222	Garvin Lane to Butler Co. Line	7	2	1,344	10,600	0.924	E
KY 234	0.365	10.333	KY 961 to I-65	7	2	1,333	5,920	0.511	B
	10.333	12.081	I-65 to Hayes Lane	16	2	1,569	18,300	1.190	F
	10.333	13.552	Hayes Lane to US 68 (Kentucky St.)	16	4	1,955	21,700	0.645	C
KY 255	0.000	6.320	KY 252 to US 68	2	2	1,421	556	0.045	A
	6.320	11.767	US 68 to US 31W	2	2	1,460	717	0.056	A
KY 259	0.000	3.087	US 68 to Edmonson Co. Line	2	2	1,381	204	0.017	A
	0.000	2.083	Warren Co. Line to US 31W	2	2	1,381	1,090	0.091	A
	2.083	9.242	US 31W to KY 101	2	2	1,381	1,480	0.123	A
	9.242	12.096	KY 101 to KY 70	2	2	1,381	4,710	0.392	B
KY 446	0.000	0.970	I-65 to US 31W	14	4	3,180	13,900	0.268	A
KY 880	0.000	1.866	KY 185 (Gordon Ave.) to KY 1435	16	4	3,108	13,100	0.245	A
	1.866	3.646	KY 1435 to US 231 (Morgantown Rd.)	6	2	1,569	11,800	0.853	E
	3.646	6.426	US 231 (Scottsville Rd.) to KY 234	17	2	1,569	12,800	1.036	F
KY 1297	0.000	6.345	KY 1402 to KY 101	2	2	1,381	839	0.070	A
	6.345	9.264	KY 101 to Barren Co. Line	2	2	1,381	857	0.071	A
	0.000	4.823	Warren Co. Line to KY 255	2	2	1,381	1,140	0.095	A
	4.823	6.585	KY 255 to KY 685	2	2	1,381	1,090	0.091	A
	6.585	12.799	KY 685 to US 31E	2	2	1,381	6,800	0.566	C
KY 1402	0.000	1.514	US 31W to I-65	2	2	1,381	3,870	0.286	A
	1.514	6.094	I-65 to KY 1297	2	2	1,381	2,840	0.236	A
	6.094	11.913	KY 1297 to KY 101	2	2	1,381	880	0.073	A

Source: Kentucky Transportation Cabinet Highway Information System (HIS) and Bernardin-Lochmueller & Associates, Inc.

Notes: (a) The highest average daily traffic (ADT) volume and worst LOS are shown for a segment when multiple values are available from the KYTC HIS. Shaded values fail to meet minimum acceptable LOS C for rural areas and LOS D for urban areas.. KYTC's *Highway Design Policy* – "Geometric Design Guidelines" (p. 13) cites Chapter 2 in AASHTO's *A Policy on Geometric Design of Highways and Streets* -- see pages 84 and 85 (2000 edition).

Notes (continued): (b) Functional Class

Functional Class	K-factor (peak hour % of ADT)	D-factor (directional split)
1 = rural interstate	10.6%	58%
2 = rural principal arterial	11.0%	57%
6 = rural minor arterial	11.5%	55%
7 = rural major collector	11.5%	60%
8 = rural minor collector	11.5%	60%
11 = urban interstate	10.4%	58%
12 = urban other freeway	10.7%	59%
14 = urban principal arterial	10.4%	59%
16 = urban minor arterial	10.2%	57%
17 = urban collector	12.7%	56%

Source: *Kentucky Transportation Cabinet Year 2000 Highway Performance Monitoring System Traffic Factors* (June 1, 2001)

(c) Existing hourly capacity at service flow for LOS E as reported in the KYTC Highway Information System. For two-lane facilities, the cited capacity is for both directions. For four or more lane facilities, the cited capacity is for one direction only.

(d) V/C ratio is volume to service flow for LOS E as reported in the KYTC Highway Information System.

(e) KYTC Highway Information System hourly capacity for level terrain (3,880 vph) replaced by hourly capacity for rolling terrain (2,940 vph).

(f) Level-of-Service versus V/C ratio comparison:

	Rural V/C Ratio					Urban V/C Ratio			
LOS	FC=1 4-lane	FC=2	FC=6	FC=7	FC=8	FC=11/12 4-lane	FC=14	FC=16	FC=17
A	0.295	0.301	0.303	0.371	0.371	0.295	0.293	0.289	0.275
B	0.473	0.507	0.507	0.528	0.528	0.473	0.496	0.492	0.471
C	0.704	0.705	0.704	0.730	0.730	0.704	0.699	0.695	0.667
D	0.887	0.842	0.838	0.854	0.854	0.887	0.835	0.835	0.814
E	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
F	>1.000	>1.000	>1.000	>1.000	>1.000	>1.000	>1.000	>1.000	>1.000

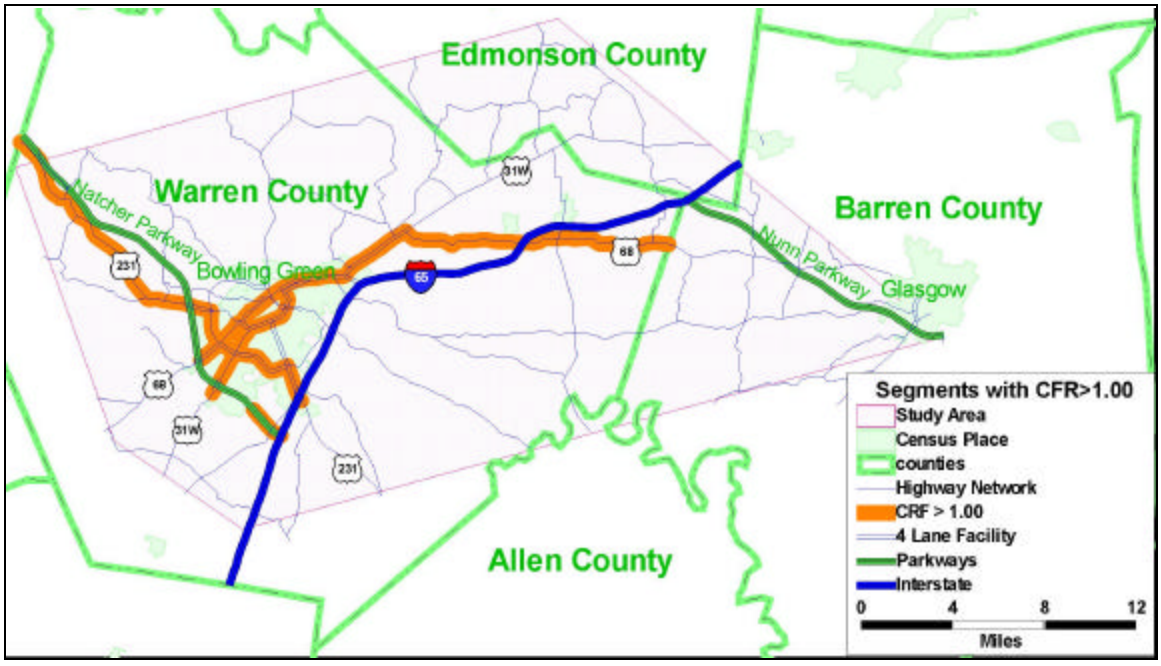
Source: Bernardin-Lochmueller & Associates from the *Highway Capacity Manual*

3. Accidents

Between 1997 and 1999, 5,736 traffic accidents were reported in the Kentucky Transportation Cabinet Highway Information System (HIS) database within the Study Area on I-65, the William Natcher Parkway, the Louie B. Nunn (Cumberland) Parkway, KY 101, KY 255, KY 1297, US 31W, US 68, US 231, and US 231 Business. These accidents included 1,853 non-fatal injury accidents and 17 accidents involving fatalities. Analysis of the accident data revealed that there were at least seven roadway segments along these routes with a Critical Rate Factor greater than 1.00. A Critical Rate Factor greater than 1.00 means that the roadway segment exceeded the statewide average accident rate per vehicle-mile for facilities of its functional class. These are highlighted in Figure 6. The number of accidents, accident rate, and Critical Rate Factor for each of these seven highway segments (as well as the high number of accidents on I-65 and US 231 Business) are shown in Tables 3 and 4.

There is evidence that heavy congestion contributed to the elevated accident rates on at least one of these seven critical segments. Forty-two percent of the accidents on the critical section of US 68 between Milepost 9.435 and 13.060 (Campbell Lane to 1st Avenue) were classified as rear-end type collisions, which are generally associated with high levels of congestion.

Because the calculation of accident rates and Critical Rate Factors depends heavily on the length of the segment, it is possible that shorter segments may have a Critical Rate Factor greater than 1.00; however, the KYTC Highway Information System database does not permit the analysis of shorter segments. In light of the high number of accidents on I-65 and US 231 Business, shorter segments of these roadways may have Critical Rate Factors in excess of 1.00. A more detailed analysis of accident data was included in the *Bowling Green Transportation Plan (August 2000),* which identified many tenth-of-a-mile roadway segments in the Bowling Green area with Critical Rate Factors above 1.00, as shown in Figure 7. This included segments of I-65, US 31W, US 68, and US 231, among others.



Source: Bernardin-Lochmueller & Associates, Inc.

Figure 6: Highway Segments with Critical Rate Factors Greater than 1.00

Table 3: Accident Severity by Route

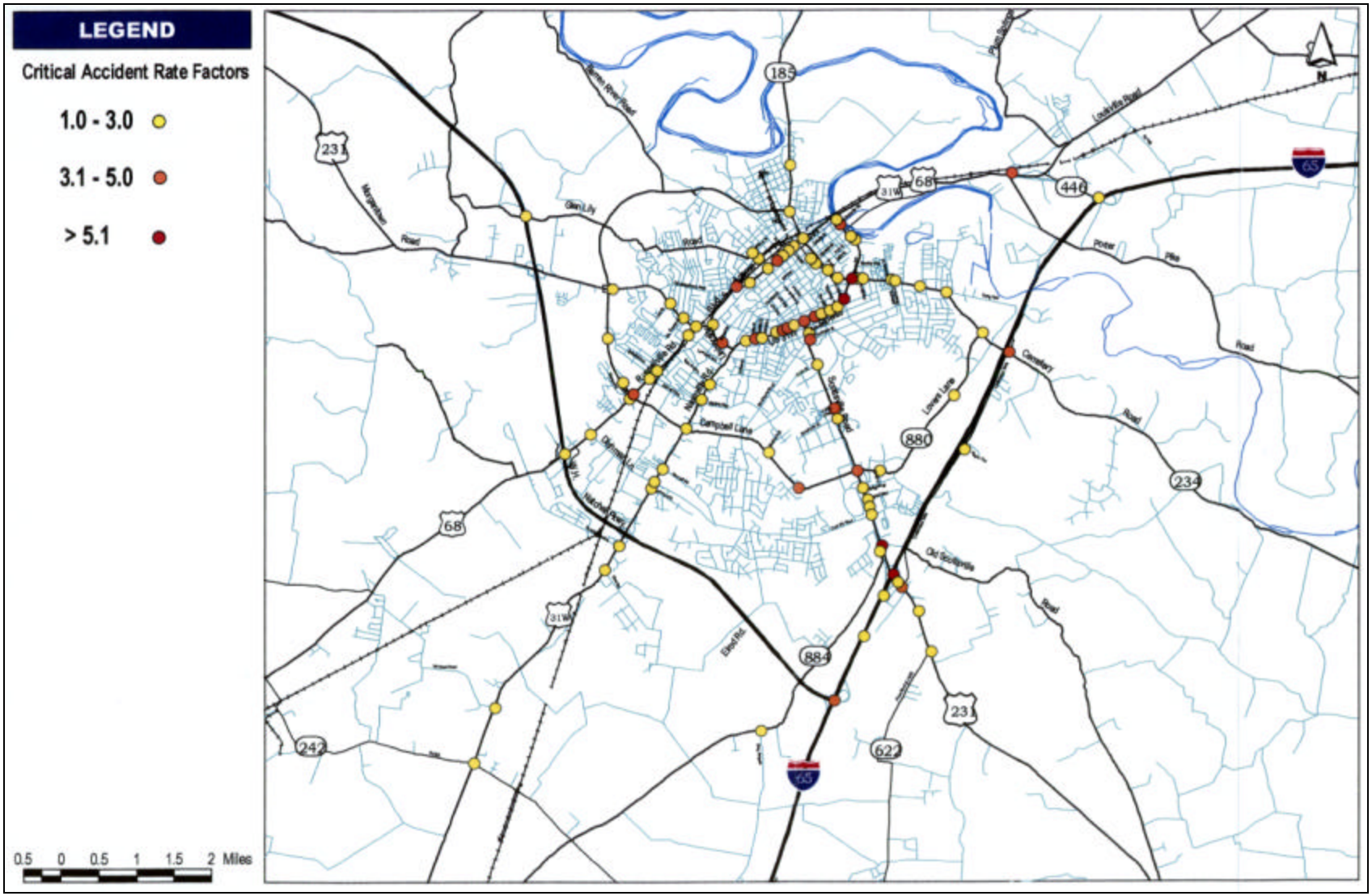
ROUTE DESCRIPTION					ACCIDENTS			
ROUTE NO.	FROM	TO	LENGTH (MILES)	AADT (VPD)	FATAL	INJURY	PDO	TOTAL
WN 9007[1]	I-65 Overpass	Elrod Rd. Underpass	1.604	5830	0	7	12	19
US 31W	Mitch McConnell Way	US 68/KY 80	6.940	16800	1	351	844	1196
US 68	US 231 (Campbell Ln.)	US 31W (at First Ave.)	3.625	14540	0	121	351	472
US 68	US 31W (at First Ave.)	Warren/Barren County Line	11.967	2680	2	49	79	130
US 231	0.16 mi. N of KY 622	US 68 (Russellville Rd.)	5.884	26180	2	308	784	1094
US 231	US 68 (Russellville Rd.)	William Natcher Pkwy Bridge	2.417	13450	0	45	119	164
US 231	William Natcher Pkwy Bridge	Warren/Butler County Line	11.136	4050	0	69	85	154
US 231X[2,3]	KY 880--US 231	KY 880--US 231	3.899	19800	0	114	300	414
I-65[3]	Simpson/Warren County Line	Warren/Barren County Line	29.179	37920	8	213	623	844

Source: Kentucky Transportation Cabinet Highway Information System (HIS) for calendar years 1997-1999.
[1] William Natcher Parkway
[2] Business US 231
[3] Although these roadway segments did not have Critical Rate Factors that exceeded 1.00, more than 100 accidents occurred on each of these two roadways (US 231X and I-65).

Table 4: Critical Rate Factors

ROUTE DESCRIPTION			RATES PER 100M VMT					TOTALS		
NO.	FROM	TO	HMVM	FUNCT. CLASS RATE	FATAL	INJURY	PDO	TOTAL ACC. RATE	RC	CRITICAL RATE FACTOR
WN 9007[1]	I-65 Overpass	Elrod Rd. Underpass	0.10	60	0	68	117	186	127	1.457
US 31W	Mitch McConnell Way	US 68/KY 80	1.28	333	0.78	274.93	661.09	937	375	2.498
US 68	US 231 (Campbell Ln.)	US 31W (at First Ave.)	0.58	541	0.00	209.65	608.16	818	621	1.317
US 68	US 31W (at First Ave.)	Warren/Barren Co. Line	0.35	252	5.70	139.53	224.95	370	323	1.148
US 231	0.16 mi. N of KY 622	US 68 (Russellville Rd.)	1.69	541	1	183	465	649	588	1.104
US 231	US 68 (Russellville Rd.)	W. Natcher Pkwy Bridge	0.36	333	0	126	334	461	413	1.115
US 231	W. Natcher Pkwy Bridge	Warren/Barren Co. Line	0.49	252	0	140	172	312	311	1.002

Source: Kentucky Transportation Cabinet Highway Information System (HIS) for calendar years 1997-1999.
[1] William Natcher Parkway



Source: Bowling Green Transportation Plan – August 2000 (HNTB) for KYTC

Figure 7: High Accident Locations in the Bowling Green Area

4. Committed Projects

The I-66 Corridor was originally defined and designated as a "high priority corridor" in the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA). The I-66 Corridor was added to the National Highway System (about 155,000 miles of interstates and principal arterials through the nation) within the Commonwealth of Kentucky in the 1995 National Highway System (NHS) Act. The 1997 Southern Kentucky (I-66) Corridor Study found the proposed interstate-type facility to be economically justified and financially feasible. As a result, I-66 was incorporated into the *Kentucky Transportation Cabinet Statewide Transportation Plan* (FY 1999-2018).

Aspects of the Bowling Green Outer Beltline first appeared in the *1972 Bowling Green Transportation Plan,* and were carried forward into the *1983 Bowling Green Transportation Plan*. The beltline was further defined in the *1990 Comprehensive Plan for Warren County* and again in the *2000 Bowling Green Urban Transportation Study*.

In addition to these two proposed projects, which are the focus of this study, there are a number of other planned "major capital" improvements that may affect traffic operations in the Study Area. Tables 5 through 8 provide an overview of these projects in the various phases of development from planning and pre-construction to construction (and recently completed):

- Table 5 includes future projects within the Study Area.
- Table 6 contains future projects located beyond the Study Area that may influence traffic flow within the Study Area.
- Table 7 records the projects within the Study Area already under construction (or recently completed).
- Table 8 presents the projects near the Study Area already under construction (or recently completed).

Figure 8 displays the relative location of the projects within the Study Area. These projects have been taken from KYTC's *2000 Six Year Highway Plan, 2002 Six Year Highway Plan*, *1999 Statewide Transportation Plan (FY1999-2018)*, and 2000 *Bowling Green Transportation Plan*.

Only "major capital" improvements with the potential to expand the traffic flow capacity of the existing roadway network are listed. Such "capacity expansion" projects include major roadway widenings, new or relocated roadways, and new or expanded interchanges. While the highway and transportation plans include many other improvements for "capacity preservation" (such as bridge and pavement replacement/reconstruction, intersection and signal improvements, etc.), these projects are not listed because they do not increase through traffic carrying capabilities.

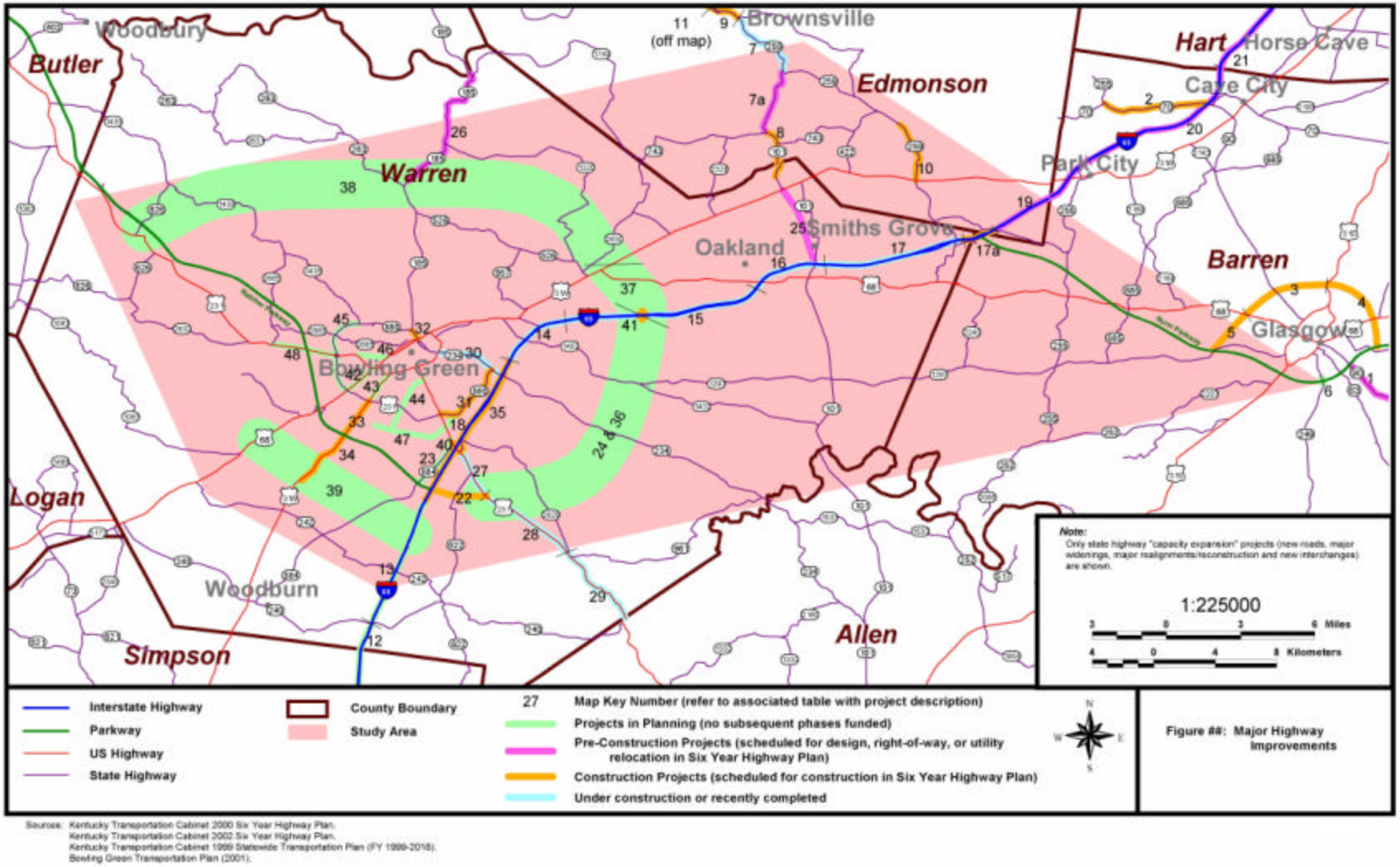


Figure 8: Committed Projects Location Map

Table 5: Future Transportation Projects within the Study Area
(capacity expansion projects only)*

County (map key #)	Facility	Description of Project	Source of Project
(1) Barren	KY 90	Reconstruct E of Glasgow from the Louie B. Nunn Pkwy. to the Metcalfe Co. Line (Item # 03-108.00)	2002 Six Year Highway Plan for right-of-way and utility relocation in 2004
(2) Barren/ Edmonson	KY 70	Reconstruct KY 70 from I-65 at Cave City to the park entrance at Chaumont (Item # 03-185.01)	2002 Six Year Highway Plan for construction in 2005
(3) Barren	New route	Glasgow outer loop from US 68 W near Donnelly Rd. to KY 90 (Item # 03-192.25) and KY 90 to US 31E N of Glasgow (Item # 03-192.27)	2002 Six Year Highway Plan for construction in 2002 for KY 90 to US 31E and in 2003 for US 68 to KY 90
(4) Barren	New route	Glasgow outer loop from US 31E to the Louie B. Nunn Pkwy. E of Glasgow (Item # 03-192.01)	2002 Six Year Highway Plan for right-of-way in 2002, utility relocation in 2004, and construction in 2005
(5) Barren	New route	Construct outer loop around Glasgow from US 68 W of Glasgow to KY 1297, including an interchange at the Louie B. Nunn Pkwy. (Item # 03-7000.00)	2002 Six Year Highway Plan for right-of-way in 2003, utility relocation in 2003 and construction in 2006
(6) Barren	Louie B. Nunn Parkway (KY 9008)	Louie B. Nunn Pkwy. - new interchange at KY 249 near Glasgow	1999 Statewide Trans. Plan (FY 1999-2018)
(7) Edmonson	**KY 101**	**Reconstruct KY 101 from Brownsville to 0.8 mi S of Rhoda (Item # 03-139.01)**	**2000 Six Year Highway Plan for construction in 2000**
(7a) Edmonson	**KY 101**	*Widening of KY 101 to match proposed improvements between Rhoda and Chalybeate (Item # 03-117.00)*	*2002 Six Year Highway Plan for design in 2006*
(8) Edmonson/ Warren	KY 101	Spot improvement through the Knobs S of Chalybeate (Item # 03-140.00)	2002 Six Year Highway Plan for construction in 2003
(9) Edmonson	KY 70	Reconstruct KY 70/KY 259 from S of the KY 70 junction to Brownsville (Item # 03-141.00)	2002 Six Year Highway Plan for construction in 2003
(10) Edmonson	KY 259	Reconstruct through the Knobs area, beginning 0.4 mi N of US 31W (Item # 03-7010.00)	2002 Six Year Highway Plan for right-of-way and utility relocation in 2003, and construction in 2004
(11) Edmonson	*KY 259*	*Reconstruct KY 70/259 from N end of existing Green River Bridge at Brownsville N to Kyrock Elementary School (Item # 03-7030.00)*	*2002 Six Year Highway Plan for right-of-way and utility relocation in 2004, and construction in 2005*
(12) Warren/ Simpson	I-65	Major widening for 2 additional lanes from KY 585 to KY 240; includes new interchange at either KY 585 or KY 1171	1999 Statewide Trans. Plan (FY 1999-2018)
(13) Warren	I-65	Major widening for 2 additional lanes from KY 240 to the William Natcher Pkwy. - includes reconstruction of parkway interchange	1999 Statewide Trans. Plan (FY 1999-2018)
(14) Warren	**I-65**	**Major widening to 6 lanes from S of the Barren River Bridges to 0.4 mi N of Bristow Rd. (Item # 03-5.00 and 5.01)**	**2000 Six Year Highway Plan for construction in 2000**

***Projects in bold print are under construction or have recently been completed.**

Projects in Italics have been added/redefined since FY 2000.

Table 5: Future Transportation Projects within the Study Area (continued)

County (map key #)	Facility	Description of Project	Source of Project
(15) Warren	**I-65**	**Major widening to 6 lanes from 0.4 mi N of Bristow Rd. to 0.3 mi S of US 68/KY 80 interchange (Item # 03-6.00)**	**2000 Six Year Highway Plan for construction in 2002 and 2003**
(16) Warren	**I-65**	**Major widening to 6 lanes from 0.3 mi S of US 68/KY 80 interchange to 0.2 mi N of Smiths Grove Rd. (Item # 03-7.00)**	**2000 Six Year Highway Plan for construction in 2001**
(17) Warren/ Edmonson	**I-65**	**Major widening to 6 lanes from 0.2 mi N of Smiths Grove Rd. to KY 1339 (Item # 03-701.00)**	**2000 Six Year Highway Plan for construction in 2001**
(17a) Warren/ Edmonson/ Barren	*I-65*	*Major widening to 6 lanes from 0.34 mi S of Barren Co. Line to KY 1339 (Item # 03-7.70 and 7.80)*	*2002 Six Year Highway Plan for construction in 2002*
(18) Warren	I-65	Major widening to 6 lanes from Sims Road to S of the Barren River Bridges (Item # 03-9.00, 9.01 and 9.03)	2002 Six Year Highway Plan for construction in 2003 and 2004
(19) Edmonson/ Barren	I-65	Major widening to 6 lanes from KY 1339 to 0.6 mi N of the KY 255 interchange (Item # 03-12.00)	2002 Six Year Highway Plan for right-of-way and utility relocation in 2002
(20) Barren	I-65	Major widening to 6 lanes from 0.6 mi N of the KY 255 interchange to 1.0 mi S of the Hart Co. Line (Item # 03-13.00)	2002 Six Year Highway Plan for right-of-way and utility relocation in 2004
(21) Barren	I-65	Major widening to 6 lanes from 1.0 mi S of the Hart Co. Line to 0.4 mi N of the KY 218 interchange (Item # 03-14.00)	2002 Six Year Highway Plan for right-of-way and utility relocation in 2007
(22) Warren	William Natcher Parkway	Extension of William Natcher Pkwy. to US 231 at Dye Ford Rd. (Item # 03-53.00, 53.01, 53.02, and 53.03)	2002 Six Year Highway Plan for right-of-way and utility relocation in 2003, and construction in 2005 through 2008
(23) Warren	KY 884	Evaluate the need for improvements to Three Springs Rd. (KY 884) between US 231 and the Natcher Pkwy. (Item # 03-102.0)	2000 Six Year Highway Plan for planning in 2002
(24) Warren	New route	Study the feasibility of a new development route located E of I-65 at Bowling Green and connecting US 231 with I-65 at the KY 446 interchange (Item # 03-103.00)	2000 Six Year Highway Plan for planning in 2002
(25) Warren	KY 101	Reconstruct KY 101 from Smiths Grove N to US 31W (Item # 03-109.00)	2002 Six Year Highway Plan for right-of-way and utility relocation in 2005
(26) Warren	KY 185	Reconstruct KY 185 from N of the junction with KY 263 near Richardville to the Butler Co. Line (Item # 03-110.00)	2002 Six Year Highway Plan for design in 2005
(27) Warren	**US 231**	**Major widening from 0.1 mi SE of Cumberland Trace Rd. to 0.3 mi NW of Dye Ford Rd. (Item # 03-146.01)**	**2000 Six Year Highway Plan for construction in 2000**
(28) Warren	**US 231**	**Relocation from 0.3 mi NW of Dye Ford Rd. to Old Scottsville Rd. at Alvaton (Item # 03-146.20)**	**2000 Six Year Highway Plan for construction in 2000**
(29) Warren	**US 231**	**Relocation from Old Scottsville Rd. at Alvaton to near the Allen-Warren Co. Line (Item # 03-146.30)**	**2000 Six Year Highway Plan for construction in 2000 and 2001**

***Projects in bold print are under construction or have recently been completed.**
Projects in Italics have been added/redefined since FY 2000.

Table 5: Future Transportation Projects within the Study Area (continued)

County (map key #)	Facility	Description of Project	Source of Project
(30) Warren	**KY 234**	**Major widening to 5 lanes from Collett Ln. to E of I-65 in Bowling Green and construct interchange (Item # 03-252)**	**2000 Six Year Highway Plan for construction in 2000, 2001 and 2002**
(31) Warren	KY 880	Major widening from US 231 to KY 234 (Item # 03-290.01)	2002 Six Year Highway Plan for utility relocation in 2003 and construction in 2005
(32) Warren	New route	Extend Bowling Green Bypass (KY 880) from KY 185 to 7th and College St. intersection (Item # 03-310.00)	2002 Six Year Highway Plan for construction in 2004
(33) Warren	US 31W	Major widening from Campbell Ln. to 4-lane section near the William Natcher Pkwy. in Bowling Green (Item # 03-312.00)	2002 Six Year Highway Plan for right-of-way in 2002, utility relocation in 2003 and construction in 2004
(34) Warren	US 31W	Major widening from W of the William Natcher Pkwy. to Dillard Rd. (Item # 03-317.00)	2002 Six Year Highway Plan for design in 2003, right-of-way in 2005, utility relocation in 2005 and construction in 2007
(35) Warren	KY 2158	Major widening of Cumberland Trace to three lanes from US 231 to KY 234 (Item #03-316.00)	2002 Six Year Highway Plan for utility relocation in 2003 and construction in 2006
(36) Warren	New Route	Bowling Green Bypass: Construct from US 231 to I-65	Bowling Green Transportation Plan
(37) Warren	New Route	Bowling Green Bypass: Construct from I-65 to US 31W	Bowling Green Transportation Plan
(38) Warren	New Route	Bowling Green Bypass: Construct from US 31W to the William Natcher Pkwy.	Bowling Green Transportation Plan
(39) Warren	New Route	Southwest Pkwy. - Construct from US 68 across US 31W to I-65	Bowling Green Transportation Plan
(40) Warren	*I-65*	*Reconstruct I-65/US 231 (Scottsville Rd.) interchange at Bowling Green (Item # 03-17.00)*	*2002 Six Year Highway Plan for design in 2005, right-of-way and utility relocation in 2007 and construction in 2008*
(41) Warren	**I-65**	*New interchange on I-65 to accommodate major development possibilities N of Bowling Green (Item # 03-16.00, 16.01, and 16.02)*	*2002 Six Year Highway Plan for design in 2002, right-of-way and utility relocation in 2003 and construction in 2004 through 2006*
(42) Warren	US 68/ KY 80	Russellville Rd. - Widen to four lanes from KY 880 (Veterans Memorial Blvd.) to University Blvd.	Bowling Green Transportation Plan
(43) Warren	US 31W	Nashville Rd. - Widen to four lanes from KY 880 (Veterans Memorial Blvd.) to University Blvd.	Bowling Green Transportation Plan
(44) Warren	Smallhouse Road	Reconstruct to three lanes from Cave Mill Rd. to Scottsville Rd. (US 231)	Bowling Green Transportation Plan
(45) Warren	KY 880	Veterans Memorial Blvd. - Widen to four lanes from Russellville Rd. (US 68) to Barren River Rd. (KY 1435)	Bowling Green Transportation Plan

***Projects in bold print are under construction or have recently been completed.**
Projects in Italics have been added/redefined since FY 2000.

Table 5: Future Transportation Projects within the Study Area (continued)

County (map key #)	Facility	Description of Project	Source of Project
(46) Warren	Old Morgantown Road	Widen to three lanes from Morgantown Rd. (US 231) to University Blvd.	Bowling Green Transportation Plan
(47) Warren	Cave Mill Road	Widen to three lanes from Dishman Ln. to Shive Ln. to Lovers Ln. (KY 880)	Bowling Green Transportation Plan
(48) Warren	US 231	Morgantown Rd. - Widen to four lanes from Veterans Memorial Blvd. (KY 880) to Briggs Hill Rd. (KY 3191)	Bowling Green Transportation Plan

*Projects in bold print are under construction or have recently been completed.
Projects in Italics have been added/redefined since FY 2000.

Sources: Bernardin-Lochmueller & Associates, Inc.; Bowling Green Transportation Plan; Kentucky Transportation Cabinet *2000 Six Year Highway Plan*, *2002 Six Year Highway Plan*, and 1999 Statewide Trans. Plan (FY 1999-2018)

Table 6: Future Transportation Projects near the Study Area (capacity expansion projects only)

County (map key #)	Facility	Description of Project	Source of Project
Allen	US 231	Relocation and surfacing of US 231 from Allen-Warren Co. Line to Dry Ridge Rd. (Grade & Drain) (Item # 03-146.41 & 146.42)	2002 Six Year Highway Plan for construction in 2003 and 2004
Butler	US 231	Construct 5-lane curb and gutter along US 231 from the Natcher Pkwy. to Bell St. in Downtown Morgantown (Item # 03-115.00)	2002 Six Year Highway Plan for design in 2003, right-of-way in 2006 and utility relocation in 2007
Hart	I-65	Major widening to 6 lanes from 0.41 mi N of the KY 218 interchange to 0.1 mi S of the Green River Bridge (Item # 04-13.00)	2002 Six Year Highway Plan for right-of-way in 2003 and utility relocation in 2003
Hart	I-65	Major widening to 6 lanes from 0.1 mi S of the Green River Bridge to 0.1 mi N of the US 31W Bridge (Item # 04-14.00)	2002 Six Year Highway Plan for right-of-way in 2002 and utility relocation in 2002
Hart	I-65	Major widening to 6 lanes from 0.1 mi N of the US 31W Bridge to 0.6 mi N of the KY 728 Bridge (Item # 04-15.00)	2002 Six Year Highway Plan for right-of-way in 2003 and utility relocation in 2003
Hart/ Larue	I-65	Major widening to 6 lanes from 0.6 mi N of the KY 728 Bridge to 0.1 mi N of KY 224 (Item # 04-16.00)	2002 Six Year Highway Plan for right-of-way in 2005 and utility relocation in 2005
Hart	US 31W	Widen US 31W to 3 lanes, including curb & gutter and sidewalks, from New Rd. to Louisville Bedding Co. in Munfordville N to I-65 (Item # 04-194.00)	2002 Six Year Highway Plan for utility relocation in 2003 and construction in 2004
Logan	New Route	Construct connector between Russellville Bypass and KY 100 E of Russellville (Item # 03-148.00)	2002 Six Year Highway Plan for right-of-way in 2003, utility relocation in 2003 and construction in 2004
Logan	US 431	Reconstruct US 431 from Epleys Station N to Lewisburg (Item # 03-273.00)	2002 Six Year Highway Plan for design in 2002
Logan	New Route	Russellville Southern Bypass from US 68 to US 79 (Item # 03-311.00)	2002 Six Year Highway Plan for right-of-way in 2006 and utility relocation in 2007
Simpson	US 31W	Major widening from Tennessee state line to KY 1008 at Franklin (includes I-65 interchange reconstruction) (Item # 03-8.00)	2002 Six Year Highway Plan for right-of-way in 2003, utility relocation in 2003 and construction in 2004
Simpson	KY 1008	Franklin NW bypass; extend KY 1008 from US 31W to KY 100W (Item # 03-106.00)	2002 Six Year Highway Plan for planning in 2003, design in 2004, right-of-way in 2006 and utility relocation in 2006

*Projects in bold print are under construction or have recently been completed.
Projects in Italics have been added/redefined since FY 2000.

Source: Kentucky Transportation Cabinet *2002 Six Year Highway Plan*

Table 7: Transportation Projects Under Construction (or recently completed) within the Study Area (capacity expansion projects only)

County	Facility	Description of Project	Source of Project
(7) Edmonson	KY 101	Reconstruct KY 101 from Brownsville to 0.8 mi S of Rhoda (Item # 03-139.01)	2000 Six Year Highway Plan for construction in 2000
(14) Warren	I-65	Major widening to 6 lanes from S of the Barren River Bridges to 0.4 mi N of Bristow Rd. (Item # 03-5.00 and 5.01)	2000 Six Year Highway Plan for construction in 2000
(15) Warren	I-65	Major widening to 6 lanes from 0.4 mi N of Bristow Rd. to 0.3 mi S of US 68/KY 80 interchange (Item # 03-6.00)	2000 Six Year Highway Plan for construction in 2002 and 2003
(16) Warren	I-65	Major widening to 6 lanes from 0.3 mi S of US 68/KY 80 interchange to 0.2 mi N of Smiths Grove Rd. (Item # 03-7.00)	2000 Six Year Highway Plan for construction in 2001
(17) Warren/ Edmonson	I-65	Major widening to 6 lanes from 0.2 mi N of Smiths Grove Rd. to KY 1339 (Item # 03-701.00)	2000 Six Year Highway Plan for construction in 2001
(27) Warren	US 231	Major widening from 0.1 mi SE of Cumberland Trace Rd. to 0.3 mi NW of Dye Ford Rd. (Item # 03-146.01)	2000 Six Year Highway Plan for construction in 2000
(28) Warren	US 231	Relocation from 0.3 mi NW of Dye Ford Rd. to Old Scottsville Rd. at Alvaton (Item # 03-146.20)	2000 Six Year Highway Plan for construction in 2000
(29) Warren	US 231	Relocation from Old Scottsville Rd. at Alvaton to near Allen-Warren Co. Line (Item # 03-146.30)	2000 Six Year Highway Plan for construction in 2000 and 2001
(30) Warren	KY 234	Major widening to 5 lanes from Collett Ln. to E of I-65 in Bowling Green and construct interchange (Item # 03-252)	2000 Six Year Highway Plan for construction in 2000, 2001 and 2002

Source: Kentucky Transportation Cabinet *2000 Six Year Highway Plan*

Table 8: Completed Transportation Projects near the Study Area (capacity expansion projects only)

County (map key #)	Facility	Description of Project	Source of Project
Allen	US 231	Relocation of US 231 from Dry Ridge Road to US 231 & US 31E intersection (Grade, Drain, and Surface) (Item # 03-146.10 & 146.11)	2002 Six Year Highway Plan for construction in 2000 and 2002

Source: Kentucky Transportation Cabinet *2002 Six Year Highway Plan*

C. Regional Travel Model Development

To assist in the evaluation of the transportation considerations for these two studies, a regional travel demand model was developed for roughly a 13-county area encompassing the I-66/Bowling Green Outer Beltline Study Area and surrounding counties (see Figure 9.) The Bowling Green Regional Travel Model is a composite of the Kentucky Statewide Traffic Model (KySTM)[3] and the Bowling Green Transportation Plan Travel Model.[4]

The Regional Travel Model was developed because:

- The KySTM did not have sufficient network detail in the Bowling Green urban area to assess the traffic diversion impacts on major local roadways and
- The Bowling Green Transportation Plan Travel Model did not encompass the entire Study Area.

Development of the Bowling Green Regional Travel Model began with the KySTM because of several advantages, including:

- Geographic coverage;
- A base year of 1999 (close to the 2000 Census);
- A horizon year of at least 20 years;
- The ease in establishing the external-external trip table and external-internal trip table;
- The ease in adding I-66 "through" traffic; and
- Truck and auto traffic assignment results.

Despite the disadvantages of covering only Warren County, having a base year of 1995, and having a horizon year of only 2020, the Bowling Green Transportation Plan Travel Model did have some advantages. It uses the typical urban four-step modeling process with a gravity model for internal trip distribution and capacity constraint for trip assignment not found in KySTM. It also has a more extensive roadway network and travel analysis zone system in Warren County (particularly in the Bowling Green urban area) than the KySTM.

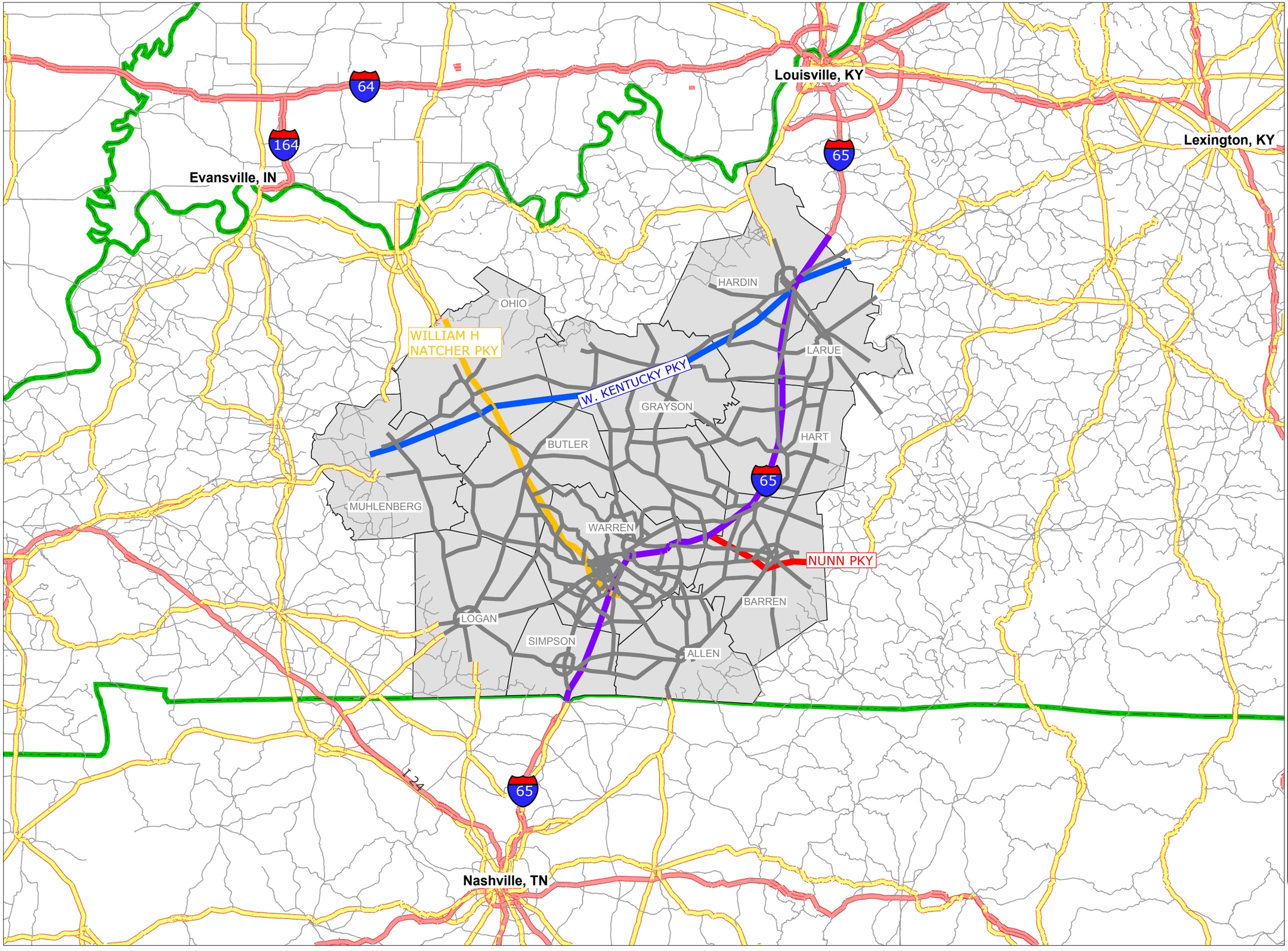
Thus, the Bowling Green Transportation Plan Travel Model roadway network and travel analysis zone (TAZ) system were incorporated into a clipped portion of the KySTM covering either all or portions of 13 of the counties in the Study Area. The Warren County TAZ system from the Bowling Green Transportation Plan was reviewed for consistency with 2000 Census Tract boundaries and major geographic barriers such as rivers and freeways. A few TAZs required minor boundary adjustments and splits. Appropriate adjustments were made to centroid connectors in Warren County including the elimination of a few inappropriate centroid connections to freeways between interchanges. A few adjustments were made to the Warren County roadway network to ensure that all freeway interchanges were modeled. For the balance of the Regional Travel Model outside Warren County, roadway network was expanded to ensure the representation of all state roadways, TAZs were split, and appropriate changes were made to centroid connectors.

