Overland Automated Transportation System

White Paper

Overland
Automated Transportation System

OVERLAND ATS, LLC

1.0 ABSTRACT

Rapid technological advancement during the late 20th century and continuing today has resulted in significant efficiency and convenience improvements for the average United States citizen. Everyday activities taken for granted today such as making phone calls and sending texts instantaneously from portable handheld devices, streaming movies to computers and TVs, and having instant access to breaking news events were not possible 30 years ago.

One of the few areas of life that has not seen significant improvement during this rapid technological advancement is transportation. Whether it is a parent taking children to school, a commuter stuck in the morning traffic jam, or a transportation company moving products cross country, there has been little progress made in improving efficiency or convenience. In most cases, the situation has gotten worse as the increased population has steadily worsened traffic gridlock and the transportation infrastructure has steadily deteriorated.

Overland ATS, LLC was created to provide solutions to radically improve the current American transportation system. Overland's vision is for America to have transportation infrastructure and transportation technology second to none. They have developed plans for a state-of-the-art transportation infrastructure system coupled with a state-of-the-art transportation system. They call this system their Automated Transportation System. This system is designed to provide robust, efficient, and cost-effective solutions to today's transportation problems and to meet the future's even more demanding needs.

Overland's Automated Transportation System consists of six-foot-wide elevated skyways with a maximum capacity equal to 12 lanes of interstate. This system forms the nucleus of a comprehensive mobility solution. The system is designed to accommodate a variety of vehicle types - single operator (manually operated or autonomous), multi-passenger, and freight transports. Vehicles seamlessly enter and exit the skyway at regularly spaced interchanges.

The system design includes both elevated urban skyway networks integrated into the local arterial and street grids and inter-city networks follow existing major highways. Inter-city speeds of up to 150 miles per hour are anticipated.

All Overland vehicles are securely attached to the skyway by a "saddle" directly underneath the center of the vehicle. This saddle wraps around the electrified security rail to conduct electric power from the rail to the vehicle. The skyway provides real-time electricity to the vehicle's electric motors and can charge the vehicle's batteries simultaneously.

This paper provides more in-depth discussions of the current transportation issues facing the United States and describes the Overland Automated Transport System and its advantages in detail. Current cost forecasts and plans for future work are discussed.

2.0 CONTENTS

3.0 BACKGROUND INFORMATION

3.1 The Problem

Transportation infrastructure development in the United States has largely been a piecemeal process. Both the federal and state governments have funded and built the existing infrastructure to meet demands that existed at the time of funding. This approach has failed to account for continually increasing needs due to population growth, increasing commercial product transportation requirements, or the needs created by the significant service industry growth the country has seen. The net result of this approach has been that when project construction is completed, often there is no improvement over the starting situation – and often increased demand has resulted in even worse traffic congestion and gridlock.

Beyond this inadequate capacity, the existing infrastructure is deteriorating; our roads and bridges are crumbling due to lack of proper maintenance. This problem is more than hitting an occasional pothole - the infrastructure problem goes much deeper than pavement deterioration. Corroding steel and crumbling concrete has left more than 10% of our bridges structurally deficient. Moreover, there is no obvious solution for this continued lack of maintenance. Funding for maintenance of the existing infrastructure continues to be significantly underfunded.

One final issue with the current transportation system in the US worth noting is our overwhelming dependence on petroleum for fuel. Overall, 28% of the energy used in the US is used for transportation. 76% of the petroleum used in transportation consists of gasoline (55%) and diesel (21%) used for ground transportation. This heavy dependence on petroleum is a problem for several reasons. First and most obvious, petroleum reserves are limited. British Petroleum estimated in 2016 that the world has approximately 50 years of petroleum reserves. It is imperative the US have alternate energy sources and transportation systems in place for this eventuality. Second, being so dependent on petroleum fuels makes the US economy sensitive to petroleum price and availability fluctuations. This is becoming more of a concern as many of the countries which export large petroleum quantities become less stable. Finally, our understanding of the role of petroleum products in climate change has improved significantly in recent years and responsible countries are working diligently to develop technologies to reduce petroleum usage.

