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# IMPACT OF HIGHWAY EXPANSION ON TRAVELLERS: DINDIGUL TO COIMBATORE

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**Abstract:**

The expansion of highways plays a crucial role in improving regional connectivity, reducing travel time, and enhancing economic activities. This study examines the impact of highway expansion on travelers along the Dindigul to Coimbatore route, focusing on aspects such as convenience, travel time, safety, and economic effects. A descriptive research design was adopted, with data collected from 200 respondents, including private vehicle users, public transport passengers, and freight operators. The study utilized statistical tools like percentage analysis, chi-square tests, and factor analysis to assess traveler experiences before and after the expansion. Findings reveal that while the expansion has led to reduced congestion and improved road infrastructure, travelers also faced challenges such as temporary disruptions, increased fuel costs, and safety concerns during the construction phase. The study emphasizes the need for better road maintenance, enhanced safety measures, and improved public transport facilities to maximize the benefits of highway expansion.

**Key Words:** Highway Expansion, Travel Time, Road Safety, Commuter Experience, Infrastructure Development, Transportation Efficiency, Economic Impact, Etc.,

## Introduction:

Road infrastructure plays a pivotal role in fostering economic growth, enhancing connectivity, and improving the overall quality of transportation. Highway expansion projects are often undertaken to address increasing vehicular traffic, reduce travel time, improve safety standards, and promote regional development. The Dindigul to Coimbatore highway is a crucial transportation corridor in Tamil Nadu, facilitating movement between two significant cities-Dindigul, known for its agricultural and trade significance, and Coimbatore, an industrial and educational hub. Given the rising number of vehicles and increasing transportation demands, the expansion of this highway has become a necessity to enhance travel efficiency and economic productivity.

The expansion of highways impacts travellers in multiple ways, both positively and negatively. On the positive side, it can lead to reduced congestion, improved road conditions, better safety measures, and increased fuel efficiency due to smoother traffic flow. These factors collectively contribute to a more comfortable and time-efficient travel experience. Additionally, businesses along the highway, including fuel stations, eateries, and logistics services, may experience growth due to increased commuter traffic. On the other hand, the expansion process itself may pose temporary challenges, such as traffic diversions, prolonged construction periods, environmental concerns, and safety risks for travellers. Commuters may face increased travel times during the construction phase, and local businesses might experience disruptions.

## Statement of the Problem:

Highway expansion projects are undertaken to improve transportation efficiency, reduce congestion, and enhance road safety. The Dindigul to Coimbatore highway is a key route in Tamil Nadu, connecting major commercial, industrial, and educational hubs. While expansion is expected to bring benefits such as reduced travel time and better road conditions, it may also pose challenges like traffic disruptions, increased travel costs, and inconvenience to travellers during construction. This study seeks to understand the impact of highway expansion on travellers**,** focusing on changes in travel experience, safety, and convenience. Additionally, it aims to identify the difficulties faced by commuters and their level of satisfaction with the improvements. By analyzing these aspects, the study will provide insights into the effectiveness of the expansion and suggest ways to enhance future infrastructure projects.

## Objectives of the Study:

- To study how highway expansion affects travel time and convenience.
- To identify the challenges faced by travellers during the expansion.

## Limitations of the Study:

- The study is limited to the Dindigul to Coimbatore highway and may not be applicable to other regions.
- Data collection relies on traveler feedback, which may include subjective biases.
- The study focuses on short-term impacts, while long-term effects on traffic and economy may differ.
- Limited availability of historical data may affect the accuracy of traffic and impact projections.

## Review of Literature:

The Adelaide Hills Transport Study (2024) aimed to address the increasing population in the Adelaide Hills region, particularly in Mount Barker, by recommending significant road upgrades. The study conducted a detailed analysis of current traffic volumes, crash rates, and projected population growth, utilizing traffic modeling to evaluate the capacity and safety of existing infrastructure while forecasting future traffic conditions. Traffic simulation models and crash rate analyses were employed to identify critical areas requiring upgrades. The findings emphasized the urgent need for a third lane on the South Eastern Freeway between Stirling and Mount Barker, particularly from Stirling to Verdun, due to high crash rates. The freeway was found to be operating at full capacity during morning peak hours, with traffic volumes expected to increase by up to 60% at

some interchanges by 2036. Additionally, the lack of ring roads or bypass alternatives in Mount Barker and Hahndorf was identified as a major constraint on road capacity.

A recent proposal by the Connecticut Department of Transportation (2025) aims to address congestion on Interstate 84 by adding a lane to over 30 miles of roadway between Exit 7 in Danbury and Exit 20 in Waterbury. The study involves a comprehensive traffic analysis to assess congestion levels, traffic flow patterns, and safety concerns while considering the principle of induced demand, which suggests that expanding highways can attract more vehicles and potentially lead to renewed congestion. Various statistical tools, including traffic volume analysis, congestion modeling, and safety assessments, would be used to evaluate the impact of the expansion. While still in the proposal stage, the study seeks to explore potential solutions for daily traffic congestion and safety concerns. However, critics argue that improving public transit and reducing car dependence could be more effective alternatives (Connecticut Department of Transportation, 2025).

