

To: Jeff Turner	
From: Christopher Kinzel	Project: BNSF Gardner EA
CC: Russell Light, Skip Kalb, Tom Schmidt	
Date: 10/12/09	Job No: 59871

RE: Traffic effects of additional Logistics Park square footage (increase to 7.1 million square feet)

The purpose of this memo is to present qualitative discussion about the potential traffic effects of assuming additional hypothetical warehouse space within the Logistics Park Kansas City (Logistics Park) adjacent to the planned intermodal facility near Gardner, Kansas.

The *Draft Environmental Assessment's* (Draft EA) 2030 "Gardner IMF Operations plus Induced Development" traffic scenario assumed a reasonably foreseeable 2.86 million square feet of development within the Logistics Park. If this number were to be increased to a maximum build-out of 7.1 million square feet (an increase of 4.24 million square feet), the Logistics Park would be expected to generate an additional 16,358 total vehicle trips per day, as shown in Table 1.

**Table 1: Potential LP Trip Generation
Additional 4.24 MSF Warehouse**

	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Trucks	3,333	46	53	99	64	48	112
Non-Trucks	13,025	628	57	685	424	525	949
Total	16,358	674	110	784	488	573	1,061

To gauge the effects of additional Logistics Park warehouses, it is useful to examine some of the key study intersections. Table 2 includes the Draft EA's 2030 Level of Service (LOS) results for the two key interchanges serving the project area: the existing I-35/Gardner Road interchange, and the future I-35/199th Street interchange. Also, the table includes the intersection of US-56 and Waverly Road, another key intersection serving the study area. Note that this table is for the 2030 scenario that includes the IMF, 2.86 million square feet of Logistics Park warehouse, and all other land-use expected to be in place in the modeling area by 2030 (including existing land-uses).

Table 2: 2030 Indirect Effects (IMF + LP) Intersection Analysis
(excerpted from EA Traffic Technical Report, Table 3-25)

		AM Peak Hour		PM Peak Hour		4.24 MSF intersection volume increase over 2030 IMF scenario (conservative surrogate**)	
		Delay	LOS	Delay	LOS	a.m.	p.m.
		11	US 56 / Waverly	27.6	C	35.0	C
21	I-35 SB / Gardner	13.7	B	23.5	C	4.1%	3.7%
22	I-35 NB / Gardner	39.0	D	27.3	C	*	3.3%
38	199 th / I-35 SB	31.0	C	43.7	D	4.6%	4.6%
39	199 th / I-35 NB	27.9	C	19.9	B	4.9%	5.9%

*The traffic modeling for the 2.86 MSF scenario showed almost no change at this intersection during the a.m. peak hour. This was due to a combination of effects, including the expectation that most of the LP non-truck traffic would be inbound from the north during the a.m. (and therefore not use the southern ramp intersection), as well as the attractive effect the LP would have on trucks formerly assigned to longer distances using the freeway.

***Conservative surrogate: see discussion in text.

As Table 2 indicates, all of these intersections were projected to operate at acceptable LOS D or better under this scenario. The intersections operating closest to the threshold of acceptability (threshold = LOS E = 55.0 seconds of delay/vehicle) were # 22 (I-35 northbound ramps/Gardner Road) during the a.m. peak hour (delay

= 39.0 seconds/vehicle) and # 38 (199th Street/I-35 ramps) during the p.m. peak hour (delay = 43.7 seconds/vehicle).

Since the traffic from the additional 4.24 million square feet of additional warehouse would be expected to be distributed in a manner somewhat similar to that of the 2.86 million square feet, the traffic volume outputs from the 2.86 million square feet scenario were used to derive order-of-magnitude intersection-level volume increases for the 4.24 million square feet scenario. To do this, the net volume percentage change caused by the 2.86 million square feet at each intersection was multiplied by the ratio 1.48 ($= 4.24 \div 2.86$). This gave an indication of the percentage change that could be caused by the additional 4.24 million square feet. These percentages are shown in Table 2. Note that the resulting percentages are conservative (dubbed “conservative surrogates” in the table), because (for simplicity) they are based on a denominator that does *not* include the 2.86 MSF.