[3] *Kentucky Statewide Traffic Model: Final Calibration Report*; prepared for Kentucky Transportation Cabinet by Wilbur Smith Associates; April, 1997. *Kentucky Statewide Traffic Model Update*; prepared for Kentucky Transportation Cabinet by Wilbur Smith Associates; January, 2001. *Traffic Model Coordination for the I-66 (Southern Kentucky) Corridor*; prepared for Kentucky Transportation Cabinet by Wilbur Smith Associates; October 5, 2001.

[4] *Bowling Green Transportation Plan*; prepared for Kentucky Transportation Cabinet by HNTB; August, 2000. *Bowling Green/Warren County, Kentucky Travel Demand Forecasting Model: Documentation of Model Extension and Validation*; prepared for Kentucky Transportation Cabinet by HNTB; June, 2000.

Figure 9

Regional Travel Model Geographic Area and Network Coverage



Map Legend

Map Layers
- State (High)
- Model Area Counties
- Model Network

Key Corridors
- Western Kentucky Parkway
- Natcher Parkway
- I-65
- Nunn Parkway

Street Type
- Highway
- Highway (Divided)
- Primary
- Secondary
- Local
- Vehicle Trail
- Other

0 8 16 24
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

To ensure consistent trip generation throughout the region, the KySTM trip generation equations were used in the regional model; however, Western Kentucky University remains a special generator to be consistent with the Bowling Green Transportation Plan Travel Model. To ensure consistency with other KYTC traffic studies, the KySTM protocols for roadway link attributes and roadway capacities were used throughout the region. A unique speed-functional class table was created for the Regional Travel Model. On the other hand, the gravity model aspect of the Bowling Green Transportation Plan Travel Model was expanded to the entire region for internal trip distribution. Congestion is also recognized in the choice of travel paths through the application of capacity constraint in the Regional Travel Model (similar to the Bowling Green Transportation Plan Travel Model).

A comparison of the source travel models and the final Bowling Green Regional Travel Model appears in Table 9. The Regional Travel Model also provides several features not found in either the KySTM or Bowling Green Transportation Plan Travel Model, including:

- An equilibrium, capacity-constrained assignment procedure; and
- A TAZ socio-economic database derived from the 2000 Census and the American Business Directory, which provided address specific employment information that was supplemented with specific employment estimates for major employers from the Kentucky Commerce Cabinet and Greater Bowling Green Chamber of Commerce.

In summary, the Regional Travel Model reflects 2000 Census and year 2000 employment data, provides greater network and travel analysis zone (TAZ) detail than either of the source travel models, incorporates new year 2030 socioeconomic forecasts for TAZs (as later described), and better replicates actual traffic volumes than either of the source travel models.

For future travel forecasts in the Bowling Green region, the KySTM is used to generate the external-external (through) trip matrix and external-internal trip matrix for the year 2030 for the Regional Travel Model. A major source of data was the Kentucky State Data Center (SDC), the officially designated source of socioeconomic data projections for Kentucky. For the high travel associated with the Kentucky State Data Center forecasts, the external-external trip matrix and external-internal trip matrix are adjusted upward for the increased population and employment in the region and the balance of the State.

The I-66 version of the KySTM was used to reflect additional trips associated with the completion of I-66 throughout Kentucky. In general, the completion of I-66 through Kentucky adds about 4,080 through trips per day to the Nunn Parkway, 690 through trips per day on I-65 north of the Nunn Parkway, 3,390 through trips per day on I-65 between the Nunn Parkway and Natcher Parkway, 740 through trips per day on I-65 south of the Natcher Parkway, and 2,650 through trips per day to the Natcher Parkway north of I-65.

Table 9: Comparison of Sources and New Regional Travel Model

Travel Model Attribute	Bowling Green Transportation Plan Travel Model (BGM)	Kentucky Statewide Traffic Model (KySTM)	Regional Travel Model
Highway Links	445 in Warren County	101 in Warren County 335 in other 12 counties	498 in Warren County 551 in other 12 counties
Travel Analysis Zones	130 in Warren County	19 in Warren County 59 in other 12 counties 4 special generators	138 in Warren County 141 in other 12 counties 4 special generators
Socioeconomic inputs to Trip Generation	Population Industrial Employment Commercial Employment Public Employment (I+C+P = Total Employment)	Population Total Employment	Population Total Employment
Trip Purposes	Home-Based Work Home-Based Other Non-Home Based Home Based College External-Internal External-External	Home-Based Work Home-Based Non-work Truck External-Internal External-External	Home-Based Work Home-Based Non-work Truck External-Internal External-External
Trip Generation Rates Change Over Time	No	Yes Grows by 19% from 1999 to 2030	Yes Grows by 19% from 1999 to 2030
Trip Distribution	Gravity Model in Base Year and Forecast Year	Gravity Model in Base Year Validation and Fratar for Forecast Year	Gravity Model in Base Year and Forecast Year
Is Trip Distribution Sensitive to Alignments?	Yes	No	Yes
Traffic Assignment	Average of 3 iterations (stochastic, all-or-nothing, all-or nothing)	Single iteration (all-or-nothing)	10 iterations of equilibrium
Capacity Constraint?	Yes	No	Yes
Overall Root Mean Square Error (comparison of assigned traffic volumes to actual traffic counts)	26%	45% in Warren County 61% for all 13 counties	23.9% in Warren County 24.8% for all 13 counties

Source : Bernardin-Lochmueller & Associates, Inc.

D. Future Conditions of the Study Area and No Build Alternative

1. Regional Growth

The base year of the Bowling Green Regional Travel Model is founded on the year 1999 population and employment database of the KySTM. In the case of Warren County, demographic data from the 2000 Census and address-specific employment data were geographically matched to the refined travel analysis zones (TAZs). For the remaining 12 counties in the Regional Travel Model, population from the 2000 Census was matched to the refined TAZs, and was used to distribute KySTM county employment to the TAZs within each county. Two future growth scenarios were developed for population and employment in the year 2030. One growth scenario uses the growth forecasts for population and employment found in the KySTM, and the other growth scenario is based on the population forecasts of the Kentucky State Data Center (SDC). The State Data Center year 2030 population forecast reflects the results of the 2000 Census, and is about ten percent higher than the KySTM forecast. To derive the year 2030 employment consistent with the SDC population forecast, the ratio of employment to population in the year 2030 of the KySTM was used. Table 10 shows the base and future year forecasts for the 13 counties in the Regional Travel Model. The next section documents the unique socioeconomic forecasts and allocation of growth in Warren County.

Table 10: Regional Population and Employment

	1999		2000 Census	2030 KySTM Growth Scenario		2030 SDC Growth Scenario	
	population	employment	population	population	employment	population	employment
Allen [(a)]	16,633	8,436	17,800	22,852	11,881	32,939	17,125
Barren[(a)]	37,481	25,823	38,033	48,872	35,270	51,524	37,184
Butler	11,839	5,405	13,010	13,176	6,226	20,895	9,873
Edmonson	11,189	2,814	11,644	12,103	3,124	15,775	4,072
Grayson[(a)]	23,609	11,269	24,053	28,824	15,031	34,572	18,028
Hardin[(a)]	87,688	53,015	94,174	107,702	68,674	108,851	69,407
Hart	16,908	7,552	17,445	22,601	10,547	28,449	13,276
Larue[(a)]	13,005	4,908	13,373	14,994	6,273	19,940	8,342
Logan[(a)]	26,493	14,426	26,573	31,935	18,040	34,643	19,570
Muhlenberg[(a)]	32,549	12,853	31,839	41,716	17,712	30,678	13,025
Ohio	22,382	9,362	22,916	28,622	12,557	29,167	12,796
Simpson	16,424	9,514	16,405	20,364	12,500	20,260	12,436
Warren	91,278	62,551	92,522	125,267	88,373	142,185	103,133
13-County	407,478	227,928	419,787	519,028	306,208	569,878	338,268

Source: Bernardin-Lochmueller & Associates, Inc.
Notes: [(a)] Only a portion of the county is included in the Regional Travel Model.

2. Warren County Growth

Forecast Control Totals. Countywide control totals of socioeconomic variables were generated from historical trends to the year 2000 and forecasted in five-year increments to the year 2030. This ensured that year 2000 Census data were used for the base year in the calibration of the Regional Travel Model and that the horizon year of 2030 is consistent with the KySTM and other metropolitan travel models being developed or updated in Kentucky. The year 2000 totals served as a basis for verifying that the year 1999/2000 population and employment matched (by geographic area and address) to the individual Travel Analysis Zones (TAZs). The year 2000 TAZ socio-economic database was used in the calibration of the Regional Travel Model for Warren County. The year 2030 totals for the two growth scenarios were used to develop growth projections for the individual Travel Analysis Zones (TAZs) for future travel in Warren County consistent with the prior growth allocation of the Bowling Green Transportation Plan.[5] As summarized in Table 11, the following forecasts were used in the allocation of trip generation variables for the I-66/Bowling Green Outer Beltline Planning Study in Warren County for the KySTM growth scenario:

1) The labor force projection for Warren County is 70,781 workers in the year 2030, an increase of 20,305 workers (28.7%) from the Kentucky Department of Employment Services (KDES) estimate of 50,566 workers in the year 2001.

2) Based on the assumption that the labor force participation rate will fluctuate around the current value, the "recommended" population forecast for Warren County is 125,267 persons for the year 2030, an increase of 32,745 persons (35.4%) from the 2000 Census count of 92,522 persons. This 30-year forecast equates to a 1.01 percent annual compound growth rate. This future growth rate is lower than the 1.90 percent annual compound growth rate experienced in the past decade (year 1990 to year 2000) and the 1.54 percent annual compound growth rate experienced in the past thirty years (1970 to 2000). Yet, the absolute change in population forecast for the next thirty years is comparable to that of the past thirty years. For the year 2020, the Warren County forecast of 114,596 persons is within 0.1% of the Woods & Poole Economics[6] forecast of 114,440 persons, and is slightly higher than the Bowling Green Transportation Plan forecast of 112,102 persons. Further, the year 2030 forecast of 125,267 persons is also within 0.1% of the Kentucky Statewide Traffic Model's forecast of 125,111 persons.

   The Kentucky State Data Center (SDC) recently released new population forecasts based on the year 2000 Census, projecting 124,518 persons in the year 2020 (compared to their prior forecast of 100,331 persons) and 142,201 persons in the year 2030 for Warren County.[7] This forecast reflects an annual compound growth rate of 1.44 percent for Warren County compared to 0.87 percent for the Commonwealth of Kentucky and 1.01 percent for Fayette County. When using the SDC growth scenario in the new Regional Travel Model, adjustments were made to population and employment in surrounding counties and the balance of the State to ensure consistent travel patterns to, from, and through Warren County.

[5] *Bowling Green Transportation Plan*; prepared for the KYTC by HNTB; August, 2000.

[6] *The Complete Economic and Demographic Data Source*; Woods & Poole Economics, Inc.: January, 2000. This is the data source for Kentucky Statewide Traffic Model.

[7] *How Many Kentuckians;* Kentucky State Data Center; 1999 Edition and 2002 Edition.

Table 11: Warren County - Summary of Forecast Control Total (KySTM Growth Scenario)

Variable	1990[a]	1995[a]	2000[a]	2005[b]	2010[b]	2015[b]	2020[b]	2025[b]	2030[b]
Labor Force	43,090	46,438	50,669	52,692	56,316	59,932	63,549	67,165	70,781
Total Population	76,673	86,301	92,522	96,685	102,486	108,844	114,596	120,246	125,267
Group Quarters	4,049 [c]	5,280	5,559	5,500	5,500	5,500	5,500	5,500	5,500
Household Population	72,624	81,021	86,963	91,185	96,986	103,344	109,096	114,746	119,767
Households (occupied units)	28,819	32,670	35,365	37,371	40,077	43,060	45,839	48,621	51,182
Household Size	2.52	2.48	2.46	2.44	2.42	2.40	2.38	2.36	2.34
Median Household Income (year 2000 dollars)	$24,666	$32,426	$35,918	$36,402	$37,326	$37,889	$38,549	$39,131	$39,822
Retail Employment	11,519	14,064	14,796	15,671	17,029	17,964	18,493	18,867	19,447
Non-Retail Employment	34,971	42,080	48,248	56,084	59,966	62,922	64,811	66,570	68,926
Mining	106	150	339	316	315	315	314	314	313
Construction	2,309	2,956	3,363	3,777	4,042	4,216	4,295	4,374	4,534
Manufacturing	8,164	10,771	11,694	12,735	13,211	13,427	13,441	13,389	13,556
Transportation / Communications/Utilities	1,731	2,106	2,228	2,395	2,600	2,778	2,925	3,070	3,246
Wholesale	2,123	2,568	2,677	2,693	2,898	3,102	3,306	3,510	3,714
Finance / Insurance / Real Estate	1,873	2,643	3,193	3,408	3,838	4,268	4,697	5,124	5,554
Services	12,868	14,443	17,478	21,962	23,819	25,258	26,120	26,974	27,959
Government	5,796	6,444	7,277	8,799	9,241	9,558	9,713	9,815	10,049
Total Non-Farm Employment	**46,490**	**56,144**	**63,044**	**71,755**	**76,995**	**80,886**	**83,304**	**85,437**	**88,373**
Farm	2,610	2,580	2,550	2,550	2,510	2,470	2,420	2,360	2,290
Total Employment	49,100	56,720	65,590	74,310	79,510	83,360	85,720	87,800	90,660

Sources: (a) Kentucky Workforce Development Cabinet Department of Employment Services for "wage and salary" employment adjusted to U.S. Bureau of Labor Statistics data for "wage and salary" employment and further adjusted to the Kentucky Statewide Traffic Model and Woods & Poole Economics "non-farm" employment numbers to add proprietorships; Woods & Poole Economics for farm employment; U.S. Bureau of Labor Statistics for labor force; U.S. Bureau of the Census for 1990-2000 population and housing; and Kentucky Cabinet for Economic Development for median household income.
(b) Bernardin-Lochmueller & Associates for Projections
(c) 1990 Census Tape File 1A includes 77 more people in group quarters.

3) Using the "recommended" population projection and assuming a stable population in group quarters, a household projection of 51,182 households in the year 2030 is proposed for Warren County resulting in a net increase of 15,817 households over the year 2000 count of 35,365 households. This reflects a future reduction in the gap between the household size of the United States and that of Warren County. In the year 2000, the household size was 2.46 persons per household for Warren County, compared to 2.59 persons per household in the United States and 2.47 persons per household in Kentucky. By the year 2025, the household size is projected to be 2.36 persons per household for Warren County, compared to 2.47 persons per household in the United States forecast by the U.S. Bureau of Census (2.39 persons per household in Warren County by Woods & Poole Economics).

4) With the "recommended" population projection and the declining household size projection, the corresponding median household income for Warren County is $39,822 in the year 2030 (in constant year 2000 dollars), up from the most recent estimate of $36,151 in 1999 (in constant year 2000 dollars).

5) Using Kentucky Workforce Development Cabinet Department of Employment Services employment statistics (adjusted to agree with U.S. Bureau of Labor Force Statistics numbers)[8] and the best employment projection regression equations, the forecasted employment by place of work in the year 2030 is 72,505 "wage and salary" jobs (non-farm jobs, excluding proprietorships and federal government employees). This forecast was adjusted to account for proprietorships and federal government employees who are included in both the Kentucky Statewide Traffic Model and Woods & Poole Economics' employment forecasts. The adjusted forecast of employment by place of work in the year 2030 is 88,373 "non-farm" jobs ("wage and salary" jobs plus proprietorships and federal employees). This is an increase of 25,329 "non-farm" jobs (40.2 %) over 63,044 "non-farm" jobs in the year 2000.

   When farm employment is added to the non-farm employment, the year 2030 employment forecast is 90,660 jobs. This year 2030 forecast is comparable to the Woods & Poole Economics forecast of 90,767 jobs used in the Kentucky Statewide Traffic Model, and the year 2020 forecast is higher than the Bowling Green Transportation Plan forecast, assuming the development of TransPark.

Forecast Methodology for Warren County. The year 2030 control totals were used in the trip generation component of the Regional Travel Model and were allocated to Travel Analysis Zones (TAZs) consistent with the previous growth allocation of the Bowling Green Transportation Plan. This preliminary TAZ growth allocation was reviewed and revised by local development officials to be consistent with recent development patterns. Historical trends for the United States, Kentucky, and Warren County were used to forecast key socioeconomic variables to the year 2030 using regression analysis provided through "Forecast Pro" software.

County control totals were generated for labor, population, households, total employment (as well as the nine major employment sectors excluding farms), and median household income. The population forecasts were developed using the "labor force linkage-cohort survival population" technique. Because labor force projections drive the population forecast model (which in turn drives the forecasts for households and income), the labor force projections are the most significant factor in the control totals except for employment.

Labor force projections were fed into the population forecast model to define the net migration component added to the cohort-survival forecasts for the indigenous population (i.e., excluding college students who previously lived outside the county). The forecast of the "recommended" population projection is summarized in Table 12. The "recommended" population projection reflects constant birth rates, projected national survival rates, and a labor force participation rate fluctuating slightly around its current value.

For the household forecast, household size in Warren County was trended with a decreasing gap between national and county household size. Assuming stability in the absolute number of persons residing in "group quarters" (dormitories, fraternity/sorority houses, and institutions), projected household size was used to convert the population forecast to households.

[8] The Kentucky Workforce Development Cabinet Department of Employment Services employment statistics are for workers covered by unemployment insurance and therefore, must be scaled up to agree with U.S. Bureau of Labor Statistics numbers.

Trending total personal income (in constant dollars), the total personal income forecast was divided by the forecasted number of households to derive the mean household income, which was converted to yield the median household income. Even with the number of total households increasing, the median household income is forecasted to increase in future years.

Finally, employment projections were developed from trends and relationships to Kentucky and the United States. Projections were made for total employment and for the major employment sectors (one digit Standard Industrial Classification code).

Table 12: Warren County - Summary of Forecasts (KySTM Growth Scenario)

Year	Labor Force	Population	Total Households	Median HH Income (yr 2000 $)	Total Personal Vehicle Registrations	EMPLOYMENT				
						Total	Retail	Non-Retail	Wholesale	Government
1990	43,090	76,673	28,819	$24,666	57,946	46,490	11,519	34,971	2,123	5,796
1991	42,841					48,446	11,897	36,549	2,189	6,038
1992	43,969					51,164	11,768	39,396	2,161	6,091
1993	44,425					52,120	12,136	39,984	2,224	6,082
1994	44,775					54,098	12,908	41,190	2,361	6,232
1995	46,438	86,301	32,670	$32,426	61,457	56,144	14,064	42,080	2,568	6,444
1996	47,984					58,094	14,137	43,956	2,576	6,573
1997	49,358					59,864	14,324	45,540	2,605	6,740
1998	49,085					60,608	14,402	46,206	2,615	6,804
1999	50,087					62,551	14,872	47,679	2,695	7,149
2000	50,669	*92,522*	*35,365*	*$35,918*	70,149	63,044	14,796	48,248	2,677	7,277
2001	*50,566*					*65,450*	*14,204*	*51,246*	*2,525*	*8,318*
2002	*50,586*					*67,065*	*14,621*	*52,445*	*2,567*	*8,450*
2003	*51,248*					*68,504*	*14,987*	*53,517*	*2,609*	*8,572*
2004	*51,966*					*69,839*	*15,319*	*54,520*	*2,650*	*8,687*
2005	*52,692*	*96,685*	*37,371*	*$36,402*	76,385	*71,755*	*15,671*	*56,084*	*2,693*	*8,799*
2006	*53,419*					*72,886*	*15,979*	*56,907*	*2,734*	*8,897*
2007	*54,144*					*73,963*	*16,262*	*57,701*	*2,775*	*8,988*
2008	*54,869*					*75,001*	*16,528*	*58,473*	*2,816*	*9,074*
2009	*55,592*					*76,009*	*16,783*	*59,226*	*2,857*	*9,159*
2010	*56,316*	*102,486*	*40,077*	*$37,326*	82,621	*76,995*	*17,029*	*59,966*	*2,898*	*9,241*
2011	*57,039*					*77,830*	*17,247*	*60,583*	*2,939*	*9,314*
2012	*57,763*					*78,628*	*17,444*	*61,184*	*2,980*	*9,380*
2013	*58,486*					*79,398*	*17,626*	*61,772*	*3,020*	*9,442*
2014	*59,209*					*80,149*	*17,799*	*62,351*	*3,061*	*9,501*
2015	*59,932*	*108,844*	*43,060*	*$37,889*	88,856	*80,886*	*17,964*	*62,922*	*3,102*	*9,558*
2016	*60,656*					*81,423*	*18,101*	*63,322*	*3,143*	*9,602*
2017	*61,379*					*81,924*	*18,217*	*63,707*	*3,184*	*9,636*
2018	*62,102*					*82,400*	*18,318*	*64,082*	*3,225*	*9,665*
2019	*62,825*					*82,858*	*18,409*	*64,449*	*3,266*	*9,690*
2020	*63,549*	*114,596*	*45,839*	*$38,549*	95,091	*83,304*	*18,493*	*64,811*	*3,306*	*9,713*
2021	*64,272*					*83,741*	*18,573*	*65,168*	*3,347*	*9,734*
2022	*64,995*					*84,171*	*18,649*	*65,523*	*3,388*	*9,755*
2023	*65,718*					*84,597*	*18,723*	*65,874*	*3,428*	*9,775*
2024	*66,442*					*85,019*	*18,796*	*66,223*	*3,469*	*9,795*
2025	*67,165*	*120,246*	*48,621*	*$39,131*	101,327	*85,437*	*18,867*	*66,570*	*3,510*	*9,815*
2026	*67,888*					*85,993*	*18,962*	*67,031*	*3,550*	*9,850*
2027	*68,611*					*86,571*	*19,071*	*67,500*	*3,591*	*9,894*
2028	*69,335*					*87,164*	*19,191*	*67,973*	*3,632*	*9,943*
2029	*70,058*					*87,765*	*19,316*	*68,449*	*3,673*	*9,995*
2030	*70,781*	*125,267*	*51,182*	*$39,822*	107,562	*88,373*	*19,447*	*68,926*	*3,714*	*10,049*

Source: Bernardin-Lochmueller & Associates, Inc.

Labor Force Projection Method. Historical labor force data for the United States, Kentucky, and Warren County were obtained from the U.S. Bureau of Labor Force Statistics and the Kentucky Workforce Development Cabinet Department of Employment Services with annual averages from 1971-2001.

National labor force projections were derived using labor force projections published in the Monthly Labor Review by the U.S. Bureau of Labor Statistics. "Forecast Pro for Windows" used the historical data and the forecast of national labor force to forecast the labor force for Kentucky. To forecast labor force for the county, dynamic regression models were used in "Forecast Pro." Dynamic regression utilizes time-series, explanatory variables, and leading indicators. When using dynamic regression, the criteria include maximizing the R-squared (the coefficient of determination), having a Durbin-Watson statistic around 2.0, and minimizing the forecast error. Warren County's selected forecast model was chosen based on the best statistical support.

Population Projection Method. The population was projected using the Labor Force Linkage/Cohort Survival Population Projection Model. The four required input files for this model are the base year population, birth rates, survival rates, and labor force projections/participation rates. This model projects population in five-year intervals from the base year to a target year. A base year of 2000 was used to utilize the Census year data. Of particular import, the cohort survival rates were applied to only the indigenous population such that the non-indigenous population associated with Western Kentucky University was removed and reinserted in each five-year period so as not to age.

Base year population, broken down by age and sex, was obtained from the 2000 Decennial Census. Age-specific birth rates for Warren County were obtained from the Kentucky Cabinet of Health Services Department of Public Health for the years 1982-1999. National five-year survival rates by age and sex, based on a middle mortality assumption, were acquired from the U.S. Bureau of the Census. The national survival rates were used due to a lack of a reliable and accurate source for local survival rates. The labor force projections used were those forecasted as described above. Labor force participation rate historical data were obtained from the Decennial Census for the years 1970, 1980, 1990, and 2000, and were calculated using the State Data Center's official estimate of population (aged 16+) and the Kentucky Workforce Development Cabinet Department of Employment Service's revised annual labor force for the year 1995. The "recommended" population projection assumed the labor force participation rate would remain essentially constant, as shown in Table 13.

Household Forecast Method. The total number of households for each county was calculated in two steps. The first step involved taking the population projections and subtracting out the group quarters population. The group quarter's population was projected assuming the absolute number from the 2000 Census would remain constant. The second step divided the total population in households (total population forecasted less those in group quarters) by the projected household size (persons-per-household) to derive the forecast of total households. Historical persons-per-household data was obtained from the U.S. Bureau of the Census for years 1970, 1980, 1990, and 2000.

Projected persons-per-household for Warren County was based on a slow convergence towards projected United States persons-per-household as reported in Current Population Reports P25-1129, published by the U.S. Department of Commerce.

Table 13: Recommended Population Projection for Warren County

LABOR FORCE LINKAGE/COHORT SURVIVAL POPULATION PROJECTION MODEL
Warren County Population Forecast
Assumption 1: Constant Birth Rates
Assumption 2: National Survival Rates
Assumption 3: Constant Lower Labor Force Participation Rate
INDIANA DEPARTMENT OF TRANSPORTATION
Bernardin, Lochmueller & Associates, Inc.

	0- 4	5- 9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	TOTAL
2000																			
FEMALES	2,851	2,871	2,730	3,022	4,136	3,307	3,048	3,528	3,473	3,250	2,777	2,154	1,743	1,497	1,349	1,097	765	623	44,221
MALES	3,071	3,081	2,968	3,203	4,218	3,480	3,016	3,306	3,324	3,013	2,763	2,065	1,569	1,218	1,029	737	429	252	42,742
TOTAL	5,922	5,952	5,698	6,225	8,354	6,787	6,064	6,834	6,797	6,263	5,540	4,219	3,312	2,715	2,378	1,834	1,194	875	86,963
2005																			
FEMALES	3,133	3,177	3,259	3,560	4,585	3,196	3,687	3,315	3,731	3,624	3,362	2,822	2,205	1,760	1,411	1,206	975	931	49,940
MALES	3,268	3,396	3,468	3,870	4,613	3,310	3,835	3,255	3,474	3,437	3,094	2,771	2,077	1,549	1,106	862	615	428	48,427
TOTAL	6,401	6,573	6,727	7,431	9,198	6,506	7,522	6,571	7,205	7,061	6,456	5,593	4,282	3,309	2,517	2,067	1,591	1,358	98,367
2010																			
FEMALES	3,082	3,281	3,356	3,875	4,782	3,162	3,366	3,799	3,399	3,783	3,648	3,338	2,780	2,130	1,624	1,243	1,018	1,214	52,880
MALES	3,224	3,416	3,574	4,154	4,902	3,248	3,455	3,908	3,300	3,484	3,424	3,038	2,683	1,959	1,381	915	660	580	51,305
TOTAL	6,306	6,698	6,929	8,029	9,685	6,410	6,821	7,706	6,699	7,267	7,073	6,376	5,463	4,088	3,006	2,158	1,677	1,793	104,184
2015																			
FEMALES	3,207	3,241	3,471	3,983	5,065	3,305	3,344	3,488	3,887	3,461	3,813	3,625	3,285	2,678	1,966	1,436	1,060	1,420	55,735
MALES	3,354	3,382	3,606	4,271	5,151	3,452	3,407	3,544	3,950	3,323	3,482	3,370	2,951	2,534	1,761	1,157	713	689	54,098
TOTAL	6,561	6,623	7,077	8,254	10,216	6,757	6,751	7,033	7,837	6,784	7,294	6,995	6,236	5,212	3,727	2,593	1,773	2,108	109,832
2020																			
FEMALES	3,285	3,389	3,459	4,127	5,191	3,524	3,514	3,487	3,596	3,960	3,509	3,797	3,574	3,164	2,475	1,744	1,236	1,591	58,622
MALES	3,435	3,536	3,599	4,331	5,282	3,654	3,638	3,518	3,612	3,977	3,342	3,442	3,289	2,807	2,297	1,492	911	790	56,950
TOTAL	6,720	6,925	7,058	8,457	10,473	7,178	7,152	7,005	7,207	7,936	6,851	7,239	6,863	5,971	4,771	3,237	2,147	2,381	115,572
2025																			
FEMALES	3,416	3,495	3,641	4,149	5,356	3,655	3,767	3,681	3,616	3,689	4,018	3,513	3,756	3,452	2,927	2,202	1,511	1,853	61,695
MALES	3,572	3,645	3,787	4,358	5,373	3,789	3,873	3,771	3,607	3,664	4,001	3,324	3,380	3,147	2,565	1,966	1,185	990	59,999
TOTAL	6,988	7,141	7,428	8,507	10,729	7,444	7,640	7,452	7,223	7,353	8,019	6,837	7,137	6,599	5,491	4,168	2,695	2,843	121,694
2030																			
FEMALES	3,571	3,656	3,781	4,365	5,417	3,810	3,932	3,958	3,829	3,725	3,765	4,022	3,493	3,634	3,194	2,602	1,898	2,210	64,863
MALES	3,734	3,811	3,931	4,581	5,439	3,900	4,041	4,028	3,876	3,676	3,709	3,975	3,279	3,244	2,877	2,196	1,549	1,262	63,108
TOTAL	7,305	7,467	7,712	8,946	10,856	7,711	7,973	7,986	7,705	7,401	7,474	7,997	6,772	6,878	6,071	4,799	3,447	3,472	127,971

YEAR	LABOR FORCE	PARTICIPATION RATE	NET MIGRATION	TOTAL POPULATION
2005	52,692	.6800	+8,715	98,367
2010	56,316	.6800	+4,029	104,184
2015	59,932	.6800	+4,288	109,832
2020	63,549	.6800	+4,902	115,572
2025	67,165	.6800	+5,656	121,694
2030	70,781	.6800	+6,424	127,971

Source: Bernardin-Lochmueller & Associates, Inc.

Median Household Income Forecast Method. Total personal income historical data for Warren County were obtained from the U. S. Bureau of Economic Analysis. These historical data were converted to year 2000 dollars using a consumer price indices adjustment program. A projection of total personal income (in year 2000 constant dollars) was made based on the income trend between years 1971 and 2000. A mean household income (in year 2000 constant dollars) was calculated by dividing the projected total personal income (in year 2000 constant dollars) by the projected number of households. A median-to-mean ratio was calculated from historical data obtained from the 1990 Census and from the most recent estimates (1997, 1998, 1999) by the Kentucky Cabinet for Economic Development. The three most recent ratios were very close in value and the median-to-mean ratio was assumed to remain constant through the target year of 2030. The median household income (in year 2000 constant dollars) for the county was calculated by multiplying the mean household income (in year 2000 constant dollars) by the median-to-mean ratio.

Employment Forecast Method. Warren County forecasts for total employment and the nine major employment sectors (i.e., industries) appear in Table 14. Historical employment data for Warren County and Kentucky were obtained from the Kentucky Cabinet for Workforce Development Department of Employment Services. Historical data for the United States were obtained from Employment & Earnings, published by the Bureau of Labor Statistics. The Kentucky Workforce Development Cabinet Department of Employment Services employment statistics are for workers covered by unemployment insurance and, therefore, were scaled up to agree with U.S. Bureau of Labor Statistics numbers, which include uninsured workers.

The Regional Economic Information System (REIS), published by the Bureau of Economic Analysis, provided projections for the United States. The growth percentages used in the REIS projections were applied to the historical data to project national employment to the target year. The national projections were used in the dynamic regression and exponential smoothing models of "Forecast Pro" to forecast employment for the state of Kentucky. Together the state and national projections were used in the dynamic regression model of "Forecast Pro" to forecast employment for Warren County. The same statistical criteria as described above were used in deciding which forecast is best supported. Forecasts were made for total employment and for each of the 1-digit Standard Industrial Classification (SIC) code industries.

These employment forecasts were for "wage and salary" jobs and did not include proprietorships or federal government employees. The Woods & Poole Economics employment forecasts, which were used in the Kentucky Statewide Traffic Model (KYSTM), include proprietorships and federal government employees. Therefore, the initial employment forecasts, based on the Kentucky Cabinet for Workforce Development Department of Employment Services and the U.S. Bureau of Labor Statistics historical data, were adjusted to include proprietorships and federal government employees, based on the ratio of Bureau of Labor Statistics data to Woods & Poole Economics data in the year 1997 applied to future years. The final employment figures in Table 14 reflect total "non-farm" employment (wage and salary jobs plus proprietorships and federal government employees). When farm employment is added to the "non-farm" employment forecast for the year 2030, the total employment turns out to be about the same as the employment forecast for Warren County in the KySTM. A comparison between the "recommended" forecasts for population and total employment and these other population and employment numbers can be seen in Table 15.

The forecasted total employment was calculated by summing the 1-digit industries. The total employment projection was rejected in favor of the sum of the 1-digit industries, as it agreed better with the projected labor force, as well as Woods & Poole's employment projection.

Table 14: Employment Forecasts for Warren County

Warren County Employment by Industry Adjusted for Total Non-Farm Employment										
Year	Total	Mining	Cnstrctn	Mnfctrng	TCPU	Wholesale	Retail	Finance	Ag&Srvc	Gvrnmnt
1980	35,802	147	1,859	8,893	1,517	1,740	7,404	1,605	7,835	4,803
1981	36,508	128	1,817	9,495	1,444	1,708	7,433	1,508	8,075	4,900
1982	35,106	170	1,343	9,185	1,313	1,669	7,432	1,464	8,118	4,412
1983	36,060	192	1,290	8,988	1,325	1,748	7,969	1,520	8,442	4,587
1984	37,862	236	1,400	9,758	1,388	1,846	8,617	1,557	8,313	4,747
1985	39,513	215	1,424	10,115	1,445	1,892	9,046	1,558	8,928	4,891
1986	40,004	122	1,508	9,408	1,492	1,875	9,189	1,630	9,646	5,134
1987	41,210	130	1,702	8,959	1,609	1,947	9,781	1,700	10,127	5,256
1988	42,919	117	2,060	8,329	1,724	2,033	10,474	1,740	11,014	5,428
1989	44,782	117	2,216	8,414	1,687	2,064	10,911	1,762	12,051	5,561
1990	46,490	106	2,309	8,164	1,731	2,123	11,519	1,873	12,868	5,796
1991	48,446	57	2,285	8,073	1,767	2,189	11,897	2,036	14,105	6,038
1992	51,164	72	2,620	8,647	1,796	2,161	11,768	2,100	15,910	6,091
1993	52,120	74	2,799	9,429	1,814	2,224	12,136	2,142	15,420	6,082
1994	54,098	73	3,010	10,084	1,883	2,361	12,908	2,441	15,106	6,232
1995	56,144	150	2,956	10,771	2,106	2,568	14,064	2,643	14,443	6,444
1996	58,094	174	3,122	10,776	2,140	2,576	14,137	2,941	15,654	6,573
1997	59,864	201	3,176	10,757	2,113	2,605	14,324	3,041	16,907	6,740
1998	60,608	213	3,298	10,552	2,226	2,615	14,402	3,033	17,466	6,804
1999	62,551	300	3,392	11,411	2,267	2,695	14,872	3,154	17,310	7,149
2000	63,044	339	3,363	11,694	2,228	2,677	14,796	3,193	17,478	7,277
2001	*65,450*	*316*	*3,572*	*11,299*	*2,199*	*2,525*	*14,204*	*3,057*	*19,959*	*8,318*
2002	*67,065*	*316*	*3,638*	*11,660*	*2,247*	*2,567*	*14,621*	*3,145*	*20,421*	*8,450*
2003	*68,504*	*316*	*3,703*	*11,915*	*2,294*	*2,609*	*14,987*	*3,232*	*20,877*	*8,572*
2004	*69,839*	*316*	*3,767*	*12,112*	*2,340*	*2,650*	*15,319*	*3,319*	*21,329*	*8,687*
2005	*71,755*	*316*	*3,777*	*12,735*	*2,395*	*2,693*	*15,671*	*3,408*	*21,962*	*8,799*
2006	*72,886*	*316*	*3,830*	*12,864*	*2,436*	*2,734*	*15,979*	*3,494*	*22,336*	*8,897*
2007	*73,963*	*316*	*3,883*	*12,973*	*2,477*	*2,775*	*16,262*	*3,581*	*22,708*	*8,988*
2008	*75,001*	*315*	*3,936*	*13,065*	*2,518*	*2,816*	*16,528*	*3,667*	*23,080*	*9,074*
2009	*76,009*	*315*	*3,989*	*13,144*	*2,559*	*2,857*	*16,783*	*3,753*	*23,450*	*9,159*
2010	*76,995*	*315*	*4,042*	*13,211*	*2,600*	*2,898*	*17,029*	*3,838*	*23,819*	*9,241*
2011	*77,830*	*315*	*4,077*	*13,269*	*2,636*	*2,939*	*17,247*	*3,925*	*24,109*	*9,314*
2012	*78,628*	*315*	*4,112*	*13,318*	*2,672*	*2,980*	*17,444*	*4,011*	*24,397*	*9,380*
2013	*79,398*	*315*	*4,147*	*13,360*	*2,707*	*3,020*	*17,626*	*4,096*	*24,684*	*9,442*
2014	*80,149*	*315*	*4,182*	*13,396*	*2,743*	*3,061*	*17,799*	*4,182*	*24,971*	*9,501*
2015	*80,886*	*315*	*4,216*	*13,427*	*2,778*	*3,102*	*17,964*	*4,268*	*25,258*	*9,558*
2016	*81,423*	*314*	*4,232*	*13,437*	*2,808*	*3,143*	*18,101*	*4,354*	*25,431*	*9,602*
2017	*81,924*	*314*	*4,248*	*13,443*	*2,837*	*3,184*	*18,217*	*4,440*	*25,604*	*9,636*
2018	*82,400*	*314*	*4,264*	*13,446*	*2,866*	*3,225*	*18,318*	*4,526*	*25,776*	*9,665*
2019	*82,858*	*314*	*4,280*	*13,445*	*2,896*	*3,266*	*18,409*	*4,612*	*25,948*	*9,690*
2020	*83,304*	*314*	*4,295*	*13,441*	*2,925*	*3,306*	*18,493*	*4,697*	*26,120*	*9,713*
2021	*83,741*	*314*	*4,311*	*13,434*	*2,954*	*3,347*	*18,573*	*4,783*	*26,291*	*9,734*
2022	*84,171*	*314*	*4,327*	*13,426*	*2,983*	*3,388*	*18,649*	*4,868*	*26,462*	*9,755*
2023	*84,597*	*314*	*4,342*	*13,415*	*3,012*	*3,428*	*18,723*	*4,954*	*26,633*	*9,775*
2024	*85,019*	*314*	*4,358*	*13,403*	*3,041*	*3,469*	*18,796*	*5,039*	*26,804*	*9,795*
2025	*85,437*	*314*	*4,374*	*13,389*	*3,070*	*3,510*	*18,867*	*5,124*	*26,974*	*9,815*
2026	*85,993*	*313*	*4,405*	*13,424*	*3,105*	*3,550*	*18,962*	*5,210*	*27,171*	*9,850*
2027	*86,571*	*313*	*4,438*	*13,459*	*3,140*	*3,591*	*19,071*	*5,296*	*27,368*	*9,894*
2028	*87,164*	*313*	*4,470*	*13,492*	*3,176*	*3,632*	*19,191*	*5,382*	*27,565*	*9,943*
2029	*87,765*	*313*	*4,502*	*13,525*	*3,211*	*3,673*	*19,316*	*5,468*	*27,762*	*9,995*
2030	*88,373*	*313*	*4,534*	*13,556*	*3,246*	*3,714*	*19,447*	*5,554*	*27,959*	*10,049*

Source: Bernardin-Lochmueller & Associates, Inc.

Table 15: Warren County Population and Employment Forecast Comparisons (KySTM Growth Scenario)

Population					
	Bowling Green Regional Travel Model		KYSTM / *Woods & Poole*	Bowling Green Transportation Plan	
1990	76,673		77,849		
1995	86,301			82,579	
1999	91,278		88,839		
2000	92,522		89,820		
2020	114,596		114,440	112,102	
2030	125,267		125,111		
Total Employment					
	Bowling Green Regional Travel Model /U.S. BLS (wage & salary)	Bowling Green Regional Travel Model Adjusted & Recommended (non-farm)	KYSTM /*Woods & Poole (farm & non-farm)*	Bowling Green Transportation Plan	Kentucky DES (wage & salary)
1990	36,035	46,490	46,976		35,216
1995	44,092	56,144		39,889	43,090
1999	48,772	62,551	60,876		47,663
2000	49,097	63,044	*62,390*		47,981
2020	68,346	83,304	81,480	52,591 / 73,677*	66,792**
2030	72,505	88,373	90,676		70,856**

Source: Bernardin-Lochmueller & Associates, Inc.

Notes : * The Bowling Green Travel Demand Model has two employment forecasts for the year 2020. The first forecast of 52,591 workers was made without considering the TransPark now being developed; the second forecast of 73,677 is based on the TransPark being developed.

** These numbers are Bernardin-Lochmueller & Associates forecasts of the Kentucky Workforce Development Cabinet Department of Employment Services statistics.

Warren County Year 2000 Travel Analysis Zone Database. Demographic data from the 2000 Census data were matched electronically to the geographic areas of the refined Warren County Travel Analysis Zones (TAZs). The demographic data included total population, group quarters, household population, households, and housing units. This demographic information by TAZ was compared to the year 1995 TAZ database of the Bowling Green Transportation Plan Travel Model, and it was also aggregated by Census Tract for comparison to Census Tract totals in year 2000 and year 1990.