3.2 The Solution

It was in response to the above problems that Overland ATS, LLC was formed. Overland's founder, Waldemar F. Kissel, Jr. is a visionary who has in the past applied his innovative talents to develop, design, and successfully market multiple products.

When Mr. Kissel began investigating improvements to the transportation system in the US, he realized that increased funding and better planning would not be adequate to provide robust long-term solutions. He realized that a paradigm shift in thinking was required to both optimize use of the existing transportation infrastructure and to introduce new technology required to build the transportation system of tomorrow.

The solution that came out of this investigation is the Overland Automated Transport System (ATS). The ATS supports dual-mode vehicles able to travel both on existing streets and on an elevated six-foot-wide elevated skyway. These vehicles seamlessly enter and exit the skyway at regularly spaced interchanges.

The elevated high-speed skyway integrates into the local street grids. This technology involves laying out an elevated urban skyway network above existing arterial streets. The skyways in this network are spaced approximately one mile apart with on/off ramps serving as entry and exit points. All ATS vehicles are securely attached to the skyway by a "saddle" directly underneath the center of the vehicle. This saddle wraps around the electrified security rail to conduct electric power from the rail to the vehicle and is the primary sensor and direct communication interface between each vehicle and the operating controls.

Illustration 1
Urban Setting

The Automated Transportation System alleviates the massive traffic congestion that currently plagues US cities. For the longer sections of their commutes, customers enter the ATS skyway and travel at 125 MPH. Travel on local streets is limited to traveling to the skyway from their origin and traveling from the skyway to their destinations.

As the system expands, the Automated Transportation System will support inter-city travel. The elevated skyway will follow existing major highway routes between cities. Entrance and exit ramps will be located at convenient locations between cities. The capacity of the single lane ATS skyway will have the same capacity 12 normal lanes of traffic. Inter-city speeds are expected to approach 150 miles per hour, significantly reducing the duration of trips.

This Overland intra- and inter-urban network will offer ride sharing, trip rental, hourly leasing, and private vehicle ownership as well as expedite same day and overnight delivery systems. As the elevated network expands, current ride-sharing services will find it essential to use Overland and using Overland-compatible vehicles.

3.3 *The Advantages*

The Overland Automated Transportation System will result in immediate and significant improvement in urban traffic congestion and gridlock, rush-hour traffic, and interstate commuter stress.

Demand on existing transportation infrastructure will also decrease significantly. Decreased traffic will minimize ongoing maintenance requirements. Resulting maintenance savings can be spent correcting existing maintenance problems without requiring increased annual maintenance budgets.

Since the Overland Automated Transportation System operates on electricity, the direct bond between ground transportation and petroleum will be broken. Overland is committed to using renewable energy sources where possible.

The skyway provides real-time electricity to both passenger and freight vehicles, so their batteries are charged as they move along the skyway. Cars designed to use the system need smaller battery packs, significantly reducing cost.

Illustration 2
Rural Setting

The Overland Automated Transportation System is inherently safer than travel in traditional automobiles. Vehicles are firmly attached to the connecting saddle for the entire time they use the system – even during transfers between skyways.

While on the skyways, each vehicle is controlled by the Overland Command & Control Center. This will result in significant reduction in traffic accidents that normally result from human error.

Overland vehicles, including its huge heavy freight transports, can travel coast to coast on the Overland Skyway without using a single battery and without the substantial (often ignored) battery consumption cost. A live electric feed is the lowest energy cost.

Numerous transportation and feasibility studies have been completed and have received environmental approval. The Overland system can be immediately implemented to deliver better services and greater revenue at a more affordable cost.

