

A study on Public Transport Network With Vehicle occupancy Survey

(As a Case Study: Gandhinagar Public Transport Network)

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Abstract— The Aim of this paper to define detail study on public transport network of VTCOS city bus service by vehicle occupancy survey for understanding of required improvement parameters in Gandhinagar City with five major routes. Gandhinagar is not only capital of Gujarat state, but is also loaded with all the accolades of being the most developed city of the state. Carrying forward its chain of developments, we try to develop the effective, economic, time consuming public transport network in the Gandhinagar city including the area which connect the major parts of the city like educational firms, government sectors , shopping mall, theatres etc. It will cover not only the city area but also cover the area which are under GUDA(Gandhinagar Urban Development Authority) and some parts of Ahmedabad city.

At present, bus operation through Public Private Partnership is given to the private operator “VTCOS” strictly on the contractual period of 5 (Five) years only. The capacity of the buses is not so good and effective transportation is not provided. It does not cover the major part of the city area and the routes are not effective

Index Terms—Public Transport Network, Vehicle Occupancy Survey, Travel forecasting, Travel time, Arrival time, Departure time , Bus Routes

I. INTRODUCTION

Public transport network

Public transport is a shared passenger transport service which is available for use by the general public, as distinct from modes such as taxicab, carpooling or hired buses which are not shared by strangers without private arrangement.

- Public transport modes include buses, trolleybuses, trams and trains, rapid transit (metro/subways/undergrounds etc.) and ferries. Public transport between cities is dominated by airlines, coaches, and intercity rail. High-speed rail networks are being developed in many parts of the world.
- Most public transport runs to a scheduled timetable with the most frequent services running to a headway. Share taxi offers on-demand services in many parts of the world and some services will wait until the vehicle is full before it starts. Para transit is sometimes used in areas of low-demand and for people who need a door-to-door service.
- Urban public transport may be provided by one or more private transport operators or by a transit authority. Public transport services are usually funded by government subsidies and fares charged to each passenger. Services are normally regulated and possibly subsidized from local or national tax revenue. Fully subsidized, zero-fare (free) services operate in some towns and cities.

Vallabhipur Transportation Cooperative Society Pvt Ltd (VTCOS)

Bus Transits System-The company has proposed to the government for their main depot and workshop to be set up next to the state transport bus station at Pathikashram. According to company sources the routes are Kh-1 to Akshardham, Akshardham to Pathikashram, Ch-0 to Gh-7, Ch-0 to Sector 19/20, Adalaj to Chiloda, Pethapur to Gh-1, Vasania Mahadev to Pathikashram, Vavol to Sector 21 and Gh-0 to Akshardham via sector

Gandhinagar Road system

- The approach roads from Khodiar railway station and Ahmedabad join towards the south of the city forming an entrance to it. The pattern of main city roads is generally rectangular forming a grid one of kilometer by three fourth kilometers.
- The roads have been oriented to run 30° north of west and 60° north of east to avoid direct facing of morning and evening sun during journeys to and from work areas.
- This orientation is suitable for the design of buildings and enables those to be sited conveniently to avail of natural breeze. The river side road follows the natural features and forms a crescent, skirting the proposed recreational area along the river front. The peripheral roads and the access road to the city center are 65 m, wide.
- Roads to Government Offices from south-west and north west and the crescent road are 100m. Wide; the other main city roads are 45 m. wide. City roads oriented North-East to South-West is named with letters of the Devnagari alphabet.
- The curved road along the river is 'J' followed by 'CHH', 'CH', 'GH' 'G', 'KH' and 'K'. The roads oriented North-West to South –East are numbered 1 to 7.The 'J' road is national highway no.8.It is out of city.

Study Area

- Gandhinagar is the capital of the state of Gujarat in western India. Gandhinagar is located approximately 23 km North from Ahmedabad, the largest city of Gujarat, on the west central point of the Industrial corridor between Delhi, the political capital of India, and Mumbai, the financial capital of India.
- It boasts of being the second planned city in India after Chandigarh.

Importance of Study Area

- Gandhinagar is one of the most important cities of western India. It is the capital city of Gujarat state. Named after the father of the Nation Gandhinagar is just 32 kms away from Ahmedabad
- There are various places to see such as Akshardham, Capital Complex, Children Park, Sarita Udhyan, and Craftmen's Village etc.

II. LITERATURE REVIEW

Sustainable public transport network development in Developing Countries

Purpose: The aim of this paper was to assess and analyse the new service development and the integration of sustainable public transport in the developing economies based on the case of Jakarta, Indonesia through "Sustainable service research perspective".

Design/methodology/approach: The paper will be of an explorative nature. The paper presents three concepts—(i) sustainable development (ii), value network and (iii) service research based on S-D logic. The paper then illustrates these concepts in a case study of Jakarta, Indonesia.

Findings: The study will reveal that sustainable public transport and service development based on BRT and future plans for Mass Rapid Transit (BRT) can be used as an active tool for promoting comprehensive public transport service changes leading to sustainable development.

The study also assesses the opportunities for value network. Research limitations/implications: The single case-study design of the present research does not enable empirical generalizations to be made. Future research in this area should focus on generalizing the present findings by studying the development and integration of values-based thinking in other empirical settings.

Practical implications: The selection of Jakarta, Indonesia as a case study for this paper, assesses the service development, environmental and social challenges of public transport in developing countries. Sustainable public transport can be an active tool for sustainable development and value creation.

Retrieving real-time information to users in public transport networks: an application to the Lisbon bus system

This paper presents a real-time trip-planner system for the public transport in Lisbon. This system has the capability of informing potential customers about which are the best routes to make the trip they want, when they want and what are the expected travel times, based on the actual locations of the public transport vehicles and the travel speeds that can be estimated for the various relevant road segments for the next hour. Using four months of operation log-files from the bus operator Carris, a process of data mining was created to analyse and classify the information of travel times and speeds.