Address-specific employment data from the American Business Directory for the year 2000 were also matched by computer to a refined Warren County TAZ system. Bowling Green Area Chamber of Commerce data on the number of employees for major employers were integrated into the employment database to ensure that the most accurate employment data for the year 2000 was used and to verify that the locations of major employers were matched correctly to the TAZ system. The matched employment by TAZ was aggregated by the ten major business sectors (industries). The employment information by TAZ was further aggregated by industrial, commercial and public categories of the Bowling Green Transportation Plan Travel Model and compared to the 1995 TAZ employment database.

Warren County Year 2030 Travel Analysis Zone Database. Based on the Warren County control totals for the population and employment forecasts for the KySTM Growth Scenario and SDC Growth Scenario, a preliminary allocation of population and employment to TAZs was developed on the basis of the year 2020 TAZ growth forecasts of the Bowling Green Transportation Plan, information on commercial/industrial site availability from the Kentucky Cabinet for Economic Development, and the *Bowling Green-Warren County Comprehensive Plan* (1990). The Kentucky TriModal TransPark Business/Commerce/Industrial Park Master Plan Report was considered in the allocation of commercial/industrial employment in both growth scenarios.[9] In the case of the KySTM Growth Scenario, only partial development of the industrial park was considered. For the SDC Growth Scenario, full development of the industrial park with a new regional airport and redevelopment of the existing airport for residential and commercial purposes were considered within the pre-established county control totals for population and employment.

The preliminary TAZ population and employment allocations for the two growth scenarios were reviewed and revised by local planning, engineering, and transportation officials. These local officials used knowledge of local subdivision and rezoning activity, building permit activity, vacant land development constraints, and availability of public sanitary sewer service to establish the anticipated magnitude of population and employment growth by TAZ for the two growth scenarios, as summarized in Tables 16 and 17 and as shown in Figures 10 through 13.

[9] Kentucky TriModal TransPark Business/Commerce/Industrial Park Master Plan Report: prepared for the Inter-Modal Transportation Authority, Inc. by Wilbur Smith Associates; October 2001.

Table 16: Summary of Existing and Future Socioeconomic Data by TAZ in Warren County

	Existing	KySTM Growth Scenario		SDC Growth Scenario	
Component	Year 2000	Change from 2000 to 2030	Year 2030	Change from 2000 to 2030	Year 2030
Population	92,522	32,745	125,267	49,663	142,185
Group Quarters Population	5,559	-59	5,500	-59	5,500
Household Population	86,963	32,804	119,767	49,722	136,685
Households (occupied dwellings)	35,365	15,817	51,182	23,055	58,420
New Dwelling Unit Permits		19,800		25,021	
Households Allocated		19,800		25,021	
Demolitions/Increased Vacancies		-3,983		-1,966	
Total Housing Units	38,350	17,283	55,633	25,092	63,442
Farm Employment[(a)]	391	-39	352	-39	352
Mining Employment	217	96	313	137	354
Construction Employment	3,326	1,208	4,534	1,803	5,129
Manufacturing Employment	10,289	3,267	13,556	5,046	15,335
Transportation, Communications & Public Utilities Employment	2,129	1,117	3,246	1,543	3,672
Wholesale Employment	3,366	348	3,714	835	4,201
Retail Employment	13,269	6,178	19,447	8,730	21,999
Finance, Insurance & Real Estate Employment	3,148	2,406	5,554	3,135	6,283
Services Employment [(b)]	21,382	14,728	36,110	19,865	41,247
Government Employment [(c)]	1,120	427	1,547	630	1,750
Total Employment	58,637	29,736	88,373	41,683	100,320

Source: Bernardin-Lochmueller & Associates, Inc.

Notes: (a) Address-specific farm employment from the American Business Directory differs from farm employment reported by Woods & Poole Associates in Table 11 because the later includes part-time farm employment.
(b),(c) Because Woods & Poole and the Kentucky Cabinet of Workforce Development categorize employment by public versus private ownership and then by Standard Industrial Classification (SIC) Code, the employment for the Services and Government Sectors in Tables 11 through 14 differ from this table, which uses American Business Directory data categorized by SIC regardless of ownership status. In essence, the difference between the Kentucky Cabinet of Workforce Development and the American Business Directory government employment future estimates are reallocated to the Services Sector.

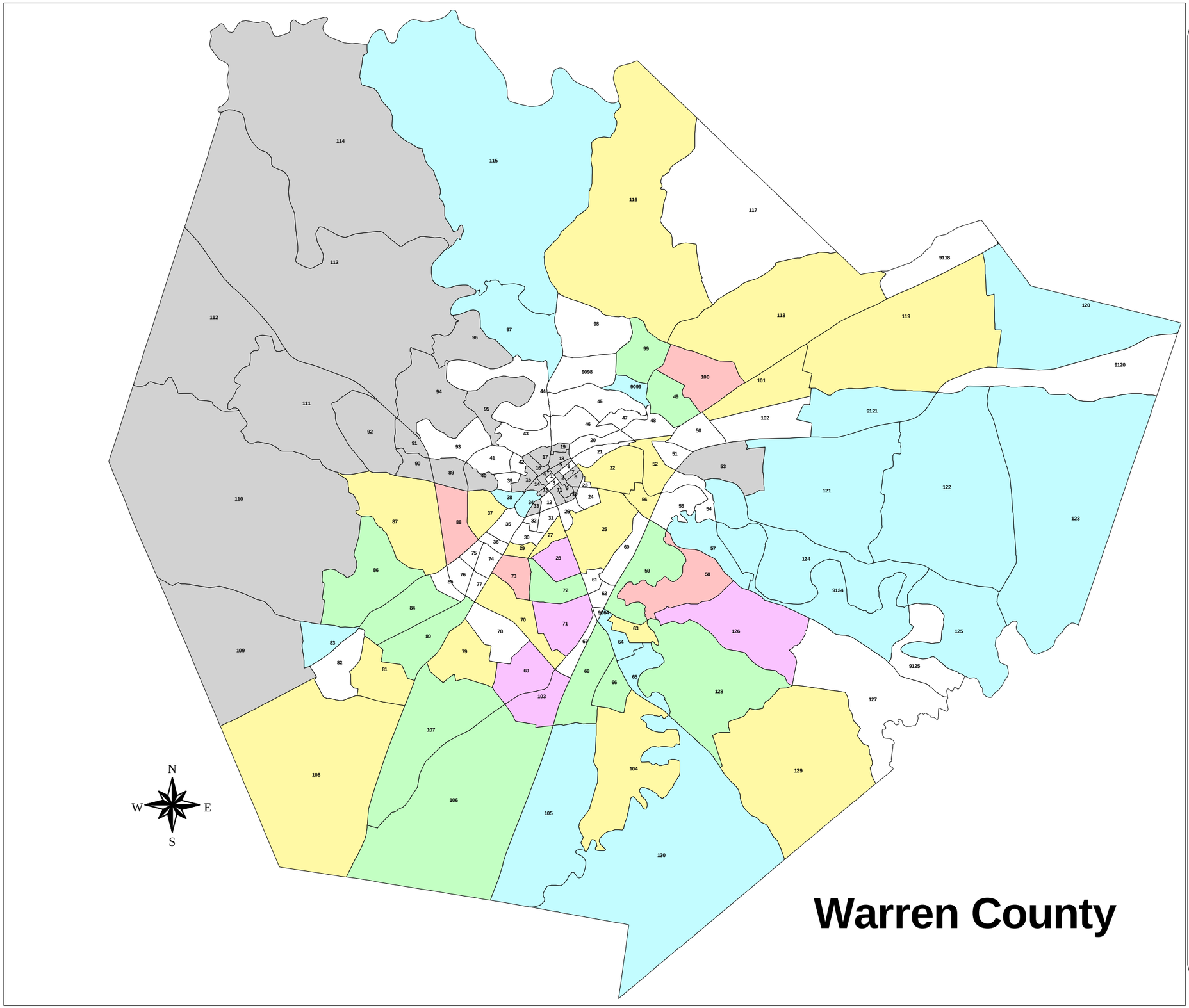
Table 17: 2000 and 2030 Warren County Population and Employment by TAZ

TAZ ID	Population			Employment			TAZ ID	Population			Employment		
		Year 2030			Year 2030				Year 2030			Year 2030	
	Year 2000	KySTM Growth Scenario	SDC Growth Scenario	Year 2000	KySTM Growth Scenario	SDC Growth Scenario		Year 2000	KySTM Growth Scenario	SDC Growth Scenario	Year 2000	KySTM Growth Scenario	SDC Growth Scenario
1	406	406	406	1110	1258	1258	**70**	1851	2136	2130	273	532	532
2	364	363	362	672	811	811	**71**	3286	6076	6059	907	1829	1829
3	68	68	67	1101	1256	1256	**72**	2063	2775	2767	4573	5543	5543
4	493	453	452	346	482	482	**73**	1850	2822	2814	291	561	561
5	85	80	80	805	946	946	**74**	912	949	947	1516	2210	2210
6	90	93	93	550	678	678	**75**	22	24	24	697	869	869
7	278	277	276	672	855	855	**76**	14	18	18	1282	1737	1737
8	528	515	514	2160	3546	3546	**77**	57	77	77	554	956	956
9	221	214	214	189	349	349	**78**	83	168	2003	71	75	325
10	80	77	77	748	896	896	**79**	974	1287	1698	690	1009	1209
11	620	597	595	778	926	926	**80**	373	1167	1163	2131	4035	4035
12	915	1014	1011	610	774	774	**81**	449	818	815	23	28	28
13	490	455	454	11	16	16	**82**	593	651	649	147	179	279
14	976	967	965	160	324	324	**83**	130	287	286	5	5	80
15	1778	1773	1768	275	302	302	**84**	452	1221	1217	58	1380	1380
16	584	553	552	414	430	430	**85**	763	808	806	172	218	218
17	844	839	837	1710	1890	1890	**86**	552	1271	1988	57	1225	1225
18	385	380	379	329	349	349	**87**	818	1190	1186	79	147	222
19	712	703	701	276	290	290	**88**	1783	3165	3156	432	703	703
20	0	0	0	532	793	793	**89**	114	107	107	251	279	279
21	363	442	440	330	493	493	**90**	265	250	249	10	22	22
22	1442	1741	1736	345	411	411	**91**	207	195	195	7	7	7
23	277	318	317	338	349	349	**92**	366	345	344	8	13	13
24	718	737	735	737	835	835	**93**	140	145	144	297	432	432
25	3461	3769	8826	2771	2974	3624	**94**	240	226	226	15	15	15
26	590	612	610	347	438	438	**95**	37	35	35	300	450	450
27	879	1121	1118	553	626	626	**96**	17	16	16	0	0	0
28	1317	2935	2927	3896	4721	4721	**97**	467	615	613	6	11	11
29	258	643	642	110	202	202	**98**	664	715	713	51	51	51
30	503	563	561	10	19	19	**99**	157	771	1253	0	2	2
31	1207	1275	1272	545	593	593	**100**	464	1646	2129	119	162	162
32	346	392	391	82	98	98	**101**	1378	1723	1718	981	3337	3337
33	432	414	413	106	117	117	**102**	33	67	67	0	168	268
34	4231	4379	4377	2329	2953	2953	**103**	167	2380	3572	9	34	159
35	1466	1551	1546	491	587	587	**104**	1903	2186	2686	48	68	118
36	173	263	262	318	978	978	**105**	960	1119	1106	78	78	103
37	3813	4097	4086	1730	2119	2119	**106**	900	1440	1426	182	201	251
38	1200	1335	1331	198	232	232	**107**	495	1048	1783	132	149	199
39	1052	1090	1087	52	81	81	**108**	962	1240	1227	119	121	121
40	300	284	283	130	176	176	**109**	643	606	604	21	21	21
41	853	884	882	12	185	185	**110**	1044	1009	1006	23	23	23
42	722	749	747	27	54	54	**111**	747	704	702	25	25	25
43	821	916	913	607	666	666	**112**	397	374	373	19	21	21
44	100	160	159	21	21	21	**113**	708	667	665	19	19	19
45	37	119	119	26	101	101	**114**	599	564	563	16	16	16
46	85	108	108	80	94	94	**115**	1337	1496	1492	197	222	222
47	15	61	61	80	158	158	**116**	1080	1430	1426	23	25	25
48	227	255	254	1136	1759	1959	**117**	866	879	876	53	53	53
49	1051	1620	2102	74	134	134	**118**	1485	1799	1794	413	488	488
50	57	74	74	1421	2383	2383	**119**	812	1169	1166	176	1988	10931
51	0	0	0	798	1477	1677	**120**	806	918	915	346	405	505
52	613	851	849	362	456	456	**121**	650	798	796	79	79	79
53	391	369	368	63	228	328	**122**	771	904	901	69	78	78
54	4	29	29	0	0	0	**123**	866	1019	1016	19	19	19
55	99	115	114	4	192	192	**124**	156	308	308	10	10	10
56	157	457	456	0	150	150	**125**	185	332	331	0	0	0
57	472	623	621	4	8	8	**126**	503	2326	2319	46	46	46
58	707	1999	2538	21	23	23	**127**	310	326	325	4	4	4
59	1018	1564	2047	145	806	806	**128**	717	1294	1941	18	48	98
60	181	233	941	1004	1334	1534	**129**	1275	1560	1555	31	53	103
61	1088	1178	1174	1658	2095	2095	**130**	1770	1881	1876	211	236	286
62	958	1044	1041	665	1184	1184	**9064**	0	0	0	86	111	111
63	470	708	1173	196	230	230	**9098**	223	238	237	0	0	0
64	322	479	603	750	1161	1161	**9099**	152	345	344	4	4	4
65	111	304	422	194	343	443	**9118**	51	67	67	133	133	133
66	508	955	1442	62	395	495	**9120**	284	317	317	7	127	127
67	199	213	212	422	984	984	**9121**	247	374	373	4	154	254
68	756	1379	2069	1252	2179	2179	**9124**	275	430	429	62	62	62
69	570	2642	3696	2	93	93	**9125**	65	79	79	0	0	0
							TOT	**92522**	**125267**	**142185**	**58637**	**88373**	**100320**

Source: Bernardin-Lochmueller & Associates, Inc.

Figure 10

2000-2030 Population Change by TAZ
KYSTM Growth Scenario



Map Legend

2000-2030 Population Change by TAZ

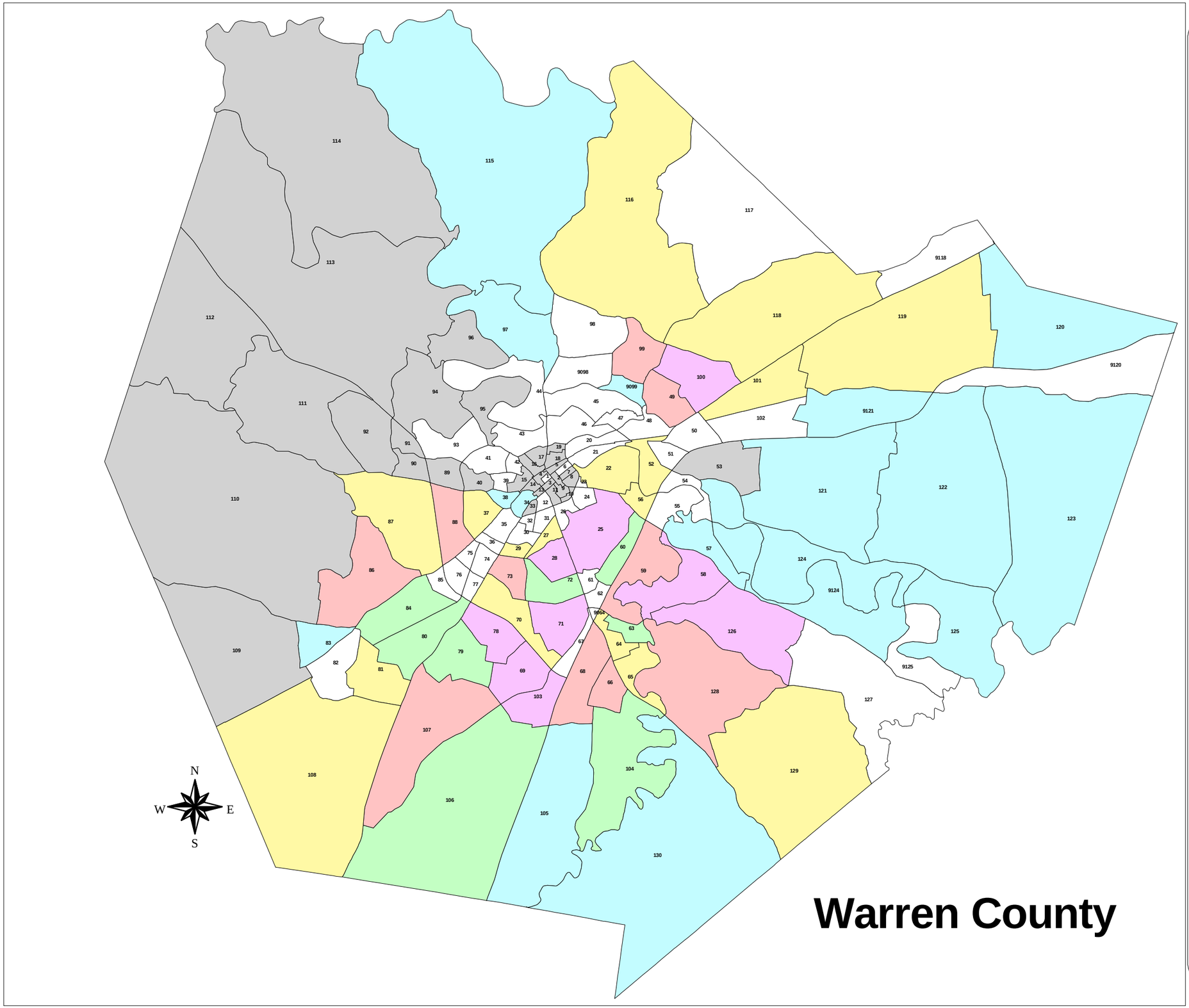
G	-49 to -1
F	0 to 100
E	101 to 200
D	201 to 400
C	401 to 800
B	801 to 1600
A	Greater than 1600

0 2 4 6 Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

Figure 11

2000-2030 Population Change by TAZ
SDC Growth Scenario



Map Legend

High Population Forecast

2000-2030 Population Change by TAZ

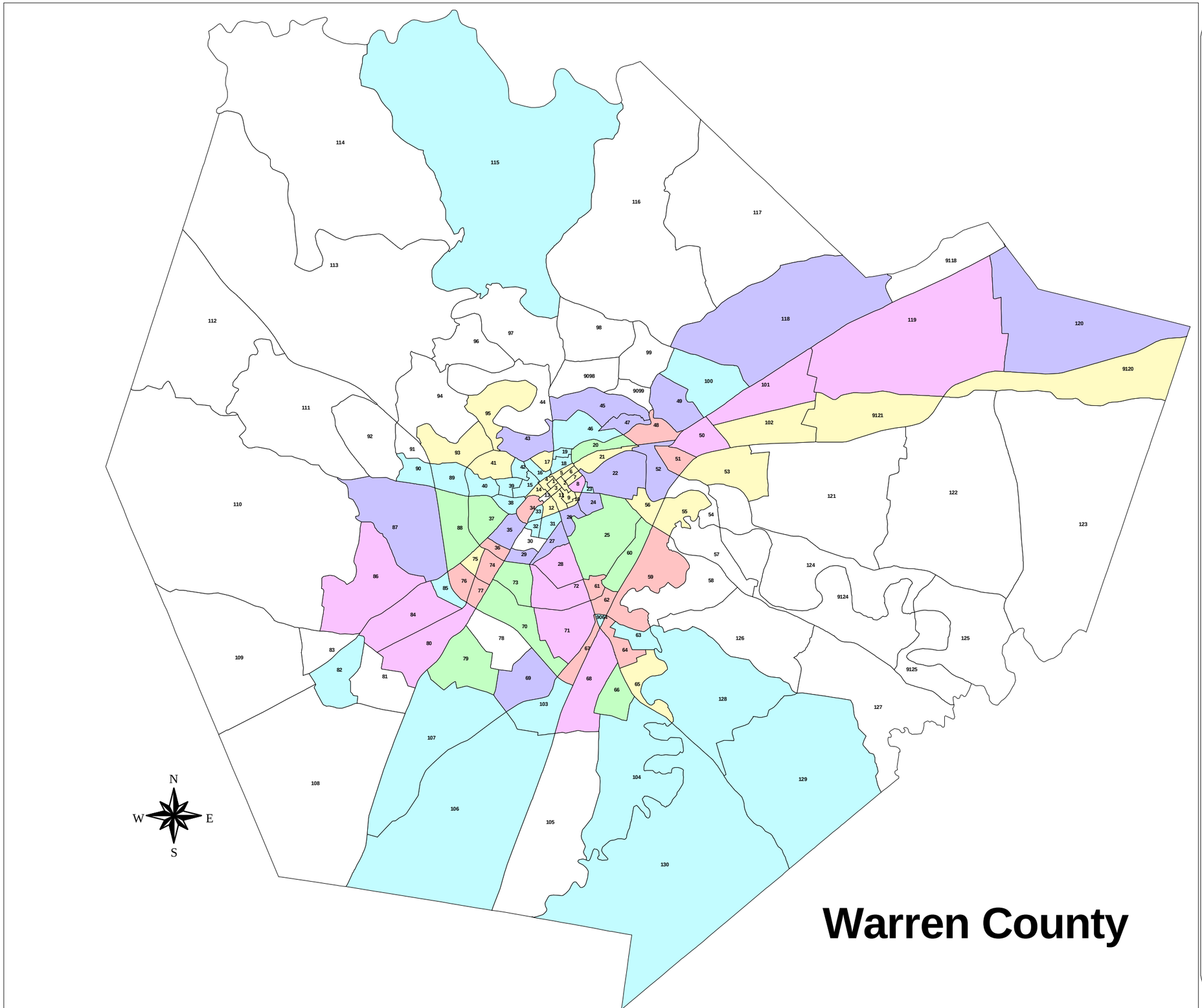
G	-49 to -1
F	0 to 100
E	101 to 200
D	201 to 400
C	401 to 800
B	801 to 1600
A	Greater than 1600

0 2 4 6 Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

Figure 12

2000-2030 Employment Change by TAZ
KYSTM Growth Scenario



Map Legend

2000-2030 Employment Change by TAZ

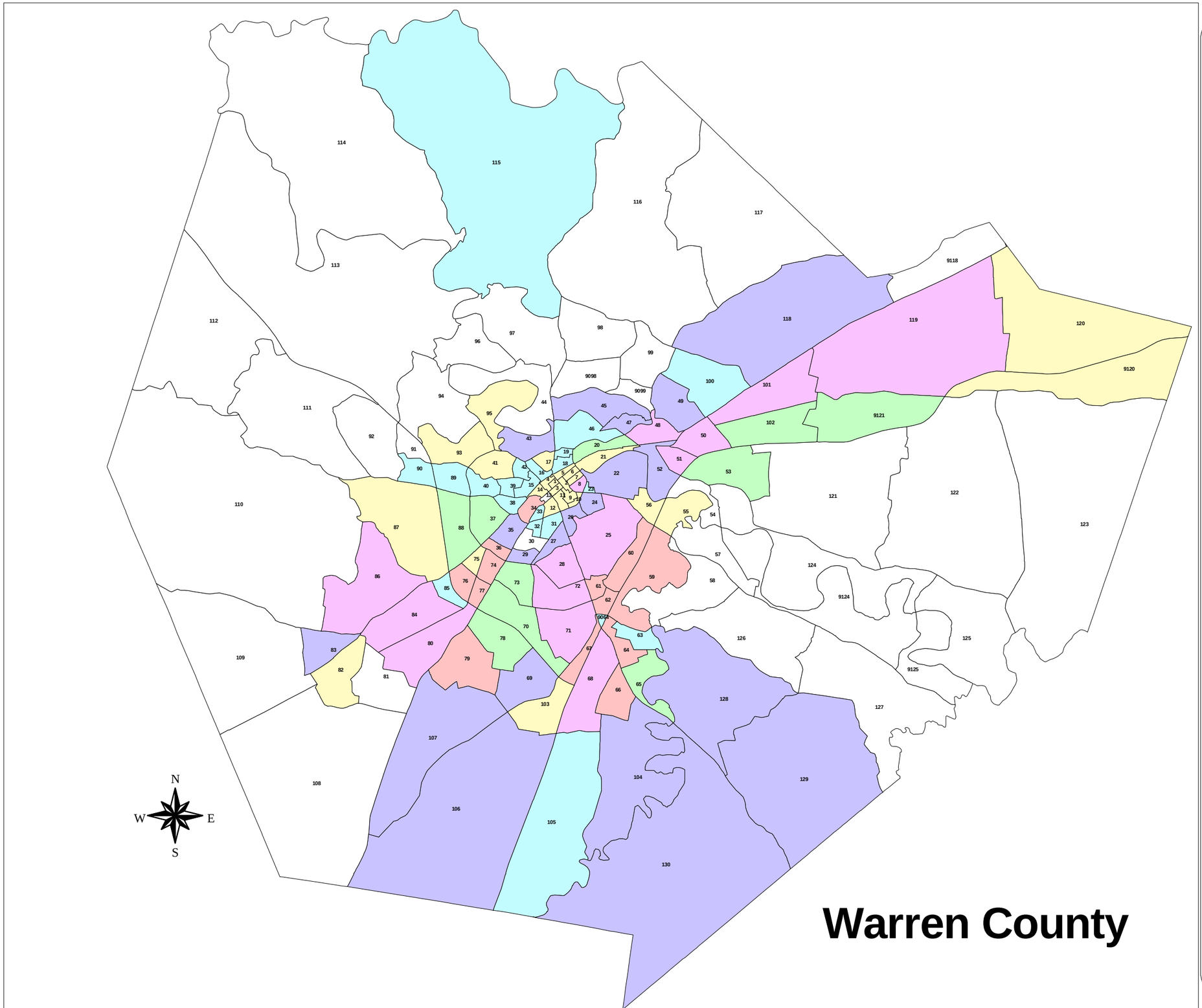
G	0 to 10
F	11 to 50
E	51 to 100
D	101 to 200
C	201 to 400
B	401 to 800
A	Greater than 800

0 2 4 6 Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

Figure 13

2000-2030 Employment Change by TAZ
SDC Growth Scenario



Map Legend

High Employment Forecast
2000-2030 Employment Change by TAZ

G	0 to 10
F	11 to 50
E	51 to 100
D	101 to 200
C	201 to 400
B	401 to 800
A	Greater than 800

0 2 4 6 Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

3. No Build Alternative

The No Build Alternative is represented by the Existing-Plus-Committed (E+C) Roadway Network. The E+C Network includes programmed improvements from the KYTC *2002 Six Year Highway Plan* and previous KYTC *2000 Six Year Highway Plan*. Referring to Tables 5 through 8 and Figure 8, any "capacity expansion" project programmed for a phase beyond planning in the Six Year Highway Plan is considered "committed," and has been added to the existing roadway network of year 2000 to create the No Build Alternative.

The following committed capacity expansion projects were added to the existing roadway network to establish the No Build (E+C) roadway network (map key number refers to Figure 8 and Tables 5 through 8):

1) Glasgow Bypass from the Nunn Parkway east of Glasgow to the Nunn Parkway west of Glasgow, ending at KY 1297 as a new four-lane divided facility (map key 3, 4 and 5).
2) I-65 major widening to six lanes from Sims Road northward through Warren, Edmonson, Barren and Hart counties with a new interchange at KY 234/Cemetery Road (map key 14 through 21).
3) Natcher Parkway Extension as a four-lane freeway from I-65 to US 231 (map key 22).
4) KY 101 reconstruction from I-65 interchange to US 31W at KY 101 (western intersection) as a new two-lane facility (map key 25).
5) US 231 major widening to four lanes from Cumberland Trace Road to US 31E in Allen County (map key 27, 28 and 29).
6) KY 234 major widening - five lanes from Clay Street to Center Street; two-lane one-way diagonal connector from 6th at Center to 7th at College (map key 32); and five lanes from Collett Lane to east of I-65 with a new interchange at I-65 (map key 30).
7) KY 880/Lovers Lane major widening to four lanes from US 231 (Scottsville Road) to KY 234/Cemetery Road (map key 31).
8) US 31W major widening to four lanes from KY 880 (Campbell Lane) to Dillard Road (map key 33 and 34).
9) KY 2158/Cumberland Trace major widening to three lanes from US 231/Scottsville Road to KY 234/Cemetery Road (map key 35).
10) US 231 major widening to five lanes from the Natcher Parkway to Bell Street in Morgantown.
11) Russellville Bypass (Logan County)– four lanes from US 79 southwest of town to US 68 east of town.
12) US 31W (Simpson County) major widening to four lanes from Tennessee State Line through I-65 to KY 1008 (Franklin Bypass).
13) KY 1008 (Franklin Bypass) two-lane extension from KY 100 west of town to US 31W north of town.

The following minor capacity expansion projects are recognized as part of the No Build (E+C) roadway network, but were not coded into the regional travel model due to the difficulty of reflecting minor capacity changes in the travel model (map key number refers to Figure 8 and Tables 5 through 8):

1) KY 90 reconstruction (map key 1).
2) KY 70 reconstruction (map key 2).
3) KY 101 reconstruction from Brownsville to Rhoda (map key 7).
4) KY 101 reconstruction from Rhoda to Chalybeate (map key 7a).
5) KY 101 spot improvements through Knobs area (map key 8).
6) KY 70/KY 259 reconstruction from KY 70 to Brownsville (map key 9).

7) KY 259 reconstruction through Knobs area (map key 10).
8) KY 259 reconstruction from Brownsville to Kyrock Elementary School (map key 11).
9) KY 185 reconstruction from Richardville to Butler County Line (map key 26).
10) I-65/US 231 interchange reconstruction (map key 40).
11) US 31W widening to three lanes in Munfordville (Hart County).
12) US 431 reconstruction from Epleys Station to Lewisburg (Logan County).

While the new interchange on I-65 near Sunnyside-Gotts Road (map key 41) is funded through construction in the KYTC *2002 Six Year Highway Plan*, this project was not included in the No Build network because it might coincide with the Outer Beltline or I-66 Corridor alternatives. Further, the execution of this project is dependent upon the commitment of an industrial tenant or tenants to the TransPark site.

The following projects have not been included in the travel model because they have not been funded beyond the planning phase (map key number refers to Figure 8 and Tables 5 through 8):

1) New interchange on the Nunn Parkway at KY 249 (map key 6).
2) KY 70 reconstruction (map key 2).
3) I-65 widening to six lanes from Sims Road southward to Tennessee State Line (map key 12 and 13). (Note: This project is currently being designed, but funding for other phases is not forthcoming.)
4) KY 884 (Three Springs Road) from the Natcher Parkway to US 231 (map key 23).
5) Bowling Green Outer Beltline (map key 24, 36, 37 and 38).
6) Southwest Parkway from US 68 to I-65 (map key 39).
7) US 68 widening to four lanes from KY 880 to University Drive (map key 42).
8) US 31W widening to four lanes from KY 880 to University Drive (map key 43).
9) Smallhouse Road widening to three lanes from Cave Mill Road to US 231 (map key 44).
10) KY 880 widening to four lanes from US 68 to KY 1435 (map key 45).
11) Old Morgantown widening to three lanes from Morgantown Road to University Drive (map key 46).
12) Cave Mill Road widening to three lanes from Dishman Lane to KY 880/Lovers Lane (map key 47).
13) US 231 widening to four lanes from KY 880 to KY 3191/Briggs Hill Road (map key 48).

4. No Build Alternative Traffic Conditions

Future travel in the year 2030 was assigned to the No Build (E+C) Roadway Network based on the Kentucky Statewide Traffic Model (KySTM) and the Kentucky State Data Center (SDC) growth scenarios. While both assignments included the through traffic associated with assumed completion of I-66 throughout the Commonwealth, the Kentucky State Data Center population forecasts result in slightly higher traffic assignments. The resulting traffic conditions for two growth scenarios appear in Table 18 for major facilities in Warren County. Figures 14 through 17 show the level-of-service for the region and an enlargement for Bowling Green for the two growth scenarios based on the Regional Travel Model. Any differences between Table 18 and the figures are a result of different segment termini and slight differences in the capacity calculations.

Referring to Table 18, I-65 as a six-lane facility fails to achieve minimum acceptable level-of-service standards in rural and urban areas in the year 2030 for both the Kentucky Statewide Traffic Model (KySTM) and State Data Center growth forecasts in Warren County. In fact, only two segments in Barren County achieve LOS C under the lower KySTM forecast.

Table 18: Future Traffic Volumes and Level-of-Service for No Build Alternative [(a)]

(Existing-Plus-Committed Roadway Network)

Route	Segment	Functional Class (b)	Existing Year 2000				No Build Alternative (E+C Network)					
									Statewide Traffic Model		State Data Center	
			Lanes	Hourly Capacity (c)	2000 ADT	LOS (e)	Lanes	Hourly Capacity (c)	2030 ADT	Future LOS	2030 ADT	Future LOS
I-65	Simpson Co. Line to Natcher Pkwy	1	4	2,985	36,800	D	4	2,985	49,300	F	51,900	F
	Natcher Pkwy to US 231	11	4	2,940 (d)	44,800	E	6	4,305	69,000	E	76,700	E
	US 231 to KY 234	11	4	2,940 (d)	44,500	E	6	4,305	78,600	E	86,700	E
	KY 234 to KY 446	11	4	2,940 (d)	44,500	E	6	4,305	84,000	E	97,300	F
	KY 446 to US 68	1	4	2,943	42,400	E	6	4,305	69,400	E	81,300	E
	US 68 to KY 101	1	4	2,943	44,500	E	6	4,305	61,100	D	63,700	D
	KY 101 to Louie B. Nunn Pkwy	1	4	2,943	36,500	D	6	4,305	61,700	D	69,300	E
	Nunn Pkwy to KY 255	1	4	2,550	29,800	D	6	4,305	49,100	C	54,100	D
	KY 255 to KY 70	1	4	2,550	30,700	D	6	4,305	49,100	C	54,100	D
	KY 70 to Hart Co. Line	1	4	2,550	32,200	D	6	4,305	60,800	D	67,800	E
Natcher Parkway	I-65 to US 31W	12	4	3,991	13,600	A	4	3,265	41,000	C	47,800	D
	US 31W to US 68	12	4	3,991	13,800	A	4	3,991	37,800	C	42,800	C
	US 68 to US 231	12	4	3,991	7,820	A	4	3,991	21,800	B	24,300	B
	US 231 to KY 79	2	4	3,603	8,490	A	4	3,603	17,200	A	19,200	B
Nunn Parkway	I-65 to US 31E	12	4	3,603	6,920	A	4	3,603	17,000	B	15,200	A
	US 31E to KY 90	2	4	3,265	8,670	A	4	3,265	18,200	B	19,800	B
US 31W	Simpson Co. Line to KY 240	7	2	1,837	5,420	A	2	1,837	13,600	D	13,900	E
	KY 240 to KY 242	7	2	1,837	8,230	B	2	1,837	11,000	C	9,500	C
	KY 242 to Memphis Junction Road	7	2	1,349	10,700	E	2	1,349	25,900	F	27,800	F
	Memphis Junction Rd. to Natcher Pkwy	16	2	1,349	11,600	E	4	3,352	31,200	C	37,200	C
	Natcher Pkwy to US 231 (Campbell Lane)	16	2	1,010	17,300	F	4	3,352	27,800	C	31,200	C
	US 231 to Business US 231 (University)	16	2	1,446	17,300	F	2	1,446	19,100	F	20,700	F
	Bus. US 231 (University) to Bus. US 231	16	4	2,828	19,400	B	4	2,828	24,900	C	26,600	C
	Bus. US 231 (Scottsville Rd.) to KY 234	16	4	2,828	20,600	B	4	2,828	27,800	C	31,000	C
	KY 234 to US 68 (Louisville Rd.)	16	4	2,828	22,000	B	4	2,828	24,000	C	25,700	C
	US 68 (Riverview Dr.) to KY 446	14	4	2,828	30,800	C	4	2,828	39,900	D	42,700	E
	KY 446 to Jackson Grove Church Rd.	16	4	2,461	22,500	C	4	2,461	30,800	D	32,400	D
	Jackson Grove Church Rd. to US 68	7	4	2,649	12,200	A	4	2,649	29,700	D	30,600	D
	US 68 to KY 743	7	2	1,361	7,140	C	2	1,361	5,300	B	6,900	C
	KY 743 to KY 101	7	2	1,346	3,240	A	2	1,346	6,600	C	8,300	C
	KY 101 to Edmonson Co. Line	7	2	1,376	3,240	A	2	1,376	4,200	A	6,000	B
	Warren Co. Line to KY 259	7	2	1,361	1,790	A	2	1,361	1,400	A	2,000	A
	KY 259 to Barren Co. Line	7	2	1,332	1,950	A	2	1,332	2,500	A	3,300	A
	Edmonson Co. Line to KY 255	7	2	1,797	2,100	A	2	1,797	2,500	A	2,900	A
	KY 255 to KY 90	7	2	1,817	3,130	A	2	1,817	3,800	A	4,300	A
US 68/ KY 80	Logan Co. Line to KY 240	2	2	1,509	8,580	C	2	1,509	14,500	F	15,300	F
	KY 240 to KY 242	2	2	1,608	4,560	B	2	1,608	13,000	E	17,100	F
	KY 242 to KY 1083	2	2	1,608	9,870	C	2	1,608	14,800	F	17,400	F
	KY 1083 to KY 432	2	4	2,526	14,400	B	4	2,526	26,000	C	26,800	C
	KY 432 to Natcher Pkwy	14	4	2,526	20,600	B	4	2,526	37,800	E	40,200	E
	Natcher Pkwy to KY 880/US 231	14	4	2,534	26,400	C	4	2,534	34,700	D	37,400	D
	KY 880 to Business US 231	14	2	1,305	19,000	F	2	1,305	30,200	F	30,400	F
	Business US 231 to US 31W	14	4	1,538	17,000	C	4	1,538	30,100	F	30,100	F
	US 31W to Sunnyside Road	7	2	1,754	2,820	A	2	1,754	6,300	B	10,100	C
	Sunnyside Rd. to I-65.	7	2	1,412	2,150	A	2	1,412	5,000	B	8,700	C
	I-65 to KY 101	7	2	1,461	3,090	A	2	1,461	6,900	C	8,900	C
	KY 101 to Barren Co. Line	7	2	1,445	2,810	A	2	1,445	3,700	A	3,600	A
	Warren Co. Line to KY 685	7	2	1,397	2,980	A	2	1,397	4,500	A	4,900	B

Note: (a) The highest average daily traffic (ADT) volume and worst LOS are shown for a segment when multiple values are available from the KYTC HIS. Shaded values fail to meet minimum acceptable LOS C for rural areas and LOS D for urban areas. KYTC's *Highway Design Policy* – "Geometric Design Guidelines" (p. 13) cites Chapter 2 in AASHTO's *A Policy on Geometric Design of Highways and Streets* -- see pages 84 and 85 (2000 edition).

Table 18: Future Traffic Volumes and Level-of-Service for No Build Alternative (continued) [a]

Route	Segment	Functional Class (b)	Existing Year 2000				No Build Alternative (E+C Network)					
									Statewide Traffic Model		State Data Center	
			Lanes	Hourly Capacity (c)	2000 ADT	LOS (e)	Lanes	Hourly Capacity (c)	2030 ADT	Future LOS	2030 ADT	Future LOS
US 231	Allen Co. Line to KY 961	2	2	1,546	4,710	B	4	2,220	13,400	B	15,700	B
	KY 961to KY 2629	2	2	1,546	7,880	C	4	2,220	13,200	B	16,700	B
	KY 2629 to KY 622	2	2	1,310	24,400	F	4	2,220	20,700	C	24,800	C
	KY 622 to I-65	14	4	2,220	26,400	D	4	2,220	24,000	C	34,600	E
	I-65 to KY 880 (Lovers Lane)	14	4	2,732	39,600	E	4	2,732	45,100	F	47,900	F
	KY 880 over Campbell to US 31W	14	4	2,636	27,700	C	4	2,636	33,500	D	34,500	D
	US 31W over Campbell to US 68	14	4	2,636	20,200	B	4	2,636	21,500	C	22,500	C
	US 68 to KY 880	16	2	1,618	10,400	C	2	1,618	14,700	E	15,100	E
	KY 880 to Natcher Pkwy	16	2	1,618	10,100	A	4	3,352	18,200	B	18,600	B
	Natcher Pkwy to KY 2632	7	2	1,445	5,920	B	2	1,445	6,900	C	7,500	C
	KY 2632 to Butler Co. Line	7	2	1,445	2,350	A	2	1,445	3,000	A	3,500	A
Business US 231	KY 880 (Lovers Ln.) to US 31W	16	4	3,115	34,600	C	4	3,115	36,900	D	38,800	D
	US 31W to US 68 (University Dr.)	16	4	3,018	19,600	B	4	3,018	24,900	C	26,600	C
	US 68 (Russellville Rd.) to KY 880	16	2	1,554	10,900	D	2	1,554	15,400	F	15,900	F
KY 101	Allen Co. Line to KY 1297	7	2	1,531	1,240	A	2	1,531	3,200	A	4,400	A
	KY 1297 to US 68	7	2	1,421	1,810	A	2	1,421	3,400	A	5,300	B
	US 68 to I-65	7	2	1,503	3,160	A	2	1,503	5,600	B	6,000	B
	I-65 to US 31W	6	2	1,412	5,010	B	2	1,412	7,300	C	7,300	C
	US 31W to Edmonson Co. Line	6	2	1,616	3,290	A	2	1,616	7,200	C	10,800	D
	Edmonson Co. Line to KY 259	6	2	1,381	5,340	B	2	1,381	7,000	C	6,900	C
KY 185	US 68 to KY 880/Gordon Ave.	16	2	1,569	14,800	E	4	2,995	23,700	B	24,600	B
	KY 880 to Double Springs Road	16	4	2,995	10,300	A	4	2,995	14,200	A	14,600	A
	Double Springs Rd. to Garvin Lane	16	2	1,569	10,100	C	2	1,569	14,200	F	14,600	F
	Garvin Lane to Butler Co. Line	7	2	1,344	10,600	E	2	1,344	13,700	F	14,000	F
KY 234	KY 961 to I-65	7	2	1,333	5,920	B	2	1,333	26,700	F	30,900	F
	I-65 to Hayes Lane	16	2	1,569	18,300	F	4	2,636	38,500	E	42,600	E
	I-65 to US 68 (Kentucky St.)	16	4	1,955	21,700	C	4	1,955	27,900	D	28,000	E
KY 255	KY 252 to US 68	8	2	1,421	556	A	2	1,421	3,000	A	3,400	A
	US 68 to US 31W	8	2	1,460	717	A	2	1,460	1,300	A	1,400	A
KY 259	US 68 to Edmonson Co. Line	8	2	1,381	204	A	2	1,381	1,000	A	1,000	A
	Warren Co. Line to US 31W	8	2	1,381	1,090	A	2	1,381	800	A	800	A
	US 31W to KY 101	8	2	1,381	1,480	A	2	1,381	1,500	A	1,500	A
	KY 101 to KY 70	6	2	1,381	4,710	B	2	1,381	8,200	C	12,300	F
KY 446	I-65 to US 31W	14	4	3,180	13,900	A	4	3,180	38,300	D	43,100	E
KY 880	KY 185 (Gordon Ave.) to KY 1435	16	4	3,108	13,100	A	4	3,108	22,500	B	22,700	B
	KY 1435 to US 231 (Morgantown Rd.)	6	2	1,569	11,800	E	2	1,569	20,400	F	20,200	F
	US 231 (Scottsville Rd.) to KY 234	17	2	1,569	12,800	F	4	2,660	19,100	C	22,900	C
KY 1297	KY 1402 to KY 101	8	2	1,381	839	A	2	1,381	1,100	A	1,000	A
	KY 101 to Barren Co. Line	8	2	1,381	857	A	2	1,381	1,400	A	1,400	A
	Warren Co. Line to KY 255	8	2	1,381	1,140	A	2	1,381	400	A	300	A
	KY 255 to KY 685	8	2	1,381	1,090	A	2	1,381	3,500	A	3,600	A
	KY 685 to US 31E	8	2	1,381	6,800	C	2	1,381	4,600	B	4,800	B
KY 1402	US 31W to I-65	16	2	1,381	3,870	A	2	1,381	9,300	C	9,000	C
	I-65 to KY 1297	8	2	1,381	2,840	A	2	1,381	3,700	A	4,400	A
	KY 1297 to KY 101	8	2	1,381	880	A	2	1,381	900	A	1,100	A

Source: Bernardin-Lochmueller & Associates, Inc.

