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Abstract— the scenario of world is changing. It has grown and is constantly growing at rate that nobody has ever imagined. Not just in economy, but also in terms of population, living standards, technology, transport system, vehicles, pollution, etc. As a result of population growth, there is also increase in number of vehicles on the roads. Money bleeds away in these vehicles and their maintenance works. Even after so much expenditure behind these vehicles, people face traffic jams, parking issues, fuel rate fluctuation etc. Ankleshwar is a fast growing city. It has huge chemical industries like ONGC, Atul, and Garda etc. It is known as Chemical Cluster due to its chemical industries. Due to its fast growth rate, there is increase in population and the number of vehicles being used on a daily basis. Having maximum economical and commercial activities, important routes like Station Road - Prateen Chokdi, City - Teen Rasta, Chautanaka, Sardarpark, Gadkholpatia Faatak (Railway Crossing) have maximum numbers of traffic jams. Ankleshwar is constantly growing in each and every aspect and so is its population. This is directly resulting in increasing traffic rate which needs to be managed efficiently.

Index Terms— Introduction, Business Model Canvas, Methodology, Grade Separator, Data Collection, Area Surveyed, Segment Casting, Summary of Result, End Section, Conclusion, References, Appendix.

1 INTRODUCTION

The scenario of world is changing. It has grown and is constantly growing at rate that nobody has ever imagined. Not just in economy, but also in terms of population, living standards, technology, transport system, vehicles, pollution, etc. As a result of population growth, there is also increase in number of vehicles on the roads. Money bleeds away in these vehicles and their maintenance works. Even after so much expenditure behind these vehicles, people face traffic jams, parking issues, fuel rate fluctuation etc. Ankleshwar is a fast growing city. It has huge chemical industries like ONGC, Atul, and Garda etc. It is known as Chemical Cluster due to its chemical industries. Due to its fast growth rate, there is increase in population and the number of vehicles being used on a daily basis. Having maximum economical and commercial activities, important routes like Station Road - Prateen Chokdi, City - Teen Rasta, Chautanaka, Sardarpark, Gadkholpatia Faatak (Railway Crossing) have maximum numbers of traffic jams.

Ankleshwar is constantly growing in each and every aspect and so is its population. This is directly resulting in increasing traffic rate. Those areas needs to be pointed out and managed efficiently.

1.1 Aim & Objectives:

The aim of this project is to propose a suitable solution for the high traffic congestion issue found at Prateen Chokdi, Ankleshwar thoughout the day.

1.2 EMERGING ISSUES:

As the numbers of vehicles are increasing the traffic rate is also increasing. Traffic scenario has changed in Ankleshwar. Many of the times, question arises on the efficiency of Traffic management system here in Ankleshwar. Traffic jam arises in different parts of the city and different intervals which causes delay in movement of vehicles. To solve this scenario, the most traffic generating area must be found. The project section has three important junctions on one route that connects about 9 roads. The three important junctions are City Teen Rasta Circle, Railway station - Prateen junction and Chautanaka Junction. Of these junctions, the most critical one is Railway Station - Prateen Junction, where severe traffic congestion is observed. However, other junctions also have significant congestion but the traffic on this reaches the highest as per the data from the
Manual Count Survey done. Data of that survey is given in 1.4.1.

1.3 Satellite Image

Fig. Most affected area
Valia Chokdi – Gadhkhol Patia Route

Reason for the high traffic at the Valia Chokdi – Gadhkhol Patia route is due to its intersection with Ankleshwar Railway Station and the people in this city travel through trains on a regular basis for Education, Work and other important things whose route fall in this direction. Hence on the arrival of different trains, vehicles accumulate on this route occasionally and this timing keeps on changing according to seasons and occasions. Other reasons:

1. GIDC flyover falls near to it which attracts huge Amount of traffic towards it.
2. Huge amount of students and people who work at Bharuch pick public vehicles through this route.
3. Recent damage to the GIDC flyover was also responsible for sudden traffic rise in that area. But it is repaired now, and the traffic issues are getting a bit reduced

1.4 SOLUTION SUGGESTION:

The following alternatives have been considered for the proposed subproject:

(i) Option 1 - Do nothing – This will not address the underlying problem of traffic congestion and conflicts between vehicles.
(ii) Option 2 - Do minimum – This option involves road widening to improve space availability, but still does not address the underlying problem of traffic congestion due to vendor accumulation.
(iii) Option 3 – A flyover from Decent Hotel near Valia Chokdi to Seva-Sadan. This offers the best, most balanced solution by providing the desired outcomes with least impacts on environment and minimum land acquisition.

2 BUSINESS MODEL CANVAS

Below is the canvas based on the proposal of a flyover on the surveyed location in Ankleshwar city.