The trip-planner is built upon an agent-based model that aims to simulate the transport network operation and create a model to make short-term travel times forecast. A system of dynamic queries was introduced in order to evaluate the built model. The obtained results indicate that this tool, if deployed, could achieve high accuracy levels in predictions and become very useful and valuable for urban public transport users.

This paper presents the formulation of a new Trip-Planner tool for the bus and tram system of the city of Lisbon. An extensive review showed intensive research on the development of travel time prediction algorithms, but a significant lack of tools that integrate a travel time estimation method along with a Trip planner component.

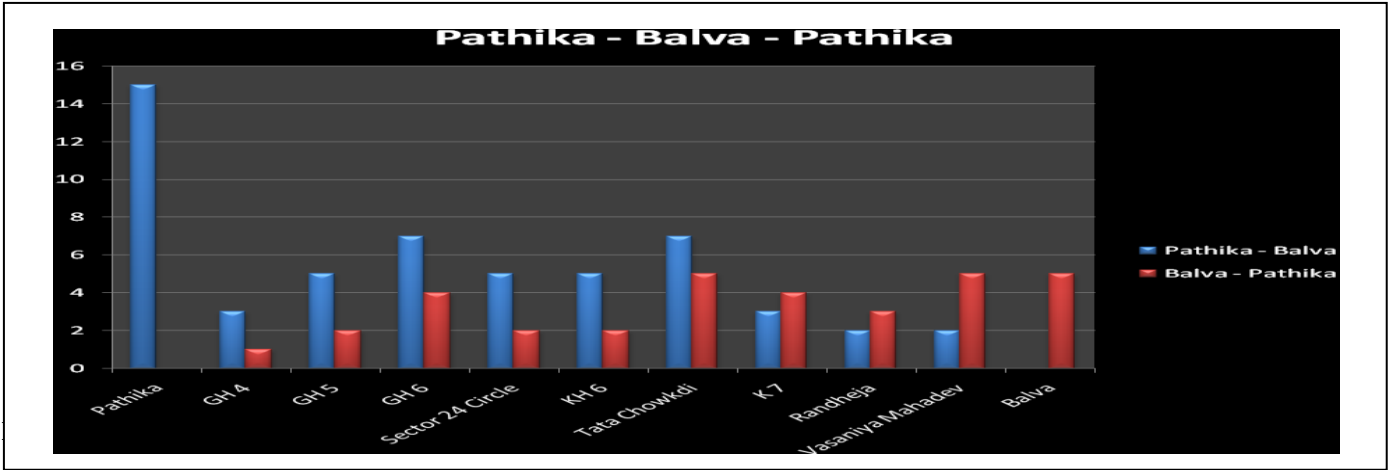
This work represents a first step on the development of this tool, presenting the several steps required for the creation of a robust system, ranging from the data collection and processing, the prediction dynamic travel times of bus routes in complex urban environments and the creation of a platform to communicate with the user.

The developed prediction model showed good results using a decision tree model which triggers a linear regression component that dynamically recalibrates the travel time estimates for each section for the next 30 minutes based on historical and real time information of section with similar speed profiles and geographical proximity.

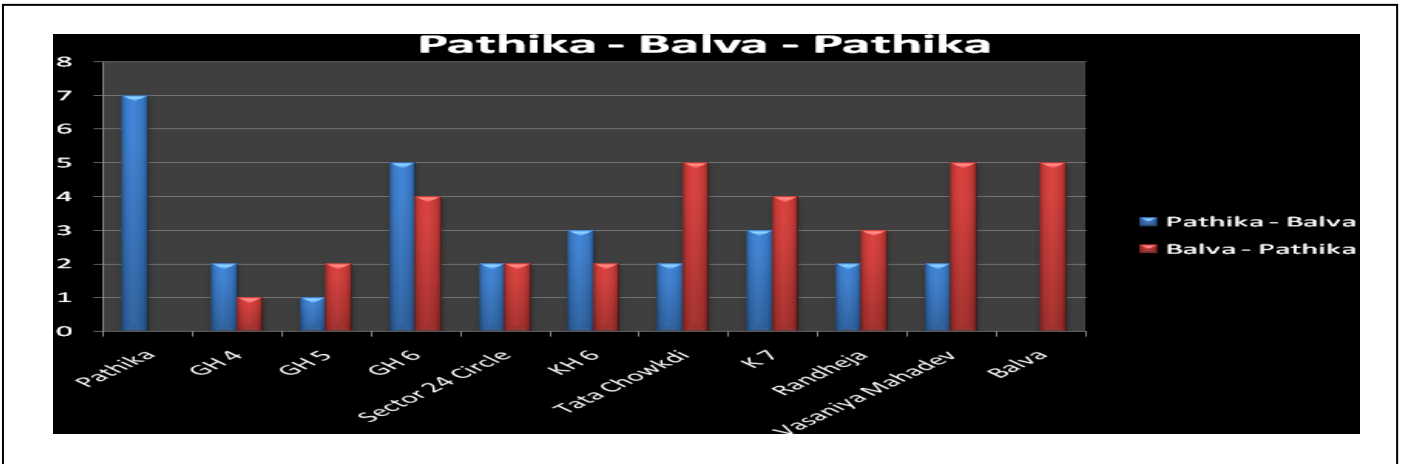
III. FIELD WORK

For better understanding of Public Transport Network of Gandhinagar city which is operated by VTCOS we have conducted a Vehicle occupancy survey between five major routes of Gandhinagar in three different sessions of Morning Session, Afternoon Session and Evening Session