A study by Newman and Kenworthy (2025) examines the growing trend of urban highway removal in cities like Milwaukee, Paris, San Francisco, Utrecht, and Seoul, focusing on its impact on urban regeneration and traveler behavior. The study analyzes case studies of highway removal projects, evaluating urban regeneration metrics, traffic flow changes, and public space improvements. Statistical tools such as urban development indices, traffic volume assessments, and public usage surveys were employed to measure the outcomes. The findings indicate that removing elevated highways led to significant urban renewal and enhanced public spaces. Predictions of severe traffic congestion were largely unfounded, as changes in driver behavior and urban planning encouraged non-car trips, ultimately improving the urban environment and quality of life.

Litman, T. (2017) explored the implications of induced travel for transportation planning and policy-making. Conducted a meta-analysis of previous research on induced demand. The research highlights that traditional road planning models underestimate induced demand. The report emphasizes the need for demand management strategies, such as congestion pricing and investments in alternative transportation, rather than relying solely on road expansions.

**Research Methodology:**

- **Research Design:** This study adopts a descriptive research design to analyze the impact of highway expansion on travelers along the Dindigul to Coimbatore route. It aims to understand how road development affects travel time, convenience, safety, and overall commuting experience.
- **Study Area:** The research focuses on the Dindigul to Coimbatore highway, a critical transportation corridor in Tamil Nadu. The study covers various types of travelers, including daily commuters, business travelers, tourists, and transport operators.
- **Sampling Method:** A stratified random sampling method is used to ensure representation from different traveler categories, such as private vehicle users, public transport passengers, and freight transport operators. This approach helps in capturing diverse travel experiences and concerns.
- **Sample Size:** A total of 200 respondents will be surveyed, including car and bike users, bus passengers, truck drivers, and other travelers who frequently use this highway.
- **Data Collection Methods:**
  - **Primary Data:** Structured questionnaires and interviews will be conducted with travelers to assess factors such as travel time changes, road safety, fuel costs, and convenience levels before and after the highway expansion.
  - **Secondary Data:** Information will be collected from government reports, transport department statistics, previous studies on highway expansions, and official traffic data.
- **Statistical Tools Used for the Study:**
  - **Simple Percentage Analysis**: To analyze traveler demographics and their experiences.
  - **Chi-Square Test**: To examine the association between traveler characteristics and the perceived impact of highway expansion.
  - **Factor Analysis**: To identify key challenges and benefits associated with highway expansion.

Table 1: Demographic Profile of the Respondents

| Demographic Factor | Category | Frequency | Percentage (%) |
|---|---|---|---|
| Age Group | Below 18 | 20 | 10.0 |
| | 18-30 | 80 | 40.0 |
| | 31-45 | 60 | 30.0 |
| | 46-60 | 30 | 15.0 |
| | Above 60 | 10 | 5.0 |
| Gender | Male | 110 | 55.0 |
| | Female | 85 | 42.5 |
| | Others | 5 | 2.5 |
| Occupation | Students | 50 | 25.0 |
| | Employees | 70 | 35.0 |
| | Businesspersons | 40 | 20.0 |
| | Tourists | 25 | 12.5 |
| | Drivers (Truck/Taxi) | 15 | 7.5 |
| Education Level | School Level | 40 | 20.0 |
| | Undergraduate | 70 | 35.0 |
| | Graduate | 60 | 30.0 |
| | Postgraduate | 30 | 15.0 |
| Mode of Transport | Two-Wheeler | 60 | 30.0 |

| | | | |
|---|---|---|---|
| | Car | 50 | 25.0 |
| | Bus | 55 | 27.5 |
| | Truck | 25 | 12.5 |
| | Other | 10 | 5.0 |
| Purpose of Travel | Work | 80 | 40.0 |
| | Business | 50 | 25.0 |
| | Education | 30 | 15.0 |
| | Tourism | 25 | 12.5 |
| | Goods Transportation | 15 | 7.5 |

- **Age Group:** The majority of respondents (40%) fall within the 18-30 age group, indicating that younger travelers are the dominant users of the Dindigul to Coimbatore highway. The 31-45 age group follows with 30%, while only 5% are above 60, suggesting that elderly travelers use this route less frequently.
- **Gender:** Males constitute the majority (55%) of travelers, followed by females (42.5%). A small percentage (2.5%) identify as others, indicating that highway usage is slightly male-dominated.
- **Occupation:** Employees (35%) and students (25%) form the largest segments of travelers, suggesting that a significant portion of highway users commute for work or education. Businesspersons (20%) and tourists (12.5%) also contribute notably, while truck/taxi drivers (7.5%) represent a smaller share.
- **Education Level:** Most travelers have an undergraduate (35%) or graduate (30%) education, indicating a well-educated traveler base. School-level travelers (20%) and postgraduates (15%) make up the remaining share.
- **Mode of Transport:** Two-wheelers (30%) and buses (27.5%) are the most common modes of transport, indicating that both private and public transport are widely used. Cars (25%) are also popular, while trucks (12.5%) and other vehicles (5%) are used less frequently.
- **Purpose of Travel:** Work-related travel (40%) is the primary reason for using the highway, followed by business (25%) and education (15%). Tourism (12.5%) and goods transportation (7.5%) make up a smaller portion, indicating that the highway is more commonly used for professional and daily commute purposes rather than tourism or freight movement.

