A Review of Literature on Improvement of Highway Capacity Due to Cycle Track in Urban Area

Arif Anwar¹, D. S. Ray²
M. Tech Scholar¹, Professor²
Department of Civil Engineering
BBDU, Lucknow, India

Abstract:
The main purpose of this paper is to calculate improvement of highway capacity due to cycle track in urban area. We will do two-way classified traffic survey of the road and also calculate average speed of commercial vehicles, personal vehicles and two wheeler vehicles I mixed traffic and without cycle traffic. We will study and comparison of fuel consumption as well as total cost saving due to separate cycle track.

I. INTRODUCTION

This paper tries to make study of the Improvement of highway capacity due to cycle track in urban area. Cycle tracks are exclusive bicycle facilities that are physically separated from motor vehicle lanes and sidewalks. Cycle tracks are an integral piece of infrastructure proven to increase ridership. Increasing bicycling can improve the overall quality in the city. A separate cycle track can increase the speed of remaining vehicles so that it can save time, fuel consumption, wear and tear etc. It can also increase the transportation choices, reduce parking and roadway congestion. Replacing vehicle trips with bicycle trips can reduce the number of single occupancy vehicle, traffic and associated air pollution, and fuel consumption also. We will do survey work on Chinhat to Dewa section of Itaunja-Kumarwara-Kursi-Dewa-Chinhat road, Lucknow. We will do two way classified traffic survey of the road and also calculate average speed of commercial vehicles, personal vehicles and two wheeler vehicles except cycle. We will study of speed of commercial vehicles, personal vehicles and two wheeler vehicles based on algorithm that there will be no cyclist on mixed traffic. Lastly we will study and comparison of fuel consumption as well as total cost saving due to separate cycle track.

II. LITERATURE REVIEW

1. Jensen (2007) compares bicycle tracks and lanes a before and after study. The construction of bicycle tracks resulted in a 20 percent increase in bicycle traffic and a decrease of 10 percent in motor vehicle traffic on those roads where bicycle tracks have been constructed. The making of bicycle lanes resulted in a 5 percent increase in bicycle traffic and a decrease of 1 percent in motor vehicle traffic on those roads where bicycles lanes have been marked.

2. Dill and Gliebein (2008) in their research understand and measures bicycle behavior. In their study they found that the bicycle trips were 13.4 minutes longer than the estimated auto travel time. The medium difference was 9.5 minutes. About half of the trips occurred during morning and evening peak travel times (6-9 AM and 4-7 PM) with about one third occurring between those time periods. Therefore, less than 20% of the trips occurred in the late evening and early morning.

3. Fraser and Lock (2010) the objective was to consider the effect of all interventions or physical factors on cycling in any population group, including cycle path or route. This review provides evidence for the positive association between certain built environment factors and cycling. Policies promoting cycle lane construction appears promising in helping to reduce physical inactivity and the transport component of greenhouse gas emission.

4. Lusk, Furth, Willett and team (2011) had studied six cycle tracks in Montreal that are two way on the one side of the street. Each cycle track was compared with one or two reference streets without bicycle facilities that were consider alternative bicycling route. All six cycle tracks were two-way on one side of the street and separated from traffic by raised medians, parking lanes, or delineator posts. There were 8.5 injuries and 10.5 crashes per million bicycle-km.

5. Morency, Luis and team (2013) researched on crash rates on cycle tracks in the United States. They studied state adopted bicycle guidelines to determine whether cycle tracks (physically separated) were recommended, whether they were built and their crash rate. For the 19 US cycle tracks they examined, the overall crash rate was 2.3% per 1 million bicycle kilometer.

6. Hull and O’Holleran (2013) has used a detailed template to benchmark the level of service provided to cyclist in six European cities. The methodology has been tested using an experienced and a novice cyclist to capture their perceptions of the design of the cycle infrastructure in these cities. The research paper identified one of the barriers to encouraging more cycling is the potential/ inexperienced cyclists perception of the safety, comfort, and continuity of the cycling network in the city.

7. Kristinsdottir (2015) had studied attitudes towards cycling in general. According to his study “travel behavior surveys all over
the world indicate that access to transportation is most important factor influencing mode choice. In this research when asked from people about the benefits of cycling, the most common answer were that is save money on both on soil/gasoline and on owning and managing a car.

8. Greibe and Thomas (2016) Study is based on empirical data collected through video recordings at 8 different locations in Denmark. Two synchronised cameras covering the observational area on the cycle track are used for the video recording. The main objective of this study is to examine how widths of one-way cycle tracks in urban areas influence the behavior, flow and capacity of bicycle traffic. Traffic safety has not been a part of the project but is of course a direct offshoot of the subject.

9. Ekblad, Svensson and Koglin (2016) studied concerning how different factors associated with bicycle planning influence then propensity to choose the cycle for transportation. It has been shown in research that the organization of transport and urban planning can have a positive or negative impact on planning on cycle.

10. Prasanna Desai (2017) provides information about the kind of cycle infrastructure that is needed at each road of the road network in the city of Pune. There are number of key success factors that need to be applied to increase the success of cycling infrastructure in Pune.

Continuity: Detailed design need to be include dealing with trees, lamp posts, bus stops and pinch points.

Footpath width: Not only cycle track need to be wide enough, footpaths need to be designed for the existing actual use and flow of pedestrians to avoid that cyclists walk on the cycle track. If footpaths are full of obstacles pedestrians will walk on the cycle track.

Maintenance: Many cycle tracks in Pune have not been maintained. It is essential that the PMC reserve an annual budget for the maintenance of cycling infrastructure in the city. This budget should increase when the total length of cycling infrastructure increases.

III. CONCLUSION

A separate cycle track can increase the speed of remaining vehicles
Reduce parking and roadway congestion
Replacing vehicle trips with bicycle trips can reduce the number of single occupancy vehicle, traffic and associated air pollution, and fuel consumption.
The construction of bicycles tracks resulted in a 20 percent increase in bicycle/ mopped traffic mileage and decrease of 10 percent in motor vehicle traffic mileage on those roads.
Roads are cycle tracks and parking permitted are safer compared to roads with parking bans.
Cycle tracks constructions appear promising in helping to reduce physical inactivity.
The construction of cycle tracks in urban area, provides the necessary space for bicycle traffic and decrease perceived risk among cyclists

IV. REFERENCES


