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The Reality of CommonMan's Dream of AirLifting UberTaxis

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Abstract–

Traffic is booming on the roads linking to time consumption in the recent times, which is an indication of alarming situation in the days to come. Road congestion is becoming a hurdle across metropolitans throughout the world which is failing the infrastructure of the overcrowded paths. By studying this dilemma, a new advancement in technology has emerged in the field of aircraft and automobiles, i.e. to build urban air mobility. The time is not far when people will rely upon these upcoming changes in the mode of traveling. The analysis of the paper will come across the scope of the uber elevate project. The electric vehicles (EVs) i.e. electrically powered manned or unmanned vehicles withzero use of fossil fuels or gases, and their potential of electric vertical take-off and landing (eVTOL) which only uses electricity for flight ability, take-off and landing is the next-generation revolution in the aerial scope of automobile industry. The new concept and heavy investments in design, working, capability, restrictions, etc. are modernizing day by day to bring a satisfactory result. This technology is highly progressive and energy- efficient for simpler, smoother and faster travel thereby reducing the congestion, time and fatigue caused due to terrestrial mode of transportation.

Keywords- Uber Elevate, Traffic Congestion, eVTOLs, Urban Air Mobility, Joby Aviation, Hyundai, NASA

I. INTRODUCTION

Uber is growing at a high pace in the field of transportation due to the rising minds of developers in technology. Humans have to travel from one place to another via walking or vehicles. Different modes of transportation suchas road, water, and air are essential to travel even longer

distances in less time. A new era of road transportation in the air will be in progress and can become a reality soon. With sophisticated advancements in technology, one of the major problems of trafficking can be resolved using the ingenious idea of Uber elevate. In recent years extreme traffic congestion pits, long routes, waterlogged roads, etc. giving rise to the forecast for evolution. Presently working from home is not a better option for bringing progress and traveling is becoming a hurdle in the path to achieving desired results, so this project can be of great use to everyone. In collaboration with Hyundai, the project can achieve great heights in the future. During the alliance, Hyundai will work on technical stuff while Uber will be responsible for logistics support. NASA is also becoming a

Figure 1: Visual representation for airlifting

Contributing factor in bringing this idea into a reality by developing an air traffic control system for the flying car project.The introduction of aerial vehicles can bring dramatic improvement not just in the automobile industry but also in the lives of the working-class citizens of the country who face various issues every day while driving, riding, or using public transport.sJust the idea of making them all-electric can revolutionize traveling in waysunimaginable.

In cities like Dubai, [1]the business of flying helicopters as"modern-day cabs" is receiving an overwhelming response.Also, in many cities of the UAE flying cars are in talks of manufacturing and implementation.

II. OVERVIEW

Nowadays 'Uber' enhances its pre-eminent transport network company (TNC) and has launched one of its projects 'Uber Elevate' in 2016. Uber Elevate - a network of on-demand electric aircraft which connect the people via Airspace can help in transportation from the rooftop to the desired location. This electric aircraft is known as eVTOLs (electrical vertical take-off and landing) the aircraft can turn a two-hour drive into a 15-minute trip. The aircraft would be able to travel at about 200 mph for about 150 miles. [2]. The Civil Aviation Minister Jyotiraditya Scindia during a press conference said that he believed that India will traverse by the airspace instead of roads and will surely develop an urban air mobility (UAM) system, he further added that the Defense Ministry, Home Ministry, and BCAS(bureau of civil aviation security) have been workingfor this new technology of eVTOLs.

Uber Elevate project is based on the technology of Urban Air Mobility (UAM)

Figure 2: [3][4] Uber Elevate with its vertiport

Urban Aviation envisions a safe and efficient transportation system. UAM is the mode of transport from one rooftop toanother. UAM leverages the sky to link the people todifferent regions.