4.0 OVERLAND AUTOMATED TRANSPORTATION SYSTEM

4.1 Elevated Skyway

4.1.1. Skyway Construction

The skyway is designed to operate at elevation 15 feet above street traffic. There are two vehicle support construction configurations as shown in Illustration 3 below:

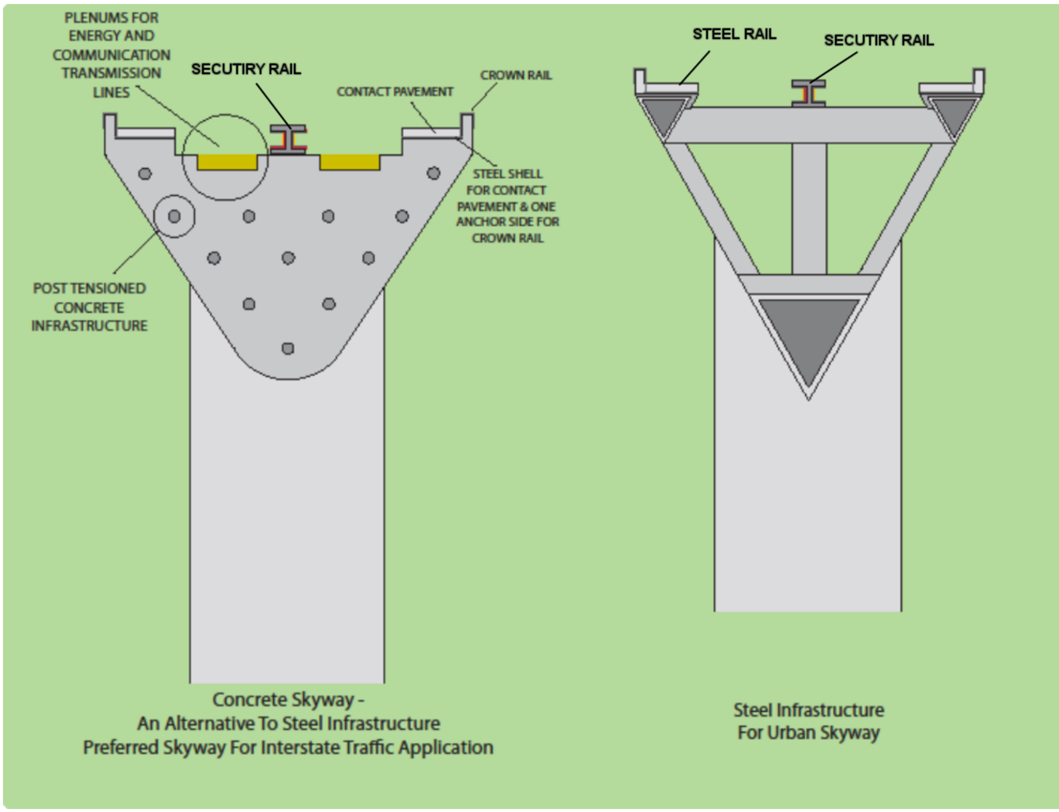

Illustration 3
Skyway Configurations

The reinforced concrete support superstructure is to be used for interchanges requiring sharp turning radii and local access. The steel support system is otherwise used in all mainline skyway.

In both cases, the support superstructure is supported by precast reinforced support columns. The center of the support columns is hollow to provide utility systems access and to provide drainage for the skyway gutters.

A typical urban skyway configuration is shown in Illustration 4. In addition to the support superstructure and utilities already described, the standard non-structural canopy is shown. This canopy serves as a visual barrier as well as to dampen external traffic noise.

