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Evaluating the Social Cost of Urban Infrastructure: A Case Study of Patna Flyover

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Abstract : *This research project aims to understand the wide-ranging social, economic, and environmental effects of the construction of the Ashok Rajpath Flyover in Patna. The study examines how this major urban infrastructure project has influenced the daily lives, livelihoods, mobility, and well-being of people living and working in the surrounding areas. Through a mixed-methods approach, combining structured surveys and in-depth interactions with shopkeepers, street vendors, residents, and commuters, this research investigates the real ground-level impacts experienced by different groups affected during and after the flyover's construction.*

The research also aims to uncover the hidden or less-discussed factors that contribute to significant changes in people's living conditions and economic stability. It explores whether the challenges faced by business owners, vendors, and local residents are similar or different, and how these issues shape their overall perception of urban development. Methods such as questionnaires and personal observations helped gather clear and rich information from respondents. Therefore, this study highlights the realities, opinions, and challenges faced by the local community, making the research more inclusive and relevant for policymakers, planners, and society.

Key words: *Urban infrastructure, Environment, Livelihood, Social cost, Footfall.*

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Introduction:

Urban infrastructure is the backbone of a developing city. Roads, bridges, flyovers, drainage systems, and public transport networks are constructed to improve mobility, reduce travel time, and support the economic and social activities of urban citizens. Although these projects are designed for long-term benefits, their construction process often creates several unavoidable challenges. Many of these challenges are not reflected in official financial records but become part of the social cost borne by the local population. Social cost includes the inconvenience, disruptions, health issues, and economic losses that arise when infrastructure projects interfere with the everyday functioning of a community (Misra, 2018).

This research focuses on the Patna Flyover project, particularly the section constructed along Ashok Rajpath—a central and historically significant road that connects important educational, commercial, and cultural institutions of the city. The flyover was introduced as a solution to Patna's chronic traffic problem. Ashok Rajpath has long suffered from overcrowding, slow vehicular movement, unsafe pedestrian conditions, and frequent traffic jams. With the rapid increase in population, expansion of educational institutions, and growing number of vehicles, the road could no longer cope with the pressure (Government of Bihar 2017).

While the flyover project was intended to provide a long-term solution, the process of construction created intense social and economic difficulties for shopkeepers, vendors, students, and residents. Large piles of construction debris—such as bricks, cement chunks, sand, metal rods, pipes, and dust—covered significant sections of the road. This not only reduced usable space for pedestrians and vehicles but also made the environment hazardous. Dust affected the air quality, debris obstructed mobility, and constant noise from heavy machinery disturbed academic activities, businesses, and social life. The present study examines these social costs in detail. Development projects often highlight their achievements—budget utilization, modern engineering, technology used, and expected future benefits—but the lived experiences of affected communities remain undocumented. This research attempts to fill that gap by presenting the voices and experiences of shopkeepers and vendors who endured long periods of disrupted business. These individuals depend heavily on daily customer footfall, especially students and local commuters, and hence they were among the most affected by the construction activities (Cernea, 2000).

Ashok Rajpath is one of the oldest and most important roads in Patna. It passes through the academic heart of the city and is lined with several iconic landmarks. Institutions such as Patna University, Patna College, Science College, NIT Patna, the Khuda Bakhsh Oriental Library, and multiple hostels and book markets contribute to its vibrant environment. Historically, the road has served as an educational corridor for thousands of students, researchers, teachers, and visitors (Singh, 2009).

When Ashok Rajpath was originally built, Patna was a smaller, less crowded city. The road was designed to support slow-moving traffic such as bicycles, hand-pulled rickshaws, Two-wheelers, cars, auto-rickshaws, e-rickshaws, and buses became a regular sight, placing heavy pressure on the narrow and historically designed road (Srinivasan, 2008).