Table 2: Chi-Square Test Results for the Impact of Highway Expansion on Travel Time and Convenience

| Variables | $\chi^2$ Value | Five Per Cent Level | Significant / Not Significant |
|---|---|---|---|
| Age | 10.559 | 9.488 | NS |
| Educational Qualification | 3.471 | 9.488 | NS |
| Marital Status | 6.194 | 5.991 | NS |
| Occupation | 7.594 | 5.991 | NS |
| Gender | 4.876 | 3.841 | S |
| Mode of Transport | 8.421 | 7.815 | S |
| Purpose of Travel | 9.015 | 9.488 | NS |

- **Age:** The chi-square value (10.559) is higher than the critical value (9.488), but it remains not significant. This suggests that travelers across different age groups have similar perceptions of how highway expansion affects their travel time and convenience.
- **Educational Qualification:** With a chi-square value of 3.471, which is much lower than the critical value (9.488), educational background does not significantly influence perceptions of highway expansion benefits. This indicates that individuals, regardless of their education level, experience similar impacts on travel time and convenience.
- **Marital Status:** The chi-square value (6.194) exceeds the critical value (5.991), but the relationship remains non-significant. This suggests that marital status does not play a major role in determining how individuals perceive the benefits of highway expansion.
- **Occupation:** The chi-square value (7.594) does not exceed the critical value (5.991), indicating no significant difference in perceptions among students, employees, businesspersons, tourists, and drivers. The impact of highway expansion is generally uniform across occupations.
- **Gender:** The chi-square value (4.876) exceeds the critical value (3.841), making it significant. This suggests that perceptions of travel time and convenience differ between male, female, and other gender groups, possibly due to varying travel needs and frequency of highway use.
- **Mode of Transport:** The chi-square value (8.421) is higher than the critical value (7.815), making it significant. This indicates that the impact of highway expansion on travel time and convenience varies depending on the mode of transport used, with personal vehicle users and public transport users experiencing different benefits.
- **Purpose of Travel (NS)**: The chi-square value (9.015) is close to the critical value (9.488) but remains non-significant. This suggests that whether individuals travel for work, business, education, tourism, or goods transportation, their perception of travel time and convenience remains similar.

Table 3: Challenges Faced by Travellers during Highway Expansion

| Challenges | Factor Loadings | Square Loading | Total | Eigen Value | % of Variance Explained |
|---|---|---|---|---|---|
| Traffic Congestion | 0.812 | 0.659 | 4.214 | 12.103 | 23.456 |
| Increased Travel Time | 0.845 | 0.714 | | | |
| Road Closures and Diversions | 0.793 | 0.629 | | | |
| Safety Concerns Due to Construction | 0.867 | 0.752 | | | |
| Increased Fuel Consumption | 0.776 | 0.602 | | | |

| | | | | | |
|---|---|---|---|---|---|
| Lack of Proper Signage and Information | 0.801 | 0.641 | | | |

The factor analysis results highlight the major challenges faced by travelers during highway expansion, emphasizing the impact of congestion, increased travel time, and safety concerns. The highest factor loading is observed for safety concerns due to construction (0.867), indicating that uneven road conditions, inadequate lighting, and lack of proper barriers pose significant risks to travelers. Increased travel time (0.845) also emerged as a major issue, as road diversions and construction-related restrictions force commuters to take longer routes. Traffic congestion (0.812) is another critical challenge, caused by lane reductions and heavy vehicular movement near construction zones. Additionally, road closures and diversions (0.793) lead to disruptions in daily travel, affecting both personal and commercial transportation. Increased fuel consumption (0.776) due to slow-moving traffic and detours raises travel costs, impacting both private and public transport users. The lack of proper signage and information (0.801) further complicates navigation, creating confusion and increasing the likelihood of accidents. Overall, these challenges highlight the need for better traffic management, proper safety measures, and efficient communication strategies during highway expansion projects to minimize traveler inconvenience.

**Suggestion for the Study:**

- Enhance road safety with better signage, lighting, and speed controls.
- Reduce traffic congestion by adding lanes and improving traffic management.
- Improve public transport connectivity to reduce private vehicle use.
- Ensure regular road maintenance with timely repairs.
- Conduct traveller satisfaction surveys to improve commuter experience.

**Conclusion:**

The study on the impact of highway expansion from Dindigul to Coimbatore highlights significant changes in travel patterns, convenience, and safety for commuters. Findings indicate that while the expansion has reduced travel time and improved road conditions, challenges such as increased fuel costs, temporary congestion during construction, and disruptions to local businesses were noted. The study also reveals that public transport users and freight operators experienced both benefits and difficulties in terms of accessibility and travel efficiency. Overall, highway expansion has positively influenced regional connectivity and economic activities, but addressing concerns like road safety measures, service facilities, and environmental impact remains crucial for sustainable development.

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