

## **Exhibit B**



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December 16, 2004

Mr. William S. Bacon  
President  
INFRASTRUCTURE VENTURES, INC.  
5121 S. Wheeling Ave  
Tulsa, OK 74105-6421

**Re: Potential Capacity and Operational Constraints on Yale Avenue  
Due to the South Tulsa County Bridge (STCB)**

Dear Mr. Bacon:

This correspondence is being provided in response to recent questions regarding the capacity and operational sufficiency of Yale Avenue leading to the northerly approach to the proposed South Tulsa County Bridge (STCB). Wilbur Smith Associates (WSA) has undertaken a select link analysis of the bridge to trace the travel patterns of the modeled traffic that would use the new facility. It is important to recognize that this analysis was conducted at opening-year 2007 levels under a toll-free condition.

The results of the select link analysis indicated that at the foot of the bridge on the east side of the river, 35 percent of bridge traffic would use Yale Avenue (to and from the north), while 65 percent would use 121<sup>st</sup> Street. Specifically, traffic on the east side of the river would be dispersed among Tulsa roadways generally as follows:

- 15 percent on Yale Avenue at the Creek Turnpike;
- 15 percent on Delaware Avenue at the Creek Turnpike;
- 10 percent on Sheridan Avenue at the Creek Turnpike;
- 20 percent on Memorial Drive (US 64) at the Creek Turnpike;
- 5 percent on Garnett Road at 101<sup>st</sup> Street;
- 10 percent on Olive Avenue at 101<sup>st</sup> Street;
- 1 percent on IH 44 at Riverside Parkway; and
- Negligible on other roadways.

Albany NY, Anaheim CA, Atlanta GA, Austin TX, Baltimore MD, Bangkok Thailand, Binghamton NY, Burlington VT, Charleston SC, Charleston WV, Chicago IL, Cincinnati OH, Cleveland OH, Columbia SC, Columbus OH, Dallas TX, Dubai UAE, Falls Church VA, Greenville SC, Harrisburg PA, Hong Kong, Hot Springs AR, Houston TX, Iselin NJ, Jacksonville FL, Kansas City MO, Kenmore WA, Knoxville TN, Lansing MI, Lexington KY, Lisle IL, London UK, Milwaukee WI, Mumbai India, Myrtle Beach SC, Nashville TN, New Haven CT, Orlando FL, Philadelphia PA, Pittsburgh PA, Portland ME, Poughkeepsie NY, Raleigh NC, Richmond VA, Riyadh Saudi Arabia, Salt Lake City UT, San Diego CA, San Francisco CA, St. Paul MN, Savannah GA, Tallahassee FL, Tampa FL, Tempe AZ, Trenton NJ, Washington DC

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Utilizing the recognized parameters of the Highway Capacity Manual (HCM) and the estimates of toll-free traffic on the STCB of 14,800 in 2007, growing to 51,000 in 2047, as well as the fact that approximately 35 percent of bridge traffic will use Yale Avenue at the bridge declining to 15 percent at the Creek Turnpike, it appears unlikely that Yale Avenue will experience any capacity constraints at any time during the 40-year projection period.

For example, in opening-year 2007, WSA estimated an average of 14,800 toll free vehicles per day on the STCB. In any one direction, assuming a peak-hour factor of ten percent, and 35 percent of STCB traffic using Yale Avenue, a total of approximately 260 additional vehicles would use Yale Avenue during the peak hour. Using the 2047 toll free estimate of 51,000 vehicles per day on the STCB, approximately 890 additional vehicles per hour are estimated to use Yale Avenue in either travel direction.

Yale Avenue is a two-lane roadway in the vicinity of the proposed STCB location. There are future highway improvement plans to widen Yale Avenue to four lanes when volumes warrant. In 2001, Yale Avenue had a total average daily traffic volume of 1,500 vehicles just north of 121<sup>st</sup> St. (in the proposed STCB vicinity) and 8,300 vehicles just north of 111<sup>th</sup> Street.

Given a roadway capacity standard of 1,500 vehicles per lane per hour for a two-lane facility, it appears that the estimates of future-year traffic on Yale Avenue would not approach capacity at any time during the forecast period. This is illustrated in Exhibit A.

<b>Exhibit A</b>			
<b>Calculation of Opening-Year 2007</b>			
<b>Yale Avenue Peak Hour Roadway Capacity Surpluses</b>			
	<u>Average Daily Traffic</u>	<u>Peak Hour Traffic (3)</u>	<u>Peak Hour Per Direction</u>
Roadway Capacity Per Lane (Vehicles) (1)	---	---	1,500
Existing ADT Count on Yale Avenue (2)			
North of 121st Street	1,500	150 (4)	90 (5)
North of 111th Street	8,300	830 (4)	500 (5)
Additional Vehicles on Yale Avenue due to STCB (3)	---	---	260
Surplus Capacity (Vehicles)			
North of 121st Street	---	---	1,150
North of 111th Street	---	---	740

(1) Based on Highway Capacity Manual (HCM) guidelines.  
 (2) From 2004 INCOG traffic count flow map.  
 (3) Estimated based on a toll-free total traffic estimate on the STCB of 14,800 vehicles.  
 (4) Ten percent of ADT.  
 (5) Sixty percent of peak hour total.



