

Research at a Glance

Technical Brief

Principal Investigator

Robert B. Noland, Ph.D.
 Alan M. Voorhees
 Transportation Center
 Rutgers, The State University of
 New Jersey
 New Brunswick, New Jersey



Newark Light Rail Origin-Destination and Intermodal Choice Study

The Newark Light Rail (NLR) serves downtown Newark and provides access to NJ TRANSIT rail lines at both Newark Penn station and Newark Broad St. station. PATH trains also serve Newark Penn station. Prior to the COVID-19 pandemic the NLR served about 19,000 customers on a typical weekday. The Orange St. station is proximate to a major off-ramp (Exit 13) from I-280 and is an access point for downtown Newark.

Research Problem Statement

The main problem that this study addresses is whether Orange St. could serve as an intermodal transfer point for drivers exiting I-280 with destinations in downtown Newark or beyond (via rail). We also collected data on NLR customers suitable for: validating and updating regional transportation forecasting models; advancing new projects for NJ TRANSIT Light Rail Operations and other regional capital projects; informing Light Rail fleet planning; and, providing updated demographic and trip pattern data for market research and to support FTA Title VI analysis..

Research Objectives

The objective of this project is to understand the trip patterns and socio-economics of customers who use the NLR. In addition, we seek to understand the characteristics of those exiting from I-280 (at Exit 13), near the Orange St. station and determine whether Orange St. could serve as an intermodal transfer site. Secondly, we provide an analysis of data collected from NLR customers for USDOT Title VI compliance monitoring. This data was weighted to provide a profile for the entire system and for every station on the NLR. Data include a summary of access modes to the stations providing a comparison with automobile drivers and passengers using Exit 13 and their destinations in downtown Newark as well as those transferring to NJ TRANSIT rail lines and PATH for destinations outside of Newark.



Research Project Manager

Giri Venkiteela
Bureau of Research
New Jersey Department of Transportation
Trenton, New Jersey

Methodology

To accomplish the objectives of this study we surveyed NLR customers using an on-board survey. Our key objective was to collect and analyze data that allows us to understand the travel patterns, socio-economic characteristics, and origins and destinations of NLR customers and those using Exit 13. Student researchers were deployed on trains in the Fall of 2022 between 6am and 4pm. We received 920 complete responses. We also used synthetic population data from Replica for our analysis of vehicles using the Exit 13 off-ramp near the Orange Street NLR station. The dataset contained over 17,000 synthetic individuals who exited I-280. We filtered this data to 3128 individuals with destinations proximate to the five NLR stations in downtown Newark and an additional 463 labeled as using public transit. We developed statistical summaries and some cross-tabulations of the data and compared the data sets to determine similarities and differences between the Exit 13 sample and those alighting the NLR in downtown Newark. We also examined factors associated with working at home for those using the NLR.

Results

Our findings suggest that those using the NLR and those driving to downtown Newark via Exit 13 differ substantially in their demographic profiles. Individuals currently driving to downtown Newark tend to have higher levels of household income, are not of minority ethnic groups, own a car, and are older. More males tend to use the NLR and more females tend to drive. Levels of employment are similar. The population identified as public transit users in the Replica data and mainly destined for New York City has even higher levels of income, is less ethnically diverse, more males, and is older, than other groups. Analysis of those more likely to work at home finds that they have higher household incomes. To fully assess the likelihood of Orange St. station being used by drivers, more detailed data on individuals will be needed, including their current parking costs, relative travel time between modes, and other individual attributes. This would require a detailed individual survey of drivers.



This brief summarizes FHWA-NJ-2024-004, “Newark Light Rail Origin-Destination and Intermodal Choice Study”, produced through the New Jersey Department of Transportation Bureau of Research, 1035 Parkway Avenue, P.O. Box 600, Ewing, NJ 08625 in cooperation with the U.S. Department of Transportation Federal Highway Administration.