



# Trip Generation Manual

11th Edition

September 2021

# Ite Trip Generation Handbook

**Kevin G. Hooper, Institute of  
Transportation Engineers**



## **Ite Trip Generation Handbook:**

**Trip Generation Handbook** Kevin G. Hooper, Institute of Transportation Engineers, 2004 *Trip Generation Handbook* Kevin G. Hooper, 2017 **Trip Generation Handbook** Kevin G. Hooper, 2004-01-01 ITE's recommended practice on how to apply trip generation data **Improving Vehicle Trip Generation Estimations for Urban Contexts**, 2013 The purpose of this research is to develop and test a widely available ready to use method for adjusting the Institute of Transportation Engineers ITE Trip Generation Handbook vehicle trip generation estimates for urban context using regional household travel survey data The ITE Handbook has become the predominant method for estimating vehicle trips generated by different land uses or establishment providing a method for data collection and vehicle trip estimation based on the size of the development e.g. gross square footage number of employees number of dwelling units These estimates are used in traffic impact analysis to assess the amount of impact the development will have on nearby transportation facilities and the corresponding charges for mitigating the development's negative impacts with roadway expansions added turning bays additional parking or traffic signalization for example The Handbook is often criticized however for its inability to account for variations in travel modes across urban contexts For more than fifty years ITE has collected suburban vehicle oriented data on trip generation for automobiles only Despite the provision of warnings against application in urban areas local governments continue to require the use of the ITE Handbook across all area types By over predicting vehicle traffic to developments in urban developments developments may be overcharged to mitigate these developments locating in urban environments despite the lower automobile mode shares discouraging infill development or densification When ITE's Trip Generation Handbook overestimates the vehicle impact of a development facilities are also overbuilt for the automobile traffic and diminishing the use of alternative modes When ITE's TGH underestimates this impact adjacent facilities may become oversaturated with traffic pushing cars onto smaller facilities nearby Currently there is momentum amongst practitioners to improve these estimation techniques in urban contexts to help support smart growth and better plan for multiple modes This research developed and tested a method to adjust ITE's Handbook vehicle trip generation estimates for changes in transportation mode shares in more urban contexts using information from household travel surveys Mode share adjustments provide direct reductions to ITE's Handbook vehicle trip estimations Household travel survey HTS data from three regions were collected Portland Oregon Seattle Washington and Baltimore Maryland These data were used to estimate the automobile mode share rates across urban context using three different adjustment methodologies A a descriptive table of mode shares across activity density ranges B a binary logistic regression that includes a built environment description of urban context with the best predictive power and C a binary logistic regression that includes a built environment description of urban context with high predictive power and land use policy sensitivity Each of these three methods for estimating the automobile mode share across urban context were estimated for each of nine land use categories resulting in nine descriptive tables Adjustment A

and eighteen regressions Adjustments B and C Additionally a linear regression was estimated to predict vehicle occupancy rates across urban contexts for each of nine land use categories 195 independently collected establishment level vehicle trip generation data were collected in accordance with the ITE Handbook to validate and compare the performance of the three adjustment methods and estimations from the Handbook Six land use categories out of the nine estimated were able to be tested Out of all of the land uses tested and verified ITE s Trip Generation Handbook appeared to have more accurate estimations for land uses that included residential condominiums townhouses LUC 230 supermarkets LUC 850 and quality sit down restaurants LUC 931 Moderate or small improvements were observed when applying urban context adjustments to mid rise apartments LUC 223 high turnover sit down restaurants LUC 932 The most substantial improvements occurred at high rise apartments LUC 222 and condominiums townhouses LUC 232 shopping centers LUC 820 or coffee donut LUC 936 or bread donut bagel shops LUC 939 without drive through windows The three methods proposed to estimate automobile mode share provides improvements to the Handbook rates for most infill developments in urban environments For the land uses analyzed it appeared a descriptive table of mode shares across activity density provided results with comparable improvements to the results from the more sophisticated binary logistic model estimations Additional independently collected establishment level data collections representing more land uses time periods and time of days are necessary to determine how ITE s Handbook performs in other circumstances including assessing the transferability of the vehicle trip end rates or mode share reductions across regions

#### **Enhancing Internal Trip Capture Estimation for Mixed-use Developments**

Brian S. Bochner, Kevin G. Hooper, Benjamin R. Sperry, Robert T. Dunphy, 2011 TRB s National Cooperative Highway Research Program NCHRP Report 684 Enhancing Internal Trip Capture Estimation for Mixed Use Developments explores an improved methodology to estimate how many internal trips will be generated in mixed use developments trips for which both the origin and destination are within the development The methodology estimates morning and afternoon peak period trips to and from six specific land use categories office retail restaurant residential cinema and hotel The research team analyzed existing data from prior surveys and collected new data at three mixed use development sites The resulting methodology is incorporated into a spreadsheet model which is available online for download

[Trip Generation: User's guide](#), 2003 Informational report

of hundreds of land uses and transportation trip generation data

*Trip Generation Manual: User's guide and handbook*

, 2012

[Incorporating the 10th Edition Institute of Traffic Engineers \(ITE\) Trip Generation Rates Into Virginia Department of Transportation Guidelines](#)

Kun Xie, 2021 The Institute of Transportation Engineers ITE released the Trip Generation TG