Notes: (a) The highest average daily traffic (ADT) volume and worst LOS are shown for a segment when multiple values are available from the KYTC HIS. Shaded values fail to meet minimum acceptable LOS C for rural areas and LOS D for urban areas. KYTC's *Highway Design Policy* – "Geometric Design Guidelines" (p. 13) cites Chapter 2 in AASHTO's *A Policy on Geometric Design of Highways and Streets* – see pages 84 and 85 (2000 edition).

Notes (continued): (b) Functional Class

Functional Class	K-factor (peak hour % of ADT)	D-factor (directional split)
1 = rural interstate	10.6%	58%
2 = rural principal arterial	11.0%	57%
6 = rural minor arterial	11.5%	55%
7 = rural major collector	11.5%	60%
8 = rural minor collector	11.5%	60%
11 = urban interstate	10.4%	58%
12 = urban other freeway	10.7%	59%
14 = urban principal arterial	10.4%	59%
16 = urban minor arterial	10.2%	57%
17 = urban collector	12.7%	56%

Source: *Kentucky Transportation Cabinet Year 2000 Highway Performance Monitoring System Traffic Factors* (June 1, 2001)

(c) Existing hourly capacity at service flow for level-of-service E as reported in KYTC Highway Information System. For 2-lane facilities, the cited capacity is for both directions. For 4 or more lane facilities, the cited capacity is for one direction only.

(d) KYTC Highway Information System hourly capacity for level terrain (3,880 vph) replaced by hourly capacity for rolling terrain (2,940 vph).

(e) Level-of-Service versus V/C ratio comparison:

	Rural V/C Ratio					Urban V/C Ratio			
LOS	FC=1 4-lane	FC=2	FC=6	FC=7	FC=8	FC=11/12 4-lane	FC=14	FC=16	FC=17
A	0.295	0.301	0.303	0.371	0.371	0.295	0.293	0.289	0.275
B	0.473	0.507	0.507	0.528	0.528	0.473	0.496	0.492	0.471
C	0.704	0.705	0.704	0.730	0.730	0.704	0.699	0.695	0.667
D	0.887	0.842	0.838	0.854	0.854	0.887	0.835	0.835	0.814
E	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
F	>1.000	>1.000	>1.000	>1.000	>1.000	>1.000	>1.000	>1.000	>1.000

Source: Bernardin-Lochmueller & Associates from *Highway Capacity Manual*

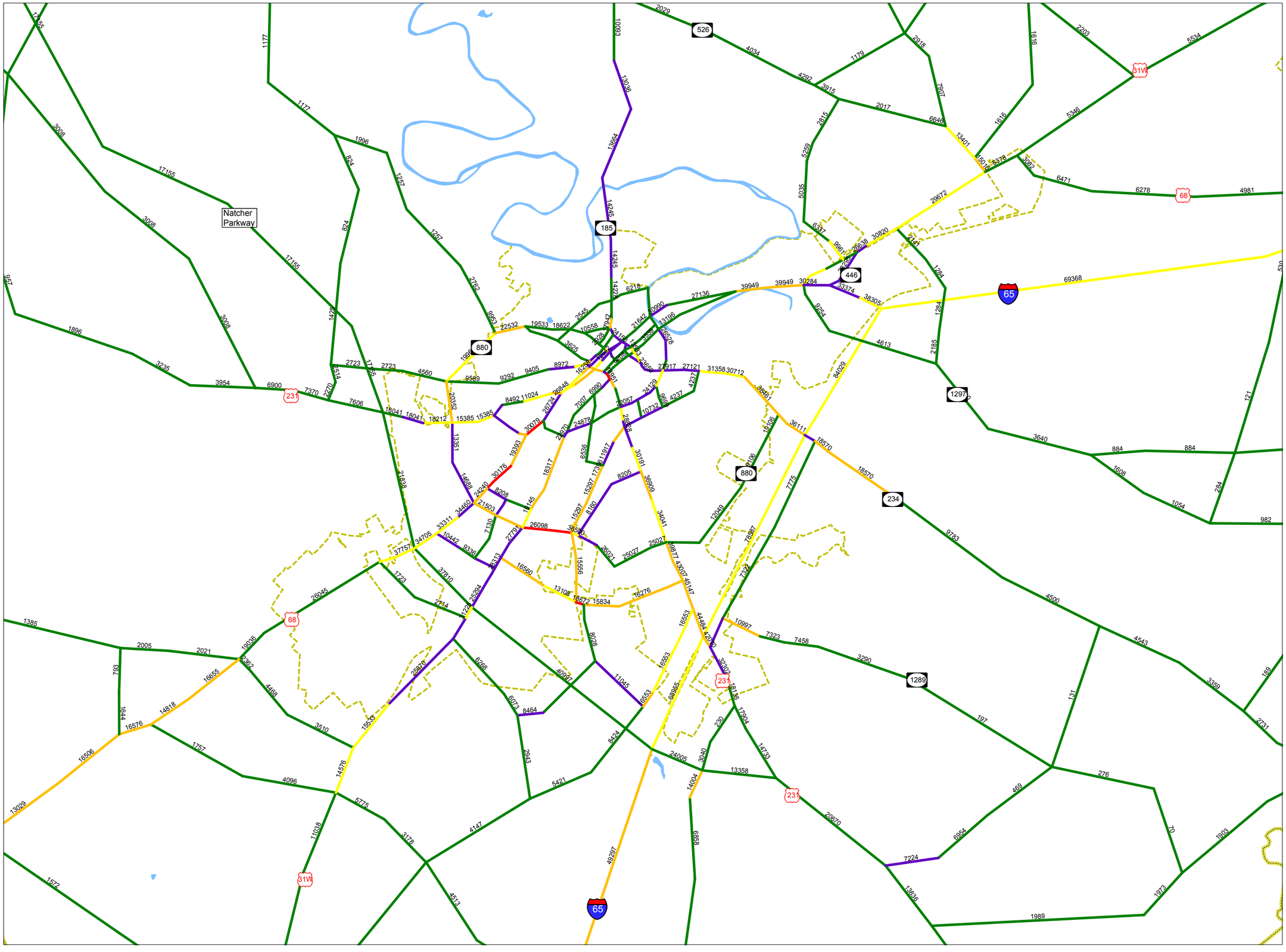


Figure 14

Year: 2030
Kentucky Statewide Traffic Model
Growth Scenario

Regional Travel Model Forecast for No Build (Existing + Committed) Network

Bowling Green Blowup

Daily Travel Model Traffic Assignment Shown

Map Legend

Map Layers
- Census Place (2000)
- Water Area
- County (High)
- State (High)
- EC30BASE

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 .7 1.4 2.1
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

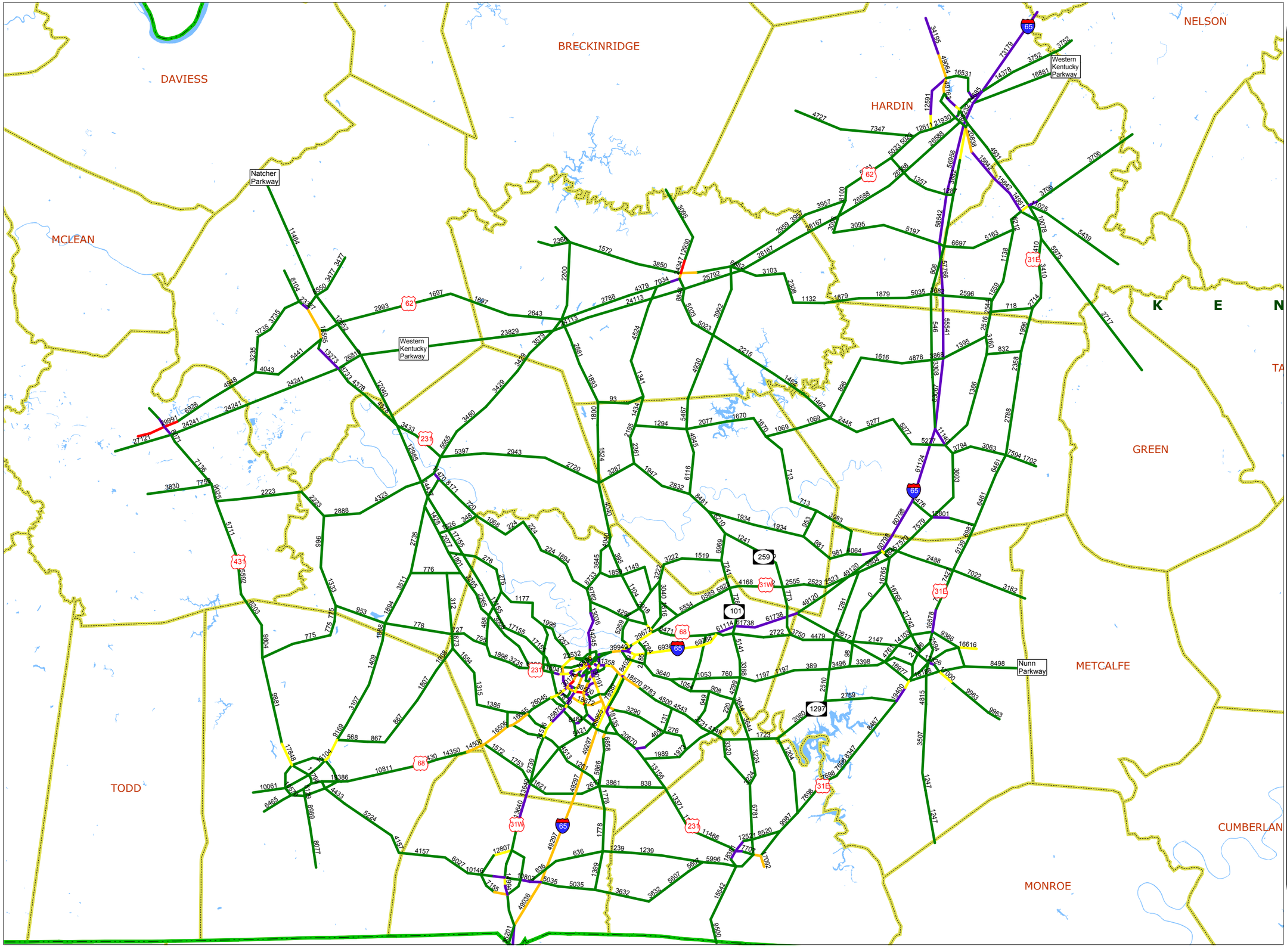


Figure 15

Year: 2030 Kentucky Statewide Traffic Model Growth Scenario

Regional Travel Model Forecast for No Build (Existing + Committed) Network

Daily Travel Model Assignment Shown

Map Legend

Map Layers
- Water Area
- County (High)
- State (High)
- EC30BASE

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 4 8 12
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

Figure 16

Year: 2030
State Data Center
Growth Scenario

Regional Travel Model Forecast for No Build (Existing + Committed) Network

Bowling Green
Blowup

Daily Travel Model
Assignment Shown

Map Legend

Map Layers
- Census Place (2000)
- Water Area
- County (High)
- State (High)
- Network

VC Ratio (LOS C Caps)
- LOS C (< 1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 .7 1.4 2.1
Miles

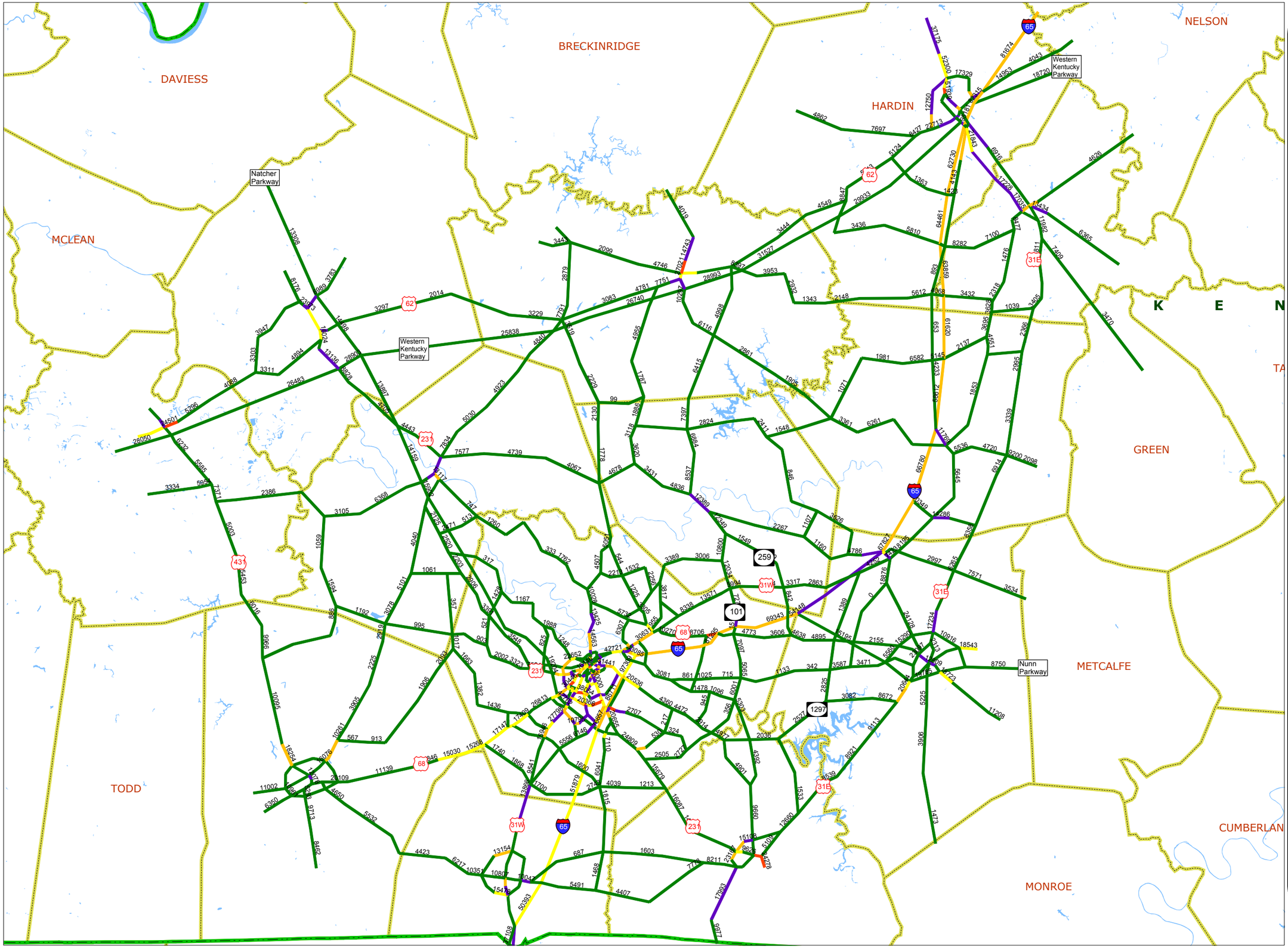
BERNARDIN LOCHMUELLER & ASSOCIATES, INC

Figure 17

Year: 2030
State Data Center
Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 2

Daily Travel Model Assignment Shown



Map Legend

Map Layers
- Water Area
- County (High)
- State (High)
- Network

VC Ratio (LOS C Caps)
- LOS C (< 1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 4 8 12
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

I-65: This means that I-65 would have to be widened to at least eight lanes to achieve LOS C (less than 95,680 vehicles per day) in rural areas and LOS D (less than 113,390 vehicles per day) in urban areas, provided trucks are only 25 percent of the total daily traffic volume. At present, trucks represent 40 percent of the total daily traffic volume. If this high percent of trucks continues into the future, even eight lanes will not be sufficient to achieve a LOS D (less than 86,000 vehicles per day) on the urban stretch of I-65 between US 231 and KY 446.

US 31W: While the programmed four-laning of US 31W from Memphis Junction Road to US 231 (Campbell Lane) addresses year 2000 LOS E and F problems on this segment, year 2000 LOS E and F problems from KY 242 to Memphis Junction Road and from US 231 (Campbell Lane) to Business US 231 (University Drive) grow worse by the year 2030. Further, under the SDC Growth Scenario, US 31W drops to LOS E from the Simpson County Line to KY 240 and US 68 (Riverside Drive) to KY 446. From Jackson Grove Church Road to US 68, US 31W drops to LOS D in the year 2030 under both growth scenarios.

US 68/KY 80: Without programmed improvements, the two-lane segment of US 68/KY 80 from KY 880 (Campbell Lane) to Business US 231 (Morgantown Road) continues to experience LOS F into the future. Significant development along Russellville Road (US 68/KY 80) will begin to push the remaining two-lane segments from the Logan County Line to KY 1083 (Browning Road) toward LOS E in the year 2030. In the future, University Drive and the one-way pair of Adams Street/Kentucky Street (US 68/KY 80) from Old Morgantown Road to KY 234 (6th Avenue) also begin to experience LOS E and F operational problems.

US 231: While the programmed four-laning of US 231 (Scottsville Road) from KY 2629 (Old Scottsville Road to KY 622 (Plano Road) addresses existing operational problems for this segment, other segments of US 231 from KY 622 to KY 880 (Campbell Lane) experience greater congestion in the future. Further, the two-lane segment of Veterans Memorial Lane (US 231) from US 68 to Business US 231 (Morgantown Road) drops to LOS E in the future.

US 231 Business: The two-lane section of Morgantown Road (US 231) begins to experience future operational failure from US 68 (Russellville Road) to Veterans Memorial Lane (KY 880/US 231).

KY 185: While the four-laning of KY 185 (Veterans Memorial Lane) from US 68 (Kentucky Street) to Gordon Avenue improves operations over the year 2000, the remaining two-lane segments of KY 185 from Double Springs Road to the Butler County Line experience operational failure in the year 2030.

KY 234: Despite the programmed four-laning of KY 234 (Cemetery Road/Fairview Avenue) from I-65 to Haynes Lane, Cemetery Road/Fairview Avenue/6th-7th Avenue will experience LOS E and F conditions from east of I-65 to US 68 (Kentucky Street) in the future.

KY 446: Finally, KY 446 drops to LOS D under the KySTM growth scenario and to LOS E under the SDC growth scenario by the year 2030.

E. Alternatives Evaluation Traffic Considerations for I-66

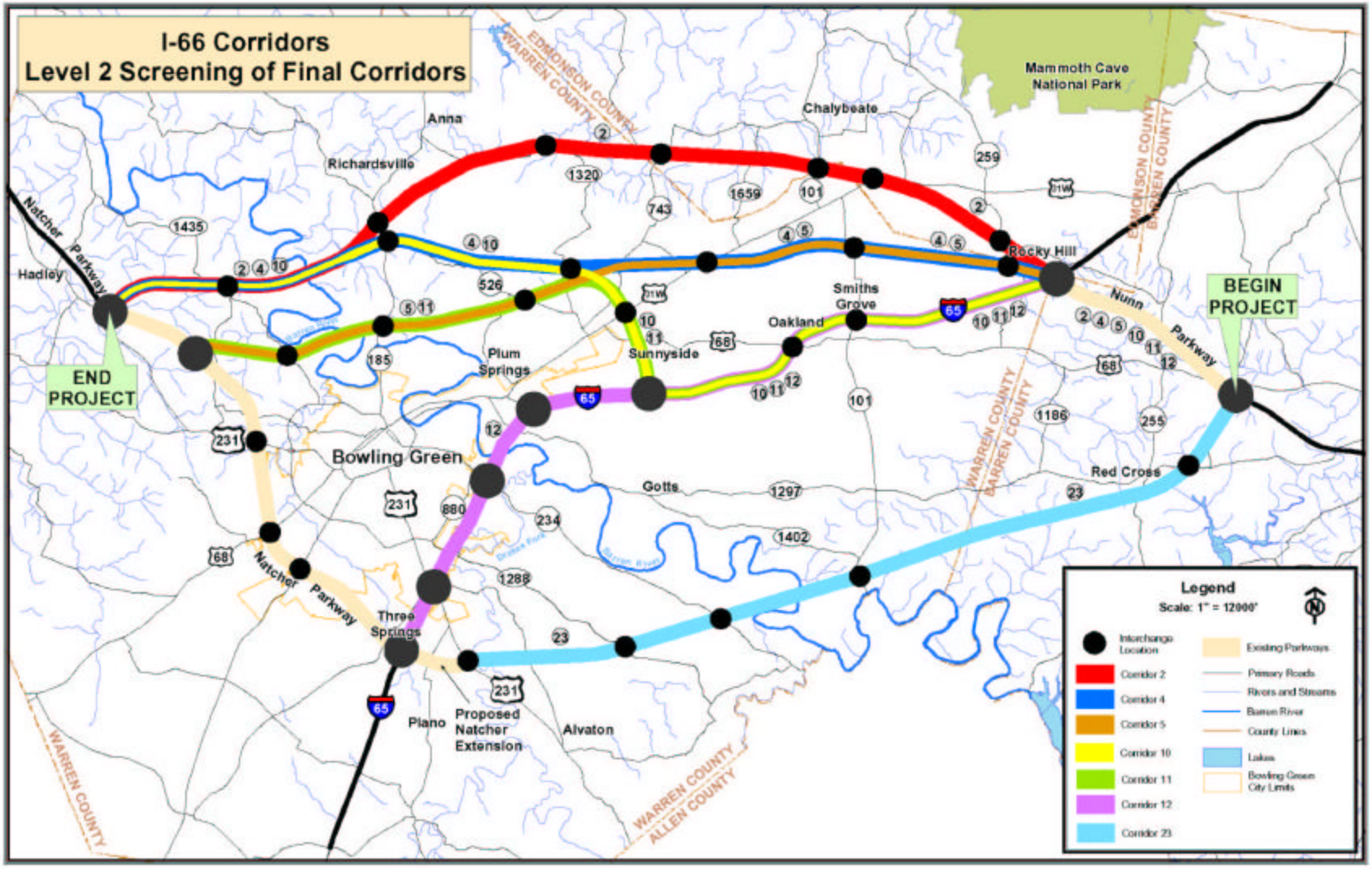
1. Alternatives

During the study, a first-level screening process was used to reduce the number of I-66 Alternate Corridors from 23 to 7, and the number of Outer Beltline Corridors was reduced from 8 to 4. The first-level screening involved a qualitative review of the alternative corridors relative to project goals, environmental issues, engineering and traffic issues, and public and review agency input. From a traffic issues standpoint, corridors were eliminated in the first-level screening for the failure to offer significantly shorter travel distances than the No Build Corridor or other Build Corridors; for connectivity problems due to the proximity of I-65 system interchanges between the Nunn Parkway and I-66; and for being too far from Bowling Green to divert traffic from congested arterials. The build alternatives are represented as four-lane freeways in the Regional Travel Model with interchanges as described. Where the I-66 corridor coincides with any portion of existing I-65, I-65 is coded in the model as a ten-lane freeway (except for the No Build Alternative). (A ten-lane freeway is assumed to determine the maximum environmental impact and to avoid problems of freeway capacity restraint. This also avoids the need to make front-end assumptions about the future peak-hour distribution of traffic, the directional split of traffic, and the vehicle mix of traffic. This does not mean a ten-lane freeway is being recommended. Please refer to page 59 for an examination of the number of lanes required based on traffic characteristic assumptions.) The Alternate I-66 Corridors are displayed in Figure 18.

No Build Corridor. The No Build Alternative is represented by the "existing-plus-committed" roadway network. This network includes major transportation improvements programmed for a phase beyond planning in the KYTC 2000 Six Year Highway Plan or 2002 Six Year Highway Plan. The most significant improvements are the widening of I-65 to six lanes between the Natcher Parkway and Nunn Parkway, the reconstruction of bridges to accommodate future widening to eight lanes, and the acquisition of right-of-way to accommodate future widening to eight lanes. The existing travel path distance is 43.7 miles from the Nunn Parkway at the US 68 grade-separation to the Natcher Parkway at the KY 626 grade-separation near Hadley.

Corridor 2. This corridor begins on the Nunn (Cumberland) Parkway at its grade-separation with US 68 near Glasgow and follows the Nunn Parkway to the I-65/Nunn Parkway interchange. At this point, it proceeds northwesterly on a new location, crossing US 31W near Dripping Spring before climbing the escarpment near KY 101. The corridor then continues in a westerly direction to parallel KY 1320, before taking a turn toward the southwest near San Hill. The corridor crosses KY 185 near its intersection with KY 526, crossing the Barren River at about the 19.0 mile marker and KY 1435 near the Barren River Fire Station #2 before connecting with the Natcher Parkway near Hadley. The total length of this corridor is 35.4 miles, with 29.5 miles of new location. This corridor could involve reconfiguration of the existing I-65/Nunn Parkway system interchange, seven possible new service interchanges (KY 259, US 31W, KY 101, KY 743, KY 1320, KY 185 and KY 1435), and a new system interchange with the Natcher Parkway.

Corridor 4. This corridor begins on the Nunn (Cumberland) Parkway at its grade-separation with US 68 near Glasgow and follows the Nunn Parkway to the I-65/Nunn Parkway interchange. At this point, it proceeds west It then proceeds west-southwest to cross the Barren River at about the 19.0 mile-marker and KY 1435 near the Barren River Fire Station #2 before connecting with the Natcher Parkway near Hadley. and KY 1435 near the Barren River Fire Station #2 before connecting with the Natcher Parkway near Hadley.



Source: Bernardin-Lochmueller & Associates, Inc.

Figure 18: Final I-66 Corridors

The total length of this corridor is 34.1 miles, with 28.2 miles of new location. This corridor could involve reconfiguration of the existing I-65/Nunn Parkway system interchange, six possible new service interchanges (KY 259, KY 101, US 31W, KY 526, KY 185 and KY 1435), and a new system interchange with the Natcher Parkway.

Corridor 5. This corridor begins on the Nunn (Cumberland) Parkway at its grade-separation with US 68 near Glasgow and follows the Nunn Parkway to the I-65/Nunn Parkway interchange. At this point, it proceeds west-northwesterly on new location, crossing KY 101 north of Smiths Grove and US 31W near Tuckertown. Unlike Corridors 2, this corridor remains in the sinkhole plain and does not climb the escarpment. The corridor then continues in a westerly direction, before turning southwest to intersect KY 526, near its intersection with KY 957. It then proceeds west-southwesterly to cross KY 185 near its crossing of the Barren River and continues to its own crossing of the Barren River at about the 26.0 mile marker. The corridor continues west to connect with the Natcher Parkway south of Hadley near the KY 2665 bridge over the Natcher and follows the Natcher Parkway to the vicinity of Hadley. The total length of this corridor is 34.9 miles, with 24.3 miles of new location. This corridor could involve reconfiguration of the existing I-65/Nunn Parkway system interchange, six possible new service interchanges (KY 259, KY 101, US 31W, KY 526, KY 185 and KY 1435), and a new system interchange with the Natcher Parkway.

Corridor 10. This corridor begins on the Nunn (Cumberland) Parkway at its grade-separation with US 68 near Glasgow and follows the Nunn Parkway to the I-65/Nunn Parkway interchange. At this point, it follows along I-65 for approximately 12 miles to the vicinity of Sunnyside-Gotts Road before proceeding northerly on a new location. This corridor is in the general vicinity of the Kentucky Trimodal Transpark development and crosses US 68/KY 80 near Sunnyside and US 31W near Warren East High School. The corridor then continues in a westerly direction to parallel KY 526 and crosses KY 185 near its intersection with KY 526. It then proceeds west - southwest to cross the Barren River at about the 19.0 mile marker and KY 1435 near the Barren River Fire Station #2, before connecting with the Natcher Parkway near Hadley. The total length of this corridor is 36.9 miles, with 18.9 miles of new location and 12.1 miles of I-65 widening. This corridor would use existing interchanges along I-65 at the Nunn Parkway, KY 101 and US 68, and it could involve two possible new system interchanges (one on I-65 west of the Sunnyside-Gotts Road overpass and on the Natcher Parkway south of Gasper River) and four possible new service interchanges (US 31W, KY 1320, KY 185 and KY 1435).

Corridor 11. This corridor begins on the Nunn (Cumberland) Parkway at its grade-separation with US 68 near Glasgow and follows the Nunn Parkway to the I-65/Nunn Parkway interchange. At this point, it utilizes I-65 for approximately 12 miles to the vicinity of Sunnyside-Gotts Road before proceeding northerly on a new location. This corridor is in the general vicinity of the Kentucky Trimodal Transpark development and crosses US 68/KY 80 near Sunnyside and US 31W near Warren East High School. The corridor then continues in a westerly direction before turning southwest to intersect KY 526, near its intersection with KY 957. It then proceeds west-southwesterly to cross KY 185 near its crossing of the Barren River and continues to its own crossing of the Barren River at about the 26.0 mile marker. The corridor continues to the west to connect with the Natcher Parkway south of Hadley near the KY 2665 bridge over the Natcher and follows the Natcher Parkway to the vicinity of Hadley. The total length of this corridor is 37.7 miles, with 15.0 miles of new location and 12.1 miles of I-65 widening. This corridor would use existing interchanges along I-65 at the Nunn Parkway, KY 101 and US 68, and it could involve two possible new system interchanges (one on I-65 west of the Sunnyside-Gotts Road overpass and on the Natcher Parkway south of Gasper River) and four possible new service interchanges (US 31W, KY 1320, KY 185 and KY 1435).

Corridor 12. This corridor can best be described as the "Improvement of Existing Routes" corridor since it utilizes the Nunn (Cumberland) Parkway, I-65 and the Natcher Parkway. It begins on the Nunn (Cumberland) Parkway at its grade-separation with US 68 near Glasgow and follows the Nunn Parkway to the I-65/Nunn Parkway interchange. At this point, it is located along I-65 for approximately 23 miles to the I-65/Natcher Parkway interchange. This corridor would likely include the widening of I-65 to accommodate I-66 traffic, as well as the traffic using I-65. The corridor then continues in a northwesterly direction along the Natcher Parkway to the vicinity of Hadley. The total length is 43.7 miles, with 22.6 miles of additional lanes on I-65.

Corridor 23. This corridor begins on the Nunn (Cumberland) Parkway at its grade-separation with US 68 near Glasgow and proceeds southwesterly on a new location generally parallel to KY 685. In an effort to avoid the sinkhole plain south of I-65, the corridor intersects KY 1297 between Red Cross and Beckton and continues in a southwesterly direction to cross the Barren River, just downstream of Martinsville Ford at about the 58.0 mile marker. It then turns to the west, crossing Drake's Creek and connecting with the Natcher Parkway Extension south of Bowling Green at US 231. The corridor is then located along the Natcher Extension and Natcher Parkway for approximately 17 miles to the vicinity of Hadley. The total length of this corridor is 39.9 miles, with 22.8 miles of new location. This corridor could involve a possible new system interchange at the Nunn Parkway near US 68, four possible new service interchanges (KY 1297, KY 101, KY 234, and KY 1288), and a connection to the Natcher Parkway Extension/US 231 interchange (currently under design).

2. Traffic Considerations

I-66 Project Goals. A reduction in the congested vehicle-hours of travel (VHT) on I-65 between the Nunn Parkway and the Natcher Parkway over the No Build Alternative measures the traffic achievement of I-66 Goal 1 ("Support I-66 across southern Kentucky to carry out the legislative intent of ISTEA, the NHS Act of 1995, and the Transportation Equity Act for the 21st Century.") and I-66 Goal 2 ("Provide an improved interstate facility between the Natcher Parkway and the Nunn Parkway so that I-66 will be continuous from West Virginia to Missouri."). The highest average daily traffic (ADT) volume remaining on I-65 between the Nunn Parkway and the Natcher Parkway is an indicator of the level of congestion remaining on I-65 and establishes whether or not I-65 must be widened further in addition to the current I-65 improvement. The highest ADT volume on any common segment of I-65 and I-66 indicates whether or not the widening of I-65 to ten lanes is necessary for any common route for I-65 and I-66. Congested speed on the build alternative is also an indicator of improved performance over the No Build Alternative.

For the eight-laning of I-65 in Warren County, thresholds have been established at 95,680 ADT for LOS C and 113,930 ADT for LOS D, in consultation with the District Pre-Construction Engineer at a Project Team meeting. These LOS thresholds are based on a freeway in rolling terrain with a free-flow speed of 70 mph, peak-hour percent of daily traffic (K-factor) of 9%, directional distribution (D-factor) of 55% and 25% trucks using the *Highway Capacity Manual* (2000 edition). Historical traffic counts on the section of I-65 from the Natcher Parkway to the Nunn Parkway have exhibited a K-factor of 6.3% to 8.5%, a D-factor of 51% to 55%, and a percent of trucks from 24.1% to 40.1%. Of the nine vehicle classification counts along this section of I-65 over time, only two counts were around 40% trucks; one count was 30% trucks; and the other six counts were 28% trucks or less. When traffic forecasts were prepared for the widening of I-65 in Warren County, the percent of trucks ranged from 28% to 31% for the day

and 19% to 21% for the design hour.[10] While the KYTC Traffic Forecasting Report (August, 2002) records a K-factor of 10.3% and D-factor of 58% as the statewide average for rural interstates, historical traffic counts shown a lower K-factor and D-factor, even in recent years.

A regional reduction in the congested vehicle-hours of travel (VHT) and vehicle-miles of travel (VMT) for all vehicles and trucks over the No Build Alternative measures the traffic achievement of I-66 Goal 3 ("Provide improved access in southern Kentucky to jobs, industry, urban centers, educational institutions, tourism, and recreation facilities.") and I-66 Goal 4 ("Provide an efficient means of transporting people and goods.") Because the addition of any new roadway is assumed to add to the total VMT of a no build alternative, the less the increase in VMT for a build alternative, the better the build alternative. The average ADT on any new roadway and the highest ADT of any segment of the new roadway are indicators of the effectiveness of the new facility.

Local and Regional Objectives. In addition to I-66 project goals, the effectiveness in satisfying local and regional objectives is also a traffic consideration. Reduction in vehicle-miles of travel (VMT) and congested vehicle-hours of travel (VHT) on non-freeway arterial and collector streets in Warren County over the No Build Alternative is an indicator of the effectiveness in diverting local traffic from congested roadways and attracting greater traffic to freeways which have lower accident rates (crashes per 100 million vehicle-miles of travel).

A reduction in congested vehicle-hours of travel (VHT) and vehicle-miles of travel (VMT) in Warren and Edmonson Counties and a reduction in the VHT and VMT for trucks in Warren and Edmonson Counties over the No Build Alternative determines the effectiveness of a build alternative in reducing user costs. Because truck travel time and vehicle-operating costs are greater than automobiles, truck VHT is the best indicator of travel time savings and truck VMT is the best indicator of a reduction or least increase in vehicle-operating costs.

Relative to providing better access to Edmonson County, a reduction in vehicle-miles of travel (VMT) and congested vehicle-hours of travel (VHT) for trucks and automobiles in Edmonson County is the best traffic performance measure.

3. Traffic Considerations Evaluation

For the comparison of the alternatives, the Regional Travel Model was run for the No Build Alternative for the KySTM and SDC growth scenarios for the year 2030, and the results reported in Tables 19 through 24 (at end of the report). The criteria in these tables are explained in the section above. Each alternative is ranked from best ("1") to worst for each criterion. For the build alternatives, the Regional Travel Model was run for each Corridor for the higher SDC growth scenario (Figures 20 through 33 at the end of the report).

I-66 Corridor Level 2 Screening Traffic Evaluation.

Average Daily Traffic (ADT): Referring to Tables 18 and 19, I-66 Corridors closer to the north side of Bowling Green and closer to I-65 carry the highest average daily traffic volumes (daily travel model traffic assignments). Significant findings are as follows:

- Corridor 5 has the highest ADT volume at 17,260 vehicles per day (vpd).

[10] Intra-Departmental Memo on Warren County Traffic Forecasts for I-65 for MP 20-29 from Bruce Siria, Director, Division of Transportation Planning to John Sacksteder, Director, Division of Highway Design, dated April 10, 1998.

- The segment of Corridor 5 between the proposed KY 526 and KY 185 interchanges has the highest segment volume at 23,698 vpd.
- Corridor 11 has the second highest ADT volume at 17,144 vpd.
- Corridor 23 is the third highest at 15,594 vpd.
- Corridor 2 has the least ADT volume at 10,663 vpd, and it has only 12,665 vpd on the highest volume segment.

Level of Service (LOS): Corridor 23 appears to be the most effective in diverting traffic from existing I-65 between the Nunn and Natcher Parkways. The highest ADT volume (daily travel model traffic assignment) along I-65 between the Nunn and Natcher parkways is in the segment between the KY 234 (Cemetery Road) and KY 446. Significant findings are as follows:

- Corridor 23 leaves a residual volume of 89,632 vpd compared to 97,309 vpd for the No Build Alternative, so that a LOS C (equal or less than 95,680 vpd, as described on page 59) may be achieved if existing I-65 is widened to eight lanes.
- The six-lane I-65 may achieve LOS C at 53,172 vpd, LOS D at 64,505 vpd and LOS E at 86,920 vpd (based on a freeway with rolling terrain, 9% K-factor, 55% D-factor and 25% trucks). Thus, the No Build Alternative with existing I-65 at six lanes results in LOS F for this segment.
- Paralleling a significant portion of I-65 from the Nunn Parkway to KY 446, Corridor 5 is the second most effective in diverting traffic from existing I-65.

However, it would appear that no I-66 Corridor alone diverts sufficient traffic from I-65 to avoid the widening of I-65 to eight-lanes within existing right-of-way by the year 2030.

Corridor 12 would involve the widening of existing I-65 to ten lanes from the Nunn Parkway to the Natcher Parkway. Significant findings for Corridor 12 are as follows:

- Year 2030 traffic assignments to Corridor 12 result in a high of 103,073 ADT (daily travel model traffic assignment) on the urban segments between the Natcher Parkway and KY 446 and a high of 85,738 ADT (daily travel model traffic assignment) on the rural segments east of KY 446.
- If I-65 were widened to only eight lanes from the Nunn Parkway to the Natcher Parkway, LOS C may be achieved on all urban and rural segments except for the urban segment between KY 234 and KY 446 where only a LOS D may be achieved.
- Thus, widening I-65 to eight lanes may achieve the minimum acceptable LOS D for urban areas and LOS C for rural areas. However, I-65 must be widened to ten lanes to achieve a LOS B in rural areas and C in urban areas between the Nunn Parkway and the Natcher Parkway suggested in AASHTO guidelines.[11]

In addition to Corridor 12, Corridors 10 and 11 would also use a portion of existing I-65 between the Nunn Parkway and their new alignment west of the US 68 interchange. Findings for Corridors 10 and 11 are as follows:

- The highest volume segment on the common route for I-65 and I-66 is west of the US 68 interchange – 87,233 vpd for Corridor 10 and 85,900 vpd for Corridor 11.
- While a LOS B may be achieved if the common route for I-65/I-66 is widened to ten lanes, LOS C may be achieved if I-65 is widened to eight lanes within existing right-of-way between the Nunn Parkway and the new alignment west of the US 68 interchange.

[11] AASHTO's *A Policy on Geometric Design of Highways and Streets* (2000 edition), Exhibit 2-32, page 85.

F. Alternatives Evaluation Traffic Considerations for the Bowling Green Outer Beltline

1. Alternatives

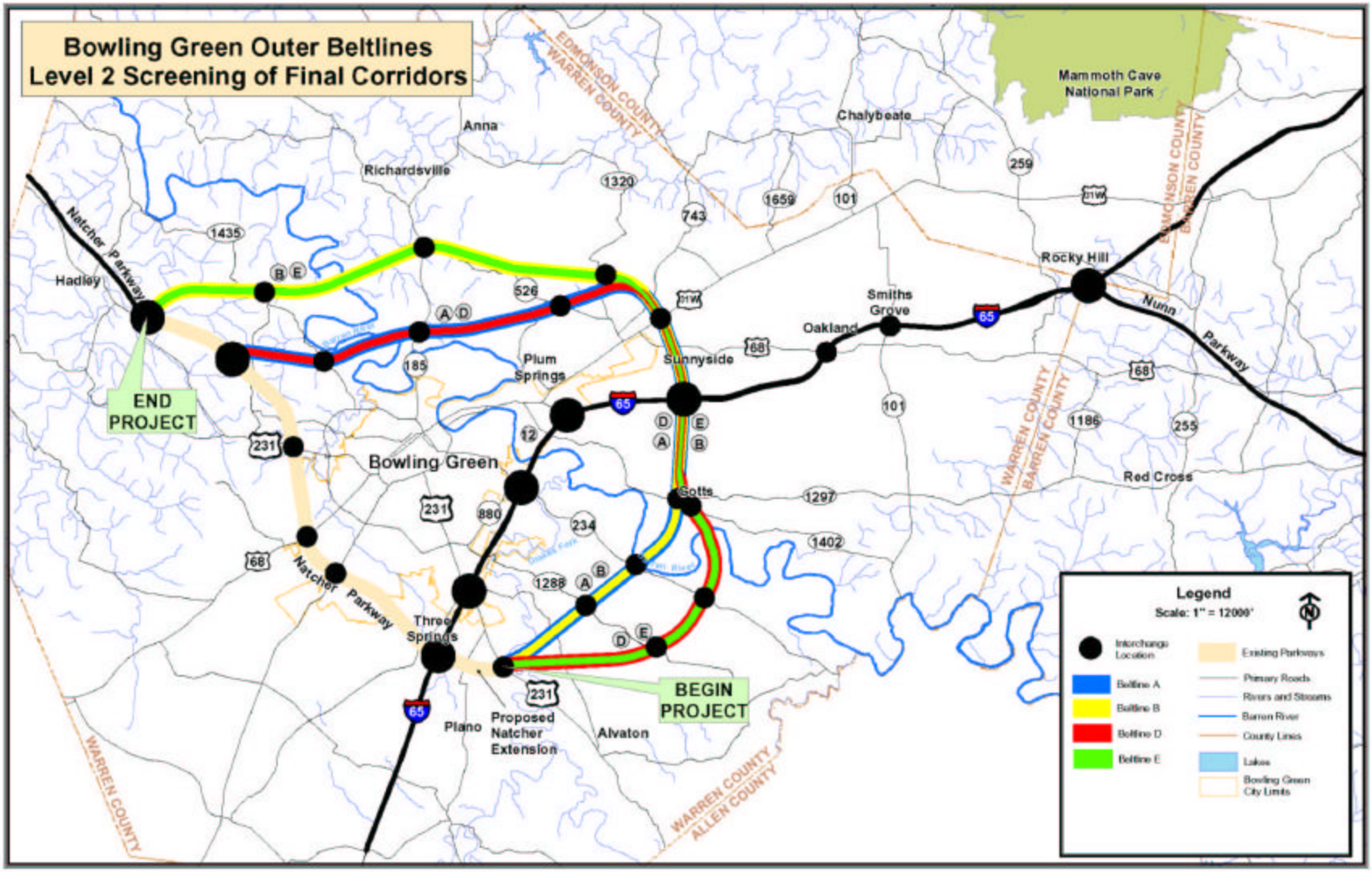
During the study, a first-level screening process was used to reduce the number of Outer Beltline Corridors from 8 to 4. This involved a qualitative review of alternative corridors relative to project goals, environmental issues, engineering and traffic issues, and public and review agency input.