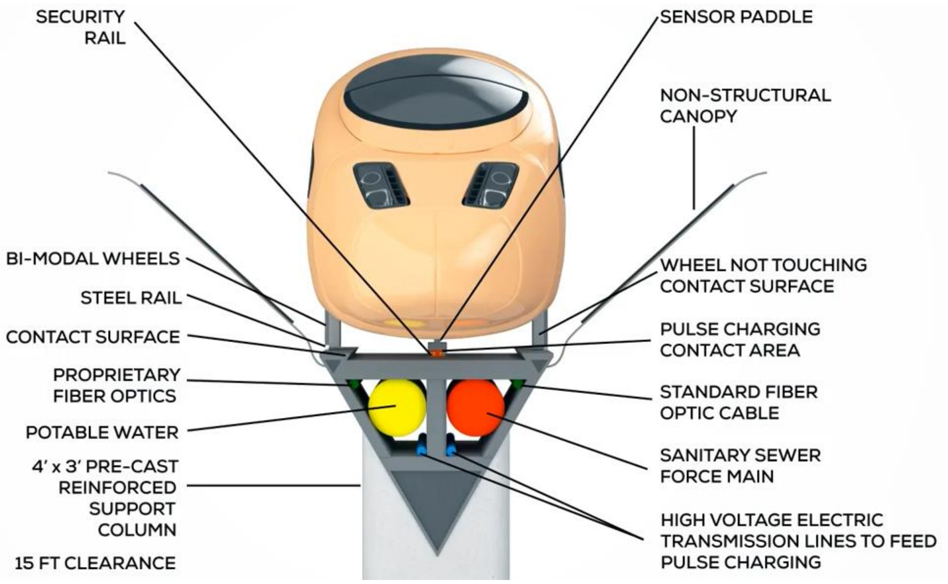

Illustration 4
Typical Urban Skyway Configuration

4.1.2. Bridges and Tunnels

The Overland Automated Transportation System is designed to follow existing roadways.

Existing bridges are not designed to handle the additional loads required by the Overland system, so Overland plans is to install new supports parallel to existing bridges for the ATS.

Where tunnels are encountered, the first choice will be to go over or around the obstacle. For steep uphill or downhill grades, Overland vehicles are provided extra contact traction, i.e. Rail height decreases 2-3 inches thereby allowing vehicle wheels to contact an extra cohesive surface.

Should re-routing be needed, it will be much easier than building new roads since the "footprint" required for the Overland ATS is very small –placing support columns will require much less time than installing a normal roadway.

4.1.3. On & Off-Ramps

On and off-ramps will be installed to ensure convenience for users. Current plans are to place ramps every mile in urban settings and at strategic locations between cities for inter-city travel.

Vehicles will enter and exit the skyway at full speed, so acceleration and deceleration provisions will be provided on the ramps. Care will be taken to provide adequate ramp surge capacity to handle maximum traffic loads.

When vehicles exit the dual-mode high-speed rail, they will decelerate down a steel rail ramp that transitions onto a paved surface. The vehicles are all equipped with bimodal wheels that allow them to travel on any paved roadway.

While on the on-ramp vehicles are identified, account verified, and performance capabilities and operating systems are tested. If a vehicle is rejected it continues down the exit ramp onto the roadway.

4.2 Vehicles

4.2.1. Vehicle Design

The Overland skyway requires vehicles specifically designed for dual mode operation. All passenger vehicles, all mass passenger transports (MPT) vehicles, and all heavy freight transports are individual self-propelled vehicles capable of operating on streets and roadways as well as on ATS skyways. Illustration 5 shows several typical vehicles designed for use on ATS skyways.

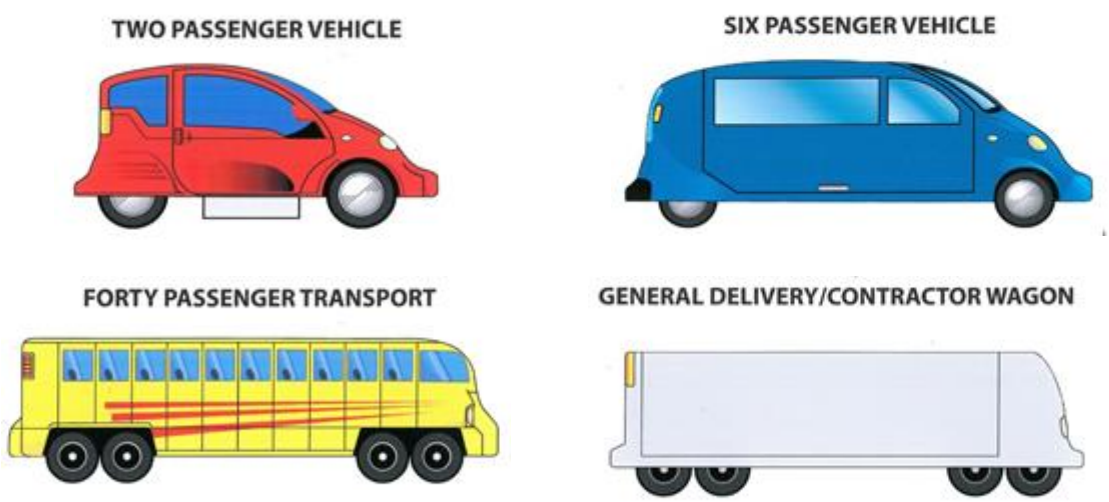

Illustration 5

Typical Dual Mode Vehicles

All Overland vehicles have a “saddle” attached securely underneath the center of the vehicle. The saddle wraps around the electrified security rail to conduct electric power from the rail into the vehicle and to secure the vehicle to the dual-mode high-speed rail. This saddle is also the primary sensor and direct communication interface between each vehicle and the infrastructure operating controls.