As the population of the country is increasing rapidly this can be seen on the roads as traffic. INDIA is a developing country where people have to move from one place to another for their job and other work. Traffic is one of the major problems in any developing country but there is onesolution to this major problem which is (UAM) Urban Air Mobility. UAM can be in the form of eVTOLs (electrical vertical take-off and landing)

which can take off from verylow heights to the sky i.e. without any runway. Uber Elevate will compose such an ecosystem that will work

with the consideration of the safety of air crafts, access tothe air space, and the engagement of the community. Trafficcongestion is impacting the quality of urban life both froman environmental perspective and citizens' mental health. Urban Air Mobility [5](UAM) is increasingly being seen asmore than 120 aviation startups and companies are involvedin the development of UAM vehicles i.e. eVTOLs whichcan fly in the straight lines at a speed of 250 km/h.

The leading eVTOL companies were created more than tenyears ago and still are in the development phase many of those are planning to start operations as soon as possible i.e.by 2024-25. Joby Aviation is currently the leader regardingproject advancement. While Volocopter has agreed to launch their first air taxi service for the 2024 Paris SummerOlympic Games.

Uber was not going to make its eVTOLs. Hyundai was going to develop the eVTOLs air crafts for Uber for their air taxi network. [6]Hyundai designed the aircraft with the two tilt- rotors on the tail, and 10 other rotors distributed around the egg-shaped cabin, the aircraft was designed to take off vertically i.e. without any runway.

[7]Transition to wings-borne lift in cruise, and then transition back to vertical flight to land. The vehicle can have a seating capacity of 5 and can fly at a speed of 150 mph at an altitude of 1000-2000 feet (300-600 meters). Small motors with electrical powered rotors can help minimize the noise of the vehicle which can be very less than the combustion engine helicopter. The vehicle can takeonly 5-7 minutes for recharging for the trip of nearly 100km (60 miles).

Uber has struck similar arguments with seven other aerospace companies namely Joby, Embrarer, Pipistrel, Karem Aircraft, Aurora, and Bell.

Uber Elevate was finally sold to Joby Aviation. Joby Aviation was launched in 2009 and has raised $820 million Uber and Joby decided to integrate the company services i.e. Uber can allow the customers to book the ground as well asthe air transportation i.e. eVTOLs from the same app as thecab booking app of uber.

III. SCOPE

The innovative proposed design of the transformation of theautomobiles from only covering the land of the earth tocovering the aerial blue sky of the earth is now found to befeasible. Since UBER is now evolving its services to air services identified as 'UBER ELEVATE'. These eVTOLsare non-polluting, efficient, economical, uses no carbon-based fuels, and also its compressed air engines helps in thereduction of the cost of production of these air taxi.

The exigency for the Urban Air Mobility (UAM) comes intothe picture when having a solution for the problems of trafficcongestion, waterlogged roads, devastating urban

infrastructure due to overcrowding on roads, and a tardy system of traveling becomes a necessity.

[8]A California-based electric aircraft startup Joby Aviation had an expanded partnership with Uber Elevate just to makethe dream of airlifting urban vehicles a reality. Uber is also investing $75 million in Joby, Joby will assist in a good transportation service at affordable rates with a speed of 200mph and a range of up to 150 miles by investing the latest technologies in the making of this project. The company intends the project to operate at an early stage forecasting up to the year 2023.

This recent advancement in the technical field of automobiles will lead to the following scenarios.

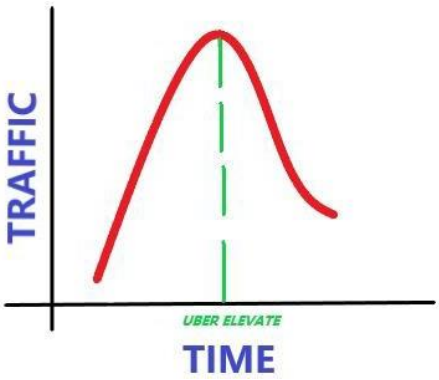

Figure 3: Alteration of traffic with Uber Elevate.

