ABSTRACT
This paper analyzes the induced demand hypothesis using a disaggregate approach at the link level. A panel data set of Minneapolis/St. Paul highway network for the years 1980-1998 is constructed. A model that predicts the traffic flow on the links in terms of Vehicle Kilometers Traveled (VKT) based on the flow and capacity conditions existing on the link in the previous years is specified and estimated. The flow and capacity conditions existing on the identified neighboring parallel links are also taken into account. Socio-demographic characteristics like population of the Minor Civil Division (MCD) to which the link belongs and the surrounding MCDs are also considered. The results indicate that capacity enhancements in the previous years, given by lane additions have a positive and significant effect on the VKT of the link, confirming the induced demand hypothesis. The elasticities are lower than reported in previous studies.

STUDY OBJECTIVES
- Analyze Induced Demand Hypothesis
- Understand network interactions and network growth
- Use Disaggregate approach
- Link: Level Analysis

NEED FOR STUDY
- Need to understand the relationship between road supply and road use
- Concerns about the potential of new highway construction to generate traffic
- Concerns about adverse environmental effects and diminished financing for highway construction
- Trade-offs between increase in personal benefits and social costs

BACKGROUND OF STUDY
Dowling and Colman (1996)
Hansen and Huang (1997)
Noland (1999)
Sethuraman et al. (2000)

DATA DESCRIPTION
- Data used:
  - Highway network data-Twin Cities Metropolitan Planning Council
  - Average Annual Daily Traffic (AADT) data-Minnesota Department of Transportation (MnDOT)
  - Population estimates for the Minor Civil Divisions-State Demographic Center at Minnesota Planning
  - Investment data
  - Transportation Improvement Program for the Twin Cities Metropolitan Area
  - Hennepin County Capital Budget

DATA MERGING

MODEL DEFINITION
\[ Q_n = \text{Summed VKT on the parallel links at base year } t \]
\[ \Delta Q_n = \text{Change in the summed population of the adjacent MCDs between time } t \text{ and } t-n \]
\[ \Delta P_n = \text{Population of the MCD at base year } t \]
\[ \Delta P_{n+1} = \text{Summed population of the adjacent MCDs at base year } t \]
\[ \text{Where: } \]
\[ P_n, P_{n+1}, Q_n, Q_{n+1}, Q_p, Q_{p+1}, \Delta P_n, \Delta Q_n, \Delta P_{n+1}, \Delta Q_{n+1} \]

RESULTS

ELASTICITY ESTIMATES

CONCLUSIONS
- Capacity expansions on a link in the previous years have a positive effect on the VKT in future, confirming induced demand hypothesis.
- Neighboring links do affect the output of a link but the influence is not clearly seen.
- Demographic characteristics also affect the output but influence not clearly seen.
- Induced demand hypothesis is largely but not universally corroborated.