3 METHODOLOGY

3.1. Types of roads and bridges:

In our country there are so many types of roads are being constructed,

1) Cart roads
2) Minor district roads
3) Major district roads
4) State highway roads
5) National highways roads

Accordingly the culverts bridges, flyover, are being constructed as mentioned below,

For small cart road and minor district roads, small culverts bridges, small flyover are constructed with minimum class a load. For major district road, state highway road, national highway roads, major bridges and flyovers are being constructed for easy flow traffic. The flyover or over bridges are to be designed Class A loading and AA loading.

3.1.1 (A) FLYOVER

It is a bridge that carries one road or railway line above another either with or without subsidiary roads, for communication between the two.

3.1.2 (B) REASON BEHIND GOING FOR A FLYOVER

As the traffic on the road goes on increasing and we don't have any space left in both the dimensions, then the only option left will be to go to the third dimension and that is done through flyover construction or a tunnel or a subway but going for a flyover would be the best option due to following reasons:

- There are pipelines that are under the area that is proposed which says no to subway.
- In addition to the above point, rain water drainage issue will also emerge during and after construction if done and thus it makes a negative point for tunnel as well.
- Flyover eliminates both the problem.
3.1.3 (C) CLASSIFICATION

At Crossings:

1. Railway Crossing: - At railway crossing where there is high traffic congestion in terms of the frequency of trains passing by or the traffic on the road, in both the cases the flyover should be provided along the road. Here the flyover becomes indispensable.

2. Road crossing: - There are two types of flyovers which are used for traffic management at road crossings.

Simple Flyovers: - In this case, the main road is used for fast traffic, which is made to pass at a high level by a bridge, providing ramps on both the approaches; and the slow traffic is made to pass underneath. Thus the traffics pass at two different levels, and leave no chance for an accident.

4. GRADE SEPARATOR

The Rotary Grade Separator dovetails the benefits of a rotary with the concept of a flyover. It is essentially a multi-level rotary with traffic segregation at distinct vertical levels on the basis of mode of traffic and not direction alone. We already accept the horizontal segregation of traffic in separate lanes based on direction and within lanes based on speed of travel. The Rotary Grade Separator carries this idea of segregation through to a traffic crossing. While the flyover focuses on enabling fast movement of traffic, it ignores the pedestrians’ difficulty in negotiation. The biggest benefit of the Rotary Grade Separator is that it is designed around the human being - the pedestrian and providing him safe and secure movement and access.

4.1 CLOVERLEAF JUNCTION:

It is also a type of grade separator. It was first used in America. It requires a very large area of land. All conflicting streams of traffic are avoided, and so traffic can move at its own speed. This is more advantageous than a roundabout, as there is no necessity for weaving and slowing down of traffic. For any person approaching the intersection there are three ways through any of which he may pass and there are four ways through which he can approach. So, totally there should be 4 x 3 = 12 connectivity, which can be seen in the figure (of the cloverleaf junction).

Cover Leaf Junction (Top View)

The cloverleaf is (on paper) the simplest way to connect two freeways. The only bridges required are to separate the two roadways. If land is expensive, so too can be the cloverleaf, which becomes a choice between tight turning radii (and lower design speed) or lots of consumed land.

Cover Leaf Junction (Isometric View)

4.1.1 ADVANTAGES OF FLYOVER:-

1. Flyovers play a major role in streamlining the traffic control system.
2. Through flyovers plenty of time is saved avoiding congestion.
3. Pollution effect is reduced.
4. Flyovers reduce the risk of accidents.
5. Flyovers also contribute a lot to the aesthetics of the city.

Flyovers have many advantages, but shortcomings arise only because of some mistakes committed during their construction or due to improper planning, etc.

5. DATA COLLECTION

The route on which the proposal is kept is State highway no.76 (SH 76) which connects to State Highway no. 13 (SH 13) and National Highway no. 8 (NH 8). Also, this is the route that connects Bharuch and Ankleshwar other than NH 8.
Below is a schematic diagram of the site

6 AREA SURVEYED

Survey for the possibility of extension of the road was done for Station Road- Prateen Chokdi (SH 76). The measurements for the same was taken using tape survey. Below given figure shows the measurements of the road from Gadkhol to valiya chokdi direction

1. The proposed road is a two lane road. The carriage way from gadkhol patia to valia chokdi (let’s say G to V) is 25 feet while from valia chokdi to gadkhol patia (Let’s say V to G) is 26 feet. Both are provided with a Crash barrier of 6 feet 9 inches.
2. Further there is Possibility of extension upto 5 feet 6 inches and 11 feet 3 inches on V to G and G to V Route respectively.
3. This makes a total of 43 feet on G to V route and 38 feet 3 inches on the V to G route. Summing this will give a total of 81 feet 3 inches. Which will be enough for the construction of a fly-over.