10th edition in 2017 which significantly updated its database and some of its trip generation rates were substantially lower than those of earlier editions This study aims to investigate the applicability of the TG 10th edition in various Virginia contexts and to recommend how to incorporate the TG 10th edition into state guidelines The research team surveyed 31 state transportation agencies to obtain a clear understanding of current practices in the adoption of trip rates and trip estimation

approaches We systematically compared trip rates of TG 9th and 10th editions using hypothesis tests and identified land uses with significant rate reduction Trip generation data were collected from 37 sites in Virginia during weekday PM peaks for the mixed use sites and single use sites with significantly reduced 10th edition rates multi family low rise and general office To investigate the use of trip rates in different settings general offices in both general urban suburban and dense multi use urban were considered For mixed use developments we explored the combinations of four internal trip capture models and TG rates of 9th and 10th editions to identify the best trip estimation approach Given that all trip data were collected after the outbreak of the COVID 19 pandemic Streetlight data were used to adjust trip counts to account for the impacts of COVID This study recommends that the VDOT Office of Land Use 1 accept the TG 10th edition for the development of a Traffic Impact Analysis TIA should the 8th or 9th edition rates show a TIA is required and select 10th edition trip rates according to settings and 2 accept the methodology presented in Trip Generation Handbook 3rd edition to estimate internal trip capture for mixed use developments This project will provide benefits to VDOT by improving the estimation of trip generation which is critical in determining charges to developers for transportation improvements and making decisions concerning the modification of existing facilities and the design of new facilities

*Trip Generation: Trip generation rates, plots and equations [cont'd]*, 2003 California Smart-growth Trip Generation Rates Study Susan Handy, Kevan R. Shafizadeh, Robert Schneider, 2013 *Truck Trip Generation Data* Michael J. Fischer, Myong Han, 2001 TRB's National Cooperative Highway Research Program NCHRP Synthesis 298 Truck Trip Generation Data identifies available data and assesses the current state of the practice in truck trip generation **Traditional Neighborhood Development Trip Generation Study**, 2005 **New Jersey Register**, 2012-11 *Trip Generation Characteristics of Traditional and Multiplex Movie Theaters*, 2001 Trip Generation Analysis Report, Hotels-casinos Within the Las Vegas Urbanized Area Emelinda M. Parentela, 1991 **Trip Generation Rates for Transportation Impact Analyses of Infill Developments** James M. Daisa, 2013 TRB's National Cooperative Highway Research Program NCHRP Report 758 Trip Generation Rates for Transportation Impact Analyses of Infill Developments details a procedure for analyzing potential vehicular trip generation impacts in urban and urbanizing locales Publisher's description **Trip-generation Rates for Urban Infill Land Uses in California**, 2008 **Trip Generation Studies for Special Generators** Mansoureh Jeihani Koohbanani, 2010 **Trip Generation Study of Free-standing Discount Superstores in Ohio** Ahmad Daoud Al-Akhras, 1998 **Evaluation of Procedures to Estimate Trip Generation for Generalized Land Uses** Cyrus Stevenson Kump, Michael J. Demetsky, Matthew C. Grimes, 2006

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## **Table of Contents Ite Trip Generation Handbook**

1. Understanding the eBook Ite Trip Generation Handbook
  - The Rise of Digital Reading Ite Trip Generation Handbook
  - Advantages of eBooks Over Traditional Books
2. Identifying Ite Trip Generation Handbook
  - Exploring Different Genres
  - Considering Fiction vs. Non-Fiction
  - Determining Your Reading Goals
3. Choosing the Right eBook Platform
  - Popular eBook Platforms
  - Features to Look for in an Ite Trip Generation Handbook
  - User-Friendly Interface

4. Exploring eBook Recommendations from Ite Trip Generation Handbook
  - Personalized Recommendations
  - Ite Trip Generation Handbook User Reviews and Ratings
  - Ite Trip Generation Handbook and Bestseller Lists
5. Accessing Ite Trip Generation Handbook Free and Paid eBooks
  - Ite Trip Generation Handbook Public Domain eBooks
  - Ite Trip Generation Handbook eBook Subscription Services
  - Ite Trip Generation Handbook Budget-Friendly Options
6. Navigating Ite Trip Generation Handbook eBook Formats
  - ePub, PDF, MOBI, and More
  - Ite Trip Generation Handbook Compatibility with Devices
  - Ite Trip Generation Handbook Enhanced eBook Features
7. Enhancing Your Reading Experience
  - Adjustable Fonts and Text Sizes of Ite Trip Generation Handbook
  - Highlighting and Note-Taking Ite Trip Generation Handbook
  - Interactive Elements Ite Trip Generation Handbook
8. Staying Engaged with Ite Trip Generation Handbook
  - Joining Online Reading Communities
  - Participating in Virtual Book Clubs
  - Following Authors and Publishers Ite Trip Generation Handbook
9. Balancing eBooks and Physical Books Ite Trip Generation Handbook
  - Benefits of a Digital Library
  - Creating a Diverse Reading Collection Ite Trip Generation Handbook
10. Overcoming Reading Challenges
  - Dealing with Digital Eye Strain
  - Minimizing Distractions
  - Managing Screen Time
11. Cultivating a Reading Routine Ite Trip Generation Handbook
  - Setting Reading Goals Ite Trip Generation Handbook
  - Carving Out Dedicated Reading Time

12. Sourcing Reliable Information of Ite Trip Generation Handbook
  - Fact-Checking eBook Content of Ite Trip Generation Handbook
  - Distinguishing Credible Sources
13. Promoting Lifelong Learning
  - Utilizing eBooks for Skill Development
  - Exploring Educational eBooks
14. Embracing eBook Trends
  - Integration of Multimedia Elements
  - Interactive and Gamified eBooks

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