The Overland vehicle has a steel beam along the center of the vehicle from front to back. The vehicle cannot be crushed along its length. The chassis is strengthened with a continuous perimeter beam all around the vehicle. The running board is reinforced against the center beam on both sides of the vehicle.

The Overland vehicle has a sensory saddle that passes through the center of this steel beam and wraps around a steel beam flange in the skyway. The saddle is ALWAYS attached to the flange even when a vehicle is transferring from one skyway to an adjacent skyway. There is no instant when each vehicle is not secured to the skyway.

Bimodal wheels allow vehicles to operate safely at high speeds of 150 MPH or more. Steel wheel flanges against steel rails provides positive steering. On the skyway steel wheels on steel rails have 14 to 17 times less rolling resistance than conventional pneumatic wheels.

4.2.2. Electric Rail Power

Pulse charging uses high-voltage power transmission lines (180 KV and up) to distribute electric energy to large-capacity power storage devices at appropriate intervals. High-voltage transmission loses less energy ~~loss~~ than a low-voltage continuous third rail. The steel skyway structure provides protection against electromagnetic pulses (EMP) for protection of electrical transmission lines, communication cables, and associated electronic components.

Overland vehicles are equipped with supercapacitors that can store a minimum of 1 kwh. Normally, 0.3 to 0.5 kwh is required to travel one mile. Pulse charging strips are located at approximately one-mile intervals - this is more efficient and less costly than continuous contact with a third rail. These strips are about five feet long. As a vehicle passes over a charging strip, a minimum of 0.5 kwh is transferred from the pulse charging strip into the onboard vehicle capacitors. By providing more energy to the vehicle than required for travel, it will always be possible to support battery charging, heating/air conditioning, vehicle controls, and passenger entertainment. Illustration 6 shows the logistics of the charging system.

Capacitors (1kw) are less expensive, have negligible weight, and are good for one million cycles (compared to batteries).

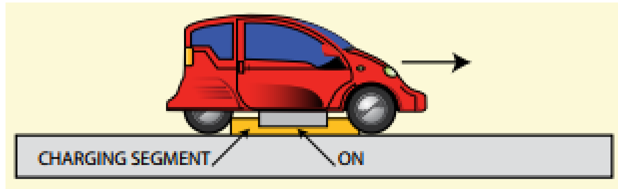

Illustration 6
ATS "ON-THE FLY" Charging Station

The Overland command and control center is programmed to make certain that urban vehicles always have adequate battery charge. Drivers never have to think about charging or plugging in their vehicles.

4.2.3. Propulsion

All Overland vehicles are powered by electric motors, one in each wheel. This means that larger vehicles with more wheels always have adequate power to support their heavier weight, additional passengers, or heavy freight.

While operating on skyways, propulsion energy is provided by the super capacitors. Batteries are only utilized when traveling on surface streets where automatic charging is not available. Illustration 7 provides a schematic of the vehicle electrical power system.

Eventually pulse charging will extend to vehicles operating on roadways. Energy pulses generated by the same energy storage, pulse generators and transformers will provide energy pulses to vehicles.