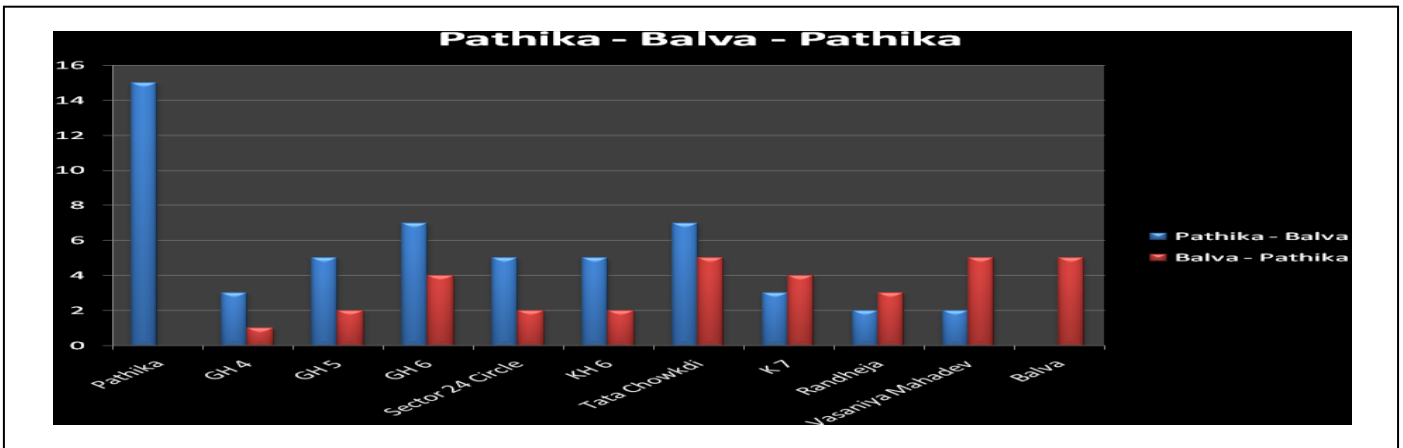
Morning Session – 9:00 AM to 1:00 PM, Afternoon Session – 1:00 PM to 5:00 PM, Evening Session – 5:00 PM to 9:00 PM



