KANE COUNTY

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TO: Carl Schoedel, Director of Transportation/County Engineer

FROM: Implementation Staff

DATE: April 25, 2005

SUBJECT: Burlington Road Traffic Study (Illinois Route 47 to Illinois Route 64)

In response to public concerns regarding safety, speed, noise and truck issues on Burlington Road, KDOT staff performed an engineering study from Illinois Route 47 to Illinois Route 64 to determine the nature and magnitude of these concerns. The following memo summarizes our methodology in assessing the public concerns and concludes with our suggested recommendations. Staff gathered and analyzed data pertinent in assessing and/or quantifying those concerns as noted below.

Data Gathering and Analysis

In order to evaluate the concerns stated above, staff collected the following data sets in an effort to determine whether traffic composition, current average speeds or accident patterns were significantly higher or is relative to similar county highways.

- Average Daily Traffic (total number of Passenger Cars and Trucks in both directions)
- Average speeds of all vehicle types and posted speed limits
- Number and type of accidents over previous 3 years
- Survey of existing traffic control devices (signs and pavement marking)
- Other topographic features (sight distances, pavement width and condition, number of access points, turn lanes, etc.)

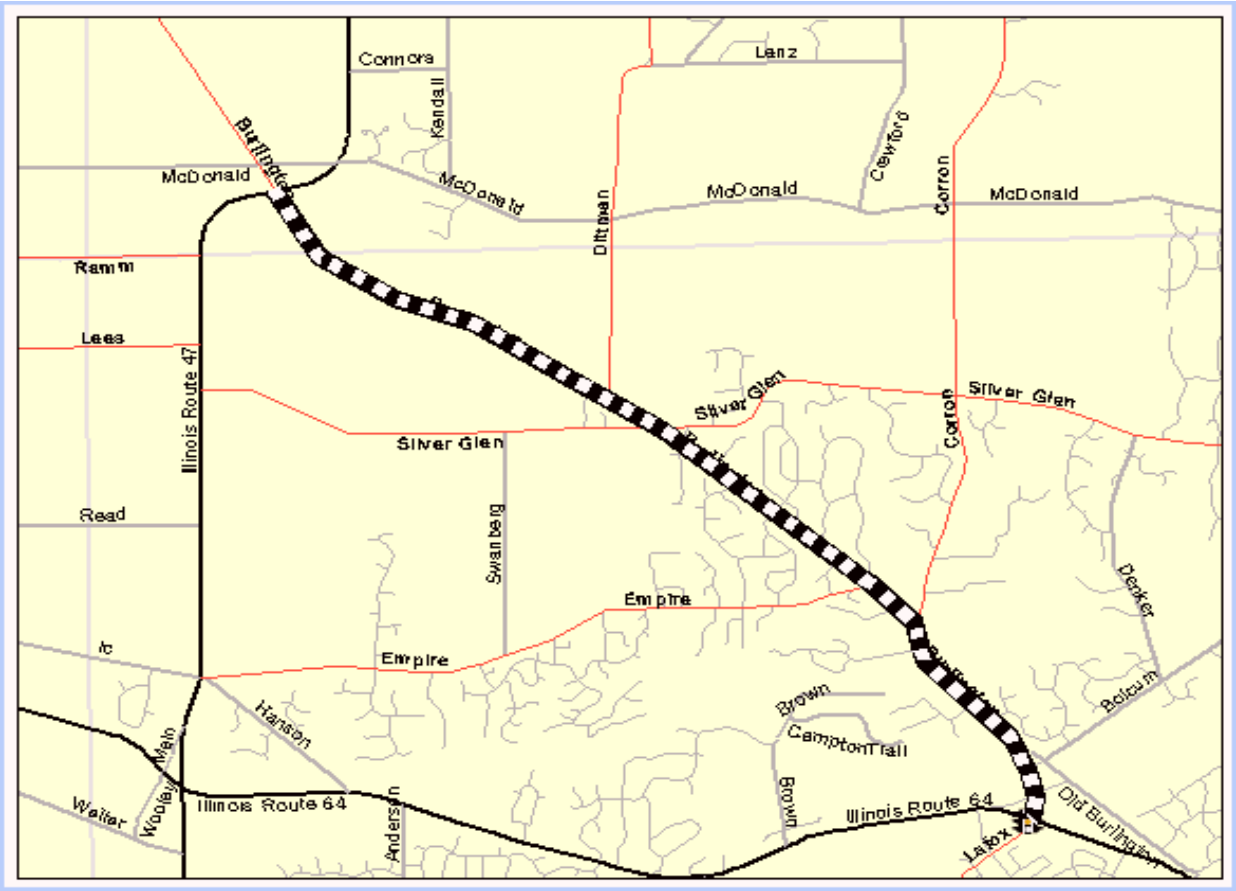
In general, staff collected data for sections of Burlington Road, Empire Road, Keslinger Road, Main Street and select information on Big Timber Road.

