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Comparative Study of Electric and diesel Mode of transport

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Abstract - *In today's world, the increasing opportunity has increased the number of commuter, and increasing competition has created a time constrain for every single commuter in the life. This has led to a huge increase in use of private vehicles. And it adversely harms the environment. The project deals with the route optimization of Gandhinagar Public transport to increase it efficiency and inter connectivity within the city, and also to reduce the delay in time and the effects of the plan of use of electric bus instead of conventional diesel bus. The methodology follow the sequence of objective, data collection, data analysis, planning of new routes and compassion of electric and diesel bus***.**

I Introduction

The use of fossil fuel bus has increased a lot due to increase in migration of people from one city to another city in search of opportunity. This has led to high usage of the limited fossil fuel available in earth and also it creates a high amount of carbon foot print. The project speaks about how the above things has affected our environment and surrounding and how it also indirectly affects the health of human.The electric bus is trending technology in today world as a alternative of diesel bus as it reduce on road transportation and also it reduce the

II Need for Study

- Migration of people from rural to urban in search of opportunity increase population
- The fossil fuel vehicle create a high green house gases and on road pollution and traffic congestion
- India's cities have been witnessing an increasing trend in motorization with deteriorating air quality, and there have been calls to promote public transport as a way out of this gridlock
- The demand for crude oil as well as CO2 emissions will reach untenable levels.Lack of proper public transport

III Objective

- Route planning for VITCO bus Service for efficient connectivity within the city
- Comparing of electric bus with convection diesel bus
- Analyzing the benefit of use of electric bus and hybrid bus instead of convectional diesel bus

IV Study Area

- Coordinates: 23.223°N 72.650°E
- Gandhinagar's streets are numbered, and have cross streets named for letters of the Gujarati alphabet (e.g., "k", "kh", "g", "gh", "ch", "chh", "j").
- The new capital city was planned by Chief Architect H.K. Mewada, educated at Cornell University, and his assistant Prakash M Apte
- All streets cross every kilometre, and at every crossing traffic circles decrease the speed of traffic

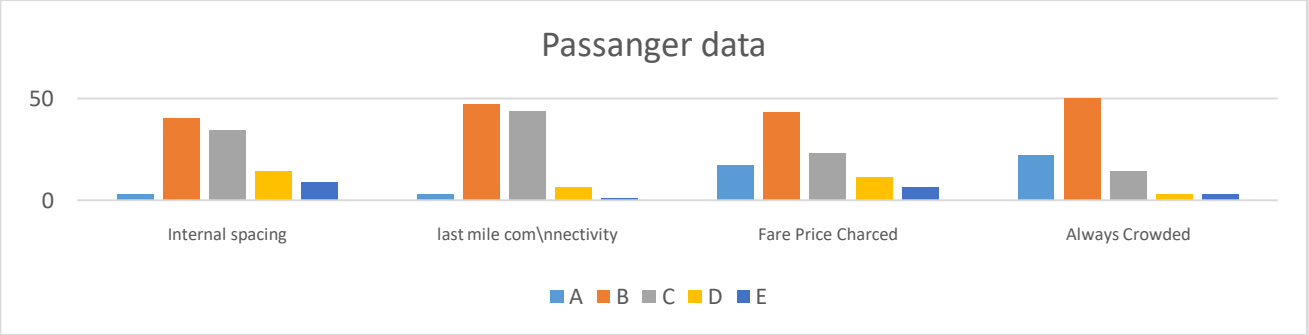
V Methodology

Problem Definition followed by Objective followed by Data Collection and analysis and then conclusion

VI Data Collection

- Maintenance Data

Fuel used per day	1000 liter/day
Maintenance cost	2-3 lakh/month
Number of route	4
Trip per day	146
Total available buses	15+3

