

Recommended Roadway Plan

Section 4 - 2040 Travel Forecast & Future System Performance

2040 Travel Forecast and Future System Performance

4.1 Introduction

To examine the adequacy of Kane County's transportation system over the planning horizon, it is necessary to assemble a forecast for the rate of growth, type of growth, the location of growth, and household travel characteristics. In the preparation of this transportation plan, information on land use and population and employment was obtained from the Chicago Metropolitan Agency for Planning (CMAP). The 2040 forecasts were furnished by quarter-section for the entire Chicago metropolitan area.

The methodology used in the development of the Kane County travel demand model has been described earlier in Section 3. This section of the report describes the application of the model to forecast 2040 travel demand and the operational performance of the future system.

4.2 Population and Employment Forecasts

Forecasts of 2010 and 2040 households, population and employment in Kane County were obtained from data developed by CMAP for the GO TO 2040 Plan, which generally reflect development projections in reference to overall growth in the region. The forecasts, furnished by CMAP for each quarter-section were aggregated into TAZ's, and slightly adjusted to reflect local existing conditions and future forecasts for the 2040 Transportation Plan. The forecasts developed for the 2040 Transportation Plan used the most current information available at the time. Many variables go into predicting future population, households and employment, and forecasts are only the best guess at the time of the assumptions. The assumptions do not provide exact locations, rather general areas of the land uses that will produce the vehicular trips that feed into the travel demand modeling efforts. The travel modeling efforts are performed to develop overall travel demand assessments for the 2040 planning horizon. Results from the modeling efforts are further examined, post-processed and adjusted to better reflect projected system performance based on local knowledge. As the County moves forward with future planning efforts, development patterns and plans change and the forecasts will be adjusted using the most recent development information and controlled data sources (such as updated CMAP 2040 RTP information and US Census information).

Table 4-1 summarizes projected growth of population, households and employment from 2009 until 2040 used for this study.

TABLE 4-1
Projected Growth of Population, Households and Employment — 2009-2040

	2009	2040	Percent Increase
Population	512,599	804,546	57.0%
Households	172,855	273,830	58.4%
Employment	261,770	368,494	40.8%

Source: 2040 Kane County Transportation Model Forecast, January 2010.

The distribution of projected growth in housing and population between 2009 and 2040 is depicted graphically in Figures 4-1 and 4-2. To a large extent, TAZs with the greatest population in 2040 are also those that would exhibit the largest numerical population growth over the 30-year planning period. Forecasted population is heavily oriented toward the easternmost sectors of the County, east of Illinois Route 47.

Estimated growth of employment in Kane County in the period of 2009 to 2040 is shown in Figure 4-3. Both existing and forecasted employment is heaviest along the eastern, northern, and southern boundaries of the county.

The projections of population, households, and employment by TAZ are the basic tool used in developing forecasts of future travel. The estimated values were applied directly into trip generation relationships determined earlier in the transportation planning process.

4.3 Existing plus Committed Highway System

An Existing plus Committed traffic assignment network was developed for travel forecasting. The network consists of the existing highway system augmented by other roads or roadway improvements that are programmed or otherwise firmly committed for improvement in the near term. Committed roadway improvements utilized to develop the Existing plus Committed network are as follows:

- Widening of Orchard Road from Jericho Road to US 30 from 2 lanes to 4 lanes;
- Widening of I-88 from Orchard Road to east of Il-25 from 2 lanes each direction to 3 lanes each direction;
- Construction of the Anderson Road Overpass;
- Construction of a full interchange at IL-47 and I-90;
- Construction of a full interchange at Eola Road and I-90; and
- Stearns Road Bridge Corridor.

The committed improvements would expand the existing highway system by approximately five lane-miles.

Zone-to-zone travel impedance used in the initial 2040 travel forecast was obtained from Existing plus committed network travel times. Later in the transportation planning process,

travel times were adjusted to reflect other roadway modifications incorporated into the future networks.

4.4 External-Internal (E-I/I-E) and Through (E-E) Travel Growth

External trip making consists of three distinct types of trip: Internal-External (I-E) trips that originate in a Kane County TAZ and have a destination outside of the county; External-Internal (E-I) trips which with an origin outside of the county and a destination within the county; and External-External (E-E) through trips that have neither an origin nor destination in Kane County.

The 2009 and 2040 forecasts of E-I/I-E and E-E/I-I trips were derived by interpolating between the assignments developed for 2003 and 2030 as part of the Kane County 2030 Transportation Plan.

4.5 2040 Vehicle Traffic Volume and Pattern

The traffic demand model was applied to forecast 2040 zone-to-zone vehicular travel based on population and employment growth described earlier and assuming implementation of the Existing plus Committed roadway network. It is projected that total daily vehicle trip making in Kane County would increase by 36 percent. The increase would not be uniform throughout the county. Areas that experience the most population and employment growth would also realize the greatest travel increase. Figure 4-4 shows the resulting forecast year 2040 estimated ADT and Figure 4-5 shows the projected change in ADT on Kane County highways during the period from 2009-2040.

The largest increase in traffic volumes would occur on the north/south arterials, primarily Randall Road. The roadway would experience traffic growth of more than 20,000 vehicles per day for most of the route. Other high growth areas would be the south central and north central portions of the counties surrounding the tollway facilities. The south central area would be expected to experience high growth on U.S. 30, IL 56 and Orchard Road. The northern sections of the county would be expected to experience high growth along U.S. 20 and IL 72. In addition, high growth in traffic would be expected in the Tri-Cities areas on IL 64.