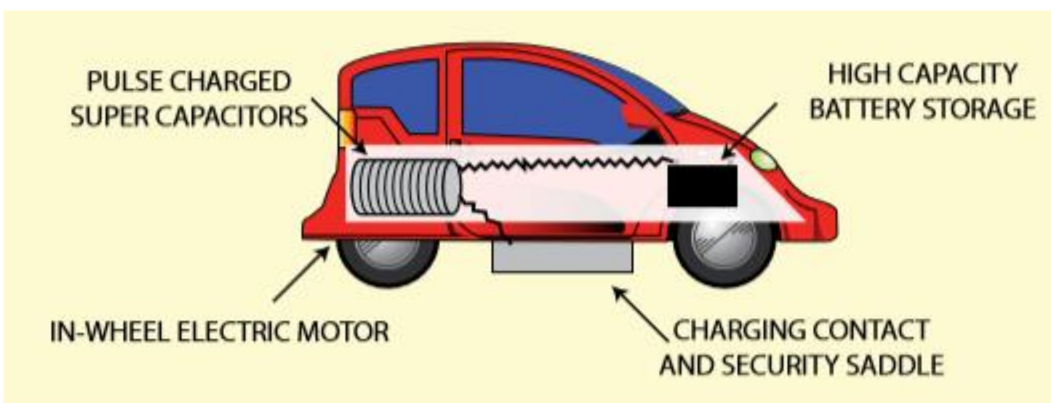

Illustration 7
Vehicle Electrical Schematic

4.3 Routes

4.3.1. Urban Routes

Initial Overland Automated Transportation System routes will be focused in urban areas where traffic congestion and gridlock are worst. Urban areas will have skyways in two directions located approximately one mile apart, along with associated entrance and exit ramps. Suburban areas will also generally follow this one square mile grid pattern depending on population density and local population concentrations.

A city with one million population and a population density of 2,500 people per mile covers an area of 400 square miles. Based on the one square mile grid pattern, this will require 1200 miles of urban skyway network.

Focusing on urban areas first will provide immediate relief from traffic congestion and gridlock for those whose lives are currently impacted most by these issues. It will also have the advantage of allowing large numbers of people to become familiar and comfortable with the Overland ATS in a relatively short time period.

The skyway urban grid is located where commuters live. Proximity makes it readily available for daily use.

4.3.2. Inter-city Routes

As the Overland Automated Transportation System is completed in nation's major cities, expansion will begin between major population centers.

Inter-city route construction would begin by connecting those cities with the highest two-way traffic density. Gradual planned expansion would continue to connect smaller cities to the system.

A total of 375,000 miles of Overland ATS skyway would eventually be able to carry approximately 70% to 75% of all vehicle miles travelled in the US.

4.4 Safety and Reliability

4.4.1. Vehicle Safety Features

Overland vehicles include all safety features normally found in vehicles today. This includes front and side airbags, seat belts, shoulder harness, and adjustable head rests for passenger protection.

Other standard vehicle safety features include the full-length center beam that cannot crumble or be crushed under any forces that might occur on the Overland System. The continuous perimeter beam provides protection from crashes in any direction. There are also two (2) foot deep crush zones located at the front and rear of the vehicle. Illustration 8 shows these details.