After Noon Session

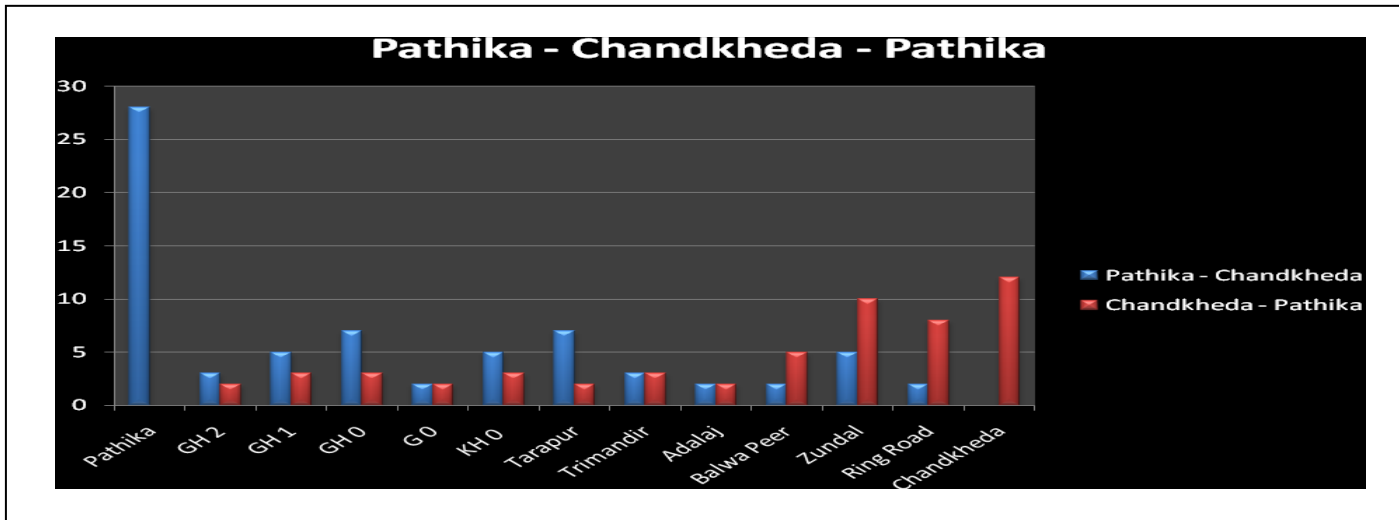


Evening Session

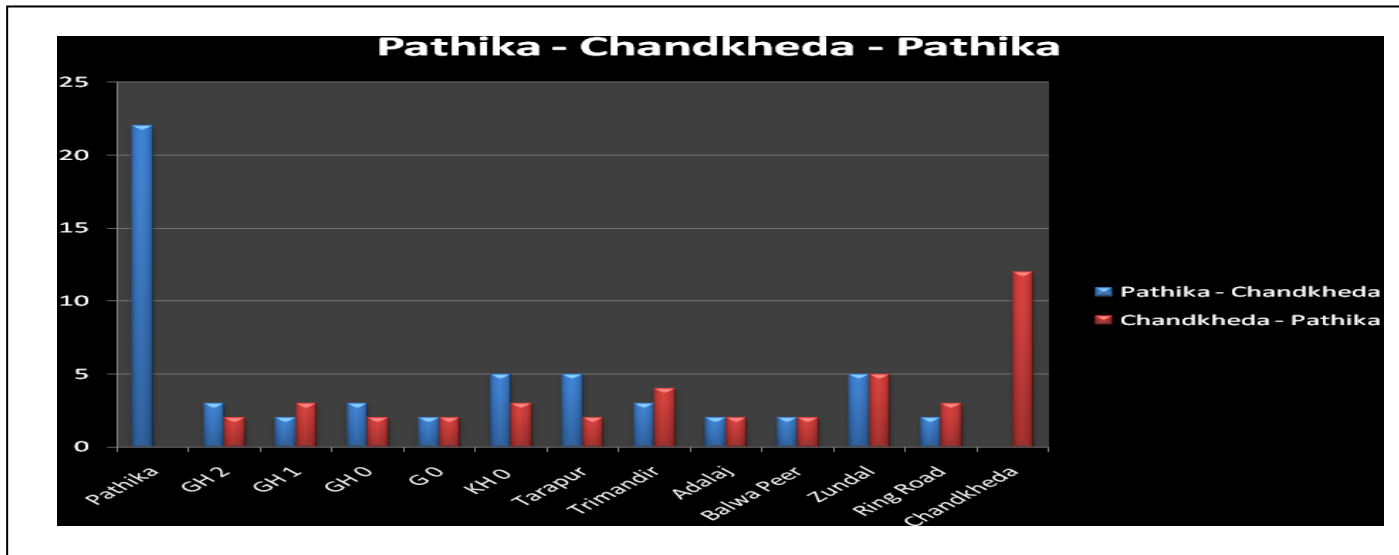


2) Route Two - Pathika – Chandkheda – Pathika

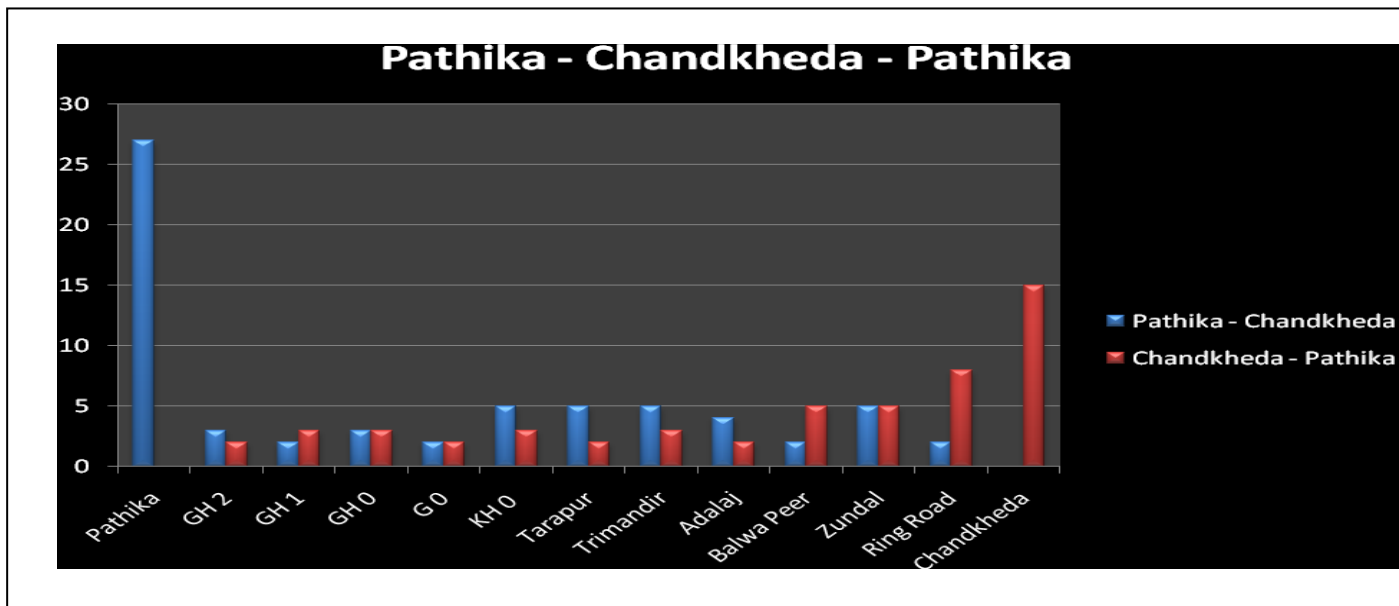
Morning Session



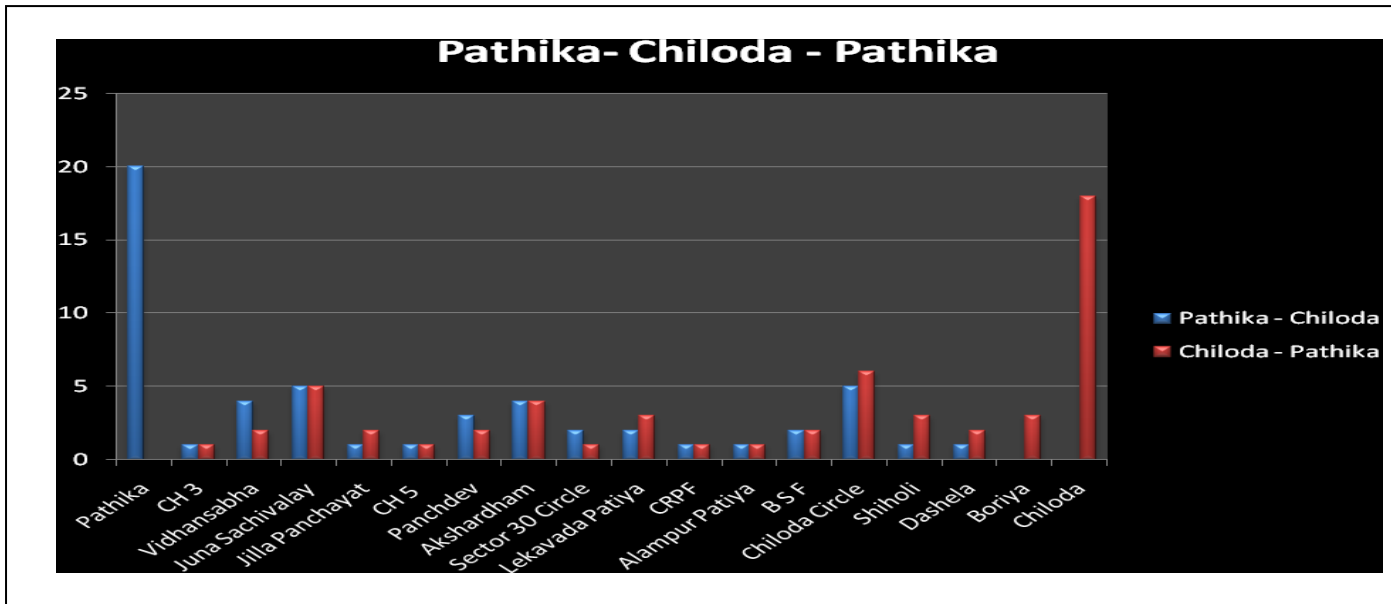