Based on this analysis, it is estimated that, with an additional 4.24 million square feet of LP warehouse, traffic at Intersection # 22 would increase by no more than 4 percent during the a.m. peak hour, and that traffic at Intersection # 38 would increase by no more than 5 percent during the peak hour. Given that the projected delay/vehicle at these intersections would need to increase by 41 percent and 26 percent, respectively, to cross the LOS E threshold, it is not expected that this additional traffic would result in impacts at these intersections.

To: Josh Marx, USACE; David Schwartz, KDOT; John Knowles, FHWA	
From: Christopher Kinzel, Rob Frazier	Project: BNSF KCIMF
CC: Skip Kalb, Russell Light	
Date: October 21, 2009	Job No: 59871

RE: Supplemental Traffic Analysis for Response to Public Comment

This memo is a follow-up response to our telephone conversation last Friday on October 16, 2009.

Gardner Road & I-35 Northbound Ramps: This intersection was projected to operate at LOS D overall (39.0 seconds of average vehicle delay) in the a.m. peak hour in the 2030 Indirect Effects (IMF+LP) Scenario. Comparing the 2030 Direct and Indirect Effects scenarios revealed an insignificant change in volumes during the a.m. peak hour due to the following factors:

- New I-35 & 199th Street interchange;
- Use of the intersection primarily for outbound Logistics Park traffic to I-35 north (the inbound traffic shows up at the southbound ramps intersection);
- Low a.m. peak hour outbound Logistics Park trip generation (<80 vehicles); and
- No Logistics Park truck traffic at this intersection due to truck restrictions on 188th and 183rd Streets.

Even though the volume change was minor, a sensitivity analysis was conducted to estimate how much more traffic could be added to the critical southbound left-turn movement before it declined to LOS E. This is the movement used by many non-truck Logistics Park related vehicles to reach I-35 northbound (i.e. employees and visitors). As noted above, Logistics Park trucks would not use this intersection. It was determined that over 180 outbound Logistics Park non-truck trips could be added to the southbound left-turn and it would still operate at LOS D overall.¹ The trip generation estimate for an additional 4.24 million square feet of warehouse development forecasts less than 60 additional outbound non-truck trips. Therefore, there appears to be more than enough a.m. capacity at this intersection to accommodate the additional Logistics Park development.

199th Street & I-35 Southbound Ramps: This intersection was projected to operate at LOS D overall (43.7 seconds of average vehicle delay) in the p.m. peak hour in the 2030 Indirect Effects (IMF+LP) Scenario. Comparing the 2030 Direct and 2030 Indirect Effects scenarios revealed an increase of 30 eastbound through vehicles, 20 eastbound right-turn vehicles, and 20 westbound through vehicles during the a.m. peak hour (including trucks and non-trucks). These increases can be generally linked to the 2.86 million square feet of warehouse space that is the change between the scenarios.

To test the intersection sensitivity these numbers were multiplied by a constant and added to the 2030 Indirect Effects volumes until the intersection reached the LOS D/E threshold. Using that approach, the intersection reached the threshold (LOS D overall with 52.8 seconds of average

¹ In the original analysis, a conservative assumption was made that limited the northbound approach to one through lane, even though two lanes were available on the bridge. If this were changed even more capacity would be available.

vehicle delay) at approximately 3.5 times the increases listed above. This would therefore more than accommodate the 4.24 million square feet of new warehouse space being discussed (only 1.5 times the original 2.86 million square feet. Adding this volume of traffic would require signal phasing and timing changes. It is important to note that this intersection is part of a future interchange and that the design and even the location of the interchange have not been decided. Thus, the intersection geometry was of necessity assumed, but it could be designed quite differently from what was used in this analysis (possibly with more capacity²).

² For example, the bridge was assumed to be a four-lane bridge, but the eastbound approach was held to a single lane. If a two lane approach was designed (with one lane as a left-only onto I-35 northbound) that could significantly increase the capacity and reduce queues. That is however a design issue for the interchange project.