Summary Roadway and Traffic Data

Highway	From	To	# of Lanes	Total ADT Range	Truck % Range	Speed limit	Prevail. Speed	Access Freq. (per mi.)
Burlington Rd.	*Illinois Rt. 47*	*Illinois Route 64*	*2*	*3,400 – 12,800*	*2.0 – 4.9*	*55/45*	*60/53*	*2.6*
Empire Rd.	Illinois Rt. 47	Burlington Rd.	2	1,900	2.0	50	55	6.2
Keslinger Rd.	Illinois Rt. 47	La Fox Rd.	2	4,300 – 6,200	5.4 – 3.4	50	58	2.2
Main St.	Illinois Rt. 47	Deerpath Rd.	2	6,100 – 9,500	10.5– 4.4	55/50/45	58/58/53	2.2

None of the intersections have turn lanes except Bolcum Road and the average roadway width is at least 22' (2-11' lanes). The nature of access within the study area consists of five (5) major, eleven (11) minor and sixty-nine (69) residential (driveways) access points with a majority (~66%) located within the section from Dittman Road to Illinois Route 64. The Burlington Road study area can be referenced in the location map below.

Location Map



The section from Illinois Route 47 to Dittman Road is characterized as a rural, higher speed arterial with fewer points of access (see photo on left). The section of Burlington Road from Dittman Road to Illinois Route 64 becomes more suburban in nature and serves a dual function as arterial as well as a collector route for local traffic to and from the numerous residential developments that exist along this section (see photograph at below right).

Burlington Road - Between Illinois Route 47 and Dittman Road (55 mph speed limit)

Burlington Road - Between Dittman Road and Illinois Route 64 (45 mph speed limit)

Traffic

The overall ADT gradually but significantly increases from Illinois Route 47 (3,400 vehicles per day or vpd) to Illinois Route 64 (12,800 vpd). The truck traffic increases from 142 to 282, but at a slower rate as shown by the decreasing truck percentages in the far right column. The highest volume of trucks occurs between Corron Road and Old La Fox, as well as Bolcum to Illinois Route 64, both segments recognized as truck cut-through routes.

Traffic Composition on Burlington Road

Road	From	To	Total ADT	Truck ADT	Truck %
Burlington	IL 47	Dittman	3,400	142	4.18%
Burlington	Dittman	Silver Glen	3,900	191	4.90%
Burlington	Silver Glen	Empire	4,800	214	4.46%
Burlington	Empire	Corron	9,700	217	2.24%
Burlington	Corron	Old La Fox	11,100	285	2.57%
Burlington	Old La Fox	Bolcum	10,800	218	2.02%
Burlington	Bolcum	IL 64	12,800	282	2.20%