Based on industry standards, Yale Avenue currently has a volume capacity of 1,500 vehicles per lane per hour. The latest traffic count volumes on Yale Avenue ranged from 90 vehicles to 500 vehicles per hour in the peak direction. It is estimated that the STCB would add an additional 260 vehicles to Yale Avenue during the peak hour in the peak direction. Therefore, a volume capacity surplus on Yale Avenue ranging between 740 and 1,150 vehicles during opening-year 2007 is estimated.

The implementation of a toll on the STCB will substantially reduce the toll-free traffic on any particular roadway attributable to the bridge, including Yale Avenue, thereby lessening the impact addressed above to an even greater degree. This would increase the likely volume capacity surpluses.

Operational considerations along thoroughfares which provide traffic access to a proposed toll facility can also produce some concerns if not carefully monitored. While WSA cannot draw any specific conclusions regarding traffic operations at intersections, either signalized or unsignalized, due to the implementation of the STCB and a detailed Highway Capacity Analysis would be necessary to draw these types of operational conclusions, it is still important to recognize potential impediments to traffic flow that can affect the toll facilities operations. In this regard it will likely be important for traffic signals along Yale Avenue be timed and synchronized to ensure the most efficient flow of traffic along that roadway, and the proposed STCB. A motorist pays a toll to use a particular toll facility in order to maximize their travel time savings in getting to an intended destination; paying a toll to maximize travel time savings and then being delayed at an adjacent signalized intersection works against this concept. Therefore, coordination among the municipalities and the bridge operating entity to ensure the proper synchronization of traffic signals is an important consideration when maximizing traffic flow along Yale Avenue.

We trust that the information contained herein adequately addresses any questions you have regarding the likely capacity impacts that the STCB would have on adjacent roadways. Please do not hesitate to contact us if any further questions arise.

Sincerely,

WILBUR SMITH ASSOCIATES

A handwritten signature in black ink that reads "John Smolley, Jr." with a stylized flourish at the end.

John Smolley, Jr.  
Vice President

BAJ/JS/

# SOUTH TULSA COUNTY BRIDGE TRAFFIC PROJECTIONS\*

YEAR	ANNUAL AVERAGE DAILY TRAFFIC			
	TOLL FREE	TOLLED		
		ETC	CASH	TOTAL
2007	14,800	4,500	3,000	7,500
2008	15,900	4,900	3,200	8,100
2009	17,100	6,100	2,600	8,700
2010	18,400	6,500	2,800	9,300
2011	19,900	7,600	2,500	10,100
2012	21,400	8,100	2,700	10,800
2013	23,000	8,800	2,900	11,700
2014	24,700	9,400	3,100	12,500
2015	26,600	11,000	3,700	14,700
2016	27,400	11,300	3,800	15,100
2017	28,300	11,700	3,900	15,600
2018	29,100	12,100	4,000	16,100
2019	30,000	12,500	4,200	16,700
2020	30,900	12,800	4,300	17,100
2021	31,900	13,200	4,400	17,600
2022	32,900	13,700	4,600	18,300
2023	33,900	14,000	4,700	18,700
2024	34,900	14,500	4,800	19,300
2025	36,000	14,600	4,900	19,500
2026	37,000	15,000	5,000	20,000
2027	38,000	15,500	5,200	20,700
2028	39,000	15,800	5,300	21,100
2029	40,000	16,200	5,400	21,600
2030	40,900	16,600	5,500	22,100
2031	41,800	17,000	5,700	22,700
2032	42,600	17,300	5,800	23,100
2033	43,400	17,600	5,900	23,500
2034	44,200	17,900	6,000	23,900
2035	45,000	17,900	6,000	23,900
2036	45,700	18,200	6,100	24,300
2037	46,400	18,500	6,200	24,700
2038	47,000	18,700	6,200	24,900
2039	47,600	18,900	6,300	25,200
2040	48,200	19,100	6,400	25,500
2041	48,700	19,400	6,500	25,900
2042	49,200	19,600	6,500	26,100
2043	49,600	19,700	6,600	26,300
2044	50,000	19,900	6,600	26,500
2045	50,400	20,000	6,700	26,700
2046	50,700	20,200	6,700	26,900
2047	51,000	20,300	6,800	27,100

\*From Wilbur Smith Associates "South Tulsa County Bridge Traffic and Toll Revenue Study – January 2005".