A. Traffic congestion

Road traffic becomes a hurdle in day-to-day life as well as in career life which stops people from being punctual. [9] NASA is also contributing to this project as they will provide a good air traffic control system by keeping in mind that they will not overburden the national air traffic control system. The space agency will develop some modelon how this aircraft will perform the actions like moving ortaking off considering that these air vehicles do not producemuch noise.

B. Development of infrastructures

The air cars will require a place to perform eVTOL (electric vertical takeoff and landing). These actions will increase the demand for the construction of vertiports infrastructure in places where these Urban Air Mobility (UAM) was to be operated. This will help in the development and advancement of the infrastructures of the areas where these projects were to be intervened.

C. Enhance travel time

This project also focuses on the reduction of time in traveling from one place to other. Using the aerial mode of transportation instead of roadways will surely increase the productivity while traveling [10] it is often said that the companies will be going to use a 5G communication network just to provide good control over the navigation system which in turn provides support in the enhancement of travel time makes people more punctual for their work.

D. Advancements in the battery and fuel technology Uber elevate was using the recent advanced technologies in the making of their project. There were many kinds of research and advancements already occurring on the safe consumption of fuel and batteries like [11] UAM industry officials are deciding to create their VTOL aircrafts fully electric through lithium-ion batteries, Rolls Royce was also may adopt the technology of eVTOL to make their fuel economy efficient and to give a better performance to their consumers. These kinds of technologies were also beingused in the building of this project "Uber Elevate".

IV. CORE COMPETENCY

Aerial electric vehicles will boost the efficiency of terrestrial vehicles.

But what will be the problems faced?

Figure 4: Proposed design of Uber Elevate

Source: Safran wants to get you inside an air taxi, but isn't sure whose yet. By Nick Zazulia

As always electronic or non-electronic CNG working or fossil fuels-based produce a lot of heat, similarly, The ignition and levitation of the vehicles will produce a lot of heat which will, in turn, increase the atmospheric temperature of the earth leading to higher risks of global warming.

Another major problem will be availability in rural and village areas people living with their till believe and use the traditional mode of transportation like chariots, bullock carts, rickshaws etc. So there must be proper campaigns andschemes to make rural people aware of this revolutionary technology.

The pickup and drop of the passengers will also create a mess. All the devices [12]have terrestrial locations and willnot work accurately while in the air. As the distance and

height will differ due to the aerial travel, the location of the maps should be updated in every single search engine and app.

This product is of the kind that is wanted by all but can onlybe afforded by the upper-middle class and the rich. [13]These next-generation electronic vehicles have their perks of upgrading the technology, high maintenance, and fast and efficient charging of batteries.

High-quality metal and other mechanical parts will be needed as the aerial EVs mostly be exposed to the sunlight every time and then that's the problem of air conditioning.[14] Overall electronic aerial vehicles have high expenses thereby resulting in raised fares of rides or rentals which cannot be afforded by the common man and hence he will prefer the usual cabs, buses, metros, auto- rickshaws or other such public transport.

How can this be tackled? There must be optimum production of EVS so that even if the fare is high it will be available tolarge crowds and even cost-cutting would not have much effect on the Uber company as bulk trips will ultimately leadto higher revenue.

The problem of permitted height: this does not apply to aircrafts but does apply to electronic cars or cabs. Many passengers are scared of height and they will resist or be reluctant to travel in aerial EVs. [15] Two counterparts: there should be a limited height adjustment mechanism ordark/black windows made of such a type of glass which doesnot let light pass from inside outside and hence the passenger will not be able to see that he is 500 or 600 feet in the air. Looking on the bright side there are many benefits if it is implemented for the mass public.

Air taxis are much faster than normal cars as they travel at aconstant speed without any interruption.

Air taxis will be less prone to accidents as there will be no barriers, potholes, pedestrians, railings, or rash driving.

In addition to this, air taxes can fly individually at different heights. Hence, we can say that aerial electronic vehicles have a higher scope of being more reliable than any other terrestrial vehicles.