Years of rapid urbanization created several problems:

- Narrow road space
- Increased student population
- Encroachments by shopkeepers and vendors
- More commercial activities
- Increase in heavy and fast-moving vehicles
- Lack of alternative routes
- Traffic congestion from morning till evening

Traffic jams became an everyday experience, especially during examinations, festivals, office hours, and college timings. Sometimes even ambulances and emergency vehicles were unable to pass due to the severe congestion.

To address these issues, the government decided to construct a flyover that would separate local traffic from through traffic. The flyover was expected to modernize the region and relieve the pressure on Ashok Rajpath. However, the historical limitations of the road—its narrow width, uneven structure, and dense commercial presence—made construction extremely challenging. As a result, the construction phase created significant disruptions that are now studied as part of the social cost (Jain, 2011).

The Ashok Rajpath Double-Decker Flyover is the first of its kind in Bihar, constructed to ease traffic congestion in one of Patna's busiest and oldest road corridors. It serves as a major urban infrastructure upgrade connecting educational, commercial, and hospital zones.

1. Timeline of construction (Ministry of road Transport and Highways 2019)

- Foundation Stone Laid: 4 September 2021
- Construction Completed: 31 May 2025
- Official Inauguration: 11 June 2025
- Inaugurated By: Shri Nitish Kumar, Chief Minister of Bihar

2. Cost of the project (Planning Commission of India 2014)

Total Estimated Cost: 422 crores

3. Key structural features (Indian Roads Congress 2011)

- Two-level elevated road (Upper Deck + Lower Deck)
- Upper Deck Length: approx. 2.17 km (Kargil Chowk to Science College)
- Lower Deck Length: approx. 1.44 km (Patna College Gate to Gandhi Maidan near BN College)
- Width of Each Deck: 8.5 meters
- One-way traffic system on each deck
- Integrated with ground-level service roads
- Connectivity planned with Patna Metro, JP Ganga Path, and multi-level parking near PMCH

4. Purpose and significance (Kadiyali, 2013)

- To reduce traffic congestion on Ashok Rajpath
- To facilitate smoother movement for students, patients, shopkeepers, and residents
- To improve connectivity between Patna College, Science College, PMCH, Gandhi Maidan, and nearby commercial areas
- Part of Patna's long-term urban mobility modernization plan

5. Expected benefits (Papa Costas,2005)

- Less travel time
- Reduced traffic jams
- Better access for emergency vehicles towards PMCH
- Modern and planned traffic flow system across central Patna

6. Issues after inauguration (Comptroller and Auditor General of India 2018)

- Reports of cracks and waterlogging during heavy rainfall shortly after opening
- Concerns raised about drainage, design quality, and construction durability
- Calls for inspection and renovation by authorities

This document covers all important details about the Ashok Rajpath Double-Decker Flyover, including construction facts, cost, features, purpose, and issues reported after inauguration.

Review of Literature:

Dutta (2012) in a paper entitled Land Acquisition and Displacement in India: The Human Cost of Development explores the social costs of infrastructure-led development projects across India, including displacement, inadequate rehabilitation, and widening inequality.

Kumar et al. (2021) in paper entitled "Urban Transport and Informal Workers in Indian Cities: A Case for Inclusive Mobility" analyses how smart mobility projects (metros, flyovers) intersect with the livelihoods of auto-rickshaw and rickshaw drivers.

Das et al. (2023) in their paper entitled Effect of Double-Decker Flyover Construction on Urban Fabric of Ashok Rajpath, Patna, India examines how the double-decker flyover has transformed the physical and visual environment of Ashok Rajpath. The authors report a reduction in "sky-view factor," increased shading, and decreased openness for foot traveller.

Their findings highlight how elevated structures can change street-level micro-climate and affect daily activities.

Salawon et al. (2015) in their paper entitled A Study of a Flyover-Bridge Improved Intersection This states that the effectiveness of flyover-bridge intersections in Thailand in reducing congestion. Results show that 30—85% of vehicles shifted to flyovers, lowering delays by nearly 30%. Using SIDRA traffic modelling, the authors identify lane traffic jam point, signal-timing issues, and U-turn conflicts that require redesign.