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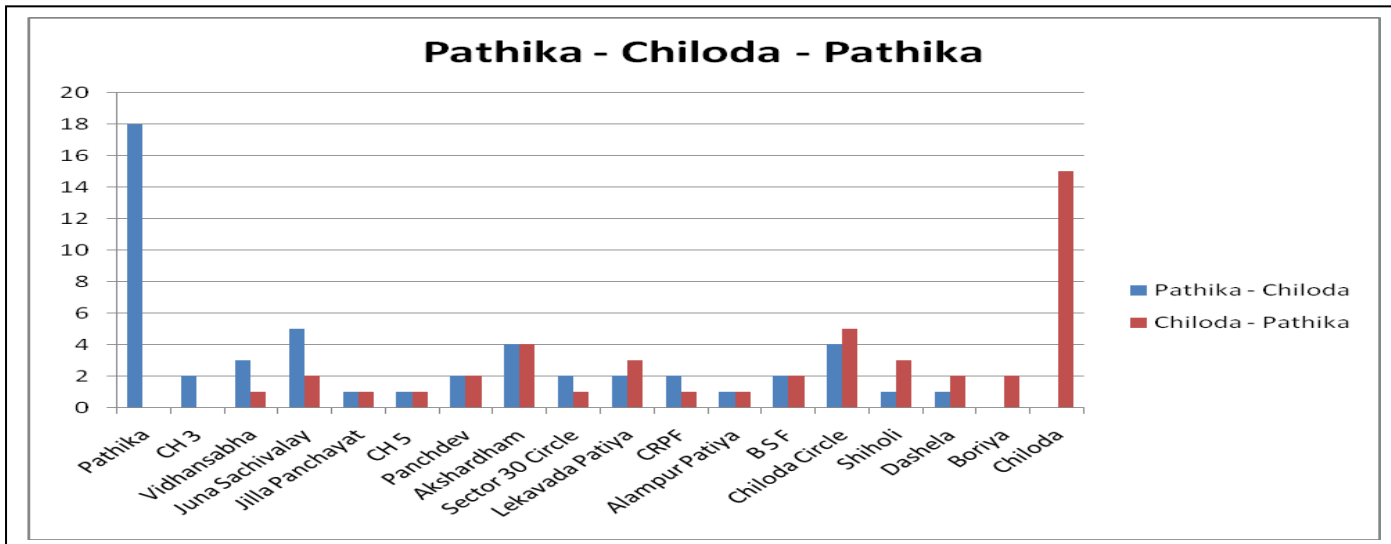
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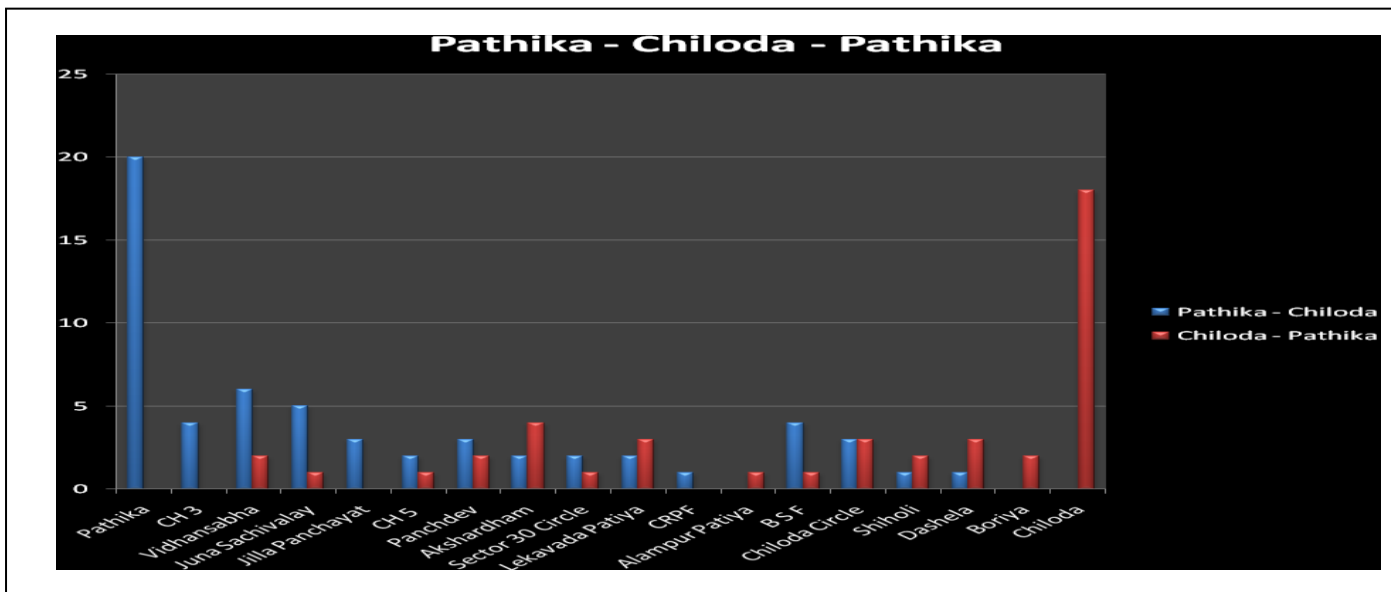
3) Route three – Pathika – Chiloda – Pathika
Morning Session