6.1.1 FLYOVER LOCATION

POINTS FOR CONSIDERING THE LOCATION OF FLYOVER:

- It should reduce the traffic congestion.
- It should divert a considerable amount of traffic.
- It should save time and fuel.
- It should have least impact on environment.
- It should be economical.

The starting and ending point that will suit this situation the most is staring from in front of Decent Hotel and end at Seva Sadan (Mamlatdar office).

Advantage of having the flyover on this location:

1. The vehicles that don’t want to go at railway station won’t have to pass through that area and it will be able to directly move further on SH 76.
2. Reduction of traffic congestion at prateen chokdi.

Below are the figure that shows the starting and ending point for the flyover
Above is a google earth image of the entire route up to the place till the flyover is going to start and end.

6.2 STEPS TO BE TAKEN BEFORE FLYOVER CONSTRUCTION ON THE PROPOSED LOCATION:

1. Road widening.
2. Proportioning of road
3. Restricting the vendors from accumulating the crash Barrier.

Necessity of above steps:

- **Road Widening**: This will give the vehicles enough space to move during the construction of the flyover.
- **Proportioning of the road**: This will be helpful for proper erection of flyover. Also, this will give equal spacing for vehicles on each of the sides of flyover starting and ending.
- **Restricting the vendors from accumulating on the crash barrier**: This should be done because the vendors are one of the main reasons for the traffic congestion and their accumulation during the flyover construction will lead to a mass traffic congestion issue.

6.3 SOME MEASURES FOR MAKING CONSTRUCTION PROCESS FASTER:

6.3.1. Pier and Pier cap:

An Innovative shutter design created for both Pier and pier cap makes it possible to cast both, pier and pier Cap in one pour. Conventional piers take about 300 hours while this structure takes about 60 hours only. This shutter design, being of one piece, provides additional strength and takes 1/6th of the time otherwise taken to be made ready. This type of self-supporting shutter decreases the time cycle from 15 days to 3 days. In addition, the process used results in the creation of slim design piers with a high degree of aesthetic value.

7. SEGEMENT CASTING

A segmental construction method for the superstructure or deck of the elevated highway. This method is comparatively faster than using girders for the superstructure. Segment casting is generally done using the short line method whereby the segments are cast in one direction only.

This method should be used with a unique construction methodology known as the long line method, wherein at first, the bed is prepared for the entire span with the same alignment and coordinates of curves (both vertical and horizontal) as it would actually be on site, after which casting is carried out from both the ends. This methodology not only reduces the time to build the casts by half, but also ensures a greater level of precision.

Similarly launching of the segments and completing the superstructure between two piers usually takes around 7 days. If it is pressed into action a round the clock segment movement with the required logistics, it can cut down the time cycle to 3 days. The fastest superstructure completion between two piers was achieved in 2.59 days in a construction company called HCC for Delhi Faridabad Expressway.
8. SUMMARY OF RESULTS

8.1. Summary

The solution as a “flyover” that is proposed here should reduce the traffic congestion issue to a greater extent.

Advantages of this proposed flyover:

- It will play a major role in streamlining the traffic control system.
- Through flyovers plenty of time will be saved avoiding congestion.
- Pollution effect will be reduced.
- Flyovers will reduce the risk of accidents.
- Flyovers will also contribute a lot to the aesthetics of the city. The persons traveling on the flyover can enjoy the panoramic view of the city.

Flyovers have many advantages, but shortcomings arise only because of some mistakes committed during their construction or due to improper planning, etc.

8.2 SCOPE OF FUTURE WORK:

If this proposal is accepted, then designing the flyover more properly and in more innovative manner will result in much efficient traffic management in the city.

8.3 LISTS OF VARIOUS STAGES FROM START TO END OF PROJECT.

There are various types of survey conducted in this Project:

1. Analysis of site area.
2. Identification of problem.
3. Problems found during survey.
4. Root cause of occurrence of the problem.
5. Justification of problem site.
6. Survey carried out with different methods.
7. Solutions of the problem.
8. Solution applied to site area.
9. Some suggested solutions (Optional)

8.4 SURVEY TYPES:

1. Conducted public Survey
2. Offset calculation (Road Margin)
3. Calculated Traffic data during peak hours.
4. Survey Report to Road and Building Department
5. Vendor Survey on roads.

9. END SECTION:

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10. CONCLUSION

Although, I had carried out survey but still the traffic issues are which can be eliminated with solution suggested for this problem. However, I had a meeting with the Road and building department and various actions will be taken and suggested solution might be implemented to eradicate the issue. Therefore, this Analysis of traffic issues survey is carried out to justify the problem and their solutions.

11. REFERENCES

- Design and Construction of the SH58 Flyover Bridge over IH70
12. APPENDIX

Pictures of the Site where survey conducted

Station Road