An air taxi service provides enhanced flexibility of driving maneuverability as the car could be steered in any direction desired. But this would not necessarily be needed as the shortest distance of travel would be in a straight line.

Earlier we have discussed how these EVs are highly advanced and energy-efficient due to simpler travel, to-

the-point transportation, and battery charging ability. Just imagine if we had solar energy-powered aerial EVs insteadof battery-charged ones. This is the next step of evolution in the history of automation.

Aerial travel will be disturbance-free with almost no soundother than that of the passengers speaking as this mode of transportation is much quieter than any other.

V. TIMELINE

There were several types of research done on this aircraft inpast years and now we have reached this extent.

In around 2001 there was a study on small aircraft transportation systems in the US by NASA and the aerospace industry which gives rise to light-jet aircraft.

There was an unexpected after this research and then it wascontinued in 2016.

In 2016 Uber announces its aerial ambition and names its project 'Uber Elevate'.

In March 2018, the first flying car was made with a single- engine, gyrocopter roadable PAL-V liberty autogyro whichdebuted at Geneva Motors and then set to launch in 2020 inGujarat, India.

In August 2020, Tokyo-based flying cars startup skydive successfully in the Japanese city of Toyota, launching the world's first manned flight in an aircraft design.

In December 2020 Joby-Aviation acquire Uber Elevate. At the end of 2020 uber conducts, a demonstration flight for its project Uber Elevates to measure vehicle safety, performance, eVTOLs noise, and access of community acceptance.

In the summer of 2022, the UK has just launched its first urban airport.

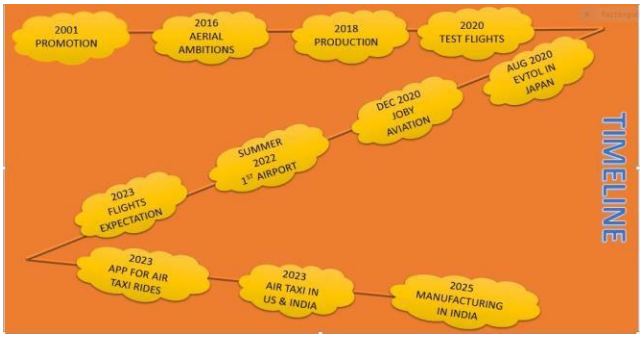

Figure5: Timeline representing evolution in aerial vehicles.

It was expected that in 2023, Uber Elevate will be in India, and US is also planning for air taxis Joby will allow Uber's app for the air taxi rides with certified flights.

'MADE IN INDIA AIR TAXI' may take its wings by 2025.

VI. CONCLUSION

The supremacy of Urban Air Mobility seems to spread its wings widely all over the earth. Recent research done showsthat this new aviation is becoming a reality not only for the upper-class people but also for the common people in the upcoming era. The brand new project of Uber which is commonly pronounced as 'Uber Elevate' is the one that turnsthe dream of a common man of airlifting into reality by launching its project by 2023. Due to the alarming rate of increase in population which directly results in overcrowding roads, damaged infrastructures of roads, traffic congestion, pollution, and various other factors enforce to build an eVTOLs. These Uber aircraft are nonpolluting, faster than normal cars, have an advanced working system, can even be charged with batteries, no disturbance from the road sounds, and more efficient and reliable mode of transportation.

This new advancement can change so many things in the future like a decrease in the rate of traffic, improvement, anddevelopment of infrastructures, expeditious travel time, clean environment due to the use of advanced fuel and battery technology which prevents pollution. The union aviation minister Jyotiraditya Scindia' in a press conferencesaid that "He believed that time is not so far when taxis thatyou see on roads will drive you in the air under the new drone policy. He further added that the defense minister, home minister, and bureau of civil aviation security have mobility system all over the country quickly". This upcoming project of Uber is highly efficient and reliable forthe people of the country and also all over the world.

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