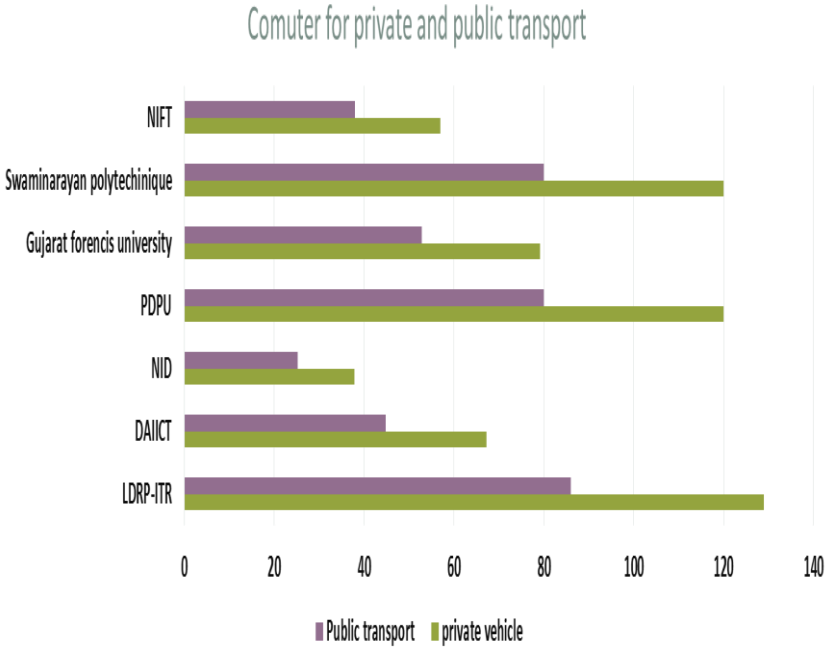


Where A – strictly agree, B- agree, C- Normal, D – Disagree, E- Strictly Disagree

- Data Related to Bus Noise Condition
  - It create stress in mind during journey
  - Make ride a non joyful
  - This noise is one of the major reason for selection of private vehicle
  - Noise increases the chances of occurrence of diseases such as headache, blood pressure, heart failure, etc

- Data Related to Bus Carbon Emission
  - Pollute air very severely, Increase the temperature
  - The Carbon emitted from diesel engine create a harmful effect to atmosphere
  - This matter become very dangerous to respiratory system

Ideal condition Bus	0.069 kg\km	
Total number for trip	146 nos	146 nos
Average kilometer per trip	12 km	12 km
Total km per day	12*146 km	1752 km
Total carbon per day	0.06*1752 kg	105.12 kg
Total carbon per month	105.12*30 kg	3153.6 kg
Total carbon per year	3152.6*12 kg	37843.2 kg



VII Conclusion

Segment	Diseal	CNG	HEV	EV
Seat	32	18	32	31
Length	12.3	12	12	12
Width	2.5	2.55	2.55	2.55
Height	3.2	3.35	3.35	3.49
Gross Weight	16,200 kg	16,000 kg	16,200kg	18,500kg
Cost	88 lakh	30 lakh	1.3 cr	1.3 cr
Fuel Cost	23/km	13-19/km	10-17/km	10/km
Range	484 km	260-390 km	286-520 km	249 km
Fueal and chargging	220 l	720 l	720 l	3-6 hr
Emission standeret	EURO	BS	BS IV	EURO Zero tail pipe emission

Category of losses	Diseal Bus (Wh/km)	BE Bus (Wh/km)
Aerodynamic	90	90
Braking losses	370	20
Wheel Losses	350	350
Transmission losses	130	270
Ancillary equipment losses	480	270
Engine/Battery Losses	2220	20
Total	3640	1020

Parameters	BE Bus	Hybrid Bus	CNG Bus	Diesel Bus
Power Source	Electricity	Electricity = Fuel	CNG	Diesal
Power Generator	Battery	IC engine+Battery	IC Engine	IC Engine
Cost (INR)	2.6 crored	>3 crores	20-88 lakhs	20-88 lakhs
Fuel efficency	1.5kwh/km	2.75-4km/l	2-3km/l	2.2-3.3 km/l
Fuel Traffic	6.95 INR/kwh	50 INR/l	40 INR/l	50 INR/l
Fuel Cost	INR 10/km	INR 13-17/km	INR 13-20/km	INR 15-23/km
Emission	Zero (local)	low (less CO, Sox,Nox and NMHC)	low (equal CO, Sox,Nox and NMHC)	high (baseline)
Noise	Minimum (at slow speed)	low	high	High(baseline)
Secondary benefit	high	moderate	low	Low
Maintenance	lowest	High	high	High
Component	EV propulsion System	ICE propagation system	ICE propagation system	ICE propagation system

VIII References

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