Times of India (2021) in the news report entitledDouble-Decker Flyover to Ease Traffic on Ashok Rajpath explained that the Ashok Rajpath flyover, built for 422 crores, aims to reduce the traffic near PMCH and NIT Patna. People who travel in this area believe that the flyover will make their daily travel easier once it is fully completed.

Research Gap:

Most of the research work done till now has been on the effect of flyovers and large road constructions in

large, already developed cities. The research work done has mostly been on congestion, traffic flow, and technical aspects, but very few studies have been done on the social effect of such projects on people living in newly developing metro cities like Patna. Hence, this research work will try to bring out the experiences of people living around Ashok Rajpath.

It is necessary to point out this aspect because the day-to-day struggles of people like shopkeepers, students, vendors, rickshaw pullers, and common citizens of Patna are mostly unreported.

Significance: This research study would reveal about the inconvenience faced by some affected sections of the society which are often ignore. It draws attention to towards affected shopkeepers whose businesses and shop were closed for months.This research will promote and raise awareness about people centric development.

Objectives:

- To examine the socio and economic impact of urban infrastructure.
- To investigate about the issues faced by affected shopkeepers and street vendors.
- To understand the short term loss and long term benefits of the project.
- To suggest strategies to minimise such social cost in future projects.

Hypotheses:

H1: Impact of flyover construction (Ashok Rajpath) on the income levels off shopkeeper and Street vendors due to decrease customer footfall.

H2: Operation difficulties including higher transportation time increased material cost and restricted access to shops increased due to the flyover construction.

H3: Recovery of the business will be slow due to permanent changes in traffic flow and pedestrian activities.

Research Methodology:

This section of a research paper deals with the different methodological choices made by the researcher during the research.

The process of data collection has been done through both qualitative and quantitative methods.

Methods of data collection:

a) Quantitative Research Method
b) Qualitative Research Method

Sources of Data collection:

During our research we used both primary and secondary data

a) Primary Data(Interview schedule and survey)
b) Secondary Data(Books, journals, newspaper, magazines, government websites, etc.)

Area of Study:

It is based on location chooses and decided by the researchers it determines the boundary of the research

Ashok Rajpath, Patna

Sample unit: Shopkeepers and Street Vendors.

Sample size: 50

Profile of Respondents:

a) Age group: above 18 to 70
b) Educational status: Illiterate, Primary, Secondary, Graduation and above
c) Occupational status: Shopkeepers and Street Vendors.

Tools and Techniques of Data Collection:

Interview schedule and survey.

Data Analysis:

Table 1. Variation in Daily Income

Average Daily Income (Rs)	No. of Respondents	Percentage
Less than 200	19	38%
200-500	23	46%
500-1000	08	16%
Above 1000	nil	0%
TOTAL	50	100%



Fig. 1

Explanation: Fig. 1 and Table 1, shows the variation in income level after the construction of flyover. 46% of the respondent on between Rs. 200 to 500 daily. 38% of the respondents on earned less than 200. And rupees 500 to 1000 is own by for about 16% of our respondents. And none of the respondents on more than 1000

Table 2. Impact of Flyover on Income

Parameter	No. of Respondents	Percentage
Income Decreased	50	100%
Income Increased	0	0
TOTAL	**50**	**100%**

Source: Primary field work.

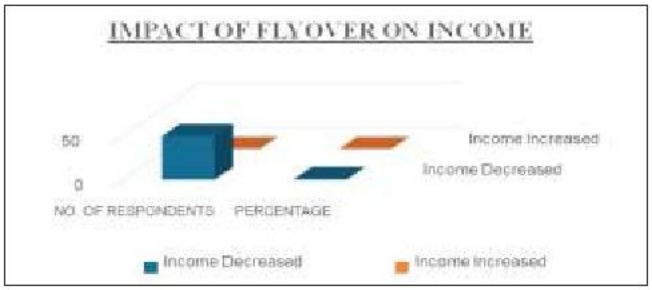


Fig. 2

Table 3: Reasons for Income Decrease

Reason	No. of Respondents	Percentage
Less Pedestrian Movement	15	30%
Road Diversion	35	70%
Increased Competition	0	0
TOTAL	**50**	**100%**

Source: Primary field work.