From a traffic standpoint, corridors were eliminated in the first-level screening for the failure to offer significantly shorter travel distances than the No Build Corridor or other Build Corridors; for connectivity problems; and for being too far from Bowling Green to divert traffic from congested arterials. Build alternatives are represented as four-lane freeways in the Regional Travel Model. The Alternate Outer Beltline Corridors are displayed in Figure 19.

No Build Corridor. The No Build Alternative is represented by the "existing-plus-committed" roadway network. This network includes major transportation improvements programmed for a phase beyond planning in the KYTC *2000 Six Year Highway Plan* or *2002 Six Year Highway Plan*. The most significant improvements are the widening of I-65 to six lanes between the Natcher Parkway and Nunn Parkway, the reconstruction of bridges to accommodate future widening to eight lanes, and the acquisition of right-of-way to accommodate future widening to eight lanes. The existing travel path distance is 43.7 miles from the Nunn Parkway at the US 68 grade-separation to the Natcher Parkway at the KY 626 grade-separation near Hadley.

Corridor A. This corridor begins at the Natcher Parkway Extension south of Bowling Green at US 231 and proceeds northeast on new location, crossing Drake's Creek. It continues in a northeasterly direction to a crossing of the Barren River at about the 48.0 mile marker. The corridor then curves to the north near its intersection with KY 1297 in the vicinity of Gotts and then toward the vicinity of the Sunnyside-Gotts Road bridge over I-65. This corridor could utilize the same interchange as a planned roadway to connect I-65 with US 31W in the vicinity of the Kentucky Trimodal Transpark development. Continuing north, the corridor crosses US 68/KY 80 near Sunnyside and US 31W near Warren East High School before curving southwest to KY 526 near its intersection with KY 957. It then proceeds west-southwesterly to cross KY 185 near its crossing of the Barren River and continues to its own crossing of the Barren River at about the 26.0 mile marker. The corridor continues to the west to connect with the Natcher Parkway south of Hadley near the KY 2665 bridge over the Natcher Parkway. The total length of this corridor is 23.9 miles. This corridor could involve a connection to the Natcher Parkway Extension/US 231 interchange (currently under design), two possible new system interchanges (I-65 west of Sunnyside-Gotts Road and the Natcher Parkway near KY 2665), and seven possible new service interchanges (KY 1297, KY 234, KY 1297, US 31W, KY 526, KY 185, and KY 1435).

Corridor B. This corridor begins at the Natcher Parkway Extension south of Bowling Green along US 231 and proceeds to the northeast on a new location, crossing Drake's Creek. It continues northeast to a crossing of the Barren River at about the 48.0 mile marker. The corridor then curves to the north near its intersection with KY 1297 in the vicinity of Gotts and continues north toward the vicinity of the Sunnyside-Gotts Road bridge over I-65. This corridor could utilize the same interchange as a planned roadway to connect I-65 with US 31W in the vicinity of the Kentucky Trimodal Transpark development.



Source: Bernardin-Lochmueller & Associates, Inc.

Figure 19: Final Outer Beltline Corridors

Continuing north, the corridor crosses US 68/KY 80 near Sunnyside and US 31W near Warren East High School before curving west to parallel KY 526. It crosses KY 185 near its intersection with KY 526 and then proceeds west-southwest to cross the Barren River at about the 19.0 mile marker and KY 1435 near the Barren River Fire Station #2 before connecting with the Natcher Parkway near Hadley. The total length of this corridor is 28.3 miles. This corridor could involve a connection to the Natcher Parkway Extension/US 231 interchange (currently under design), two possible new system interchanges (I-65 west of Sunnyside-Gotts Road and the Natcher Parkway near KY 2665), and seven possible new service interchanges (KY 1297, KY 234, KY 1297, US 31W, KY 1320, KY 185, and KY 1435).

Corridor D. This corridor begins at the Natcher Parkway Extension south of Bowling Green along US 231 and proceeds to the east on a new location, crossing Drake's Creek. Just before crossing KY 234 (Cemetery Road), it curves to the north and crosses the Barren River at about the 51.0 mile marker. At this point, the corridor continues to the north intersecting with KY 1297 in the vicinity of Gotts and proceeds toward the vicinity of the Sunnyside-Gotts Road bridge over I-65. This corridor could utilize the same interchange as a planned roadway to be constructed to connect I-65 with US 31W in the general vicinity of the Kentucky Trimodal Transpark development. Continuing north, the corridor crosses US 68/KY 80 near Sunnyside and US 31W near Warren East High School before curving southwest to intersect KY 526 near its intersection with KY 957. It then proceeds west-southwesterly to cross KY 185 near its crossing of the Barren River and continues to its own crossing of the Barren River at about the 26.0 mile marker. The corridor continues to the west to connect with the Natcher Parkway south of Hadley near the KY 2665 bridge over the Natcher Parkway. The total length of this corridor is 26.5 miles. This corridor could involve a connection to the Natcher Parkway Extension/US 231 interchange (currently under design), two possible new system interchanges (I-65 west of Sunnyside-Gotts Road and the Natcher Parkway near KY 2665), and seven possible new service interchanges (KY 1297, KY 234, KY 1297, US 31W, KY 526, KY 185, and KY 1435).

Corridor E. This corridor begins at the Natcher Parkway Extension south of Bowling Green along US 231 and proceeds to the east on new location, crossing Drake's Creek. Just before crossing KY 234 (Cemetery Road), it curves to the north and crosses the Barren River at about the 51.0 mile marker. At this point, the corridor continues to the north intersecting with KY 1297 in the vicinity of Gotts and proceeds toward the vicinity of the Sunnyside-Gotts Road bridge over I-65. This corridor could utilize the same interchange as a planned roadway to connect I-65 with US 31W in the general vicinity of the Kentucky Trimodal Transpark development. Continuing north, the corridor crosses US 68/KY 80 near Sunnyside and US 31W near Warren East High School before curving in a westerly direction to parallel KY 526. It crosses KY 185 near its intersection with KY 526 and then proceeds west-southwest to cross the Barren River at about the 19.0 mile marker and KY 1435 near the Barren River Fire Station #2 before connecting with the Natcher Parkway near Hadley. The total length of this corridor is 31.0 miles. This corridor could involve a connection to the Natcher Parkway Extension/US 231 interchange (currently under design), two possible new system interchanges (I-65 west of Sunnyside-Gotts Road and the Natcher Parkway near KY 2665), and seven possible new service interchanges (KY 1297, KY 234, KY 1297, US 31W, KY 1320, KY 185, and KY 1435).

2. Traffic Considerations

This section describes the relation between project goals and traffic considerations identifying the transportation performance measures from the Regional Travel Model runs that were used for the evaluation of alternatives. These transportation measures are only one of several considerations in the evaluation of alternatives.

Outer Beltline Project Goals. Relative to the Bowling Green Outer Beltline Goals, a reduction of vehicle-miles of travel (VMT) and congested vehicle-hours of travel (VHT) for all vehicle types in Warren County over the No Build Alternative measures the effectiveness of achieving Goal 1 ("Accommodate the transportation needs of the Bowling Green urban area by completing an Outer Beltline – an access controlled freeway with interchanges that is consistent with the 2000 Bowling Green Urban Transportation Study.").

A reduction in vehicle-miles of travel (VMT) and congested vehicle-hours of travel (VHT) on arterial and collector streets in Warren County measures the effectiveness of achieving Goal 2 ("Reduce current and future traffic congestion on the highways and streets in Warren County by diverting traffic to a new freeway facility."). The average ADT on any new roadway and the highest ADT of any segment of the new roadway are indicators of the effectiveness of the new facility.

A reduction of vehicle-miles of travel (VMT) and congested vehicle-hours of travel (VHT) for all vehicle types in Warren County and a reduction in congested vehicle-hours of travel on non-freeway arterial and collector streets in Warren County measures the effectiveness of achieving Goal 3 ("Strengthen the regional highway system by improving the connections between major highways and streets in the region.").

Finally, a reduction of vehicle-miles of travel (VMT) and congested vehicle-hours of travel (VHT) for trucks and autos in Warren County measures the effectiveness of achieving Goal 4: ("Provide better access to major employment centers, regional commercial centers, major education and health facilities, and regional recreation facilities in Warren County.").

3. Traffic Considerations Evaluation

For the comparison of the alternatives, the Regional Travel Model was run for the No Build Alternative for the KySTM and SDC growth scenarios for the year 2030, and the results reported in Tables 19 through 24 (at the end of the report). The criteria in these tables is explained in the section above. Each alternative is ranked from best ("1") to worst for each criterion. For the build alternatives, the Regional Travel Model was run for each Corridor for the higher SDC growth scenario (Figures 34 through 41, at the end of the report).

Average Daily Traffic (ADT): As shown in Tables 19, 20, 21, 22 and 23 (at the end of the report), Outer Beltline Corridors closer to the Bowling Green urban area show better performance. Significant findings are as follows:

- Beltline A results in the highest average daily traffic volume at 16,006 ADT (daily travel model traffic assignment) with the segment between the KY 526 and KY 185 interchanges having the highest volume at 19,217 ADT (daily travel model traffic assignment) in the year 2030.
- Beltline A also diverts the greatest traffic from I-65, leaving 86,166 ADT on I-65 between KY 234 and KY 446.
- While the Outer Beltline Corridors are slightly more effective than the best I-66 Corridors in diverting traffic from the urban portion of I-65 between KY 446 and the Natcher Parkway, the residual traffic on existing I-65 still results in a LOS E for existing six-lane I-65.
- Beltline E attracts the least traffic and diverts the least traffic from existing I-65.

Congestion Relief: Reviewing Figures 34 through 41 and Table 23 (at the end of the report), the following observations can be made on the relief of congested facilities (facilities failing to meet minimum LOS standards for urban and rural areas) as compared to the No Build Alternative:

- None of the Outer Beltline Corridors diverts sufficient traffic from I-65 to achieve an acceptable LOS if I-65 remains at six lanes between the Natcher Parkway and the I-65/ northern Beltline interchange. All Outer Beltline Corridors can achieve a LOS C for the urban portion of I-65 if I-65 is widened to eight lanes within existing right-of-way.
- Beltlines A and D provide the greatest congestion relief to the northeast side of Bowling Green by improving the LOS on US 31W from Riverside Drive to US 68 and on KY 446 between US 31W and I-65 to an acceptable urban level. Beltlines B and E are too far north of Bowling Green to be as effective as Beltlines A and D in relieving congestion on the northeast side.
- Because of their proximity to the north side of Bowling Green, Beltlines A and D draw additional traffic onto KY 185 between Veterans Memorial Lane (KY 880) and the proposed KY 185 interchange, and this pushes the LOS to F on the two-lane segment of KY 185. The other Beltline Corridors are not as effective in drawing traffic onto KY 185 such that the LOS only drops from C to D.
- In general, congested facilities south of Bowling Green or inside the Inner Beltline formed by KY 880 are too far away from the alternative Beltline Corridors to get relief.

Average Daily Traffic (ADT): On the other hand, the portion of the Beltline Corridors between the Natcher Parkway and I-65 result in reductions in traffic on radials. The impact of the Beltlines on US 231 (Scottsville Road) southeast of I-65 is minor. Beltlines D and E result in an ADT volume of 500 to 1,000 vpd less than Beltlines A and B on US 231 between the Natcher Parkway and I-65. However, Beltlines A and B decrease traffic on:

- Old Scottsville Road (just east of Cumberland Trace) from 13,000 vpd (under the No Build Alternative) to 7,500 vpd; and
- Cemetery Road (KY 234 just east of Cumberland Trace) from 20,500 ADT (under the No Build Alternative) to 15,500 ADT.

Beltlines D and E result in more modest reductions to 11,500 vpd on Old Scottsville Road and 17,000 ADT on Cemetery Road.

Vehicle Hours of Travel (VHT): Referring to Table 21, Beltline A results in the greatest reduction in regional VHT, truck VMT, Warren County VHT, Warren County VHT on non-freeway facilities and Warren County truck VHT. Because Beltlines B and E are closer to Edmonson County, they are more effective than Beltlines A and D in reducing total VHT, truck VHT and VHT on non-freeway facilities in Edmonson County.

Vehicle Miles of Travel (VHT): Because Beltline A carries the greatest traffic, it results in the greatest Beltline VMT (see Table 22). The Outer Beltline Corridors are nearly equal for the increase in regional VMT and regional truck VMT. For Warren County, Beltline A results in the greatest decrease in total VMT and truck VMT, and is the best in diverting VMT from non-freeway facilities. Beltline E is the least effective. For Edmonson County, Beltline B results in the greatest decrease in total VMT and truck VMT, and is best in diverting VMT from non-freeway facilities.

All Traffic Considerations: Examining all of the traffic considerations, findings are as follows:

- Beltline A is the best if greater weight is given to regional and Warren County service than Edmonson County service.
- Beltline B is the best if equal weight is given to regional, Warren County and Edmonson County performance.
- Beltline E is the worst regardless.

G. Alternatives Evaluation Traffic Considerations for I-66 and the Bowling Green Outer Beltline Combined

1. Alternatives

Seven I-66/Bowling Green Outer Beltline Corridor combinations were examined in the Regional Travel Model, based on the most logical combinations where the two routes would best overlap, as shown in Tables 19 through 23. These seven corridor combinations are as follows:

1) I-66 Corridor 2 and a short segment of Outer Beltline Corridor B from the Natcher Parkway north of Bowling Green to KY 185;
2) I-66 Corridor 4 and a segment of Outer Beltline Corridor B from the Natcher Parkway north of Bowling Green to KY 1320;
3) I-66 Corridor 5 and a segment of Outer Beltline Corridor A from the Natcher Parkway north of Bowling Green to KY 1320;
4) I-66 Corridor 10 and the segment of Outer Beltline B from the Natcher Parkway north of Bowling Green to I-65 east of Bowling Green;
5) I-66 Corridor 11 and the segment of Outer Beltline A from the Natcher Parkway north of Bowling Green to I-64 east of Bowling Green;
6) I-66 Corridor 12 and the segment of Outer Beltline A from the Natcher Parkway north of Bowling Green to I-64 east of Bowling Green; and
7) I-66 Corridor 23 and a segment of Outer Beltline D from the I-65 and/or US 231 south of Bowling Green to KY 1288 southeast of Bowling Green.

2. Traffic Considerations

In looking at a combination of the I-66 and Outer Beltline projects, the project goals for both were applied and traffic considerations were applied, as discussed in previous sections for each project. Therefore, the transportation performance measures from the Regional Travel Model runs that were used for the evaluation of alternatives, as previously discussed. These transportation measures are only one of several considerations in the evaluation of alternatives.

3. Traffic Considerations Evaluation

For the comparison of the alternatives, the Regional Travel Model was run for the No Build Alternative for the KySTM and SDC growth scenarios for the year 2030, and the results reported in Tables 19 through 24 (at the end of the report). (See pages 59 and 65 for an explanation of the criteria in these tables.) Each alternative is ranked from best ("1") to worst for each criterion. For the build alternatives, the Regional Travel Model was run for each Combined Corridor for the higher SDC growth scenario (Figures 41 through 53, at the end of the report).

Average Daily Traffic (ADT): I-66 Corridor 5 with Beltline A has the highest average daily traffic volume (daily travel model traffic assignment) at 17,154 vehicles per day (vpd), and the segment between the proposed KY 526 and KY 185 interchanges has the highest segment volume at 23,007 vpd. Other findings are as follows:

- I-66 Corridors 11 or 12 with Beltline A has the second highest average daily traffic volume at 17,144 vpd (daily travel model traffic assignment).

- In general, the addition of a beltline corridor to I-66 Corridors 2, 4, 10 and Corridor 23 results in lower average daily traffic volumes on both I-66 and the Outer Beltline.
- In particular, the combination of I-66 Corridor 23 with Beltline D results in I-66 through traffic using existing I-65 from the Nunn Parkway to the Beltline around the north side of Bowling Green to the Natcher Parkway rather than the longer route using I-66 Corridor 23. In combination with Corridor 23, the segment of Beltline D from KY 1288 to KY 234 drops from 8,400 vpd without Corridor 23 to 5,000 vpd with Corridor 23.

Traffic Diversion: Corridor 23 with Beltline D is the most effective in diverting traffic from existing I-65 between the Nunn and Natcher parkways. Corridor 23 leaves a residual volume of 82,075 vpd in the segment between KY 234 (Cemetery Road) and KY 446. However, the traffic diversion from I-65 still results in a LOS E for the urban segments of I-65 as a six-lane facility. Thus, the widening of I-65 to eight lanes will still be needed by the year 2030. I-66 Corridor 5 with Beltline A is the second most effective, followed by I-66 Corridor 11 or 12 with Beltline A.

Reviewing Figures 42 through 53 and Table 23 (at the end of the report), the following observations can be made on the relief of congested facilities (facilities failing to meet minimum LOS standards for urban and rural areas) as compared to the No Build Alternative:

- No combination of the I-66 and Outer Beltline Corridors divert sufficient traffic from I-65 to achieve an acceptable LOS with I-65 remaining at six lanes. However, a LOS C can be achieved for all seven corridor combinations if I-65 is widened to eight lanes.

- Corridor 11 or 12 with Beltline A provides the greatest congestion relief to the northeast side of Bowling Green by improving the LOS on US 31W from Riverside Drive to US 68 and on KY 446 between US 31W and I-65 to an acceptable urban level. Corridor 10 with Beltline B is too far north of Bowling Green to be as effective as Corridor 11 with Beltline A in relieving congestion on the northeast side.

- Because of their proximity to the north side of Bowling Green, Corridor 5 with Beltline A, Corridor 11 with Beltline A, and Corridor 23 with Beltline D draw additional traffic onto KY 185 between Veterans Memorial Lane (KY 880) and the proposed KY 185/I-66 interchange. This results in a LOS F on the two-lane segment of KY 185. The other combination corridors are not as effective in drawing traffic onto KY 185 such that the LOS only drops from C to D.

- In general, congested facilities south of Bowling Green or inside the Inner Beltline formed by KY 880 are too far removed from the combination corridors to see relief.

- On the other hand, the portion of the combination corridors between the Natcher Parkway and I-65 does result in reductions in traffic on radials. The impact of the combination corridors on US 231 (Scottsville Road) southeast of I-65 is minor. Corridor 23 with Beltline D results in an ADT volume of 500 to 1,000 vpd less than the other five combination corridors on US 231 between the Natcher Parkway and I-65. However, all combination corridors, except Corridor 23 with Beltline D, decrease traffic on Old Scottsville Road (just east of Cumberland Trace) from 13,000 vpd (under the No Build Alternative) to 7,500 vpd and on Cemetery Road (KY 234 just east of Cumberland Trace) from 20,500 vpd (under the No Build Alternative) to 15,500 vpd. Corridor 23 with Beltline D results in more modest reductions to 11,500 vpd on Old Scottsville Road and 17,000 vpd on Cemetery Road.

Vehicle Hours of Travel (VHT): As shown in Table 21, a reduction in congested vehicle-hours of travel (VHT) is an indicator of the reduction in system congestion and travel time. Since it diverts the most traffic from the existing I-65, I-66 Corridor 23 with Beltline D results in the greatest reduction in congested VHT on existing I-65 between the Nunn Parkway and the Natcher Parkway. I-66 Corridor 5 with Beltline A is the second most effective in reducing existing I-65 VHT. I-66 Corridor 10 with Beltline B is the least effective in reducing VHT on existing I-65.

I-66 Corridor 23 with Beltline D is essentially tied with I-66 Corridor 5 with Beltline A in reducing regional VHT, regional truck VHT, Warren County VHT and Warren County truck VHT. I-66 Corridor 11 with Beltline A ranks next in these categories. While I-66 Corridor 5 with Beltline A is the most effective in diverting traffic from non-freeway facilities in Warren County, I-66 Corridor 11 with Beltline A ranks a close second.

For Edmonson County, I-66 Corridor 10 with Beltline B performs the best in reducing the combination of total VHT and Truck VHT. I-66 Corridor 4 with Beltline B is the most effective in reducing VHT on non-freeway facilities in Edmonson County.

Vehicle Mile of Travel (VMT): As shown in Table 22, I-66 Corridor 10 with Beltline B results in the least increase in regional VMT over the No Build Alternative, and is closely followed by I-66 Corridor 11 with Beltline A. I-66 Corridor 2 with Beltline B results in the greatest increase in regional VMT.

Considering regional VMT for trucks, I-66 Corridor 23 with Beltline D results in the least increase in VMT, followed by I-66 Corridor 10 with Beltline B and I-66 Corridor 11 with Beltline A.

In Warren County, I-66 Corridor 23 with Beltline D results in the least increase in total VMT with I-66 Corridor 11 with Beltline A in third place. Relative to the diversion of traffic from local routes, I-66 Corridor 5 with Beltline A shows the greatest reduction in VMT on non-freeway facilities in Warren County.

In Edmonson County, I-66 Corridor 10 with Beltline B is the most effective in reducing total VMT and truck VMT, and is closely followed by I-66 Corridor 23 with Beltline D and I-66 Corridor 11 with Beltline A.

All Traffic Considerations: Examining all of the traffic considerations displayed in Tables 19 through 23, each composite corridor alternative was ranked for each criterion from best to worst, with the best ranked as "1". All criteria received the same weight. The results are as follows:

- I-66 Corridor 11 or 12 with Beltline A shows the best performance;
- I-66 Corridor 5 with Beltline A and Corridor 23 with Beltline D are second and third; and
- Corridor 2 with Beltline B shows the worst performance.

Table 19: Year 2030 Assigned Daily Traffic Volumes for Corridors (SDC Growth Scenario)

(daily travel model traffic assignments)

Segment	No Build	I-66							Outer Beltline				Combinations					
		2	4	5	10	11	12	23	A	B	D	E	2B	4B	5A	10B	11A/12A	23D
I-65 (with Common Segments of I-66 highlighted in yellow) – highest route segment shaded in green																		
Natcher Parkway to US 231	76,657	76,820	78,126	73,565	77,061	74,061	83,638	69,756	71,086	72,081	73,120	74,344	72,021	71,957	70,605	72,081	71,086	66,405
US 231 to KY 234	86,711	85,106	84,848	83,835	86,233	84,231	93,461	78,920	78,685	80,067	81,567	82,997	79,723	79,952	78,319	80,067	78,685	74,244
KY 234 to KY 446	97,309	95,759	95,323	94,161	97,973	95,472	103,073	89,632	86,166	88,752	89,657	92,552	88,089	88,450	85,434	88,752	86,166	82,075
KY 446 to Beltway (if any)	81,295	79,563	79,048	75,161	86,610	80,430	85,738	73,228	75,965	80,611	79,498	84,973	80,171	80,226	73,930	80,611	75,965	71,384
Beltway (if any) to US 68	81,295	79,563	79,048	75,161	87,223	85,900	85,738	73,228	84,145	84,800	84,012	84,671	81,646	79,154	77,044	84,800	84,145	77,446
US 68 to SR 101	63,701	62,723	63,127	60,973	69,664	69,163	67,947	56,872	67,222	67,266	67,166	67,254	64,134	62,201	61,283	67,266	67,222	61,235
SR 101 to Nunn Parkway	69,343	67,881	61,758	60,979	75,296	75,183	73,207	63,036	74,075	74,201	74,112	74.076	69,771	62,025	61,147	74,201	74,075	67,376
I-66 – highest route segment shaded in green																		
I-65 to KY 259		11,887	17,721	18,424									10,347	17,538	18,236			
KY 259 to US 31W		10,734											8,984					
US 31W to KY 101		8,134											7,587					
KY 101 to KY 743		9,011											7,587					
KY 743 to KY 1320		12,665											7,979					
KY 1320 to KY 185		10,901											11,297					
KY 259 to KY 101			16,027	16,941										15,664	16,553			
KY 101 to US 31W			9,309	11,417										9,456	10,790			
US 31W to KY 526 to KY 1320			15,635	16,379										15,118	15,891			
Nunn Parkway to KY 1297								16,096										12,839
KY 1297 to KY 101								13,287										10,010
KY 101 to KY 234								18,755										10,286
KY 234 to KY 1288								18,755										13,987
KY 1288 to US 231								20,250										18,195
Beltway (with Common Segments of I-66 highlighted in yellow) **– highest route segment shaded in green**																		
US 231 to KY 1288									16,355	16,349	8,377	8,289	16,270	16,307	16,252	16,349	16,355	18,195
KY 1288 to KY 234									12,832	12,792	8,417	8,441	12,803	12,737	12,747	12,792	12,832	5,036
KY 234 to KY 1297									14,639	14,635	10,355	10,384	14,652	14,546	14,589	14,635	14,639	9,617
KY 1297 to I-65									14,654	14,664	11,730	11,776	14,708	14,589	14,606	14,664	14,654	11,091
I-65 to US 31W					17,175	12,237			16,511	20,707	15,463	20,646	15,233	11,879	7,630	20,707	16,511	14,359
US 31W to KY 526 or KY 1320					17,688	15,652			15,042	16,665	15,301	16,534	11,970	6,203	20,034	16,665	15,042	15,157
KY 526 to KY 1320 to KY 185			15,016	23,698	13,760	20,365			19,217	12,699	19,630	12,932	8,065	14,438	23,077	12,699	19,217	19,377
KY 185 to KY 1435		10,753	11,652	18,639	10,514	18,651			17,265	9,537	17,598	9,679	11,297	10,759	18,941	9,537	17,265	17,517
KY 1435 to Natcher Parkway		12,526	12,896	18,100	11,912	17,490			16,180	11,144	16,554	11,296	12,403	11,963	17,779	11,144	16,180	16,426

Source: Bernardin-Lochmueller & Associates, Inc.

Table 20: Travel Volumes in Corridors

(alternatives ranked by each criterion from best to worst with best ranked as "1", daily travel model traffic assignments)

Alternative	Year 2030 Forecast	I-66 Natcher to Nunn Congested Speed (mph) ***	Beltline Congested Speed (mph)	Average I-66 ADT (new location only)	Highest Segment I-66 ADT (new location only)	I-65 Natcher to Nunn Highest ADT	I-65/I-66 Common Segment Highest ADT	Average Beltline ADT	Highest Segment Beltline ADT
E+C 2030	KySTM*	61.7				84,029			
E+C 2030	SDC**	59.6				97,309			
I-66 Corridor 2	SDC**	65.0		10,663	12,665	95,759			
% change from E+C		9.0%			KY 743 to KY 1320	-1.6%			
rank		2		6	6	5			
I-66 Corridor 4	SDC**	65.0		13,664	17,721	95,323			
% change from E+C		9.0%			I-65 to KY 259	-2.0%			
rank		2		4	4	3			
I-66 Corridor 5	SDC**	65.0		**17,260**	**23,698**	94,161			
% change from E+C		9.0%			KY 526 to KY 185	-3.2%			
rank		2		**1**	**1**	2			
I-66 Corridor 10	SDC**	64.4		13,395	17,688	97,963	87,223		
% change from E+C		8.1%			US 31W to KY 1320	0.7%	US 68 to Beltline		
rank		6		5	5	6	2		
I-66 Corridor 11	SDC**	64.6		17,144	20,365	95,472	**85,900**		
% change from E+C		8.2%			KY 1320 to KY 185	-1.9%	US 68 to Beltline		
rank		5		2	2	4	**1**		
I-66 Corridor 12	SDC**	64.1				103,073	103,073		
% change from E+C		7.4%				5.9%	KY 234 to KY 446		
rank		7				7	3		
I-66 Corridor 23	SDC**	65.0		15,694	20,250	**89,632**			
% change from E+C		9.0%			US 231 to KY 1288	**-7.9%**			
rank		2		3	3	**1**			
Beltline Corridor A	SDC**		65.0			**86,166**		**16,006**	19,217
% change from E+C						**-11.5%**			KY 526 to KY 185
rank			2.5			**1**		**1**	4
Beltline Corridor B	SDC**		65.0			88,752		13,642	**20,707**
% change from E+C						-8.8%			I-65 to US 31W
rank			2.5			2		3	**1**
Beltline Corridor D	SDC**		65.0			89,657		13,720	19,630
% change from E+C						-7.9%			KY 526 to KY 185
rank			2.5			3		2	3
Beltline Corridor E	SDC**		65.0			92,552		11,679	20,646
% change from E+C						-4.9%			I-65 to US 31W
rank			2.5			4		4	2
Corridors 2 and B	SDC**	65.0	65.0	9,719	12,403	88,089		12,735	16,270
% change from E+C		9.0%			Natcher to KY 1435	-9.5%			US 231 to KY 1288
rank		3.5	3.5	6	6	4		5	5
Corridors 4 and B	SDC**	65	65.0	13,164	17,538	88,540		13,113	16,307
% change from E+C		9%			I-65 to KY 259	-9.0%			US 231 to KY 1288
rank		3.5	3.5	3	5	5		4	4
Corridors 5 and A	SDC**	65	65.0	**17,154**	**23,077**	85,434		12,167	16,252
% change from E+C		9%			KY 526 to KY 185	-12.2%			US 231 to KY 1288
rank		3.5	3.5	**1**	**1**	2		6	6
Corridors 10 and B	SDC**	65	65.0	12,431	20,707	88,752	84,800	14,710	16,349
% change from E+C		9%			I-65 to US 31W	-8.8%	US 68 to Beltline		US 231 to KY 1288
rank		3.5	3.5	4	2	6		2	**3**
Corridors 11/12 and A	SDC**	65	65.0	16,866	19,217	86,166	84,145	**14,714**	16,355
% change from E+C		9%			KY 526 to KY 185	-11.5%	US 68 to Beltline		US 231 to KY 1288
rank		3.5	3.5	2	3	3		**1**	2
Corridors 23 and D	SDC**	65	65.0	12,260	18,195	**82,075**		13,907	**19,377**
% change from E+C		9%			US 231 to KY 1288	**-15.7%**			KY 526 to KY 185
rank		3.5	3.5	5	4	**1**		3	**1**

Source: Bernardin-Lochmueller & Associates, Inc.

Notes: * KySTM = Kentucky Statewide Traffic Model
** SDC = State Data Center
*** Includes any segment in common with I-65

Table 21: Vehicle-Hours of Travel for Corridors

(alternatives ranked by each criterion from best to worst with best ranked as "1", daily travel model traffic assignments**)**

Alternative	Year 2030 Forecast	I-65 Nunn to Natcher Congested VHT ***	Regional		Warren County			Edmonson	
			Congested VHT for Trucks	Congested VHT	Non-Freeway Congested VHT	Congested VHT for Trucks	Congested VHT	Non-Freeway Congested VHT	Congested VHT for Trucks
E+C 2030	KySTM*	27,599	71,327	172,344	130,669	17,643	11,240	9,087	1,442
E+C 2030	SDC**	32,395	77,961	204,053	155,811	19,728	15,147	12,764	1,575
I-66 Corridor 2	SDC**	31,629	78,393	202,179	151,969	19,426	16,954	12,389	1,811
% change from E+C		-2.4%	0.6%	-0.9%	-2.5%	-1.5%	11.9%	-2.9%	15.0%
rank		4	7	5.5	5	4	7	3	7
I-66 Corridor 4	SDC**	30,874	78,298	202,247	149,907	19,562	15,061	**12,243**	1,566
% change from E+C		-4.7%	0.4%	-0.9%	-3.8%	-0.8%	-0.6%	**-4.1%**	-0.6%
rank		3	6	5.5	4	7	3	**1**	3
I-66 Corridor 5	SDC**	29,694	78,175	200,681	148,349	19,404	15,277	12,442	1,575
% change from E+C		-8.3%	0.3%	-1.7%	-4.8%	-1.6%	0.9%	-2.5%	0.0%
rank		2	4	2	2	3	6	4	6
I-66 Corridor 10	SDC**	33,312	78,214	201,955	149,379	19,516	**14,734**	12,312	**1,549**
% change from E+C		2.8%	0.3%	-1.0%	-4.1%	-1.1%	**-2.7%**	-3.5%	**-1.7%**
rank		7	4	3	3	6	**1**	2	**1**
I-66 Corridor 11	SDC**	32,166	78,108	**200,430**	**148,135**	19,371	14,897	12,474	1,554
% change from E+C		-0.7%	0.2%	**-1.8%**	**-4.9%**	-1.8%	-1.7%	-2.3%	-1.3%
rank		6	2	**1**	**1**	2	2	5	2
I-66 Corridor 12	SDC**	32,067	78,185	204,182	155,317	19,442	15,209	12,831	1,570
% change from E+C		-1.0%	0.3%	0.1%	-0.3%	-1.4%	0.4%	0.5%	-0.3%
rank		5	4	7	7	5	5	7	4.5
I-66 Corridor 23	SDC**	**28,622**	**78,067**	202,879	153,610	**19,298**	15,141	12,785	1,571
% change from E+C		**-11.6%**	**0.1%**	-0.6%	-1.4%	**-2.2%**	0.0%	0.2%	-0.3%
rank		**1**	**1**	4	6	**1**	4	6	4.5
Beltline Corridor A	SDC**	**31,359**	**77,747**	**197,667**	**143,578**	18,984	14,904	12,488	1,536
% change from E+C		**-3.2%**	**-0.3%**	**-3.1%**	**-7.9%**	-3.8%	-1.6%	-2.2%	-2.5%
rank		**1**	**1**	**1**	**1**	1	4	4	3.5
Beltline Corridor B	SDC**	32,119	77,846	199,459	145,558	19,135	14,747	**12,328**	1,530
% change from E+C		-0.9%	-0.1%	-2.3%	-6.6%	-3.0%	-2.6%	**-3.4%**	-2.9%
rank		2	2	3	3	2	1.5	**1**	1.5
Beltline Corridor D	SDC**	32,161	77,970	198,574	144,245	19,199	14,886	12,470	1,536
% change from E+C		-0.7&	0.0%	-2.7%	-7.4%	-2.7%	-1.7%	-2.3%	-2.5%
rank		3	3	2	2	3	3	3	3.5
Beltline Corridor E	SDC**	33,025	78,078	200,588	146378	19,373	14,759	12,347	1,530
% change from E+C		1.9%	0.2%	-1.7%	-6.1%	-1.8%	-2.6%	-3.3%	-2.9%
rank		4	4	4	4	4	1.5	2	1.5
Corridors 2 and B	SDC**	31,045	77,774	197,981	144,565	18,875	16,638	12,309	1,776
% change from E+C		-4.2%	-0.2%	-3.0%	-7.2%	-4.3%	9.8%	-3.6%	12.8%
rank		4	5	4	4	3	6	2	6
Corridors 4 and B	SDC**	29,891	77,724	198,785	144,705	18,998	15,033	**12,213**	1,563
% change from E+C		-7.7%	-0.3%	-2.6%	-7.1%	-3.7%	-0.8%	**-4.3%**	-0.8%
rank		3	3.5	5	5	5	4	**1**	4
Corridors 5 and A	SDC**	28,712	77,580	196,720	**142,402**	**18,816**	15,266	12,431	1,571
% change from E+C		-11.4%	-0.5%	-3.6%	**-8.6%**	**-4.6%**	0.8%	-2.6%	-0.3%
rank		2	2	1.5	**1**	**1**	5	4	5
Corridors 10 and B	SDC**	32,119	77,846	199,459	145,558	19,135	**14,747**	12,328	**1,530**
% change from E+C		-0.9%	-0.1%	-2.3%	-6.6%	-3.0%	**-2.6%**	-3.4%	**-2.9%**
rank		6	6	6	6	6	**1**	3	**1**
Corridors 11/12 and A	SDC**	31,359	77,747	197,667	143,578	18,984	14,904	12,488	1,536
% change from E+C		-3.2%	-0.3%	-3.1%	-7.9%	-3.8%	-1.6%	-2.2%	-2.5%
rank		5	3.5	3	2	4	3	6	2.5
Corridors 23 and D	SDC**	**28,599**	**77,518**	196,792	143,943	18,836	14,854	12,455	1,535
% change from E+C		**-11.7%**	**-0.6%**	-3.6%	-7.6%	-4.5%	-1.9%	-2.4%	-2.5%
rank		**1**	**1**	1.5	3	2	2	5	25

Source: Bernardin-Lochmueller & Associates, Inc.

Notes: * KySTM = Kentucky Statewide Traffic Model
** SDC = State Data Center
*** Includes any segment in common with I-65

Table 22: Vehicle-Miles of Travel for Corridors

(alternatives ranked by each criterion from best to worst with best ranked as "1", daily travel model traffic assignments**)**

Alternative	Year 2030 Forecast	Regional		Warren County			Edmonson			
		VMT	VMT for trucks	VMT	Non-Freeway VMT	VMT for Trucks	VMT	Non-Freeway VMT	VMT for Trucks	Beltline VMT
E+C 2030	KySTM*	23,075,374	3,826,376	5,973,784	3,409,327	870,962	495,566	357,047	77,744	
E+C 2030	SDC**	25,823,745	4,063,943	6,765,851	3,877,440	925,894	648,335	495,639	82,822	
I-66 Corridor 2	SDC**	26,374,476	4,107,575	6,848,815	3,817,934	922,597	767,784	473,872	98,610	
% change from E+C		2.1%	1.1%	1.2%	-1.5%	-0.4%	18.4%	-4.4%	19.1%	
rank		3	4.5	2	5	1	7	2	7	
I-66 Corridor 4	SDC**	26,386,941	4,107,271	6,962,821	3,785,099	937,447	653,627	**473,337**	83,003	
% change from E+C		2.2%	1.1%	2.9%	-2.4%	1.2%	0.8%	**-4.5%**	0.2%	
rank		5.5	4.5	5	3	4	5	**1**	5	
I-66 Corridor 5	SDC**	26,401,711	4,106,800	6,958,068	**3,758,490**	936,163	659,649	478,211	83,188	
% change from E+C		2.2%	1.1%	2.8%	**-3.1%**	1.1%	1.7%	-3.5%	0.4%	
rank		5.5	4.5	4	**1**	3	6	4	6	
I-66 Corridor 10	SDC**	26,383,023	4,110,670	6,993,785	3,786,713	942,766	**632,074**	477,444	**81,747**	
% change from E+C		2.2%	1.1%	3.4%	-2.3%	1.8%	**-2.5%**	-3.7%	**-1.3%**	
rank		5.5	4.5	7	4	7	**1**	3	**1**	
I-66 Corridor 11	SDC**	26,382,149	4,110,020	6,978,617	3,764,332	940,662	637,405	482,691	81,832	
% change from E+C		2.2%	1.1%	3.1%	-2.9%	1.6%	-1.7%	-2.6%	-1.2%	
rank		5.5	4.5	6	2	5.5	2	5	2	
I-66 Corridor 12	SDC**	26,268,231	4,107,187	6,919,447	3,858,921	941,035	650,371	497,947	82,528	
% change from E+C		1.7%	1.1%	2.3%	-0.5%	1.6%	0.3%	0.5%	-0.4%	
rank		1.5	4.5	3	7	5.5	4	7	3	
I-66 Corridor 23	SDC**	26,270,697	**4,102,070**	**6,828,350**	3,826,039	924,699	647,622	496,625	82,602	
% change from E+C		1.7%	**0.9%**	**0.9%**	-1.3%	-0.1%	-0.1%	0.2%	-0.3%	
rank		1.5	**1**	**1**	6	2	3	6	4	
Beltline Corridor A	SDC**	26,374,530	4,105,195	**6,998,282**	**3,700,663**	**937,809**	637,805	483,547	81,011	434,894
% change from E+C		2.1%	1.0%	**3.4%**	**-4.6%**	**1.3%**	-1.6%	-2.4%	-2.2%	
rank		2	2	**1**	**1**	**1**	4	4	3.5	
Beltline Corridor B	SDC**	26,363,367	4,104,633	7,002,362	3,732,937	939,110	632,668	**478,247**	80,850	400,385
% change from E+C		2.1%	1.0%	3.5%	-3.7%	1.4%	-2.4%	**-3.5%**	-2.4%	
rank		2	2	2.5	3.5	2.5	1.5	**1**	1.5	
Beltline Corridor D	SDC**	26,379,450	4,106,506	6,999,638	3,702,374	939,071	637,063	482,794	81,020	403,504
% change from E+C		2.2%	1.0%	3.5%	-4.5%	1.4%	-1.7%	-2.6%	-2.2%	
rank		4	2	2.5	2	2.5	3	3	3.5	
Beltline Corridor E	SDC**	26,372,925	4,106,701	7,006,287	3,735,378	940,985	633,037	479,028	80,854	368,931
% change from E+C		2.1%	1.1%	3.6%	-3.7%	1.6%	-2.4%	-3.4%	-2.4%	
rank		2	4	4	3.5	4	1.5	2	1.5	
Corridors 2 and B	SDC**	26,463,588	4,108,990	6,952,475	3,696,256	**928,208**	749,249	**471,289**	96,149	265,148
% change from E+C		2.5%	1.1%	2.8%	-4.7%	**0.2%**	15.6%	**-4.9%**	16.1%	
rank		6	5	2	3	**1**	6	**1**	6	
Corridors 4 and B	SDC**	26,436,221	4,107,718	7,015,533	3,702,099	938,619	652,761	472,315	82,884	200,101
% change from E+C		2.4%	1.1%	3.7%	-4.5%	1.4%	0.7%	-4.7%	0.1%	
rank		4.5	5	5.5	5	5.5	4	2	4	
Corridors 5 and A	SDC**	26,456,034	4,108,066	7,015,719	**3,665,136**	937,559	659,505	478,103	83,035	185,663
% change from E+C		2.4%	1.1%	3.7%	**-5.5%**	1.3%	1.7%	-3.5%	0.3%	
rank		4.5	5	5.5	**1**	3.5	5	3.5	5	
Corridors 10 and B	SDC**	26,363,367	4,104,633	7,002,362	3,732,937	939,110	**632,668**	478,247	**80,850**	159,604
% change from E+C		2.1%	1.0%	3.5%	-3.7%	1.4%	**-2.4%**	-3.5%	**-2.4%**	
rank		1.5	2	4	6	5.5	**1**	3.5	**1**	
Corridors 11/12 and A	SDC**	26,374,530	4,105,195	6,998,282	3,700,663	937,809	637,805	483,547	81,011	159,645
% change from E+C		2.1%	1.0%	3.4%	-4.6%	1.3%	-1.6%	-2.4%	-2.2%	
rank		1.5	2	**3**	4	**3.5**	3	6	2.5	
Corridors 23 and D	SDC**	26,380,130	4,102,658	**6,938,175**	3,680,156	930,141	635,152	482,006	81,008	349,893
% change from E+C		2.2%	1.0%	**2.5%**	-5.1%	0.5%	-2.0%	-2.8%	-2.2%	
rank		3	2	**1**	2	2	2	5	2.5	

Source: Bernardin-Lochmueller & Associates, Inc.