Afternoon Session

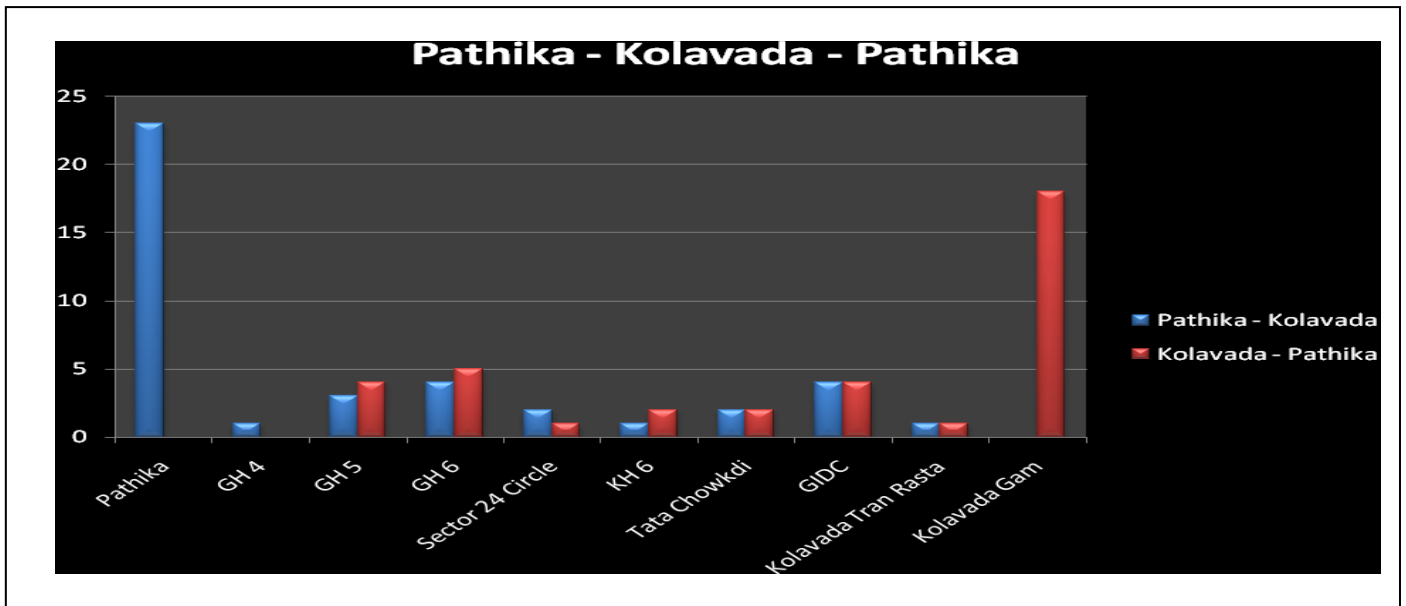


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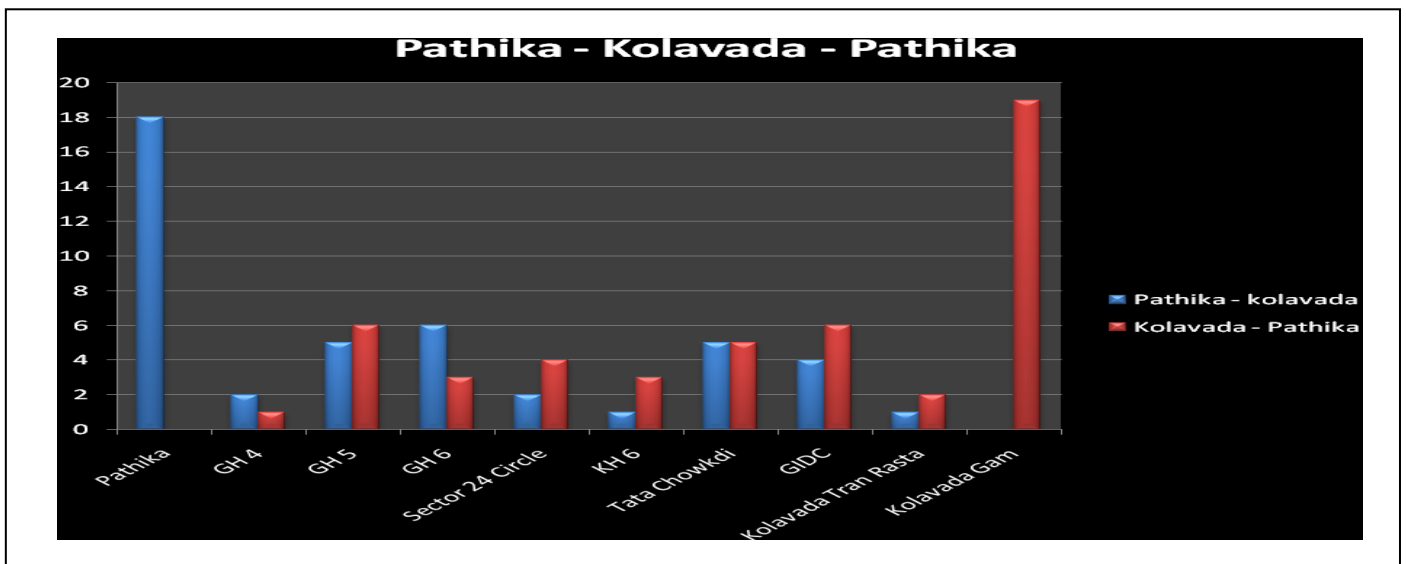