Fig. 3

Explanation: The Table 3 and Fig. 3, displace the reason for income decline. 70% of the respondents mentioned it affected due to diversion of roads about 30% of them says less pedestrian movement is the main reason of decrement.

Table 4. Perception Analysis

Perceotion	Number of Respondents	Agree %	Neutral %	Disagree %
Diversions well planned	25	50%	10%	40%
Authorities communicated well	07	15%	5%	80%
Compensation was fair	15	30%	nil	70%
No proper alternatives made	22	45%	20%	35%

Source: Primary field work.



Fig. 4

Explanation: The above table and figure for shows the perception analysis. The responses about it was mixed 80% of the respondents are dissatisfied with the level of communication. 70% of them considered at the compensation was unfair. 50% of them said that diversions was not well planned. And 35% of them had opinion that no proper alternative were mode.

Hypotheses Testing:

Hypothesis 1: Impact of flyover construction (Ashok Rajpath) on the income levels off shopkeeper and Street vendors due to decrease customer footfall.

Table 5. Change in Income Level

Change in Income Level	Number of Respondents	Percentage
Significantly Decline	22	44%
Moderately Decline	15	30%
Slightly Decline	8	16%
No change	5	10%
TOTAL	**50**	**100%**

Source: Primary field work.



Fig. 5

Explanation: On the basis of Table 5 and Fig. 5, the data revealed that experienced decline in their income due to their construction. Precisely, 44% of the respondents experience significant decline. About 30% of 10 experienced moderately decline followed by 16% phased slide decline and 10% faced no change in income levels.

The data considerably backs the hypothesis that majority of the respondents faced income decline, some faced measure drop in the income where as some stated miner change in the income.

In conclusion, the data notably supports the hypothesis that flyover construction has negatively impacted shopkeepers and Street vendors.

Hence, **it supports Hypothesis no. 1**

Hypothesis 2: Operation difficulties including higher transportation time increased material cost and restricted access to shops increased due to the flyover construction.

Table 6. Operational Difficulties Faced During Construction

Type of Operational Difficulty	No of Respondents	Percentage
Highly affected	20	40%
Moderately affected	17	34%
Slightly affected	9	18%
Not affected	4	8%
TOTAL	50	100%

Source: Primary field work.



Fig. 6

Explanation: On the basis of Table 6 and pie chart represented 40% of the respondents were highly affected buy operation difficulties.About 34% of them were moderately affected. And 18% for slightly affected by the flyover construction. Only 8% of the respondents wasn't affected of it.

The data certainly validated the hypothesis that flyover construction has increase the operational difficulties. With 46 out of 50 respondents and green with the perception that construction has created operational difficulties. Despite, few respondents was in favour of no change, the data overwhelmingly supported the idea.

Hence, **it supports Hypothesis no. 2**

HYPOTHESIS 3 : Recovery of the business will be slow due to permanent changes in traffic flow and pedestrian activities.

Table 7. Perception of Future Business Recovery

Perception About Recovery	No of Respondents	Percentage
Recovery will be very slow	18	36%
Recovery will be slow	16	34%
Recovery will be normal	10	20%
Recovery will be fast	6	12%
TOTAL	50	100%

Source: Primary field work.