Traffic Composition on Functionally Similar Roads

Road	From	To	Total ADT	Truck ADT	Truck %
Keslinger	Dauberman	IL 47	4,500	225	5.0%
Keslinger	La Fox	Bunker	6,300	260	4.1%
Main	IL 47	Bunker	6,100	682	11.1%
Empire	IL 47	Burlington	1,900	38	2.0%
Big Timber	IL 47	IL 72	3,800	205	5.4%
A V E R A G E			**22,600**	**1,410**	**6.2%**

In comparing ADT, Truck ADT and number of trucks as a percentage of ADT, it can be seen from the above two tables that Burlington Road is used as less of a truck route than nearly all other routes. While Empire Road has significantly less ADT than Burlington Road, in terms of frequency and nature of access Empire Road is the most similar and does have slightly less trucks and truck percentage. Overall, analysis shows that Burlington truck traffic is slightly lower than the average of comparable routes and therefore not identified as a concern.

Speed

Spot speed studies were administered at various locations approximately a mile apart on Burlington Road within the study limits. These results indicate (See table below) that the average speed along the entire route ranges from **5** to **8** mph over the legal speed limits and the majority of drivers exceed these limits (average violation rate greater than 50%). In situations where the violation rate equals or exceeds 30%, studies have shown that lowering the posted speed limit is not expected to be a safe or effective method of reducing travel speeds.

Speed Information on Burlington Road

Location	Speed Limit	Prevailing	Difference	Violation
Illinois Route 47 to Dittman Road	55 mph	60 mph	+5 mph	45%
Dittman Road to Illinois Route 64	45 mph	53 mph	+8 mph	65%

Speed Information on Empire Road, Keslinger and Main, respectively

Location	Speed Limit	Prevailing	Difference
Empire; IL 47 to Burlington	50 mph	55 mph	+5 mph
Keslinger; IL 47 to LaFox	50 mph	58 mph	+8 mph
Main Street; IL 47 to Deerpath	55/50/45 mph	58/58/53 mph	+3/+8/+8

Based on the speed information shown in the 2 tables above, the traffic speed composition on each of the measure roads is very similar and none stand out as significant. However, it is recognized that the prevailing speed is higher than the posted and may merit consideration for some form of speed treatments.

Accident History

Accident data was gathered for the most recent three-year period (2002-2004) to identify trends and predominant accident types along the segment and at the intersections analysis was done over a three-year period from 2002 to 2004. Accident rates (# of crashes vs. # vehicles entering intersection) were used to be able to compare intersections where traffic volumes might artificially skew the raw number of accidents.

In the years 2002, 2003, and 2004, the raw data showed 36, 46, and 51 accidents respectively along the entire segment. Of the 133 total accidents for this section, rear-end collisions (28), turning collisions (18) and fixed object collisions (29) compose 21%, 13 % and 22% of total accidents respectively. Typical causes for rear-end collisions include “driver not aware of intersection”, “large number of turning vehicles” and “excessive speed on approach”. For turning accidents, typical causes include “restricted sight distance”, “large total intersection volume” and “excessive speed on approaches”. Lastly, the typical causes of fixed object collisions include “obstructions in or too close to roadway”, “inadequate pavement marking and/or signage” and “excessive speed on approaches”.

Overall, the most common identified potential cause for all 3 predominant accident types is “excessive speed on approaches”. Combining this information with the results from the speed analysis confirms the need for speed treatments.

The table below provides the accident rates of each of the subject intersections with that had the five highest accident rates per every 1,000,000 vehicles entering the intersection (million entering vehicles or MEV).

Intersection Location	Number of Accidents	Accident Rate (3 year Average)
Illinois Route 47	28	1.01
Dittman Road	12	0.65
Silver Glen Road	11	1.35
Corron Road	16	0.85
Old La Fox Road	17	0.80

It should be noted that the average IDOT Illinois Department of Transportation accident rate for an unsignalized two-lane rural intersection is 0.24 MEV with a standard deviation of 0.40 thus similar type locations with a rate of **0.64** or more are considered statistically relevant and would warrant attention. Each of accident rates for the intersections listed above exceed what is considered statistically significant, further reinforcing the need for some form of improvement at these locations.