Notes: * KySTM = Kentucky Statewide Traffic Model
** SDC = State Data Center
*** Includes any segment in common with I-65

Table 23: Future Level-of-Service for Congested Facilities for Alternatives (daily travel model traffic assignments)

Route/Segment	No Build		I-66														Outer Beltline								Combinations											
			2		4		5		10		11		12		23		A		B		D		E		2B		4B		5A		10B		11A/12A		23D	
	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADTS	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS
I-65																																				
Simpson Co. Line to Natcher	51,879	F	53,839	F	53,867	F	53,797	F	53,807	F	53,804	F	53,872	F	54,103	F	53,918	F	53,917	F	53,846	F	53,863	F	53,911	F	53,898	F	53,857	F	53,917	F	53,918	F	54,031	F
Natcher Pkwy to US 231	76,657	E	76,820	E	78,126	E	73,565	E	77,061	E	74,061	E	83,638	C	69,756	E	71,086	E	72,081	E	73,120	E	74,344	E	72,021	E	71,957	E	70,605	E	72,081	E	71,086	E	66,405	E
US 231 to KY 234	86,711	E	85,106	E	84,848	E	83,835	E	86,233	E	84,231	E	93,461	C	78,920	E	78,685	E	80,067	E	81,567	E	82,997	E	79,723	E	79,952	E	78,319	E	80,067	E	78,685	E	74,244	E
KY 234 to KY 446	97,309	F	95,759	E	95,323	E	94,161	E	97,973	E	95,472	E	103,073	C	89,632	E	86,166	E	88,752	E	89,657	E	92,552	E	88,089	E	88,450	E	85,434	E	88,752	E	86,166	E	82,075	E
KY 446 to US 68	81,295	E	79,563	E	79,048	E	75,161	E	87,223	E/C	85,900	E/C	85,738	C	73,228	E	84.145	E	84,800	E	84,012	E	84,973	E	81,646	E	80,226	E	77,044	E	84,800	E/C	84.145	E/C	77,446	E
US 68 to KY 101	63,701	D	62,723	E	63,127	D	60,973	D	69,664	C	69,163	C	67,947	C	56,872	D	67,222	E	67,266	E	67,166	E	67,254	E	64,134	D	62,201	D	61,283	D	67,266	C	67,222	C	61,235	D
KY 101 to Nunn Pkwy	69,343	E	67,881	E	61,758	D	60,979	D	75,296	C	75,183	C	73,207	C	63,036	D	74,075	E	74,201	E	74,112	E	74,076	E	69,771	E	62,025	D	61,147	D	74,201	C	74,075	C	67,376	E
Nunn Pkwy to KY 255	54,148	D	56,808	D	56,706	D	56,826	D	54,833	D	54,863	D	54,051	D	53,545	D	54,701	D	54,759	D	54,705	D	54,613	D	57,055	D	56,836	D	56,890	D	54,759	D	54,701	D	54,307	D
KY 255 to KY 70	54,148	D	56,808	D	56,706	D	56,826	D	54,833	D	54,863	D	54,051	D	53,545	D	54,701	D	54,759	D	54,705	D	54,613	D	57,055	D	56,836	D	56,890	D	54,759	D	54,701	D	54,307	D
KY 70 to Hart Co. Line	67,827	E	68,649	E	68,677	E	68,868	E	68,244	E	68,249	E	67,852	E	66,821	E	68,206	E	68,211	E	68,285	E	68,116	E	68,840	E	68,711	E	68,923	E	68,211	E	68,206	E	67,206	E
US 31W																																				
Simpson Co. Line to KY 240	13,866	E	13,913	E	13,884	E	13,893	E	13,915	E	13,875	E	14,954	E	14,948	E	14,910	E	14,866	E	13,844	E	13,869	E	13,853	E	13,865	E	13,866	E	14,866	E	14,910	E	13,890	E
KY 242 to Memphis Junction	27,798	F	27,943	F	27,765	F	27,734	F	27,187	F	35,035	F	27,763	F	27,835	F	26,801	F	26,672	F	27,914	F	27,858	F	27,903	F	27,921	F	27,801	F	26,672	F	26,801	F	27,812	F
US 231 to Business US 231	20,724	F	22,849	F	25,874	F	25,750	F	25,754	F	25,644	F	26,324	F	26,647	F	22,809	F	17,331	F	23,425	F	26,101	F	26,057	F	26,082	F	25,383	F	21,084	F	22,809	F	25,554	F
US 68 to KY 446	42,721	E	41,313	E	40,288	E	35,925	E	40,909	E	36,942	D/E	42,434	E	42,306	E	36,016	D/E	40,112	E	36,480	D/E	40,471	E	39,444	E	39,609	E	35,211	D/E	40,010	E	36,016	D/E	36,450	D/E
Jackson Grove Ch. Rd. to US 68	30,631	D	29,209	E	28,739	D	26,273	D	25,248	D	25,131	C	30,303	E	30,500	E	24,517	C	25,278	C/D	24,924	C	24,891	C/D	24,318	C/D	24,876	C/D	23,450	C	25,278	C/D	24,517	C	23,810	C
US 68/KY 80																																				
Logan Co. Line to KY 240	15,268	F	14,964	F	14,806	F	14,849	F	14,863	F	14,849	F	15,190	F	15,174	F	15,131	F	15,087	F	15,151	F	15,036	F	15,052	F	15,063	F	15,123	F	15,087	F	15,131	F	15,152	F
KY 240 to KY 242	17,147	F	16,811	F	16,863	F	16,927	F	16,943	F	15,066	F	17,068	F	17,041	F	17,230	F	16,950	F	17,027	F	16,874	F	16,894	F	16,931	F	17,002	F	16,950	F	17,230	F	17,023	F
KY 242 to KY 1083	17,409	F	17,123	F	17,142	F	17,201	F	17,205	F	16,923	F	17,401	F	17,374	F	17,360	F	17,331	F	17,357	F	17,183	F	17,298	F	17,296	F	17,360	F	17,331	F	17,360	F	17,362	F
KY 432 to Natcher Pkwy	40,191	E	39,896	F	39,848	F	39,867	F	04,012	F	39,887	F	40,238	F	40,225	F	40,045	F	40,112	F	40,145	F	40,021	F	40,029	F	40,070	F	39,932	F	40,112	F	40,045	F	40,117	F
KY 880 to Business US 231	30,446	F	30,020	F	29,938	F	30,393	F	30,374	F	35,385	F	30,465	F	30,576	F	35,142	F	35,525	F	30,060	F	30,064	F	34,637	F	34,207	F	30,055	F	35,525	F	35,142	F	30,053	F
Business US 231 to US 31W	30,079	F	29,421	E	28,933	E	29,130	E	29,615	E	31,912	E	30,487	F	30,366	F	30,513	E	29,666	E	28,845	E	29,780	E	19,494	E	29,475	E	28,478	E	29,666	E	30,513	E	29,255	E
US 231																																				
KY 622 to I-65	34,586	E	32,803	E	31,135	D	34,342	D	32,913	D	34,423	D	32,217	D	34,946	D	33,471	D	33,448	D	32,948	D	32,803	D	33,406	D	33,445	D	33,479	D	33,448	D	33,471	D	33,643	D
I-65 to KY 880 (Lovers Lane)	47,915	F	47,455	F	47,383	F	46,483	F	47,262	F	46,961	F	48,789	F	47,844	F	46,872	F	47,371	F	46,802	F	47,416	F	47,216	F	47,389	F	46,816	F	47,371	F	46,872	F	47,235	F
US 68 to KY 880	15,126	E	15,728	D	15,243	D	15,499	D	15,187	D	15,509	D	15,625	D	15,460	D	14,887	D	15,415	D	14,824	D	15,604	D	15,394	D	15,392	D	14,968	D	15,415	D	14,887	D	14,961	D
Bus US 231/US 68 to KY 880	15,915	F	38,462	E	38,306	E	39,264	E	39,809	E	39,339	E	40,370	E	40,256	E	38,524	E	39,543	E	38,439	E	39,798	E	19,597	E	39,652	E	38,469	E	39,543	E	38,524	E	38,555	E
KY 185																																				
Double Springs Rd. to Garvin Ln.	14,563	F	13,945	D	13,614	D	20,473	D	12,156	D	19,752	D	14,478	D	14,451	D	19,313	D	12,221	D	19,380	D	12,204	D	13,507	D	12,399	D	19,900	D	12,221	D	19,313	D	19,294	D
Garvin Lane to Butler Co. Ln.	13,992	C	13,488	D	13,167	D	11,062	D	12,079	D	12,166	F	13,904	D	13,893	D	12,036	F	12,134	D	12,111	F	11,951	D	13,093	D	11,986	D	10,736	F	12,134	D	12,036	F	11,452	F
KY 446/I-65 to US 31W	43,085	E	41,201	E	40,890	E	38,263	E	36,598	E	41,201	D	44,594	E	42,959	E	35,683	D	35,935	D	36,814	D	36,151	D	36,160	D	36,501	D	35,105	D	35,935	D	35,686	D	37,094	D
KY 880/KY 1435 to US 231	20,179	F	17,394	F	18,019	F	18,693	F	17,622	F	18,726	F	19,831	F	20,279	F	19,602	F	17,664	F	19,845	F	17,682	F	17,566	F	17,774	F	20,047	F	17,664	F	19,602	F	20,042	F

Source: Bernardin-Lochmueller & Associates, Inc. Note: This table covers major facilities in the No Build Alternative failing to meet minimum urban LOS D and rural LOS C. Shading shows alternatives with significant LOS differences

Table 24: Traffic Considerations Evaluation

(composite of Tables 21, 22, and 23)

(alternatives ranked by each criterion from best to worst with best ranked as "1", daily travel model traffic assignments)

	Alternative	Year 2030 Forecast	Speeds: I-66 Natcher to Nunn Congested Speed (mph) ***	Speeds: Beltline Congested Speed (mph)	Daily Traffic Volumes for Corridors: Average I-66 ADT (new location only)	Daily Traffic Volumes for Corridors: Highest Segment I-66 ADT (new location only)	Daily Traffic Volumes for Corridors: I-65 Natcher to Nunn Highest ADT	Daily Traffic Volumes for Corridors: I-65/I-66 Common Segment Highest ADT (c)	Daily Traffic Volumes for Corridors: Average Beltline ADT	Daily Traffic Volumes for Corridors: Highest Segment Beltline ADT	Vehicle-Hours of Travel for Corridors: I-65 Natcher to Nunn Congested VHT ***	Vehicle-Hours of Travel for Corridors: Regional: Congested VHT	Vehicle-Hours of Travel for Corridors: Regional: Congested VHT for Trucks	Vehicle-Hours of Travel for Corridors: Warren County: Congested VHT	Vehicle-Hours of Travel for Corridors: Warren County: Non-Freeway Congested VHT	Vehicle-Hours of Travel for Corridors: Warren County: Congested VHT for Trucks	Vehicle-Hours of Travel for Corridors: Edmonson County: Congested VHT	Vehicle-Hours of Travel for Corridors: Edmonson County: Non-Freeway Congested VHT	Vehicle-Hours of Travel for Corridors: Edmonson County: Congested VHT for Trucks	Vehicle-Miles of Travel for Corridors: Regional: VMT	Vehicle-Miles of Travel for Corridors: Regional: VMT for trucks	Vehicle-Miles of Travel for Corridors: Warren County: VMT	Vehicle-Miles of Travel for Corridors: Warren County: Non-Freeway VMT	Vehicle-Miles of Travel for Corridors: Warren County: VMT for Trucks	Vehicle-Miles of Travel for Corridors: Edmonson County: VMT	Vehicle-Miles of Travel for Corridors: Edmonson County: Non-Freeway VMT	Vehicle-Miles of Travel for Corridors: Edmonson County: VMT for Trucks	Beltline VMT
	E+C 2030	KySTM*	61.7				84,029				27,599	583,920	71,327	172,344	130,669	17,643	11,240	9,087	1,442	23,075,374	3,826,376	5,973,784	3,409,327	870,962	495,566	357,047	77,744	
	E+C 2030	SDC**	59.6				97,309				32,395	667,240	77,961	204,053	155,811	19,728	15,147	12,764	1,575	25,823,745	4,063,943	6,765,851	3,877,440	925,894	648,335	495,639	82,822	
I-66 Corridor Alternatives	I-66 Corridor 2	SDC**	65.0		10,663	12,665	95,759				31,629	671,878	78,393	202,179	151,969	19,426	16,954	12,389	1,811	26,374,476	4,107,575	6,848,815	3,817,934	922,597	767,784	473,872	98,610	
	% change from E+C		9.0%			KY 743 to KY 1320	-1.6%				-2.4%	0.7%	0.6%	-0.9%	-2.5%	-1.5%	11.9%	-2.9%	15.0%	2.1%	1.1%	1.2%	-1.5%	-0.4%	18.4%	-4.4%	19.1%	
	rank		2		6	6	5				4	6.5	7	5.5	5	4	7	3	7	3	4.5	2	5	1	7	2	7	
	I-66 Corridor 4	SDC**	65.0		13,664	17,721	95,323				30,874	670,309	78,298	202,247	149,907	19,562	15,061	**12,243**	1,566	26,386,941	4,107,271	6,962,821	3,785,099	937,447	653,627	**473,337**	83,003	
	% change from E+C		9.0%			I-65 to KY 259	-2.0%				-4.7%	0.5%	0.4%	-0.9%	-3.8%	-0.8%	-0.6%	**-4.1%**	-0.6%	2.2%	1.1%	2.9%	-2.4%	1.2%	0.8%	**-4.5%**	0.2%	
	rank		2		4	4	3				3	4	6	5.5	4	7	3	**1**	3	5.5	4.5	5	3	4	5	**1**	5	
	I-66 Corridor 5	SDC**	65.0		**17,260**	**23,698**	94,161				29,694	669,348	78,175	200,681	148,349	19,404	15,277	12,442	1,575	26,401,711	4,106,800	6,958,068	**3,758,490**	936,163	659,649	478,211	83,188	
	% change from E+C		9.0%			KY 526 to KY 185	-3.2%				-8.3%	0.3%	0.3%	-1.7%	-4.8%	-1.6%	0.9%	-2.5%	0.0%	2.2%	1.1%	2.8%	**-3.1%**	1.1%	1.7%	-3.5%	0.4%	
	rank		2		**1**	**1**	2				2	2	4	2	2	3	6	4	6	5.5	4.5	4	**1**	3	6	4	6	
	I-66 Corridor 10	SDC**	64.4		13,395	17,688	97,963	87,223			33,312	669,623	78,214	201,955	149,379	19,516	**14,734**	12,312	**1,549**	26,383,023	4,110,670	6,993,785	3,786,713	942,766	**632,074**	477,444	**81,747**	
	% change from E+C		8.1%			US 31W to KY 1320	0.7%	US 68 to Beltline			2.8%	0.4%	0.3%	-1.0%	-4.1%	-1.1%	**-2.7%**	-3.5%	**-1.7%**	2.2%	1.1%	3.4%	-2.3%	1.8%	**-2.5%**	-3.7%	**-1.3%**	
	rank		6		5	5	6	2			7	3	4	3	3	6	**1**	2	**1**	5.5	4.5	7	4	7	**1**	3	**1**	
	I-66 Corridor 11	SDC**	64.6		17,144	20,365	95,472	**85,900**			32,166	**668,504**	78,108	**200,430**	**148,135**	19,371	14,897	12,474	1,554	26,382,149	4,110,020	6,978,617	3,764,332	940,662	637,405	482,691	81,832	
	% change from E+C		8.2%			KY 1320 to KY 185	-1.9%	US 68 to Beltline			-0.7%	**0.2%**	0.2%	**-1.8%**	**-4.9%**	-1.8%	-1.7%	-2.3%	-1.3%	2.2%	1.1%	3.1%	-2.9%	1.6%	-1.7%	-2.6%	-1.2%	
	rank		5		2	2	4	**1**			6	**1**	2	**1**	**1**	2	2	5	2	5.5	4.5	6	2	5.5	2	5	2	
	I-66 Corridor 12	SDC**	64.1				103,073	103,073			32,057	672,042	78,185	204,182	155,317	19,442	15,209	12,831	1,570	26,268,231	4,107,187	6,919,447	3,858,921	941,035	650,371	497,947	82,528	
	% change from E+C		7.4%				5.9%	KY 234 to KY 446			-1.0%	0.7%	0.3%	0.1%	-0.3%	-1.4%	0.4%	0.5%	-0.3%	1.7%	1.1%	2.3%	-0.5%	1.6%	0.3%	0.5%	-0.4%	
	rank		7				7	3			5	6.5	4	7	7	5	5	7	4.5	1.5	4.5	3	7	5.5	4	7	3	
	I-66 Corridor 23	SDC**	65.0		15,694	20,250	**89,632**				**28,622**	671,127	**78,067**	202,879	153,610	**19,298**	15,141	12,785	1,571	26,270,697	**4,102,070**	**6,828,350**	3,826,039	924,699	647,622	496,625	82,602	
	% change from E+C		9.0%			US 231 to KY 1288	**-7.9%**				**-11.6%**	0.6%	**0.1%**	-0.6%	-1.4%	**-2.2%**	0.0%	0.2%	-0.3%	1.7%	**0.9%**	**0.9%**	-1.3%	-0.1%	-0.1%	0.2%	-0.3%	
	rank		2		3	3	**1**				**1**	5	**1**	4	6	**1**	4	6	4.5	1.5	**1**	**1**	6	2	3	6	4	
Beltline Corridor Alternatives	Beltline Corridor A	SDC**		65.0			**86,166**		**16,006**	19,217	**31,359**	**665,938**	**77,747**	**197,667**	**143,578**	18,984	14,904	12,488	1,536	26,374,530	4,105,195	**6,998,282**	**3,700,663**	**937,809**	637,805	483,547	81,011	434,894
	% change from E+C						**-11.5%**			KY 526 to KY 185	**-3.2%**	**-0.2%**	**-0.3%**	**-3.1%**	**-7.9%**	-3.8%	-1.6%	-2.2%	-2.5%	2.1%	1.0%	**3.4%**	**-4.6%**	**1.3%**	-1.6%	-2.4%	-2.2%	
	rank			2.5			**1**		**1**	4	**1**	**1**	**1**	**1**	**1**	1	4	4	3.5	2	2	**1**	**1**	**1**	4	4	3.5	
	Beltline Corridor B	SDC**		65.0			88,752		13,642	**20,707**	32,119	667,251	77,846	199,459	145,558	19,135	14,747	**12,328**	1,530	26,363,367	4,104,633	7,002,362	3,732,937	939,110	632,668	**478,247**	80,850	400,385
	% change from E+C						-8.8%			I-65 to US 31W	-0.9%	0.0%	-0.1%	-2.3%	-6.6%	-3.0%	-2.6%	**-3.4%**	-2.9%	2.1%	1.0%	3.5%	-3.7%	1.4%	-2.4%	**-3.5%**	-2.4%	
	rank			2.5			2		3	**1**	2	2.5	2	3	3	2	1.5	**1**	1.5	2	2	2.5	3.5	2.5	1.5	**1**	1.5	
	Beltline Corridor D	SDC**		65.0			89,657		13,720	19,630	32,161	666,986	77,970	198,574	144,245	19,199	14,886	12,470	1,536	26,379,450	4,106,506	6,999,638	3,702,374	939,071	637,063	482,794	81,020	403,504
	% change from E+C						-7.9%			KY 526 to KY 185	-0.7%	0.0%	0.0%	-2.7%	-7.4%	-2.7%	-1.7%	-2.3%	-2.5%	2.2%	1.0%	3.5%	-4.5%	1.4%	-1.7%	-2.6%	-2.2%	
	rank			2.5			3		2	3	3	2.5	3	2	2	3	3	3	3.5	4	2	2.5	2	2.5	3	3	3.5	
	Beltline Corridor E	SDC**		65.0			92,552		11,679	20,646	33,025	668,492	78,078	200,588	146378	19,373	14,759	12,347	1,530	26,372,925	4,106,701	7,006,287	3,735,378	940,985	633,037	479,028	80,854	368,931
	% change from E+C						-4.9%			I-65 to US 31W	1.9%	0.2%	0.2%	-1.7%	-6.1%	-1.8%	-2.6%	-3.3%	-2.9%	2.1%	1.1%	3.6%	-3.7%	1.6%	-2.4%	-3.4%	-2.4%	
	rank			2.5			4		4	2	4	4	4	4	4	4	1.5	2	1.5	2	4	4	3.5	4	1.5	2	1.5	
I-66/Beltline Composite Corridor Alternatives	Corridors 2 and B	SDC**	65.0	65.0	9,719	12,403	88,089		12,735	16,270	31,045	667,406	77,774	197,981	144,565	18,875	16,638	12,309	1,776	26,463,588	4,108,990	6,952,475	3,696,256	**928,208**	749,249	**471,289**	96,149	265,148
	% change from E+C		9.0%			Natcher to KY 1435	-9.5%			US 231 to KY 1288	-4.2%	0.0%	-0.2%	-3.0%	-7.2%	-4.3%	9.8%	-3.6%	12.8%	2.5%	1.1%	2.8%	-4.7%	**0.2%**	15.6%	**-4.9%**	16.1%	
	rank		3.5	3.5	6	6	4		5	5	4	5.5	5	4	4	3	6	2	6	6	5	2	3	**1**	6	**1**	6	
	Corridors 4 and B	SDC**	65	65.0	13,164	17,538	88,540		13,113	16,307	29,891	666,769	77,724	198,785	144,705	18,998	15,033	**12,213**	1,563	26,436,221	4,107,718	7,015,533	3,702,099	938,619	652,761	472,315	82,884	200,101
	% change from E+C		9%			I-65 to KY 259	-9.0%			US 231 to KY 1288	-7.7%	-0.1%	-0.3%	-2.6%	-7.1%	-3.7%	-0.8%	**-4.3%**	-0.8%	2.4%	1.1%	3.7%	-4.5%	1.4%	0.7%	-4.7%	0.1%	
	rank		3.5	3.5	3	5	5		4	4	3	4	3.5	5	5	5	4	**1**	4	4.5	5	5.5	5	5.5	4	2	4	
	Corridors 5 and A	SDC**	65	65.0	**17,154**	**23,077**	85,434		12,167	16,252	28,712	665,274	77,580	196,720	**142,402**	**18,816**	15,266	12,431	1,571	26,456,034	4,108,066	7,015,719	**3,665,136**	937,559	659,505	478,103	83,035	185,663
	% change from E+C		9%			KY 526 to KY 185	-12.2%			US 231 to KY 1288	-11.4%	-0.3%	-0.5%	-3.6%	**-8.6%**	**-4.6%**	0.8%	-2.6%	-0.3%	2.4%	1.1%	3.7%	**-5.5%**	1.3%	1.7%	-3.5%	0.3%	
	rank		3.5	3.5	**1**	**1**	2		6	6	2	1.5	2	1.5	**1**	**1**	5	4	5	4.5	5	5.5	**1**	3.5	5	3.5	5	
	Corridors 10 and B	SDC**	65	65.0	12,431	20,707	88,752	84,800	14,710	16,349	32,119	667,251	77,846	199,459	145,558	19,135	**14,747**	12,328	**1,530**	26,363,367	4,104,633	7,002,362	3,732,937	939,110	**632,668**	478,247	**80,850**	159,604
	% change from E+C		9%			I-65 to US 31W	-8.8%	US 68 to Beltline		US 231 to KY 1288	-0.9%	0.0%	-0.1%	-2.3%	-6.6%	-3.0%	**-2.6%**	-3.4%	**-2.9%**	2.1%	1.0%	3.5%	-3.7%	1.4%	**-2.4%**	-3.5%	**-2.4%**	
	rank		3.5	3.5	4	2	6		2	**3**	6	5.5	6	6	6	6	**1**	3	**1**	1.5	2	4	6	5.5	**1**	3.5	**1**	
	Corridors 11/12 and A	SDC**	65	65.0	16,866	19,217	86,166	84,145	**14,714**	16,355	31,359	665,938	77,747	197,667	143,578	18,984	14,904	12,488	1,536	26,374,530	4,105,195	6,998,282	3,700,663	937,809	637,805	483,547	81,011	159,645
	% change from E+C		9%			KY 526 to KY 185	-11.5%	US 68 to Beltline		US 231 to KY 1288	-3.2%	-0.2%	-0.3%	-3.1%	-7.9%	-3.8%	-1.6%	-2.2%	-2.5%	2.1%	1.0%	3.4%	-4.6%	1.3%	-1.6%	-2.4%	-2.2%	
	rank		3.5	3.5	2	3	3		**1**	2	**5**	3	3.5	3	2	4	3	6	2.5	1.5	2	**3**	4	**3.5**	3	6	2.5	
	Corridors 23 and D	SDC**	65	65.0	12,260	18,195	**82,075**		13,907	**19,377**	**28,599**	665,075	**77,518**	196,792	143,943	18,836	14,854	12,455	1,535	26,380,130	4,102,658	**6,938,175**	3,680,156	930,141	635,152	482,006	81,008	349,893
	% change from E+C		9%			US 231 to KY 1288	**-15.7%**			KY 526 to KY 185	**-11.7%**	-0.3%	**-0.6%**	-3.6%	-7.6%	-4.5%	-1.9%	-2.4%	-2.5%	2.2%	1.0%	**2.5%**	-5.1%	0.5%	-2.0%	-2.8%	-2.2%	
	rank		3.5	3.5	5	4	**1**		3	**1**	**1**	1.5	**1**	1.5	3	2	2	5	25	3	2	**1**	2	2	2	5	2.5	

Source: Bernardin-Lochmueller & Associates, Inc.

Notes: * KySTM = Kentucky Statewide Traffic Model

** SDC = State Data Center

** SDC = State Data Center

LOS C for 8-lane freeway = 95,680 ADT with K = 9%, D = 55%, and T = 25% trucks, rolling terrain

LOS D for 8-lane freeway = 113,390 ADT with K = 9%, D = 55%, and T = 25% trucks, rolling terrain

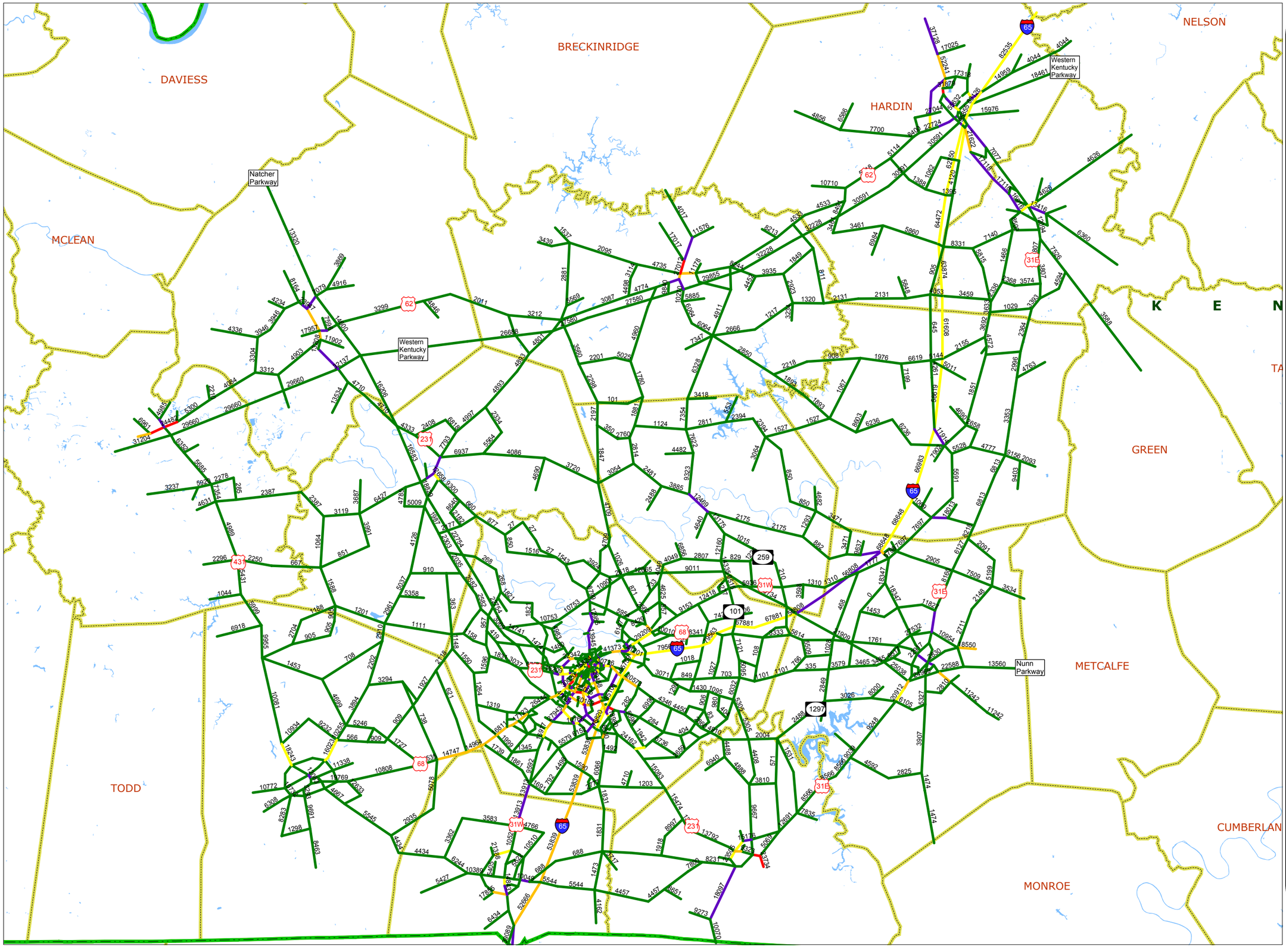


Figure 20

Year: 2030
State Data Center Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 2

Daily Travel Model Assignment Shown

Map Legend

Map Layers
- Water Area
- County (High)
- State (High)
- I66130HI

VC Ratio (LOS C Caps)
- LOS C (0 to 1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 4 8 12
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

Figure 21

Year: 2030
State Data Center
Growth Scenario

Regional Travel
Model Forecast
for I-66 Corridor 2

Bowling Green
Blowup

Daily Travel Model
Assignment Shown

Map Legend

Map Layers
- Census Place (2000)
- Water Area
- County (High)
- State (High)
- I66130HI

VC Ratio (LOS C Caps)
- LOS C (< 1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 .7 1.4 2.1
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

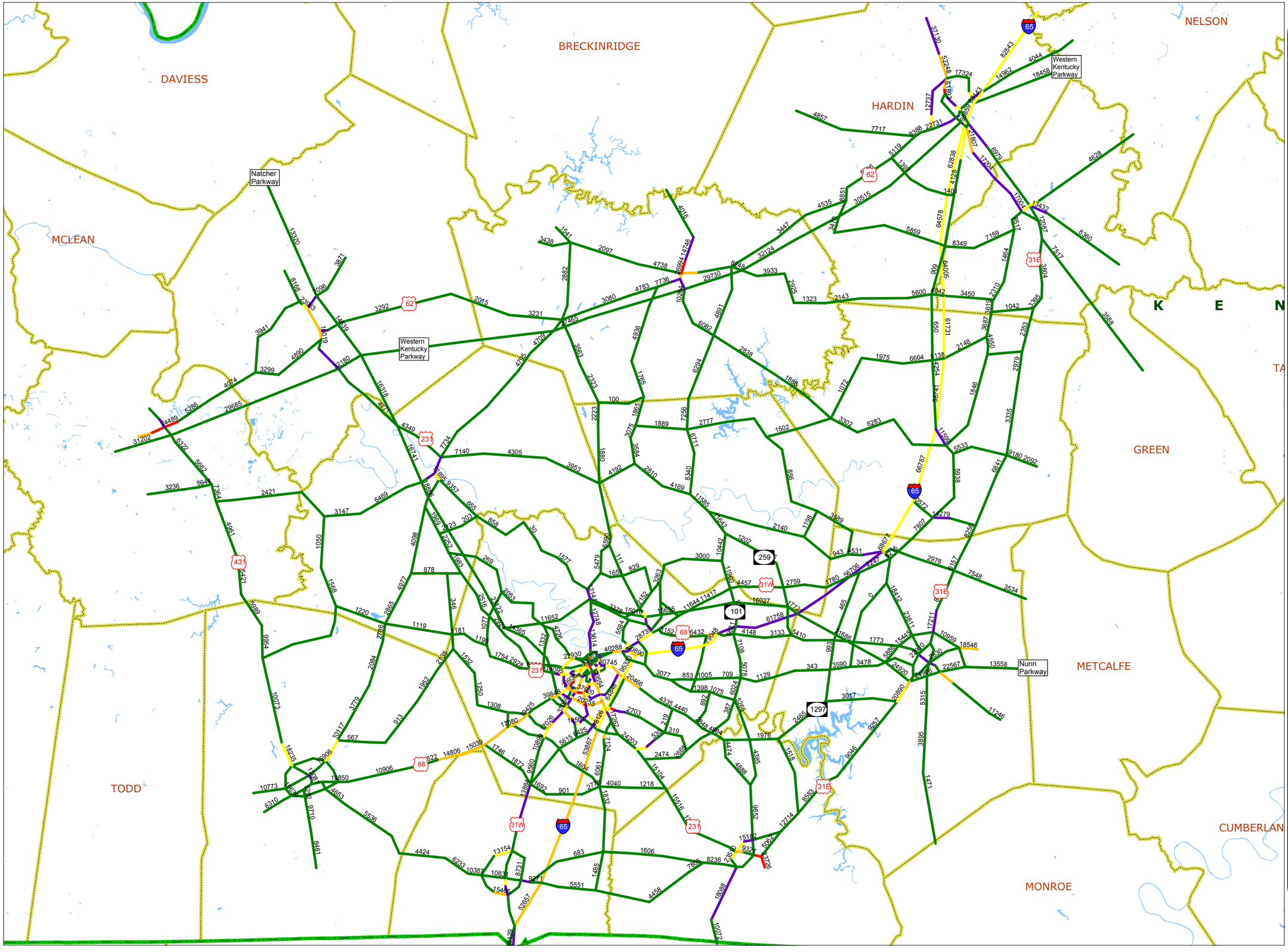


Figure 22

Year: 2030
State Data Center Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 4

Daily Travel Model Assignment Shown

Map Legend

Map Layers
- Water Area
- County (High)
- State (High)
- I66230HI

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 4 8 12
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

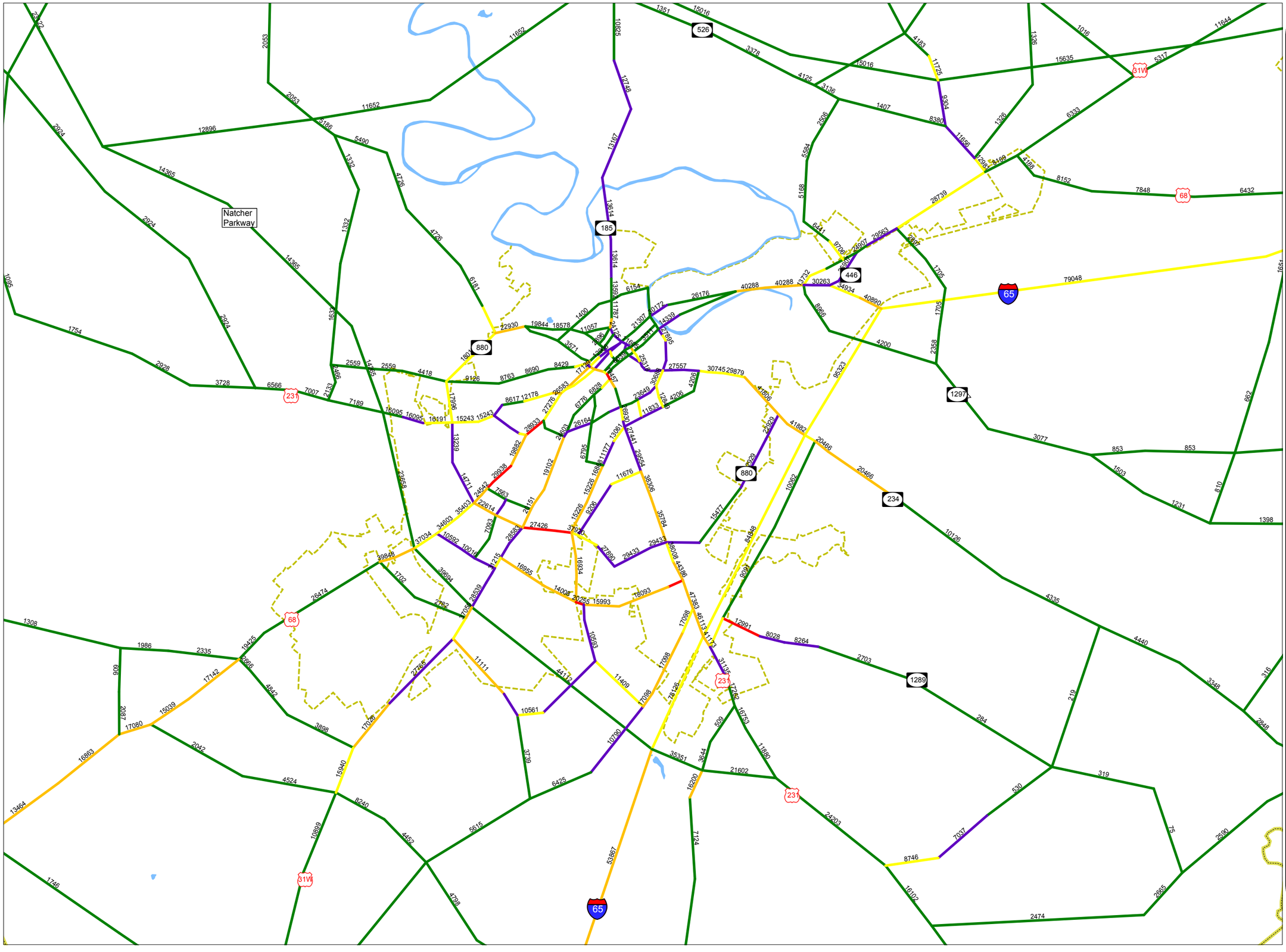


Figure 23

Year: 2030
State Data Center
Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 4

Bowling Green Blowup

Daily Travel Model Assignment Shown

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

Figure 24

Year: 2030
State Data Center
Growth Scenario

Regional Traffic Model Forecast for I-66 Corridor 5

Daily Travel Model Assignment Shown

Map Legend

Map Layers
- Water Area
- County (High)
- State (High)
- I66330hi

VC Ratio (LOS C Caps)
- LOS C (<1.00)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 4 8 12
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

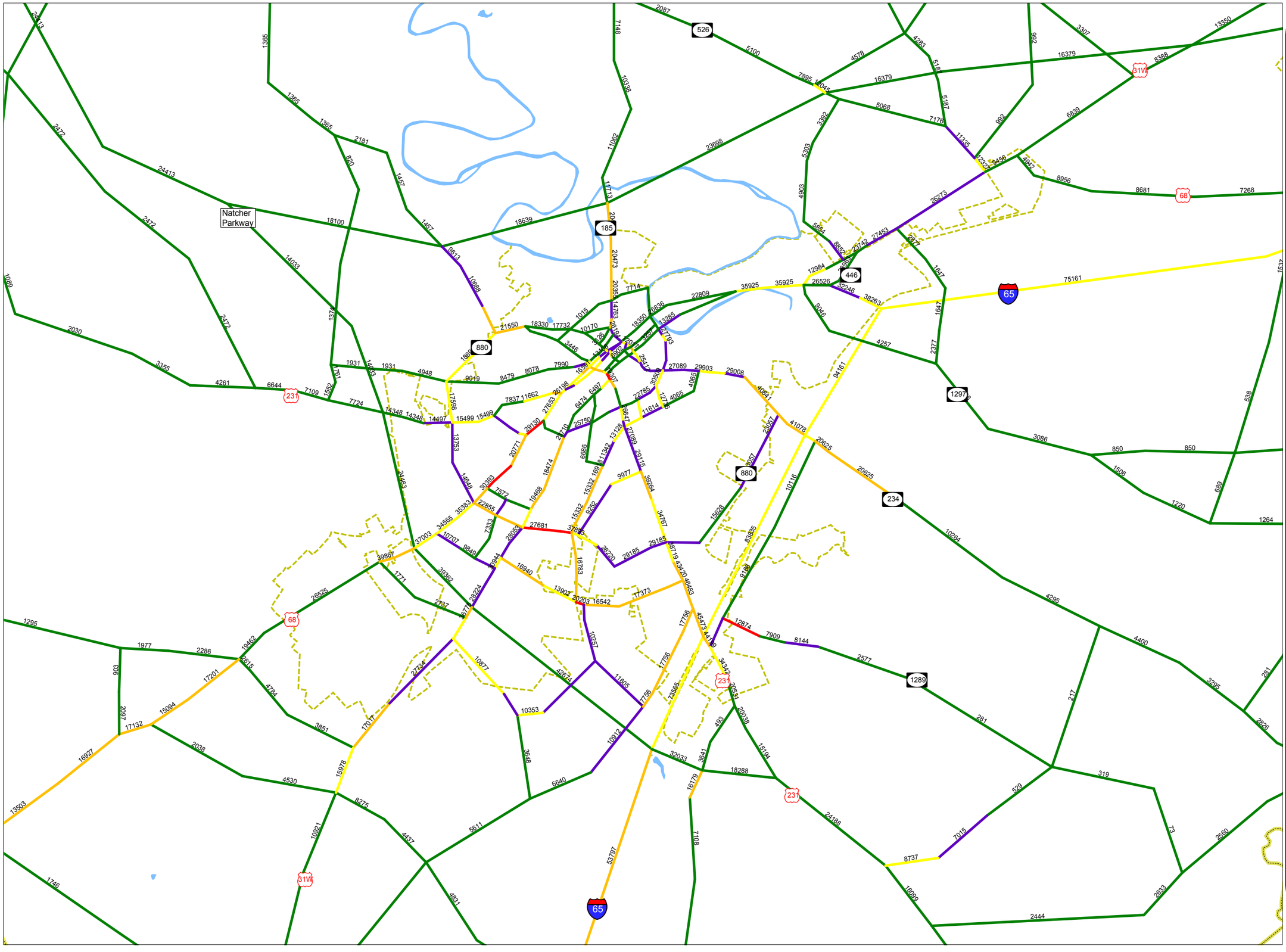


Figure 25

Year: 2030
State Data Center Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 5

Bowling Green Blowup

Daily Travel Model Assignment Shown

Map Legend

Map Layers
- Census Place (2000)
- Water Area
- County (High)
- State (High)
- I66330hi

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 .7 1.4 2.1
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