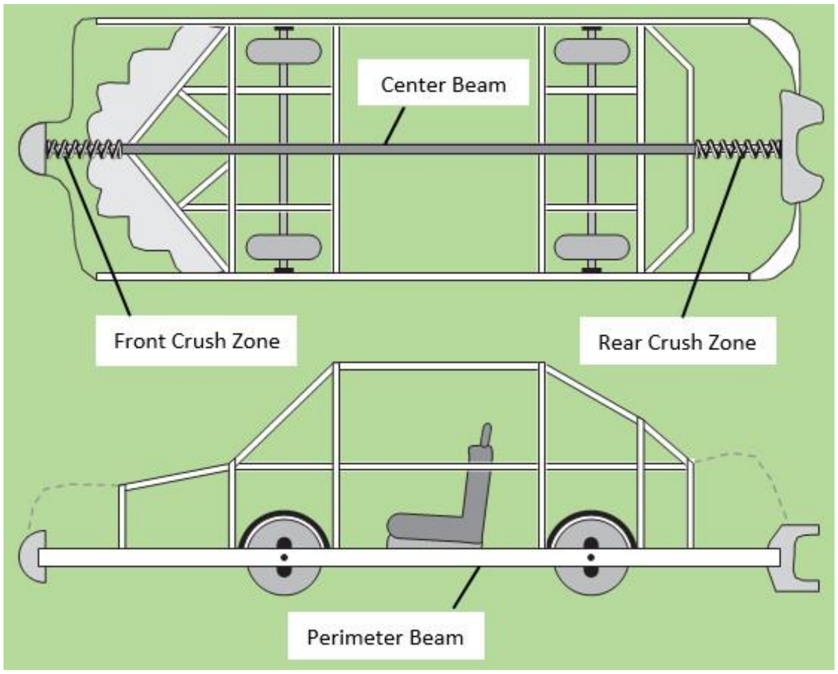

Illustration 8
Overland Vehicle Structural Design

4.4.2. Overland Transportation System Safety Features

Vehicles are ALWAYS securely attached to the skyway center guide rail. This means there is no possibility of a vehicle losing control and falling off the skyway.

The Overland Command & Control System always knows each vehicle's location, speed, and location in relation to adjacent vehicles and makes continuous adjustments to individual vehicles. This means that the chance for collusions is very low.

There are no intersections, no stop lights, no yield signs, no reversing of vehicles, and vehicles do not stop on the guideway. As a result, vehicles cannot be hit broadside, cannot roll over, and cannot run into trees or pedestrians. No lane changing takes place and there is no two-way traffic, so there can be no collisions between vehicles.

4.4.3. Communications Safety and Power Outages

Atmospheric disturbances such as lightning, random electromagnetic frequencies, radio frequencies, computer hackers, shorting or failure of electric components will not cause a catastrophic failure of the Overland Systems. All communications are channeled through a proprietary fiber optic backbone with no outside connections. The electronic devices programmed to communicate over this backbone use a proprietary protocol developed expressly for the exclusive use of the Overland System.

The Overland ATS is designed to remain safe in the event of complete electrical power outages. All vehicles will remain on the skyway and will shut down safely based on pre-programmed procedures.

4.4.4. Natural Disasters

The Overland System will provide emergency operation and evacuations during hurricanes, strong winds, sand storms, floods, and white-out blizzards. Also, depending on the nature of the disaster, complete or partial hazard mitigation due to avalanches, rock slides, tornadoes, and earthquakes.

4.4.5. Onboard Passenger Emergency

The Overland network divides urban areas up into approximately one-mile squares. An Emergency Paramedic/First Responder station would be established in the center of each 16 square mile urban sector. This serves a population of about 64,000 citizens.

When a passenger or fellow vehicle occupant presses a panic button in the vehicle, an alert is immediately sent that there is a medical emergency in that vehicle. That vehicle is then routed to the nearest paramedic/first responder station. Two minutes is the maximum time it would take to reach the paramedic station.

5.0 ESTIMATED COST AND REVENUE

To illustrate the estimated infrastructure costs and anticipated revenue, the following analysis is based on a one-mile length segment of skyway.

5.1 Estimated Infrastructure Cost

Skyway cost per mile = $5,000,000 direct construction cost (excludes right of way, site engineering and design)

5.2 Estimated Revenue

5.2.1. Revenue Basis

Estimated revenue is based on a skyway toll cost of 1¢/mile per foot of vehicle length.

Toll is 15¢/mile for standard length 15-ft. personal vehicle.

Toll is 60¢/mile for a 60-ft.-long mass passenger transport.

Toll is 60¢/mile for a 60-ft.-long heavy freight transport.

5.2.2. Maximum Possible Revenue

Maximum toll revenue per mile for 10 hours per day:

= 5,280 ft. x 0.5 (utilization) x $.01/mile x 150 miles/hour x 10 hours/day

= $39,600/day

For a full year, $39,600/day x 365 days/year = $14,454,000

5.2.3. Estimated Actual Revenue

10,000 standard vehicles/day/mile x 15¢ average/mile x 365 days/year:

= $547,500

700 mass passenger vehicles/day/mile x 60¢ average/mile x 365 days/year = $153,300

600 freight transports/day/mile x 60¢ average/mile x 365 days/year

= $131,400

Total annual skyway tolls collected/mile = $832,200

Average annual return per mile per year = 832,200/5,000,000 = 16.6%

5.3 Estimated Vehicle Costs

Autonomous private vehicles: $50,000 each

Mass passenger transports: $350,000 each

Heavy freight transports: $300,000 each

6.0 CONCLUSIONS

Transportation in the United States is like a jigsaw puzzle with thousands of pieces. Some of the pieces are useless. They do not result in better solutions. Some pieces are useful but belong to a different puzzle. They are part of the solution to a different problem.