4) Route four – pathika- Kolavada- pathika

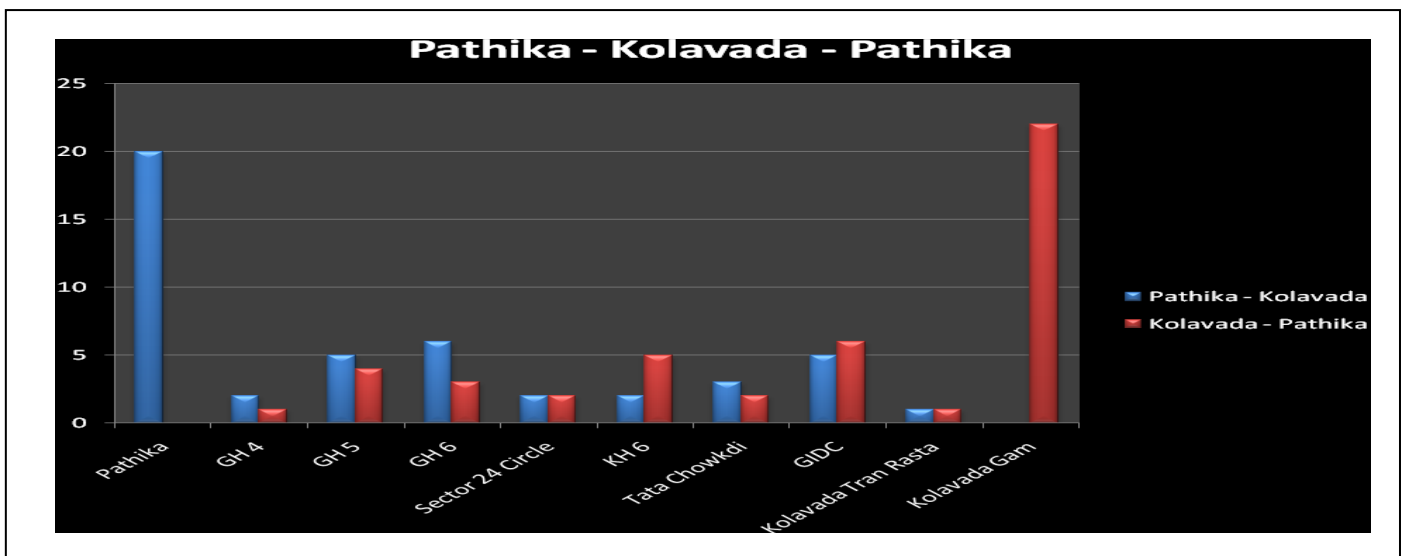
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After Noon Session