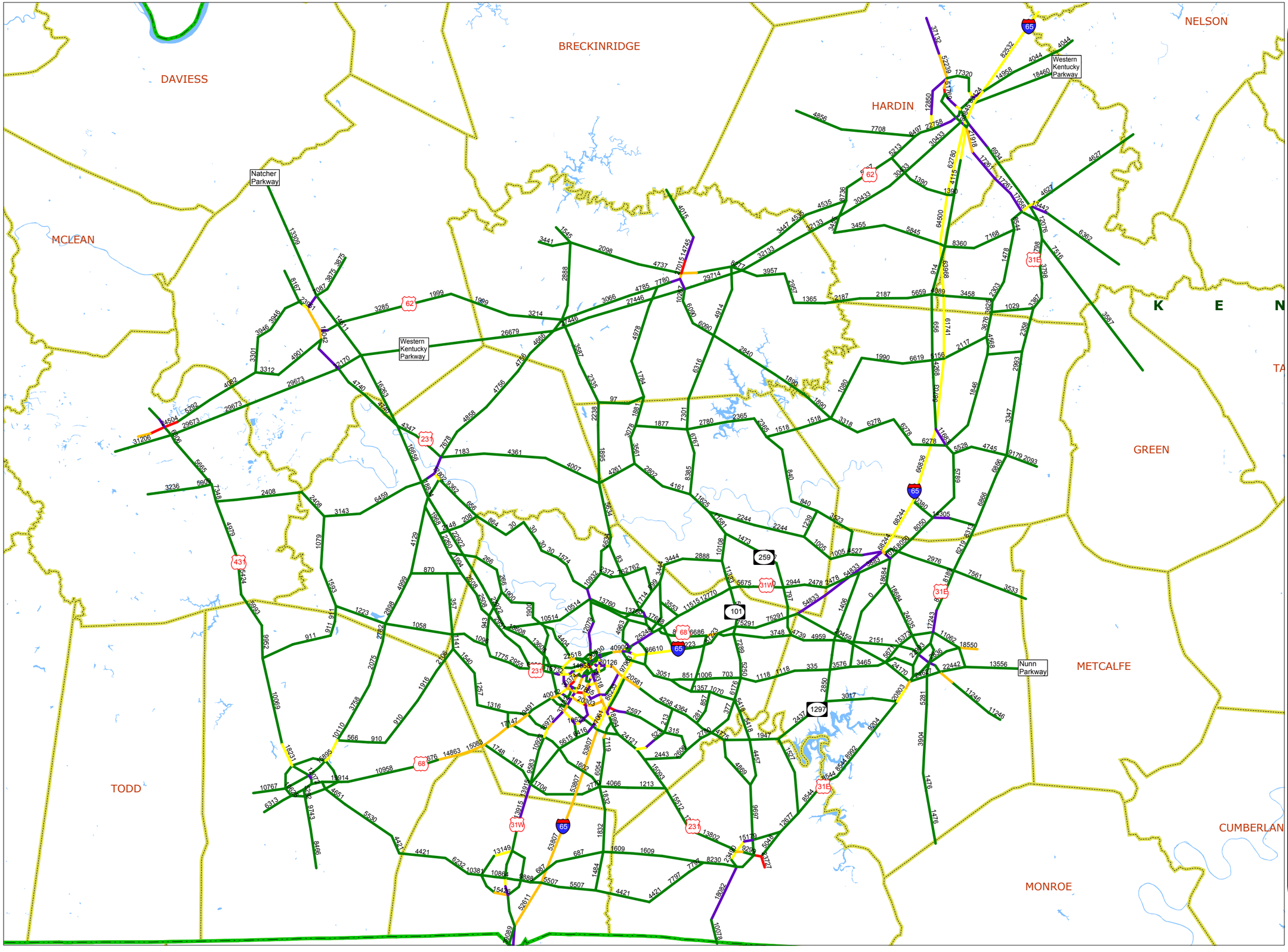


Figure 26

Year: 2030
State Data Center Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 10

Daily Travel Model Traffic Assignment Shown

Map Legend

Map Layers
- Water Area
- County (High)
- State (High)
- I66430hi

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- >LOS F (>1.8)

0 4 8 12
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

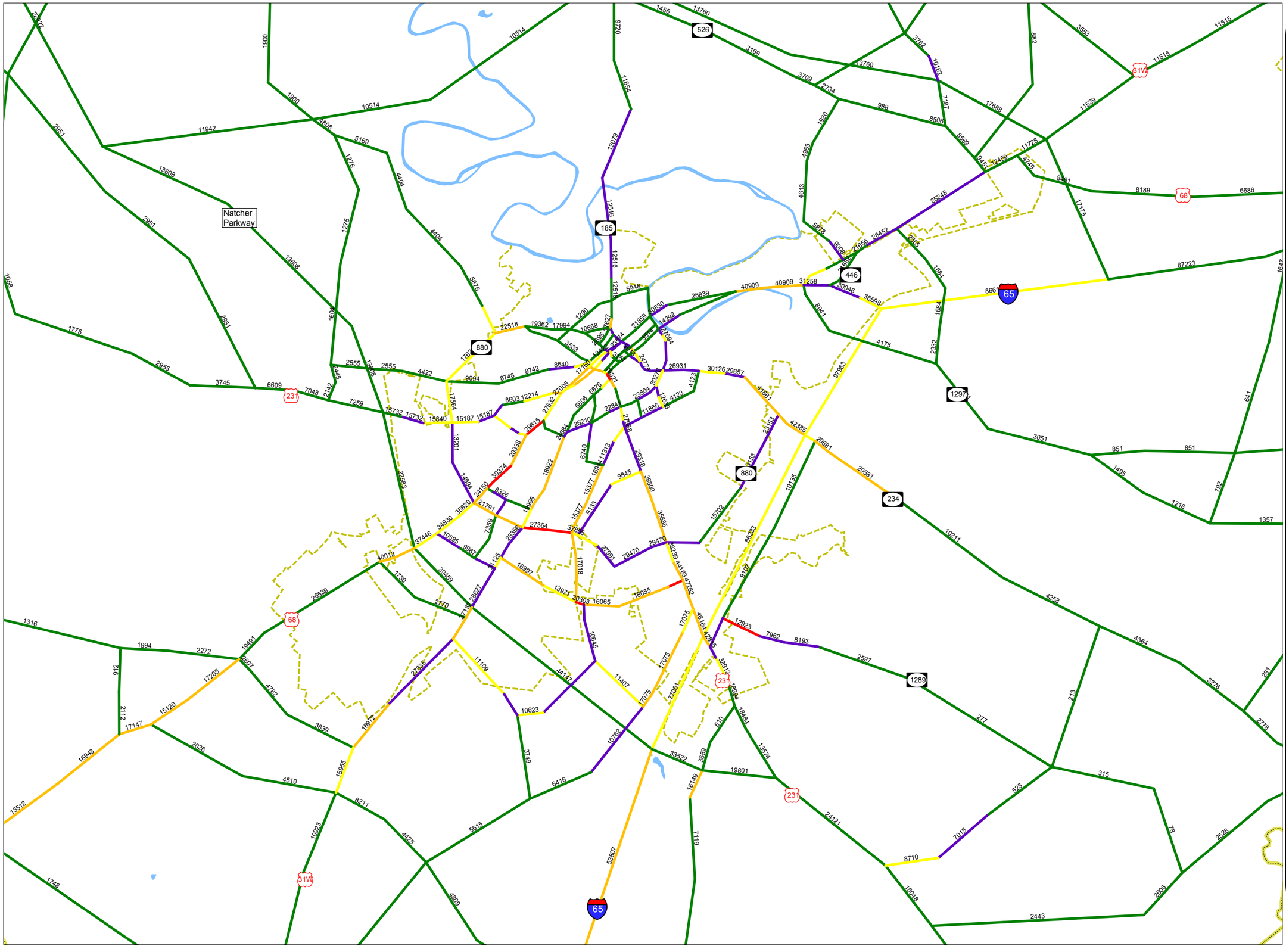


Figure 27

Year: 2030
State Data Center
Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 10

Bowling Green Blowup

Daily Travel Model Assignment Shown

Map Legend

Map Layers

- Census Place (2000)
- Water Area
- County (High)
- State (High)
- I66430hi

VC Ratio (LOS C Caps)

- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 .7 1.4 2.1
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

Figure 28

Year: 2030
State Data Center
Growth Scenario

Regional Traffic Model Forecast for I-66 Corridor 11

Daily Travel Model Assignment Shown

DAVIESS
BRECKINRIDGE
NELSON
HARDIN
MCLEAN
GREEN
TODD
METCALFE
CUMBERLAN
MONROE
K E N
TA
Natcher Parkway
Western Kentucky Parkway
Nunn Parkway

Map Legend

Map Layers
- Water Area
- County (High)
- State (High)
- I66530hi

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- >LOS F (>1.8)

0 4 8 12
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

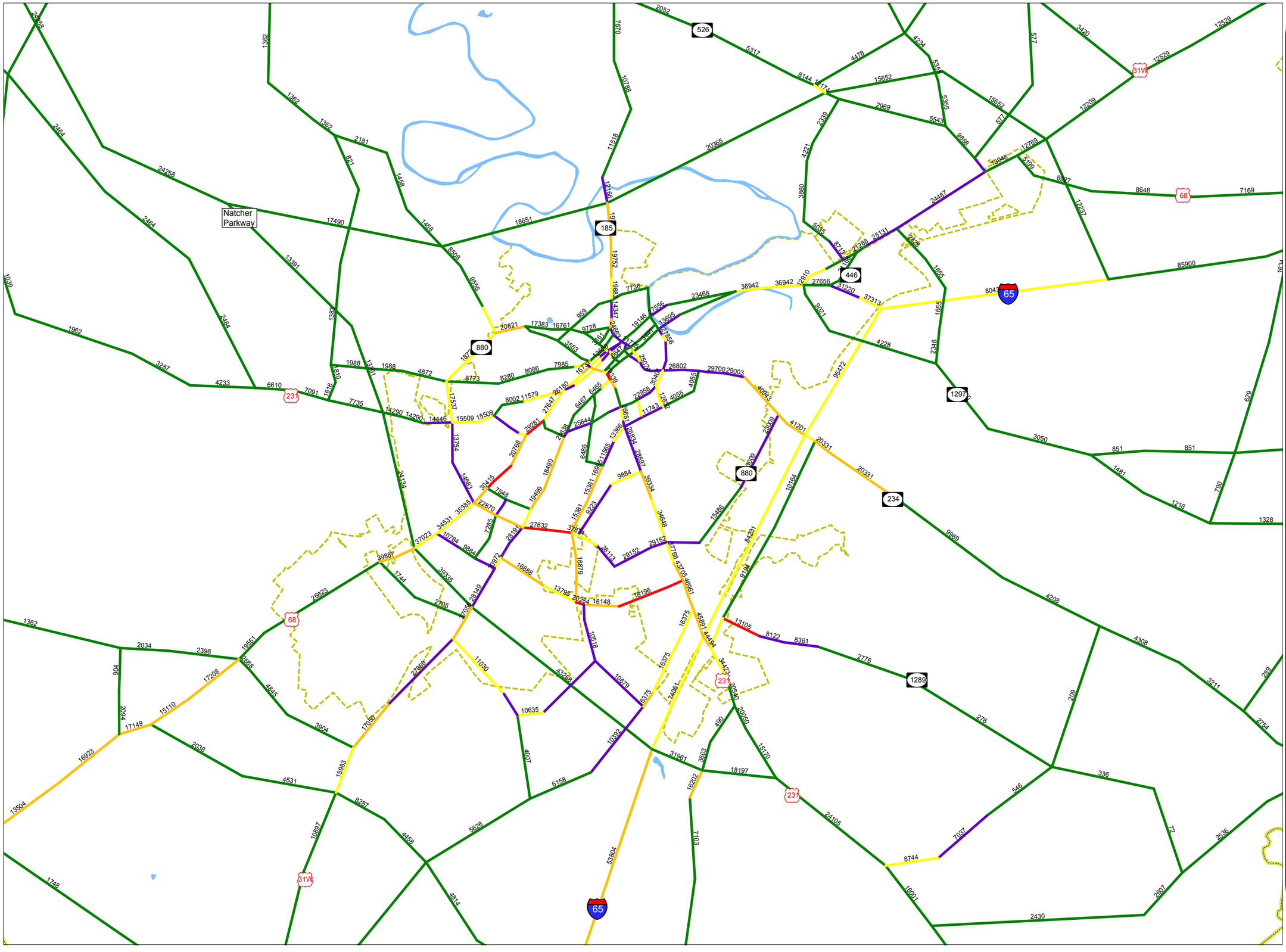


Figure 29

Year: 2030
State Data Center Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 11

Bowling Green Blowup

Daily Travel Model Assignment Shown

Map Legend

Map Layers
- Census Place (2000)
- Water Area
- County (High)
- State (High)
- I66530hi

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 .7 1.4 2.1
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

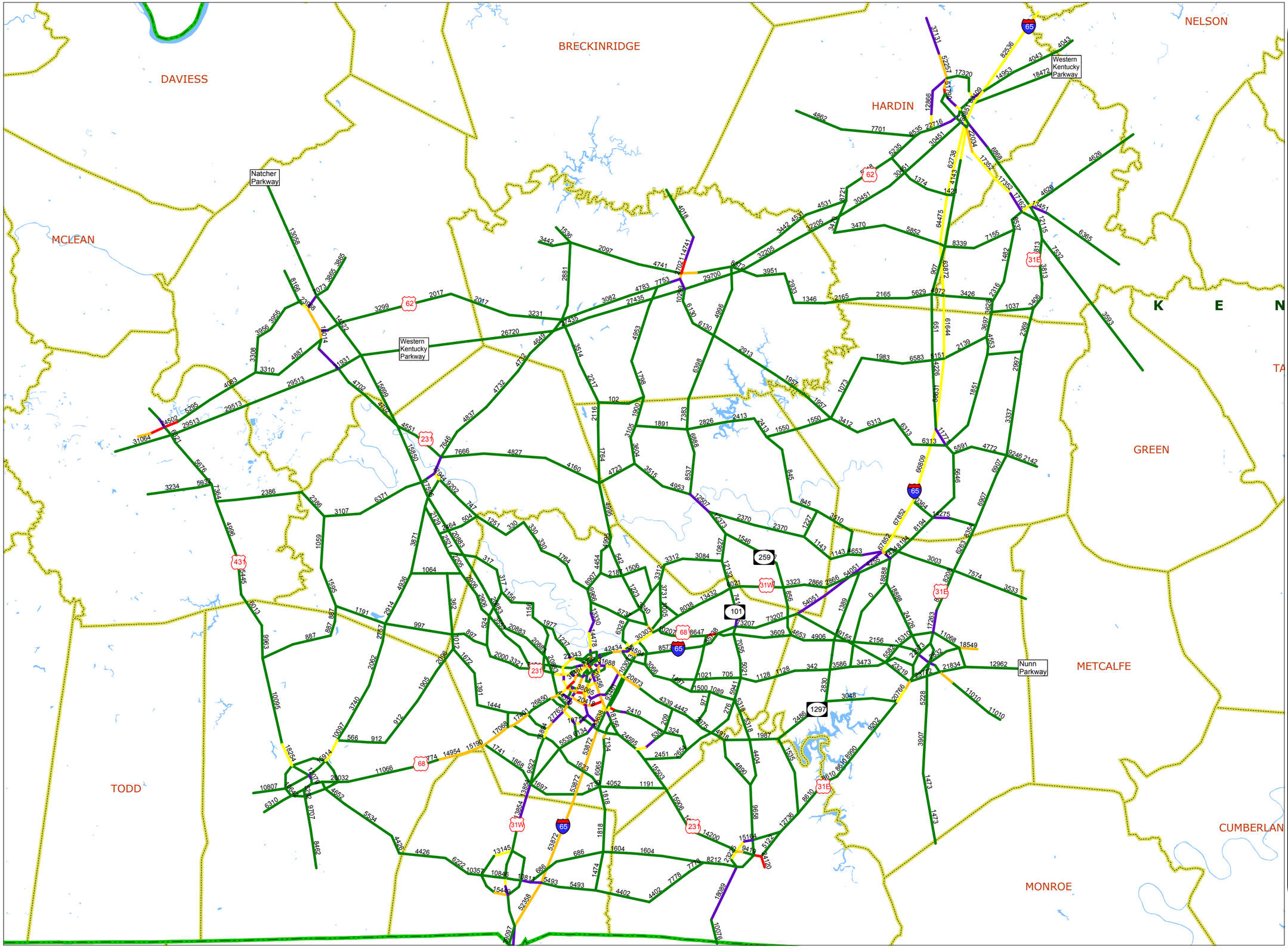


Figure 30

Year: 2030
State Data Center Growth Scneario

Regional Travel Model Forecast for I-66 Corridor 12

Daily Traffic Model Assignment Shown

Map Legend

Map Layers
- Water Area
- County (High)
- State (High)
- I66630hi

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 4 8 12
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

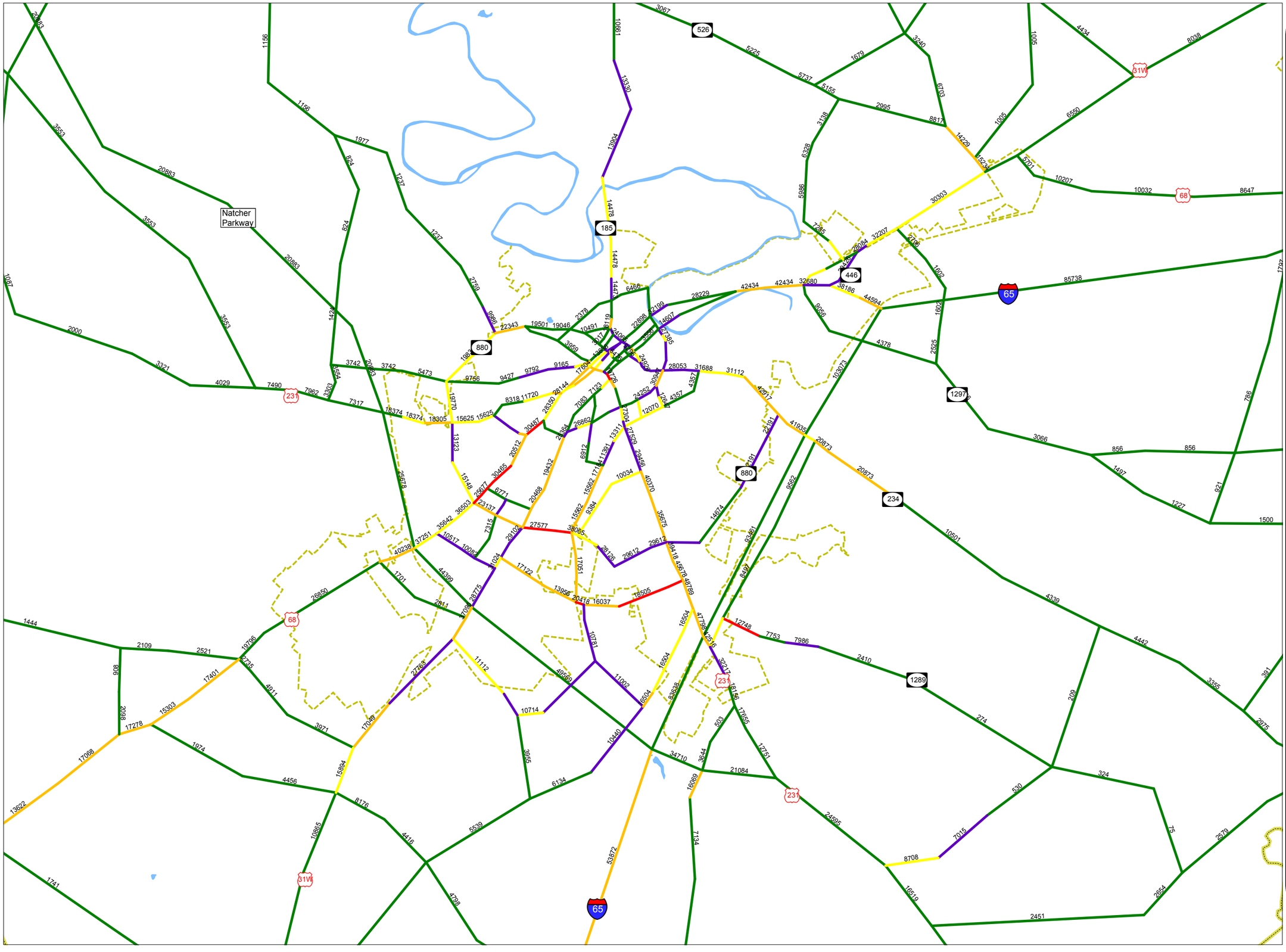


Figure 31

Year: 2030
State Data Center
Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 12

Bowling Green Blowup

Daily Traval Model Assignment Shown

Map Legend

Map Layers
- Census Place (2000)
- Water Area
- County (High)
- State (High)
- I66630hi

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 .7 1.4 2.1
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

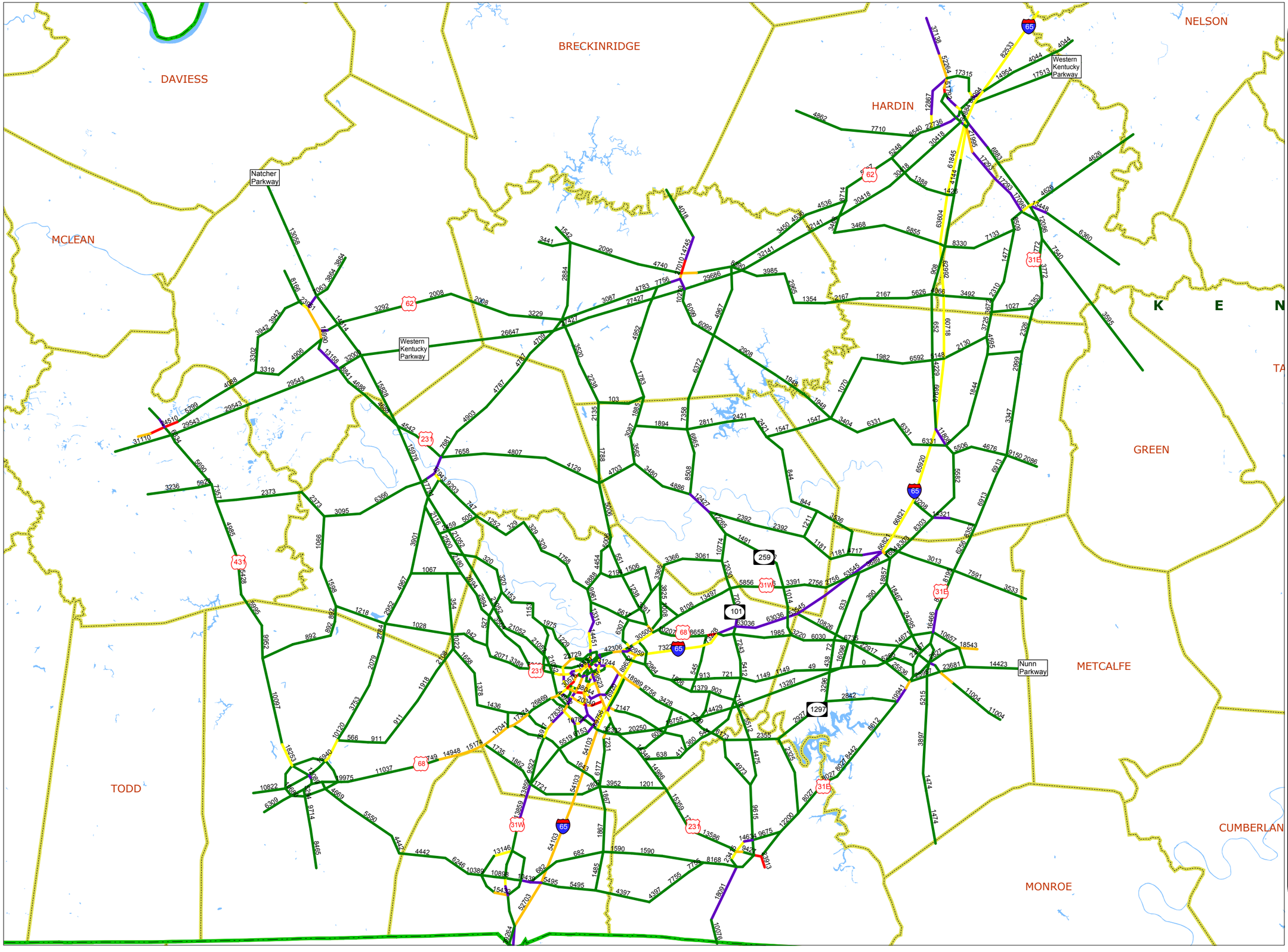


Figure 32

Year: 2030
State Data Center Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 23

Daily Travel Model Traffic Assignment Shown

Map Legend

Map Layers
- Water Area
- County (High)
- State (High)
- I66730HI

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 4 8 12
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

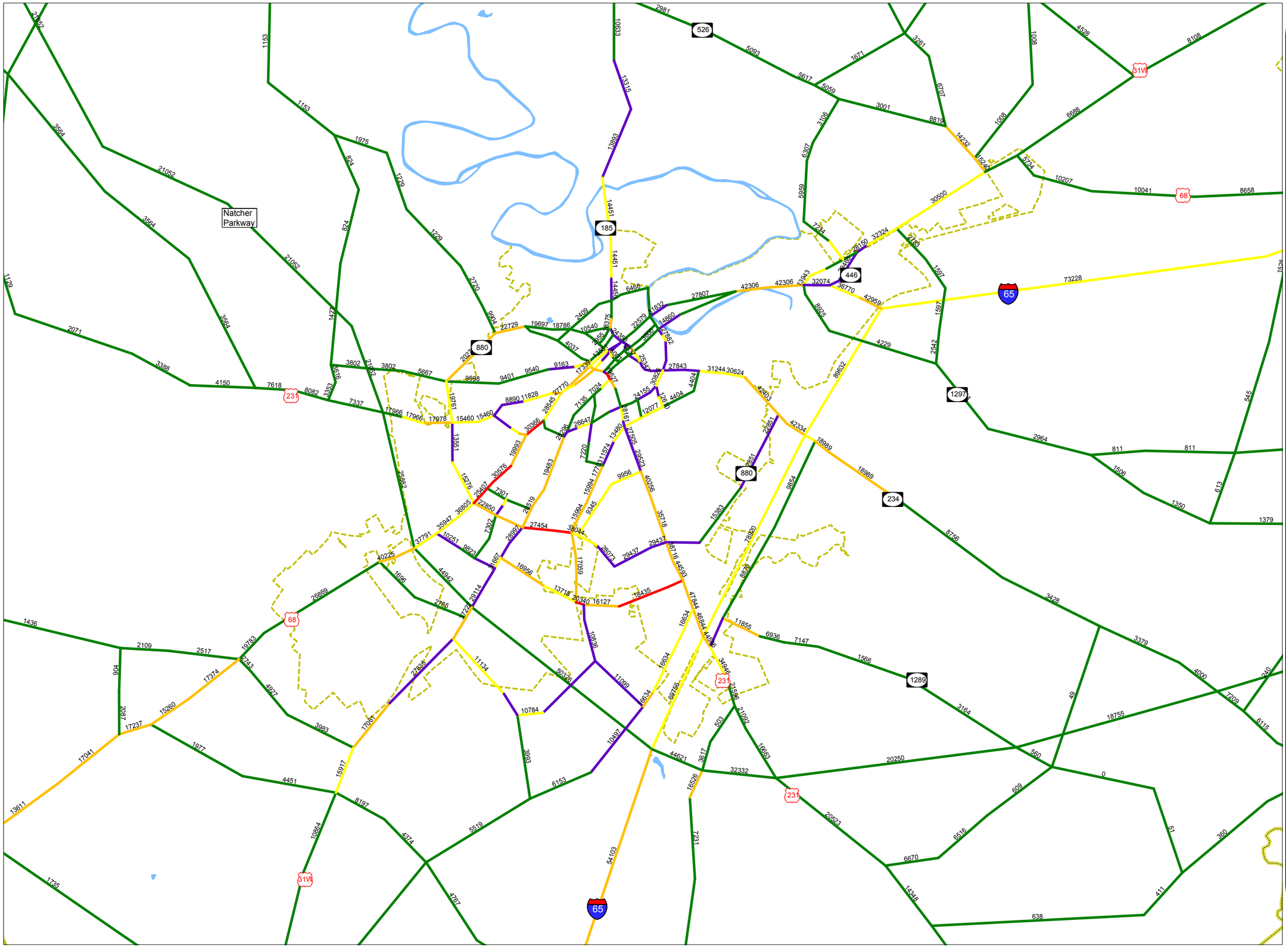


Figure 33

Year: 2030
State Data Center Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 23

Bowling Green Blowup

Daily Travel Model Assignment Shown

Map Legend

Map Layers
- Census Place (2000)
- Water Area
- County (High)
- State (High)
- I66730HI

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 .7 1.4 2.1
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

Figure 34

Year: 2030
State Data Center
Growth Scenario

Regional Travel Model Forecast for Outer Beltline Corridor A

Daily Travel Model Assignment Shown

DAVIESS
BRECKINRIDGE
NELSON
HARDIN
MCLEAN
TODD
GREEN
METCALFE
CUMBERLAND
MONROE
TAYLOR
KENTON

Natcher Parkway
Western Kentucky Parkway
Nunn Parkway

Map Legend

Map Layers
- Water Area
- County (High)
- State (High)
- Bla30hi

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 4 8 12
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

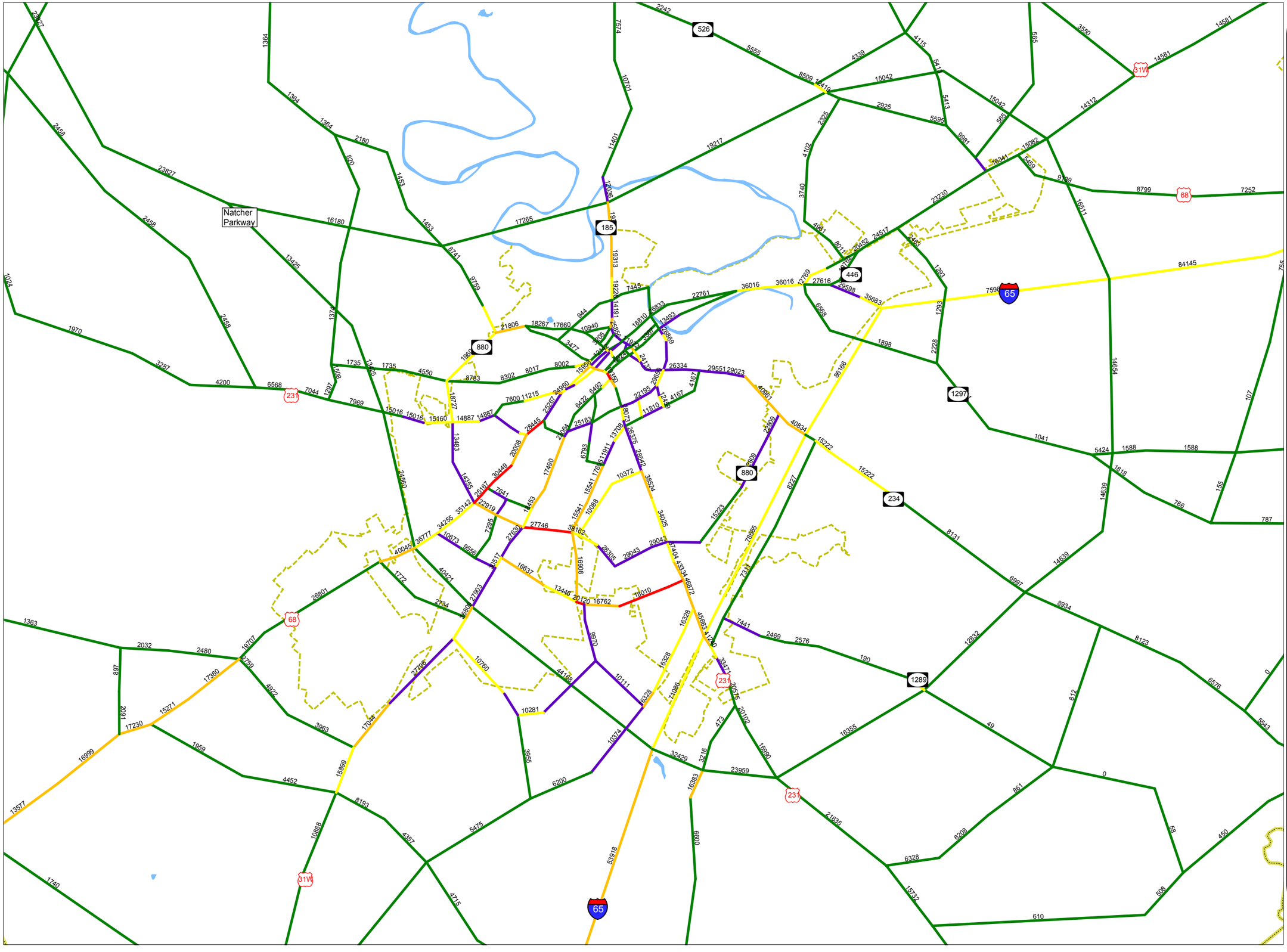


Figure 35

Year: 2030
State Data Center Growth Scenario

Regional Travel Model Forecast for Outer Beltline Corridor A

Bowling Green Blowup

Daily Travel Model Assignment Shown

Map Legend

Map Layers
- Census Place (2000)
- Water Area
- County (High)
- State (High)
- Bla30hi

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 .7 1.4 2.1
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

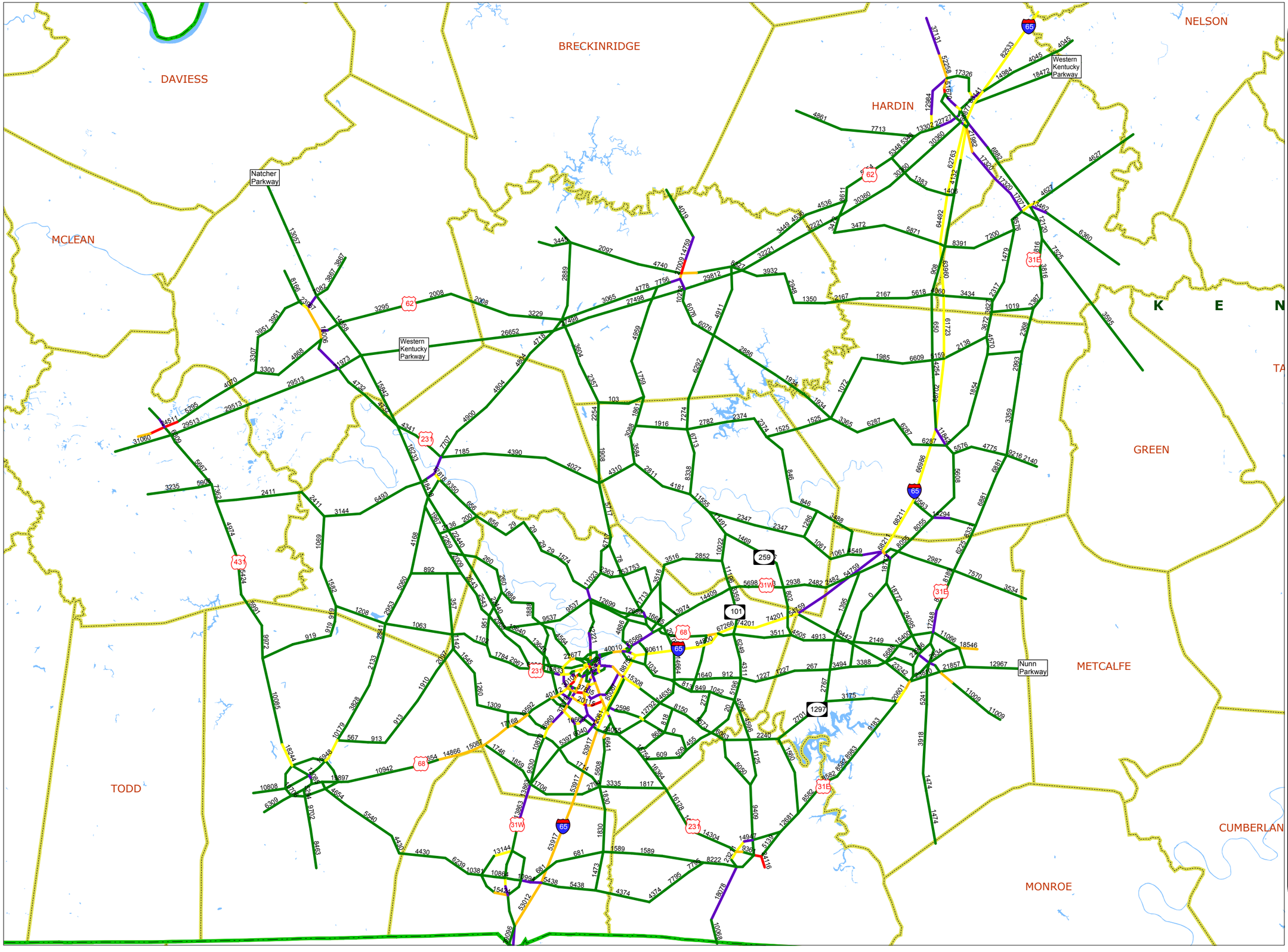


Figure 36

Year: 2030
State Data Center Growth Scenario

Regional Traffic Model Forecast for Outer Beltline Corridor B

Daily Travel Model Assignment Shown

Map Legend

Map Layers
- Water Area
- County (High)
- State (High)
- Blb30hi

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 4 8 12
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

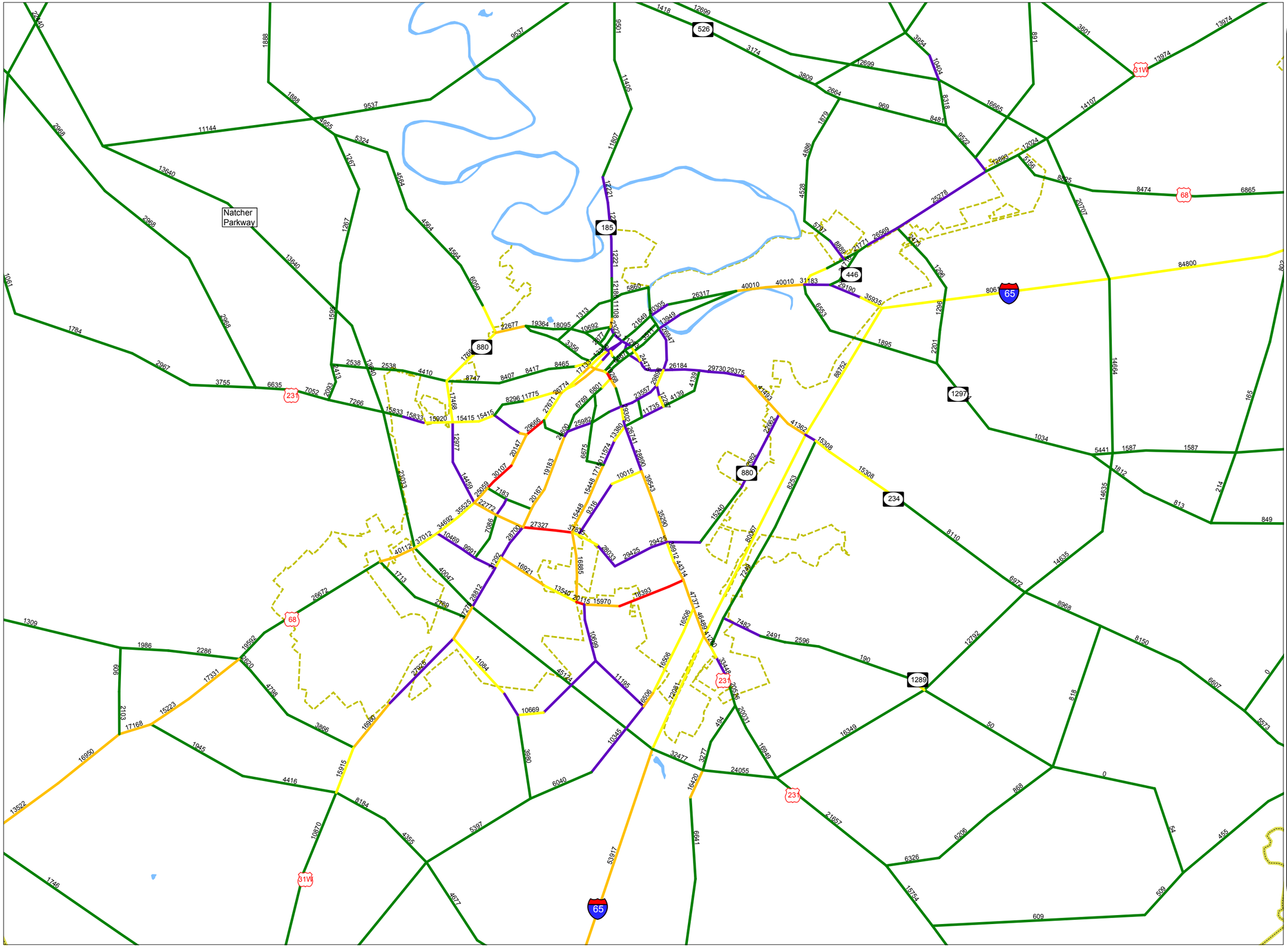


Figure 37

Year: 2030
State Data Center Growth Scenario

Regional Travel Model Forecast for Outer Beltline Corridor B

Bowling Green Blowup

Daily Travel Model Assignment Shown

Map Legend

Map Layers
- Census Place (2000)
- Water Area
- County (High)
- State (High)
- Blb30hi

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- >LOS F (>1.8)

0 .7 1.4 2.1
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

Figure 38

Year: 2030
State Data Center
Growth Scenario

Regional Travel Model Forecast for Outer Beltline Corridor D

Daily Travel Model Assignment Shown

Map Legend

Map Layers
- Water Area
- County (High)
- State (High)
- Blc30hi

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 4 8 12
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

Figure 39

Year: 2030
State Data Center Growth Scenario

Regional Travel Model Forecast for Outer Beltline Corridor D

Bowling Green Blowup

Daily Travel Model Assignment Shown

Map Legend

Map Layers
- Census Place (2000)
- Water Area
- County (High)
- State (High)
- Blc30hi

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- >LOS F (>1.8)

0 .7 1.4 2.1
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

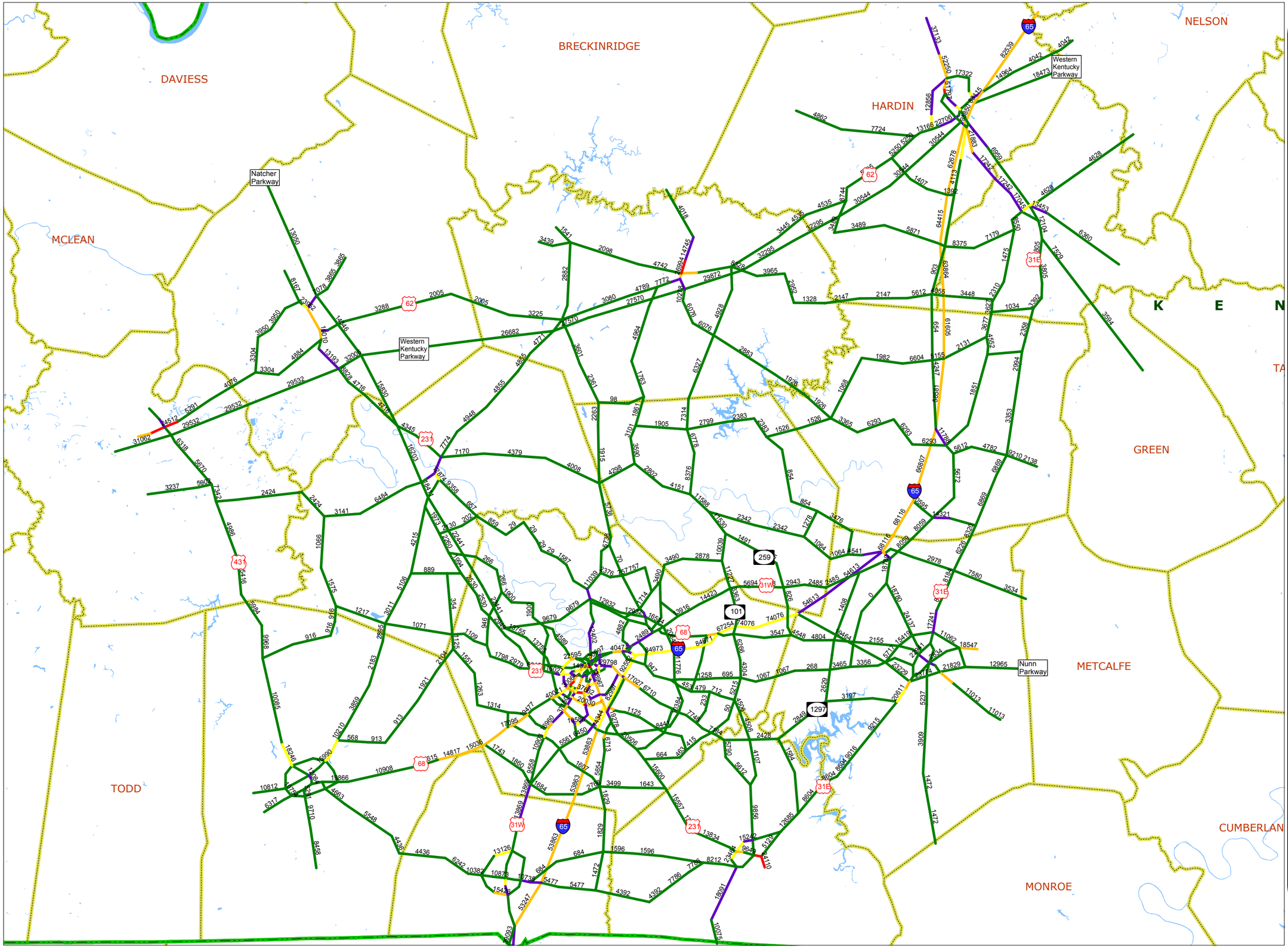


Figure 40

Year: 2030
State Data Center Growth Scenario

Regional Travel Model Forecast for Outer Beltline Corridor E

Daily Travel Model Traffic Assignment

Map Legend

Map Layers
- Water Area
- County (High)
- State (High)
- BLD30HI

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 4 8 12
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