Desire bands can also be used to provide a depiction of the pattern of travel growth. Figure 4-6 shows a combination of 2009 and 2040 vehicular travel desire bands. Travel growth is represented by the difference in bandwidth from the base year (2009) until the forecast year (2040). The heavy existing north-south travel desires that presently exist in eastern Kane County would be further magnified. There would also be significant travel increases in the vicinity of Sugar Grove as well as in the Upper Fox and Greater Elgin areas.

4.6 2040 System Performance

The traffic performance analysis of the future Kane County highway system relied on data described in previous sections of the report related to future travel demand and Existing plus Committed facilities, as well as, measures of effectiveness derived from the travel

demand model. Performance is described by measures of traffic service, congestion, and traffic safety.

4.6.1 Traffic Service Measures

The traffic service measures applied in this analysis, described in Section 5, consist of VMT, VHT, and VHD. Table 4-2 summarizes 2040 traffic service measures separately for all highways and for county roads alone, stratified by functional classification. Similar to existing traffic conditions, principal arterials would carry a large share of the traffic burden (approximately 41 percent of the VMT) and would experience 32 percent of VHD, and would constitute 29 percent of the lane-miles. This trend also carries through for county roadways. County roads that are classified as principal arterials would carry about 46 percent of the vehicle miles traveled and would experience 43 percent of the VHD, but would represent only 28 percent of the county road lane-miles.

TABLE 4-2
2040 Traffic Service

Functional Class	VMT		VHT		VHD	
	Miles	%	Hours	%	Hours	%
2040 All Highways						
Expressways	2,163,981	9	86,214	4	49,501	3
Principal Arterials	9,511,841	41	736,707	33	470,100	32
Minor Arterials	5,374,915	23	634,584	29	446,039	30
Collectors	6,169,663	27	764,956	34	518,062	35
Totals	23,220,454	100	2,222,461	100	1,483,702	100
2040 County Highways						
Principal Arterials	2,953,565	46	301,254	43	216,912	43
Minor Arterials	3,039,096	47	360,487	51	249,553	51
Collectors	445,628	7	45,534	6	27,709	6
Totals	6,438,289	100	707,275	100	494,174	100

4.6.2 Congestion Measures

Forecast 2040 levels of congestion on existing and committed highways based on ADT are shown in Figure 4-7. For the entire system, 74 percent of route miles and 78 percent of lane-miles would be congested (Table 4-3). For county roads alone, 70 percent of route miles and 75 percent of lane-miles would be congested. The areas found to be congested in 2009 would remain so in 2040, and in some locations would worsen as a result of the increase in travel demand. In year 2009, about half of the county would be congested. In 2040, the congestion would spread west into the northern area of the County, Sugar Grove, and west of Tri-Cities to Elburn, encompassing about three quarters of the county.

TABLE 4-3
Future Roadway Congestion

Level of Service	Route Miles		Lane Miles	
	Miles	%	Miles	%
2040 All Highways				
A	165	14	331	12
B	55	5	114	4
C	83	7	172	6
D	57	5	124	5
E	113	0	269	10
F	682	59	1,717	63
Total	1,155	100	2,727	100
Total Congested	852	74	2,110	78
2040 County Highways				
A	44	14	87	11
B	29	9	57	8
C	22	7	45	6
D	14	4	28	3
E	27	8	59	8
F	184	58	470	64
Total	320	100	746	100
Total Congested	225	70	557	75

4.7 Conclusions and Comparisons

4.7.1 Existing and Committed Highway System

Table 4-4 shows the change in VMT, VHT, and VHD between 2009 and 2040 stratified by functional classification. For all roads, the VMT would increase by 90% and the VHT would increase nearly 2 times between 2009 and 2040. In addition, the VHD would increase by approximately 2.5 times as a result of increased congestion. For county highways, the VMT would more than double, the VHT would more increase by more than three times and the VHD by more than six times. This dramatic deterioration of traffic performance indicates that the existing and committed facilities, alone, would not adequately handle future travel demand.

The number of route miles and lane-miles at each range of LOS would shift. In 2009, most roadways were found to operate at LOS C or better. By 2040, most roadways would operate at LOS D or worse. Table 4-5 illustrates the projected change in route miles and lane-miles for the different classifications of LOS. For the entire highway system, congested lane-miles would increase to 78 percent. While 41 percent of Kane County experienced congestion in 2009, congestion would expand to cover 74 percent of the county in 2040.

TABLE 4-4
Comparison of Traffic Performance

Functional Class	VMT		VHT		VHD	
	Δ Miles	Δ %	Δ Hours	Δ %	Δ Hours	Δ %
2009-2040 All Highways						
Expressways	747,010	-3	58,126	0	45,738	2
Principal Arterials	3,389,689	-9	465,510	-1	371,287	8
Minor Arterials	3,112,326	5	291,959	-15	180,276	-34
Collectors	3,783,057	7	623,014	16	471,646	24
Totals	11,032,136		14,937,574		14,567,911	
2009-2040 County Highways						
Principal Arterials	1,126,958	-17	253,197	-12	221,190	-8
Minor Arterials	2,091,012	14	648,709	9	571,186	3
Collectors	322,708	3	99,130	3	86,223	5
Totals	3,540,678		1,001,036		878,599	

TABLE 4-5
Comparison of Congestion

Level of Service	Route Miles		Lane Miles	
	Δ Miles	Δ %	Δ Miles	Δ %
2009-2040 All Highways				
A	-262	-23	-530	-20
B	-87	-7	-186	-7
C	-33	-3	-144	-6
D	-56	-5	-145	-5
E	-49	-14	-149	-5
F	493	42	1,178	43
Total Congested	388	33	884	33
2009-2040 County Highways				
A	-106	-34	-216	-32
B	-15	-5	-32	-4
C	-9	-3	-22	-3
D	3	0	3	-1
E	-19	-7	-77	-11
F	156	49	378	51
Total Congested	140	42	304	39

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