Conclusions and Recommendations

The Traffic Analysis on Burlington Road, from Illinois Route 47 to Illinois Route 64 determined that when compared to similar facilities, truck volumes and percentages are relatively low. The Speed Analysis showed that on average, traffic is traveling between 5 and 8 mph over posted speed limits at a violation rate of over 50%, which decreases all drivers' perception times and appears to be a major contributor to the 3 identified predominant accident types (rear-end/turning/fixed object). The higher traveling speeds are also resulting in increased noise levels. Lastly, the accident analysis identified that over the previous three-year period, the accidents at the intersections are significantly high.

Staff has concluded that by reducing average travel speeds, there will be a reduction in noise and a reduction in accidents. In order to reduce travel speeds along this section of Burlington Road, staff looked at both short-term and long-term treatments that would assist in lowering the overall speed and providing better roadway configuration, respectively.

Short-term Treatments/Estimated Costs:

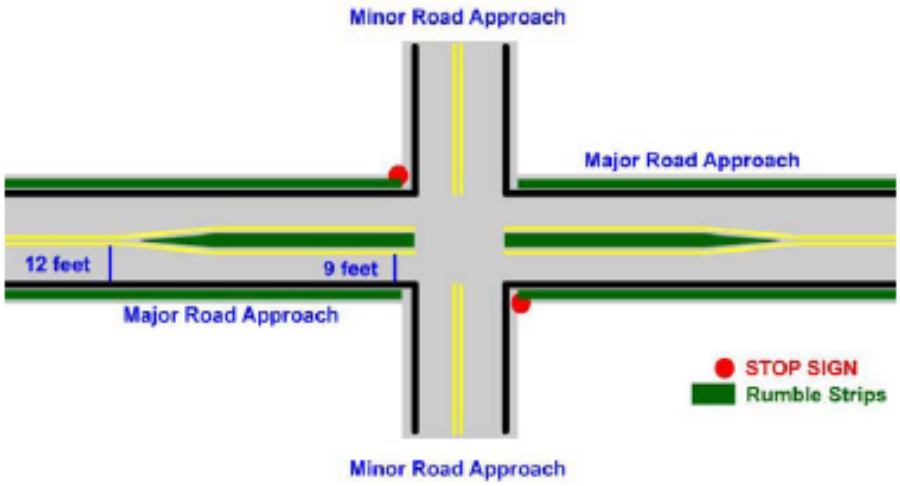
1. Placement of W3-5 (Speed Reduction) signs - $500
2. Placement of Driver Feedback Signs (Your Speed Is) - $8,000
3. Additional/larger Speed Limit (45) signs - $1,000
4. Request for re-allocating priority of Sheriff's police enforcement. - None
5. A multi-way stop (w/flashing overhead beacon) at Burlington Road and Silver Glen Road - $6,000
6. FHWA Concept pavement marking and rumble strips treatment and "Narrow Lanes Ahead" signs at 5 intersections - $20,000 (see figure on page 6 for graphic).

Long-Term Treatments/ Estimated Costs:

1. Road widening from Illinois Route 64 to Nancy Lane that would include a center turn lane/median – $5,000,000
2. Full intersection improvements at Corron Road and Burlington Road - $1,200,000

At this time, staff recommends the pavement marking and rumble strip treatment (short-term treatments #6, see figure below for description) to the five major access points including the intersection of Dittman Road, Silver Glen Road, Briarwood Drive, Empire Road, etc. These treatments are low-cost and have been shown to permanently reduce travel speeds at intersection approaches by 10-15%. To complement this treatment, staff also recommends short-term treatments #1, #3, and #4.

Presently, staff does not propose immediate implementation of either Long-Term Treatment as this section of Burlington Road has reserve traffic capacity. Both of these treatments should be considered in the KDOT long-range plan.



Concept 1 - Major Road Approaches