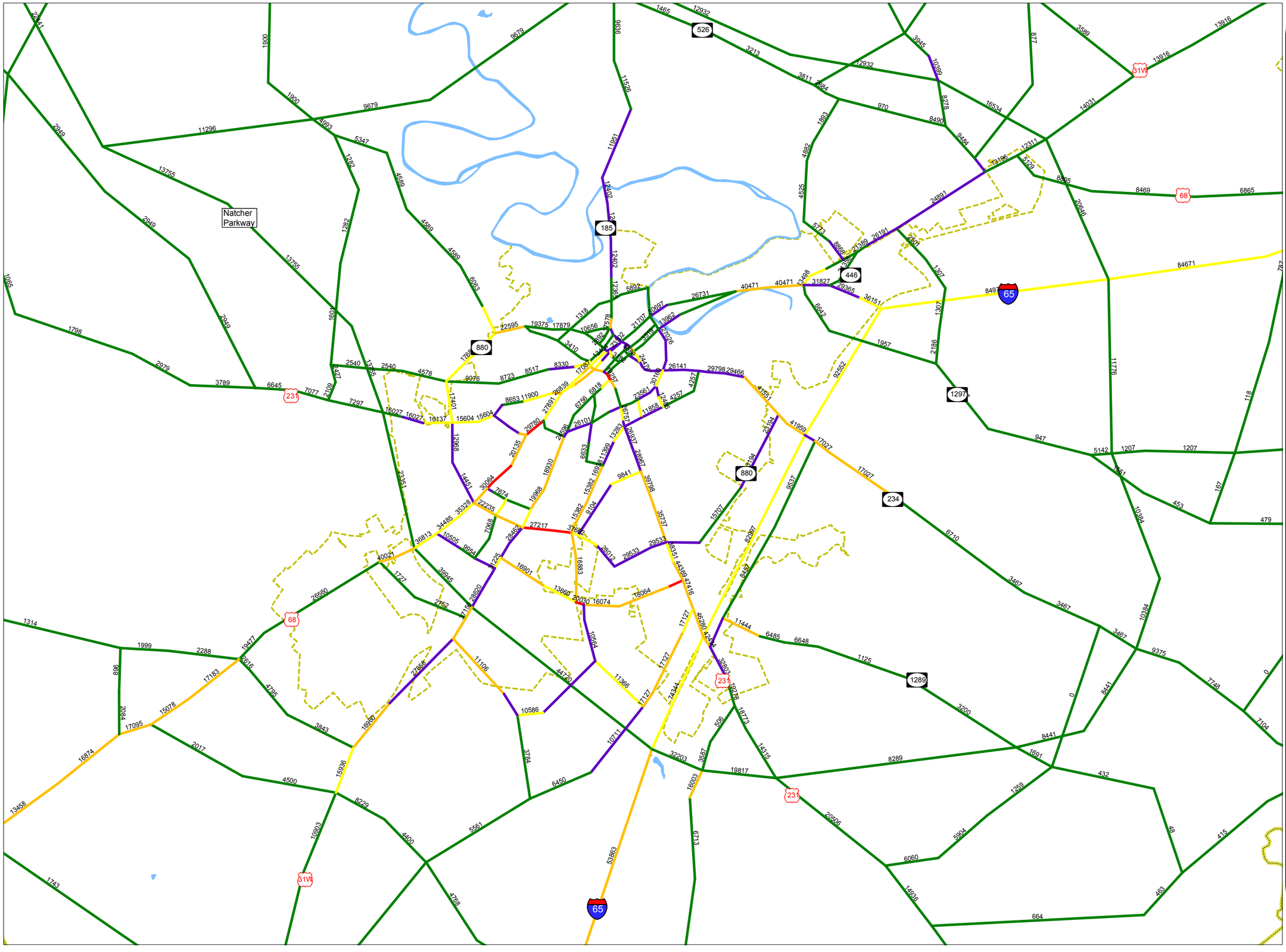


Figure 41

Year: 2030
State Data Center Growth Scenario

Regional Travel Model Forecast for Outer Beltline Corridor E

Bowling Green Blowup

Daily Travel Model Assignment Shown

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

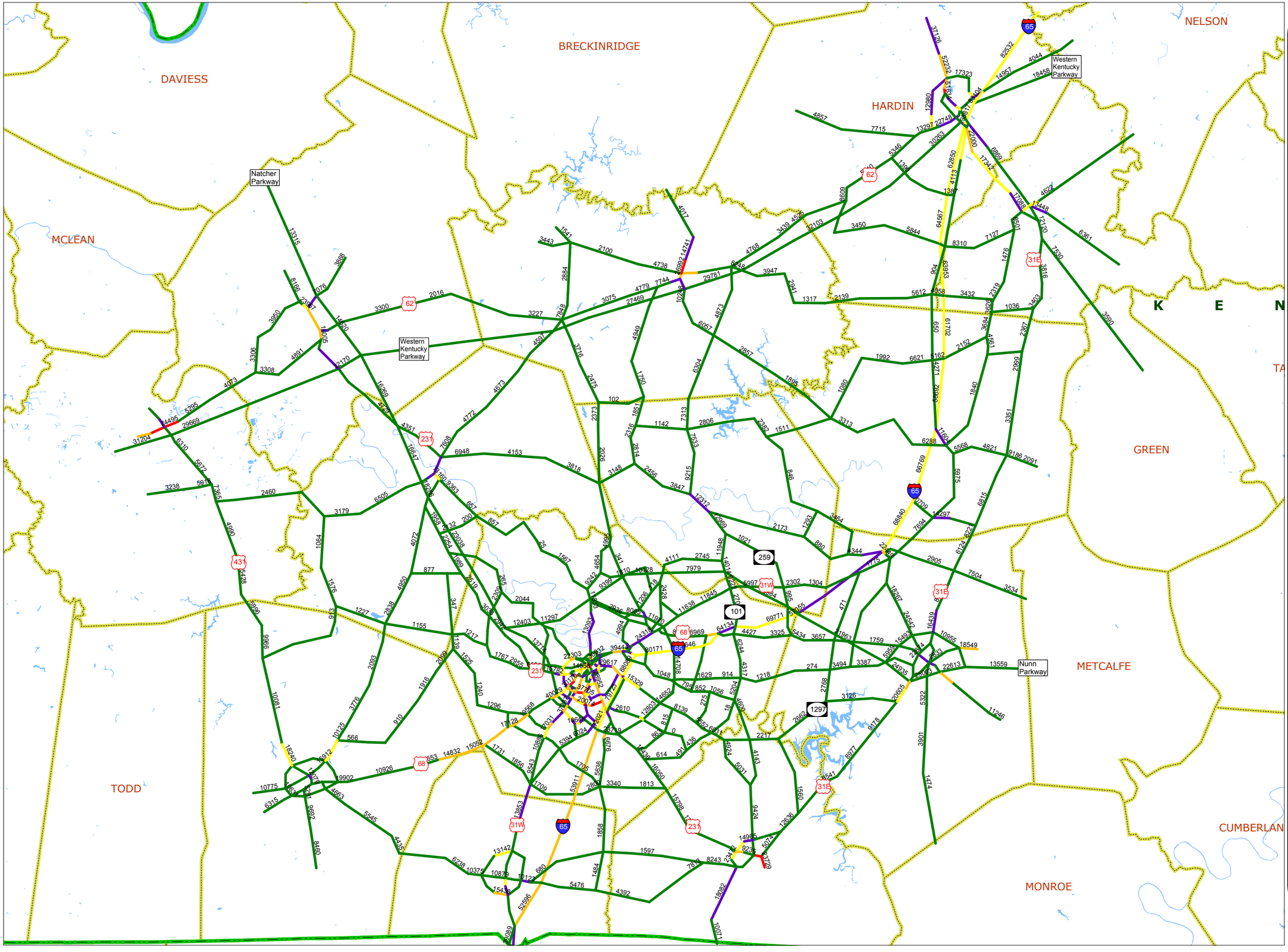


Figure 42

Year: 2030
State Data Center Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 1 with Beltline Corridor B

Daily Travel Model Assignment Shown

Map Legend

Map Layers
- Water Area
- County (High)
- State (High)
- Com1b30h

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- >LOS F (>1.8)

0 4 8 12
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

Figure 43

Year: 2030
State Data Center
Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 1 with Beltline Corridor B

Bowling Green
Blowup

Daily Travel Model
Assignment Shown

Map Legend

Map Layers
- Census Place (2000)
- Water Area
- County (High)
- State (High)
- Com1b30h

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 .7 1.4 2.1
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

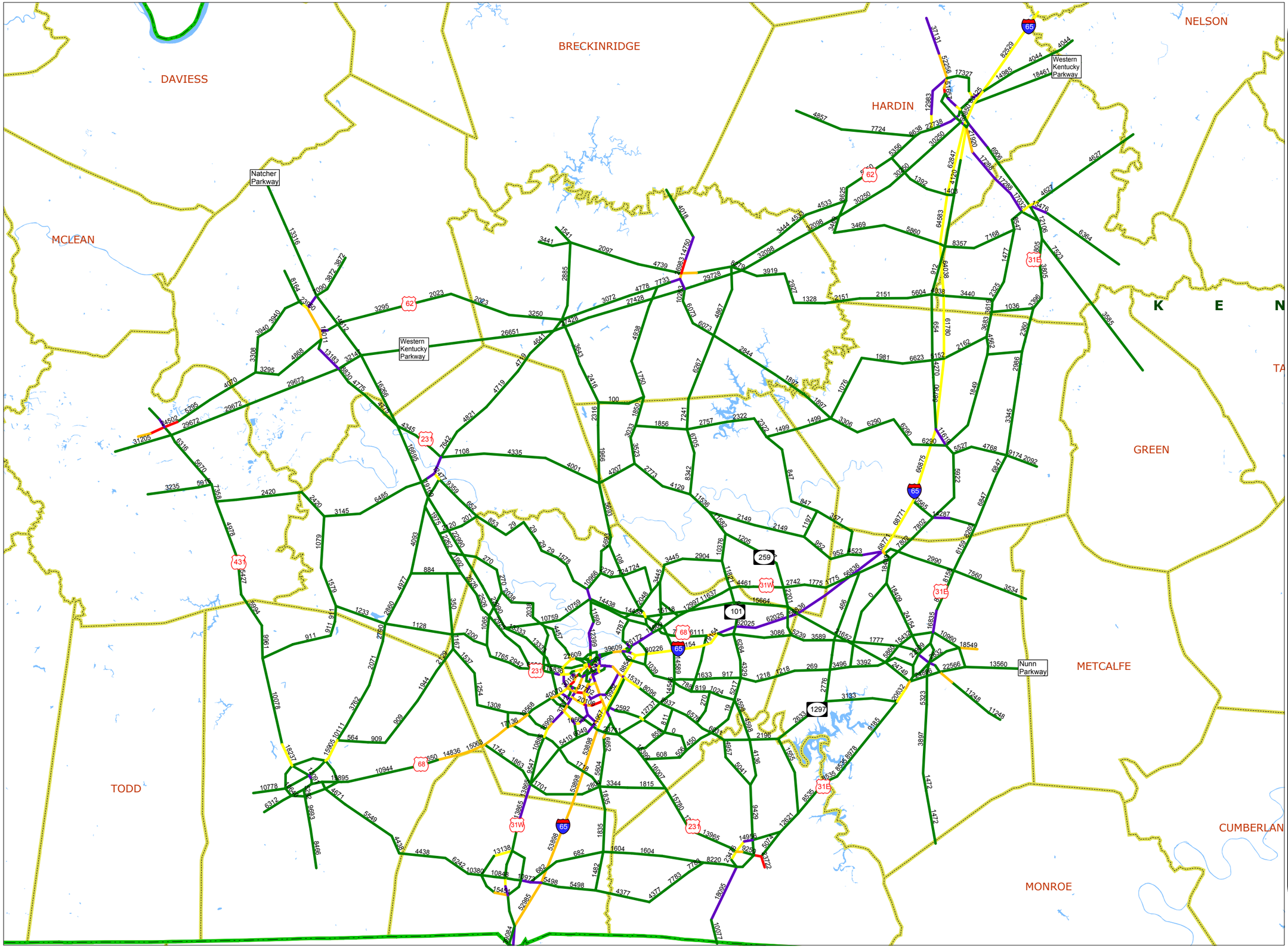


Figure 44

Year: 2030
State Data Center Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 4 with Beltline Corridor B

Daily Travel Model Assignment Shown

Map Legend

Map Layers
- Water Area
- County (High)
- State (High)
- COM2B30H

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- >LOS F (>1.8)

0 4 8 12
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

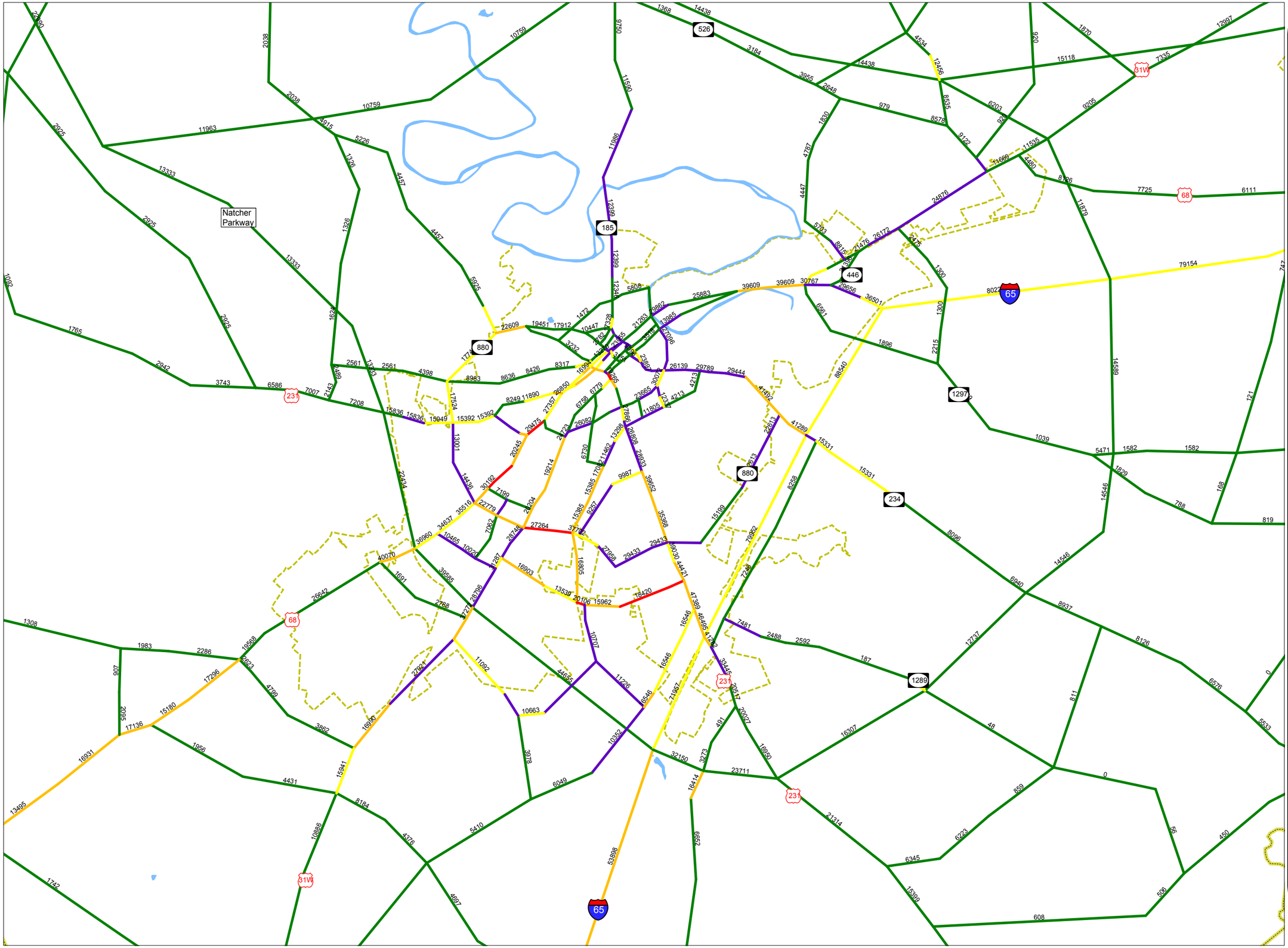


Figure 45

Year: 2030
State Data Center Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 4 with Beltline Corridor B

Bowling Green Blowup

Daily Travel Model Assignment Shown

Map Legend

Map Layers
- Census Place (2000)
- Water Area
- County (High)
- State (High)
- COM2B30H

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- >LOS F (>1.8)

0 .7 1.4 2.1
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

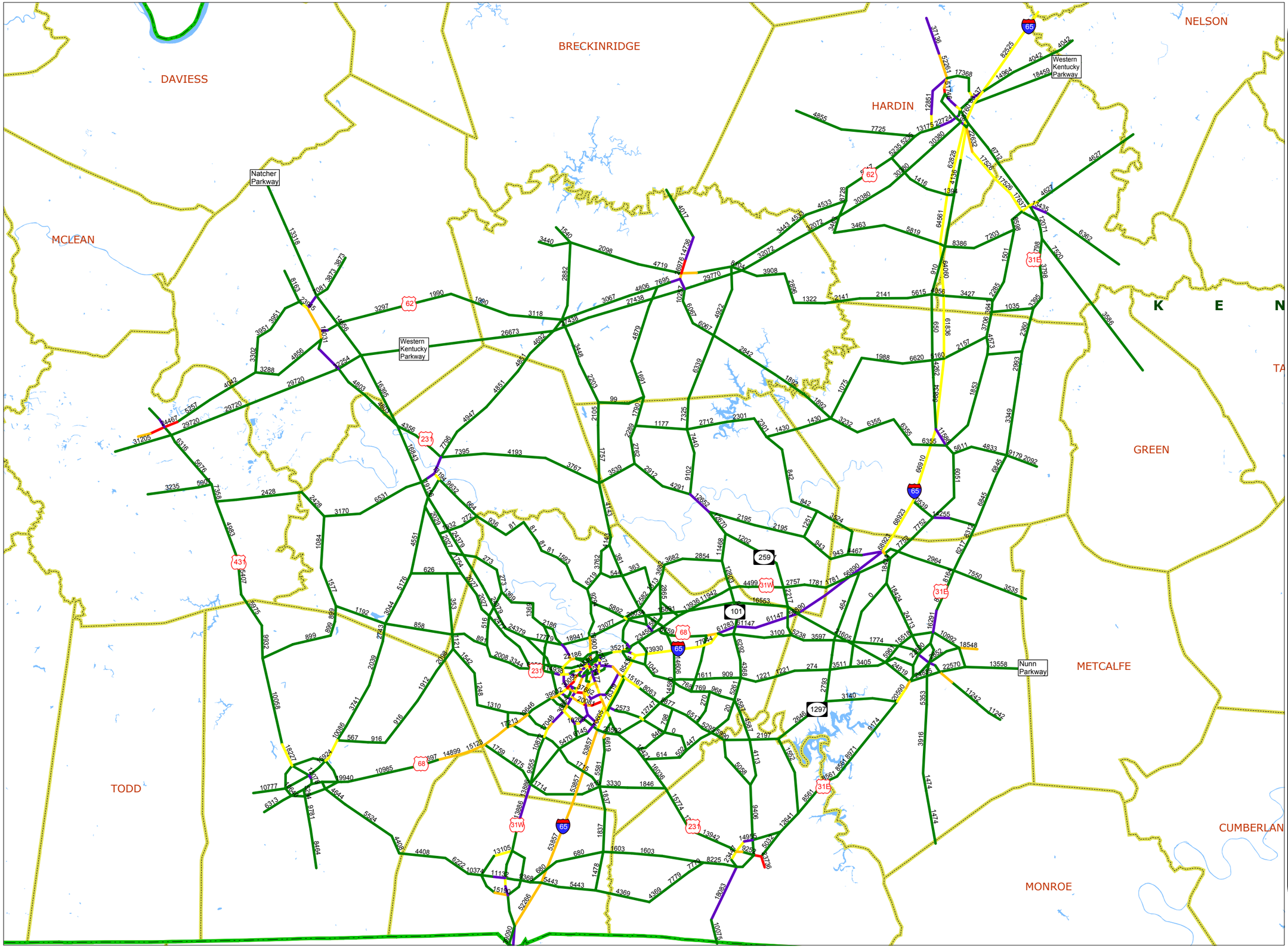


Figure 46

Year: 2030
State Data Center Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 5 with Beltline Corridor A

Daily Travel Model Assignment Shown

Map Legend

Map Layers
- Water Area
- County (High)
- State (High)
- COM3A30H

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- >LOS F (>1.8)

0 4 8 12
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

Figure 47

Year: 2030
State Data Center
Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 5 with Beltline Corridor A

Bowling Green Blowup

Daily Travel Model Assignment Shown

Map Legend

Map Layers
- Census Place (2000)
- Water Area
- County (High)
- State (High)
- COM3A30H

VC Ratio (LOS C Caps)
- LOS C (< 1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- >LOS F (>1.8)

0 .7 1.4 2.1
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

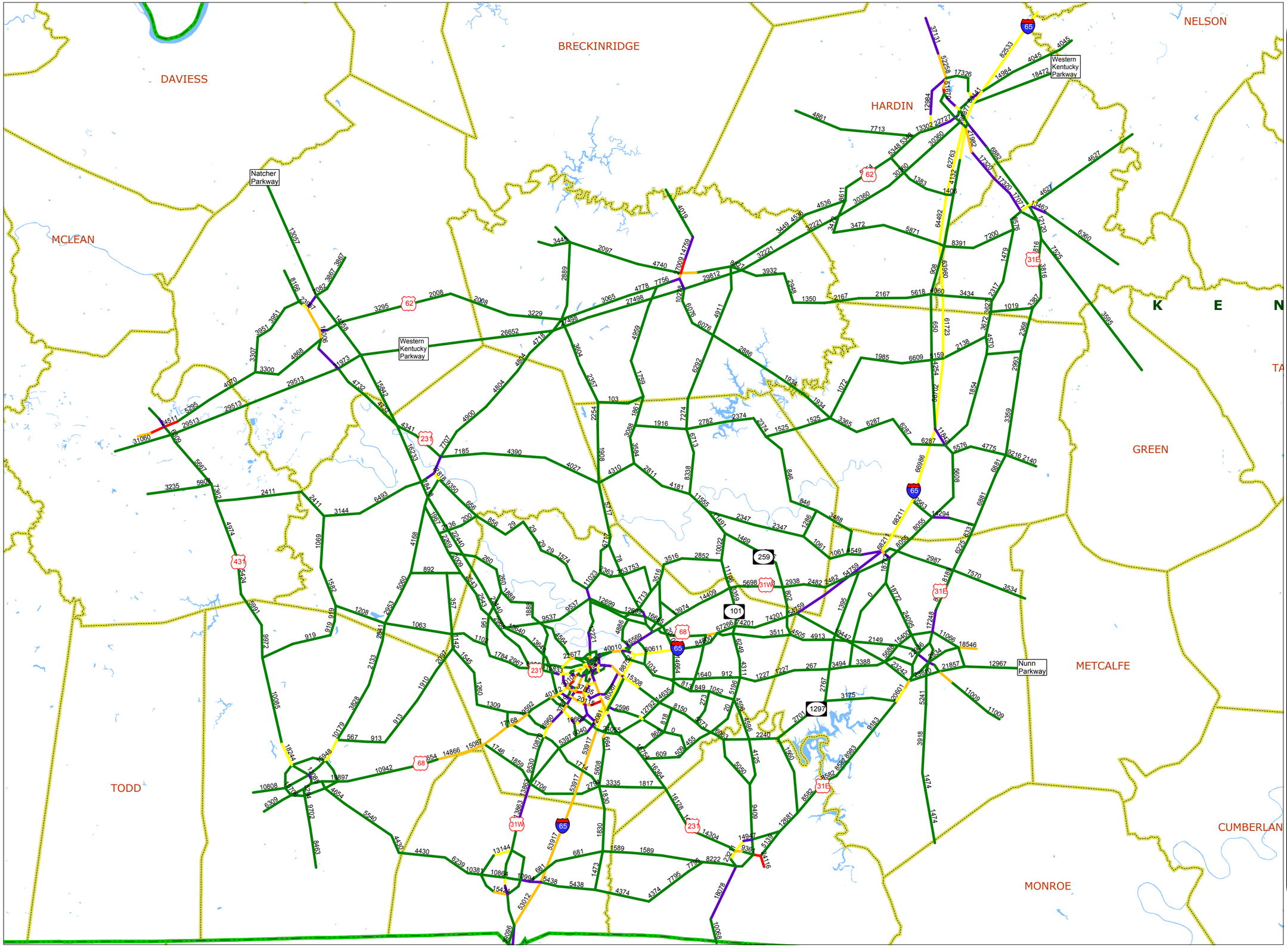


Figure 48

Year: 2030
State Data Center Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 10 with Beltline Corridor B

Daily Travel Model Assignment Shown

Map Legend

Map Layers
- Water Area
- County (High)
- State (High)
- Blb30hi

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 4 8 12
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

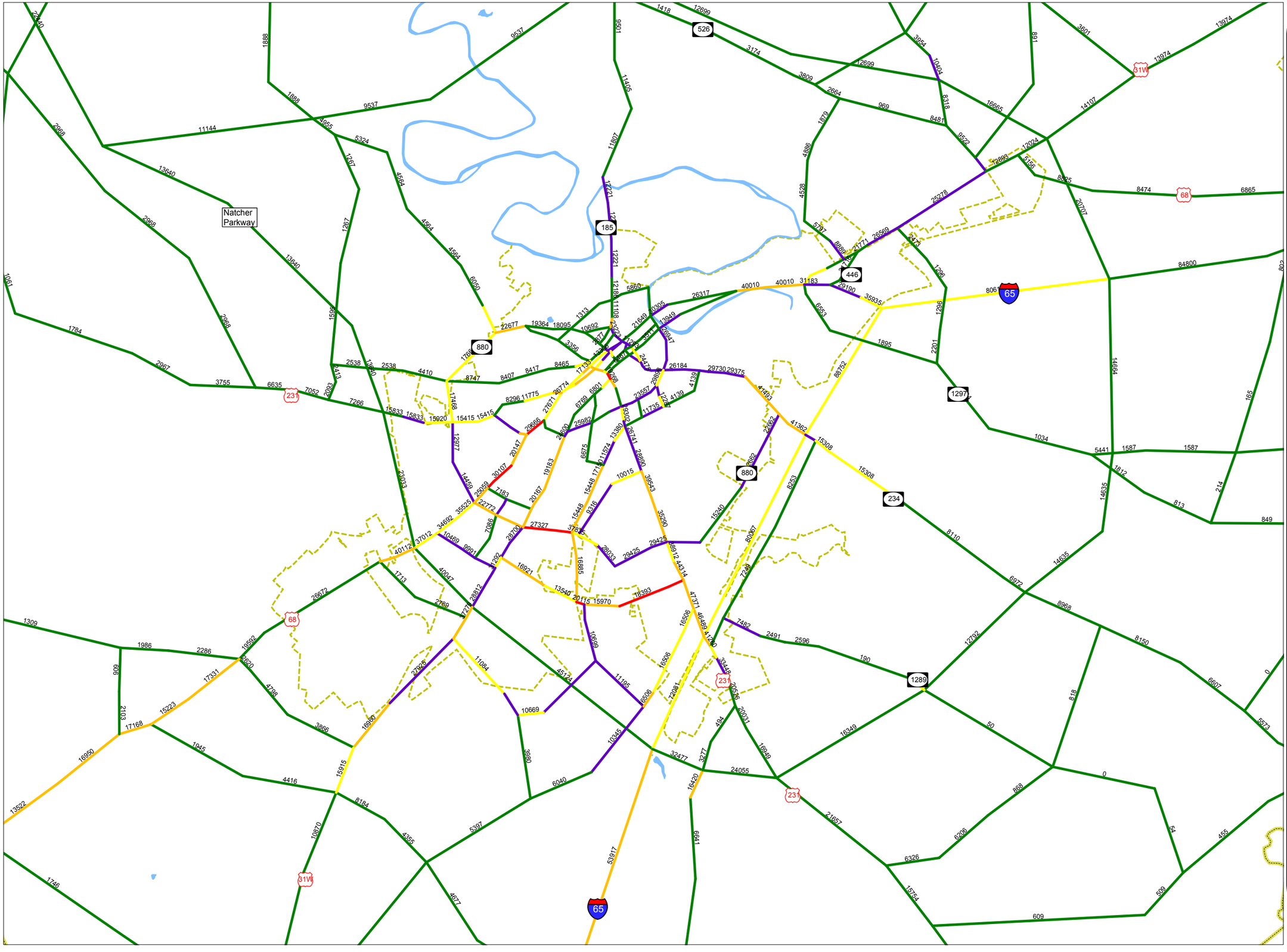


Figure 49

Year: 2030
State Data Center Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 10 with Beltline Corridor B

Bowling Green Blowup

Daily Travel Model Assignment Shown

Map Legend

Map Layers
- Census Place (2000)
- Water Area
- County (High)
- State (High)
- Blb30hi

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- >LOS F (>1.8)

0 .7 1.4 2.1
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

Figure 50

Year: 2030
State Data Center Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 11 or 12 with Beltline Corridor A

(Except I-65 achieves LOS C from Natcher Parkway to Beltline under I-66 Corridor 12)

Daily Travel Model Assignment Shown

Map Legend

Map Layers
- Water Area
- County (High)
- State (High)
- Bla30hi

VC Ratio (LOS C Caps)
- LOS C (< 1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 4 8 12
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

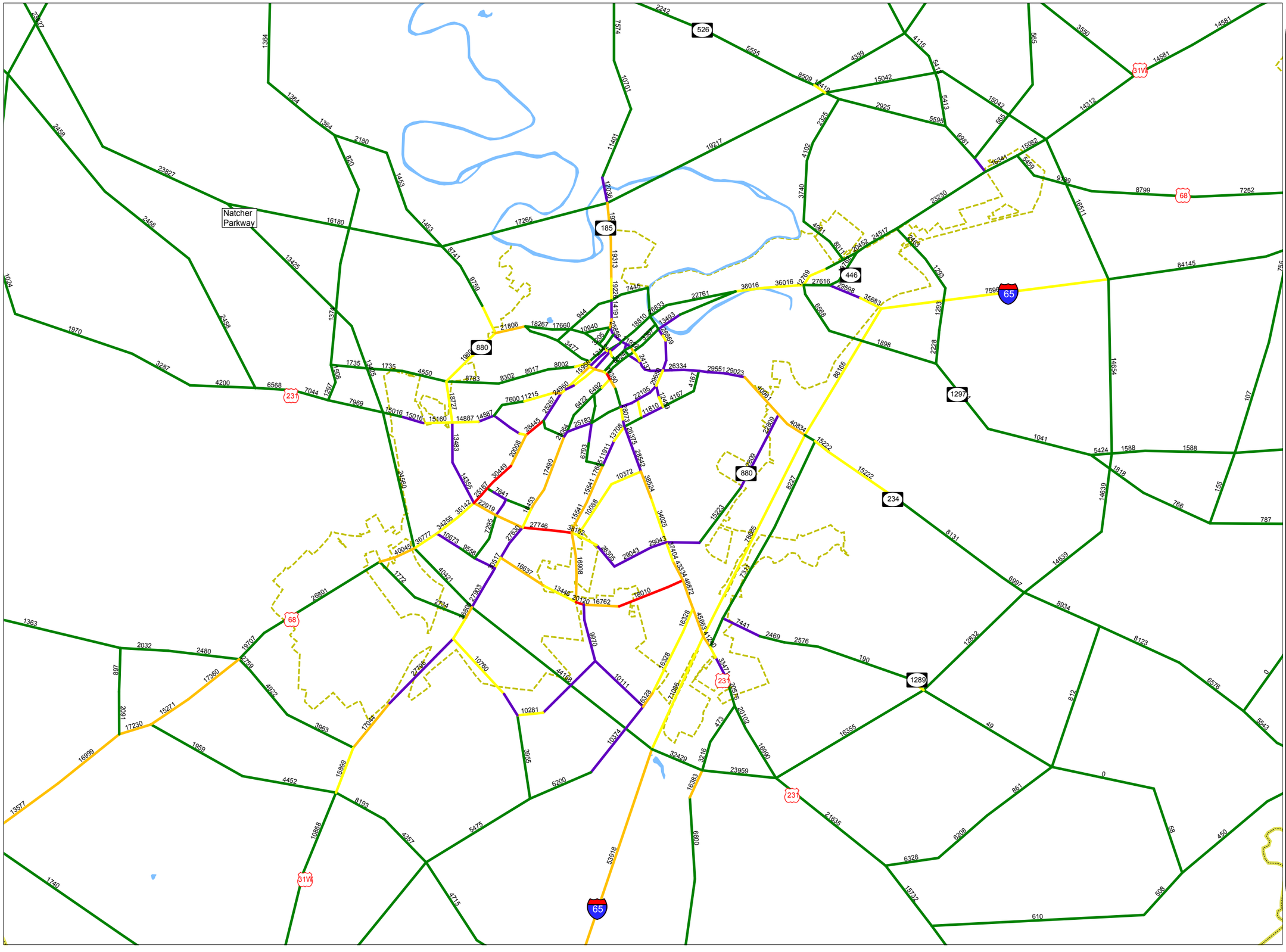


Figure 51

Year: 2030
State Data Center Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 11 or 12 with Beltline Corridor A

(Except I-65 achieves LOS C from Natcher Parkway to Beltline under I-66 Corridor 12)

Bowling Green Blowup

Daily Travel Model Assignment Shown

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

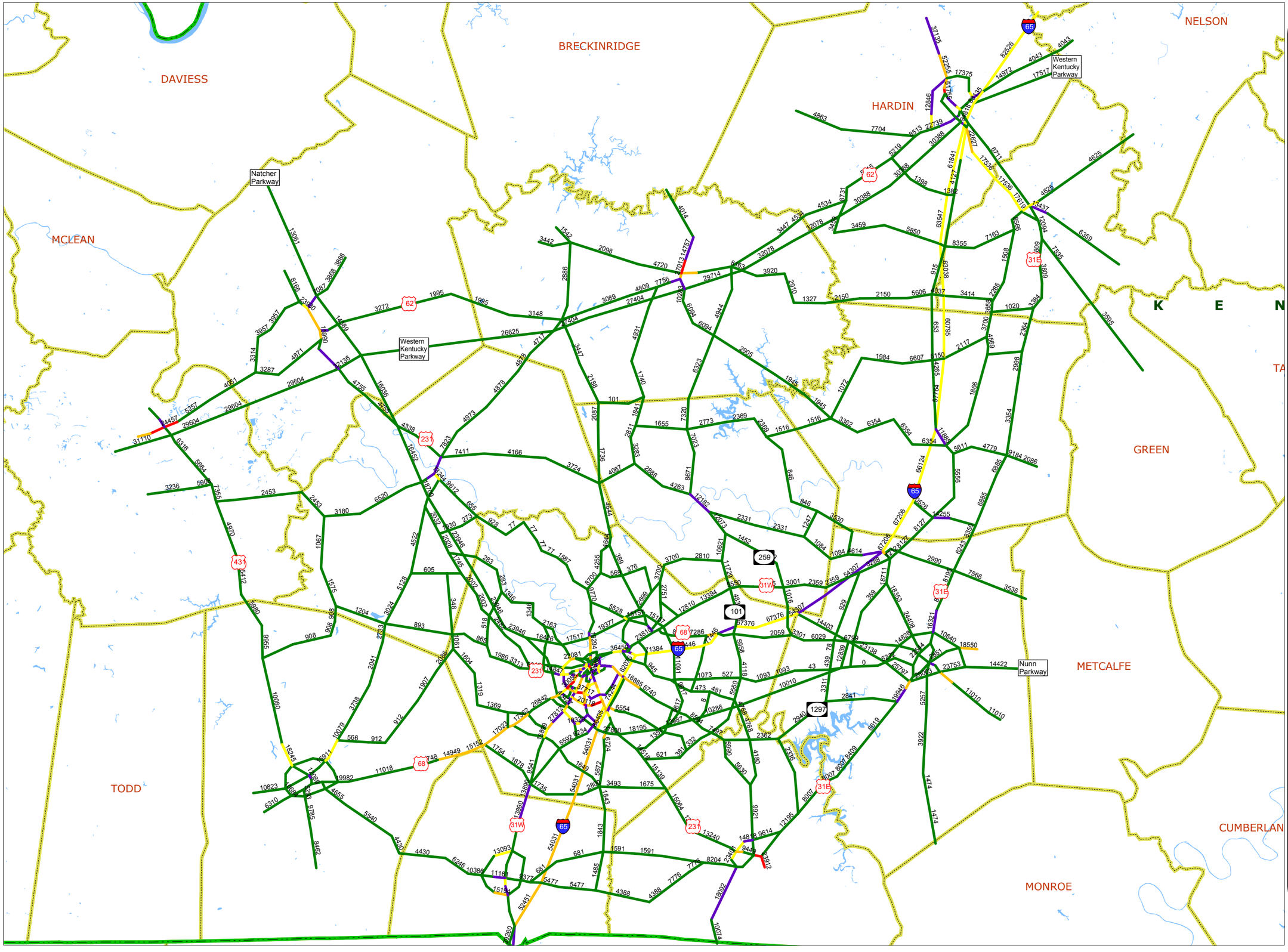


Figure 52

Year: 2030
State Data Center Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 23 with Beltline Corridor D

Daily Travel Model Assignment Shown

Map Legend

Map Layers
- Water Area
- County (High)
- State (High)
- COM7C30H

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- > LOS F (>1.8)

0 4 8 12
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC

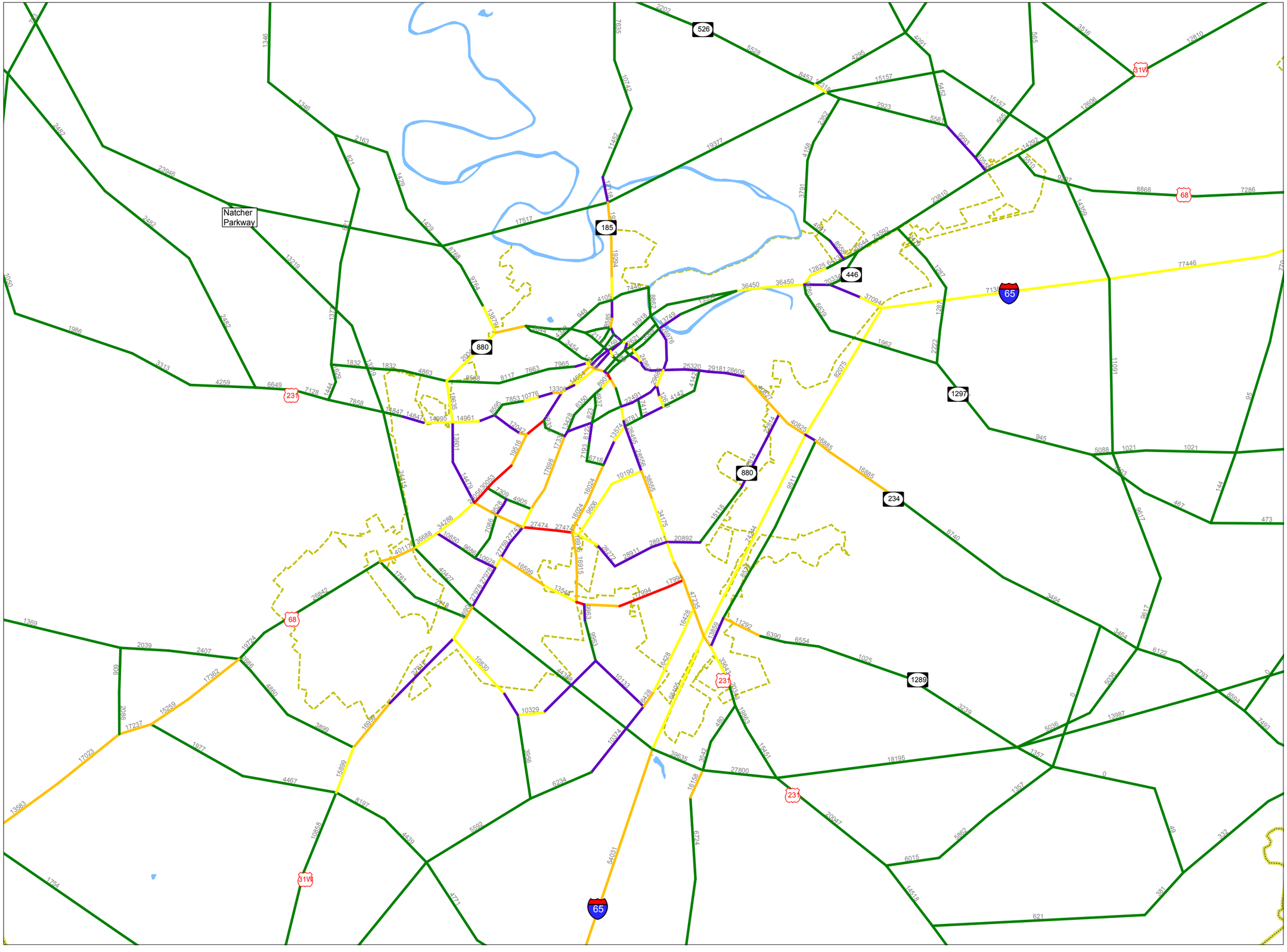


Figure 53

Year: 2030
State Data Center Growth Scenario

Regional Travel Model Forecast for I-66 Corridor 23 with Beltline Corridor D

Bowling Green Blowup

Daily Travel Model Assignment Shown

Map Legend

Map Layers
- Census Place (2000)
- Water Area
- County (High)
- State (High)
- COM7C30H

VC Ratio (LOS C Caps)
- LOS C (<1.0)
- LOS D (1.0 to 1.2)
- LOS E (1.2 to 1.4)
- LOS F (1.4 to 1.8)
- >LOS F (>1.8)

0 .7 1.4 2.1
Miles

BERNARDIN LOCHMUELLER & ASSOCIATES, INC