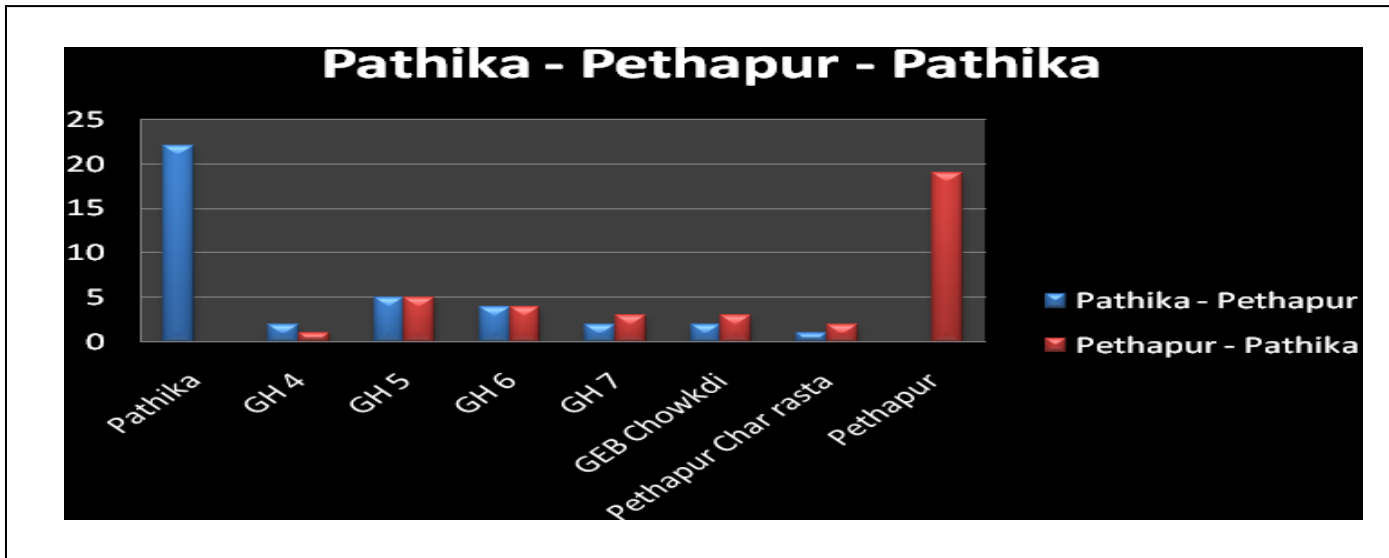


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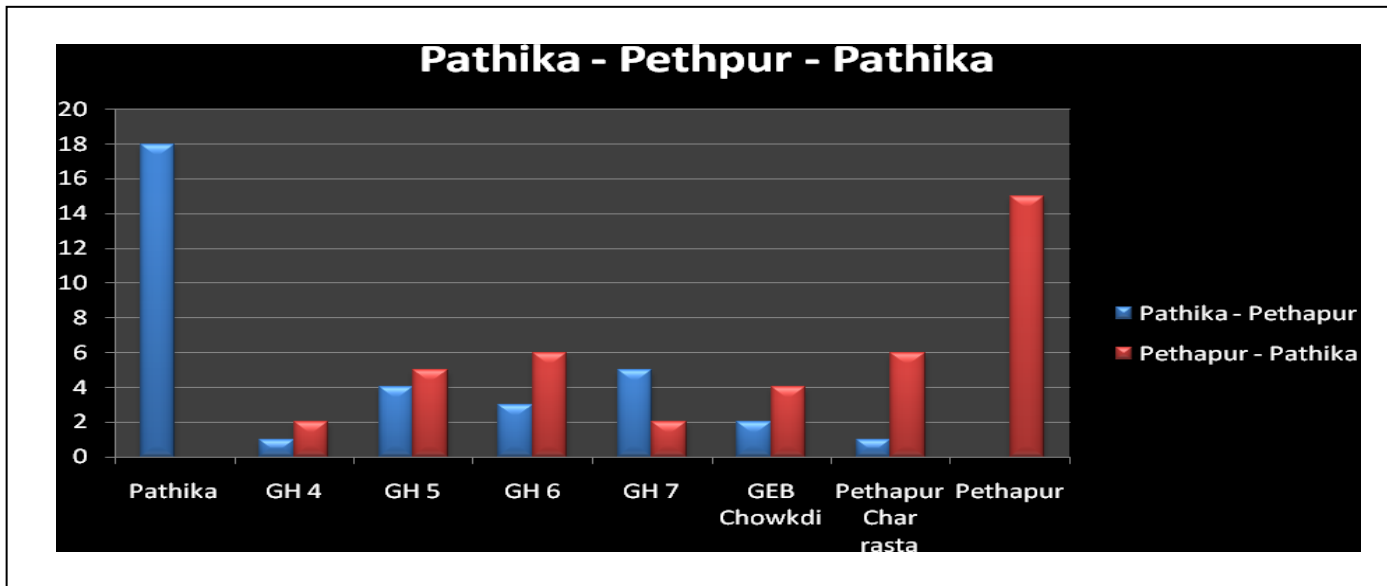


5) Route five – Pathika – Pethapur – pathika

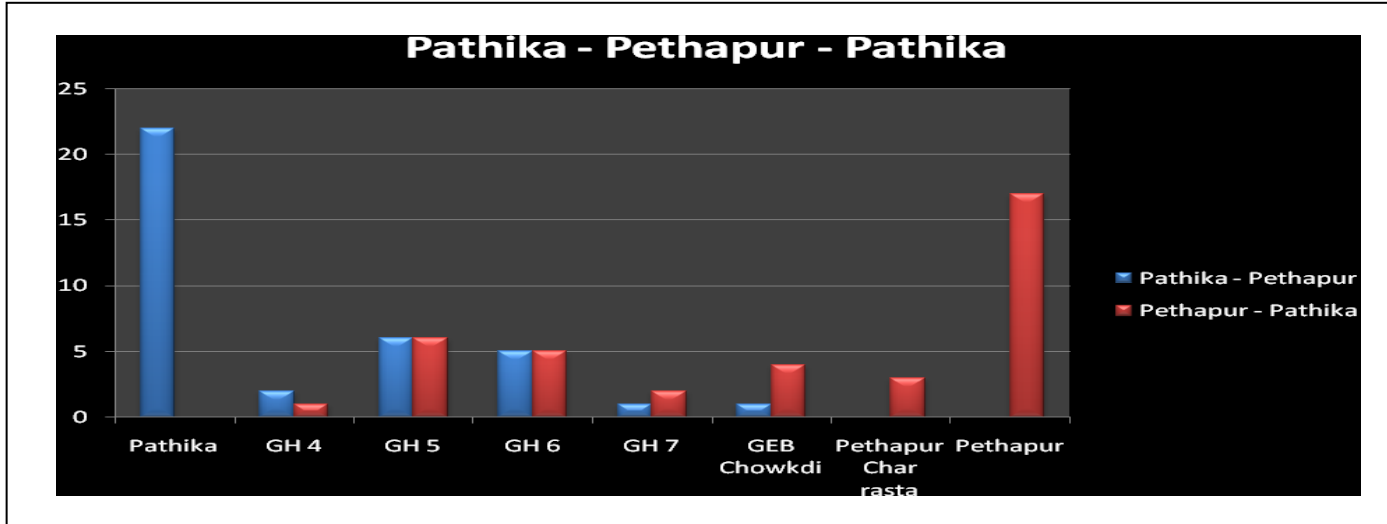
Morning Session



After Noon Session



Evening Session



IV. CONCLUSION AND FUTURE SCOPE

Conclusion

From above mentioned survey we can conclude that according to population of gandhinagar people of gandhinagar are not feasible with Current Public transport network of Gandhinagar which is operated by VTCOS.

During morning and after noon session usage of public transport network by people is very less because of lack of Frequent bus network and annual improvement with respect to population.

Future Scope

For development of Origin and Destination matrix which is important to generate Trip Generation and Trip Distribution Route.

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