Florida cannot have one solution and Texas a different solution; Chicago one urban network and Detroit a different urban network. They must all use the same system; all must support the same vehicles.

The Federal Highway Administration makes it clear it is thinking in terms of one solution that is scalable to all cities and interstate highways. The federal government has repeatedly stated that private capital must be used to build the transportation infrastructure. The equity markets, debt markets and alternative investments are all looking for investments that are not overpriced. The Overland Skyway is a sound hard asset investment that will make use of the capital to grow our country, jobs and economy.

Instead of interstate highways that average 2,100 vehicles per lane per hour, we need to build one six-foot-wide lane to handle the equivalent of 12 lanes of interstate highway at full capacity. Americans love speed and powerful vehicles. Cars are now safer than ever, now we need a safer infrastructure. We need a transportation system that can be used in adverse weather. This is what American drivers want.

The Overland Automated Transportation system gives them everything they want. The Overland skyway provides a full-capacity, robust, and economical structure with an ultra-compact footprint. The Overland ATS dual-mode surface transportation system has been carefully, thoughtfully, and thoroughly detailed. There are no missing details or oversights.

The Overland dual-mode surface transportation system is a three-dimensional continuation and extension of the present highway infrastructure. Overland can provide all transportation services needed in any urban area. Urban networks can be connected using inter-urban skyways.

All vehicles are owned by separate private or public entities.

Individuals will be able to simplify their lives and have more time with family and friends due to significantly decreased commute times in urban areas and significant inter-city time saved when traveling at 150 mph on the Overland skyway infrastructure.

A commercial bus with 30 passengers traveling from Orlando to Atlanta currently takes nine hours. Using the Overland ATS, the trip duration will be decreased so that it can make four one-way trips in the same time frame. This will result in the potential to quadruple current gross revenue.

An 18-wheel tractor trailer driver can today legally drive approximately 500 miles in 11 hours. and gross $800. Using the Overland skyway, the same driver will be able to travel 1,650 miles in the same time, more than tripling the distance legally traveled.

The Overland Automated Transportation System - the future of transportation in the US.

7.0 COMPANY STATUS AND UPCOMING WORK

Overland ATS has grown from a "Big Idea" into a lean startup machine.

The Overland ATS Skyway is still being conceptualized and engineered. Among other current transportation projects, Overland ATS remains the leader in:

1. Most patents (12) granted for an inter-modal transportation system.
2. The only viable transportation system that can merge with existing street and highway grids and could be implemented today.

The current focus is ramping up marketing efforts to improve Overland ATS' name recognition with potential investors, government transportation agencies, and the public.

The marketing team will consist of highly qualified urban transportation planners, urban land planners, urban environment planners, and transportation engineers. It will spread the word with multiple websites directed to assorted audiences, social media presence, publications, PR releases, speaking opportunities, and educational seminars.

The team will consult with the U.S. Department of Transportation, Federal Highway Administration, and regional, state and local agencies on topics such as:

- Private and public-sector transportation clients' organizational goals related to traffic congestion, capacity, sustainability and funding
- Focus on how high-volume, high-speed, all-electric transportation infrastructure improves mobility
- Integrated focus on energy efficiency, environment, safety, speed, reliability, resilience, sustainability and affordability
- Master planning for dual-mode transportation and comprehensive dual-mode transportation implementation planning
- Ways for highway and automotive technology, rail, freight and public transportation to be integrated into safe and seamless dual mode
- Application for dual-mode command and control integration with ride sharing services (Uber, Lyft, Didi Chuxing, etc.)

In addition to these activities, Overland ATS is also planning to build a full-scale test facility in South Central Florida so that interested people will be able to see a real-world demonstration of the product.

As the above activities progress, Overland will select strategic projects on which to bid to begin growing the system and illustrating the system's convenience and robustness. It is expected that once the system becomes available in select locations, demand will grow exponentially as transportation agencies and the public begin to grasp the system's potential in their communities and lives.

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