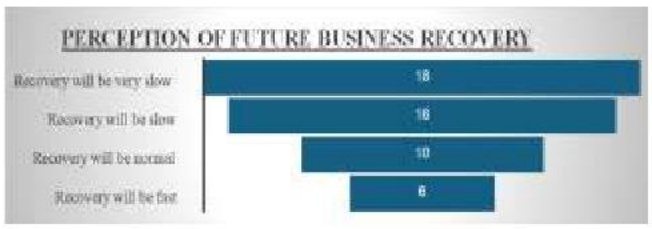


Fig. 7

Explanation: Above Fig.7 and Table 7, displays the future business recovery. 36% of the respondents is in the favors that recovery will be very slow. Only a small group of respondents i.e. 12% of them believed recovery will be fast.

Although, the data indicates that business recovery is doubtful.

Hence, **itsupports Hypothesis no. 3**

Findings :

With the help of various research methodologies including primarily surveys, in depths in- depth interviews, these are some of the findings of our research:-

- Around 39% of respondents earn less than Rs.200 per day, showing extremely low economic stability. And none of the respondents earn more than Rs. 1000 which shows absence of high income opportunities.
- Most of the shopkeepers were more impacted due to reduced visibility and changes in pedestrian movement after the construction.
- Almost, all of the respondents reported gradual decrease in their income after flyover construction.
- Majority of them found reduction in workspace, visibility and reduced customer footfall.
- Due to decrement in income, spending on children's education will be decrease which reveals long term social consequence.
- Health disturbance were moderate, sum of the respondents notably 35% of them were affected by dust and allergies during construction.

The overall future outlook appears pessimistic—only 25% believe their business will recover, and 45% are considering relocation due to long-term loss of customers.

Urban infrastructure plays a decisive role in shaping everyday urban life, particularly through transport-related projects aimed at improving mobility and safety. Flyovers are commonly constructed to reduce congestion, shorten travel time, and facilitate smoother vehicular movement. In the case of the Ashok Rajpath Flyover in Patna, the outcomes of such development have been complex. Although the project has improved traffic flow along one of the city's busiest corridors, it has also generated social challenges for communities residing and working in its vicinity (Banister, 2008; UN-Habitat, 2013).

The study reveals that while a significant proportion of commuters benefitted from reduced delays and improved road efficiency, several groups operating at street level experienced negative consequences. Shopkeepers reported a decline in customer footfall due to reduced pedestrian visibility and access at ground level. Similarly, street vendors faced displacement and income loss during the construction phase as well as after the completion of the flyover. Pedestrians continue to encounter difficulties such as narrow or discontinuous footpaths, unsafe crossings, and limited walking space near the flyover structure (Jacobs, 1961; Roy, 2005).

Suggestions:

After conducting the research following are the suggestions that could be used by policy makers in future projects.

Involvement of local stakeholders: One of the most effective ways to reduce this issue is to involve the locals decision making process. Participatory planning will not only minimise the social cause but will also promote inclusive growth.

Continuous monitoring: Post construction, monitoring plays a crucial role in identifying the on intended consequences of infrastructure projects.

Enhancement of pedestrian infrastructure: The flyover design must incorporate alternative footpath and safe pedestrian crossings.

Limitations:

Limitations of the Study

1. Hesitation and Non-disclosure by Respondents: Some shopkeepers and Street vendors were hesitate in responding to questions mainly the income levels. This might lead to incomplete data collection.

2. Risk of overgeneralize action: Applying the findings of the research to the aggregate population code potential give risk of over generalization. Sample size was limited to only 50 units might create inferences about the study.

3. Non-availability of secondary data: This particular topic is often neglected by most of the research very few researchers are done on social cost of infrastructure.

In conclusion, source of income is the base of a person's life. Development means the betterment of people. But there are some group of people who are left behind and get negatively affected. Where as majority people get benefited by the development. Our concern is towards development for all. Not a single person should get negatively affected by it.

The government provides support but it doesn't compensates to the fullest. Government should think of the before building anything.

This research contributed to the existing body of knowledge by providing insights of social cost of urban infrastructure in the context of Patna, where no prior research done on this topic. The findings of the study understand the need of inclusive growth. Ultimately, this research demonstrated that people thinks development benefits everybody, but there are some people who are left behind and their life completely changes.

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