



GENERIC PROPOSAL FOR EVACUATED TUBE TRANSPORT TECHNOLOGY (ET3) HIGH SPEED GROUND TRANSPORTATION SYSTEM by et3.com Inc.

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A) Executive Summary

Transportation should be clean, green, fast, and comfortable. Transportation globally must also be financially feasible. The ET3 vision is 'Space Travel on Earth'. The global ET3 network provides crystal clean, lightning fast, almost free transport in recliner comfort. By the year 2030 over 90% of people and goods will travel via ET3. The ET3 mission is a fair and open market. Here licensees profitably leverage their assets to optimally implement ET3. ET3 uses existing skills, capacities, and materials to maximize transportation value for all.

Evacuated Tube Transport Technologies (ET3)™ is a patented transportation technology that is faster than jets. ET3 will achieve 50 times more transportation per kWh (or ton of CO2) than electric cars or trains. The cost is only 1/10. ET3.com Inc is an open consortium of licensees who own the ET3 intellectual property (IP). With \$100M of private investment, 30 km of ET3 can be built within 24 months. To limit risks, a 36 month phased development cycle could start with an initial investment as low as \$1M. This 30 km demonstration will prove that the projected returns could stimulate private investments exceeding \$500B. Within 10 years this could yield over \$2.3T/year in security, economic, and environmental benefit in the US alone. **THE TIME FOR A NEW MODE OF TRANSPORTATION IS NOW!**

HOW DOES ET3 WORK?

Think about this: No Form of transportation in our universe is older, more proven or more efficient than what we are proposing. Our planet itself has been traveling this way for all of recorded history - and it works successfully. Average world citizens travel at least 200 billion miles **in orbit** during their lifetimes without expending any fossil energy to do so. The scientific principals of ET3 are highly proven.

ET3 is literally "Space Travel on Earth"™ where car sized passenger capsules travel in 1.5m (5') diameter tubes on frictionless maglev(magnetic levitated vehicle). Air is permanently removed from the two-way tubes that are built along a travel route. Airlocks at portals allow transfer of capsules without admitting air. Linear electric motors accelerate the capsules, which then coast through the vacuum for the remainder of the trip using no additional power. Most of the energy is regenerated as the capsules slow down where kinetic energy of the capsule is converted to electric power with a linear electric generator. ET3 can provide 50 times more transportation per kWh of electricity than the most efficient electric cars or trains.

ET3 is networked like freeways, except the capsules are **automatically** routed from origin to destination. Speed in initial ET3 systems is 600km/h (370 mph) for local trips. This will be developed to 6,500 km/h (4,000 mph) for international travel that will allow passenger or cargo travel from New York to Beijing in 2 hours. Velocity may even extend to that of a rocket in future for low cost access to space.

ET3 capsules weigh only 183 kg (400 lbs), yet like an automobile, can carry up to six people or 367 kg (800 lbs) of cargo. Compared to High-Speed-Rail (HSR), ET3 needs only 1/20th the material because the vehicles are so light. Automated passive switching allows a 600km/h ET3 route to exceed the



capacity of a 40 lane freeway thus producing further economy. This exceptional capacity can be leveraged to carry water, sewer, oil, gas, and garbage, etc., all in special capsules. For cargo, the capsule can accommodate up to three euro-pallets (0.8 m wide, by 1.2 m long, by 1.0 m high). The ability to consolidate different utility needs into the same right-of-ways creates great economy of scale. **ET3 can be built for 1/10th the cost of High Speed Rail (HSR), or 1/4th the cost of a freeway.**

Status: ET3 stands for Evacuated Tube Transport Technologies. The company et3.com Inc. is an open consortium of licensees dedicated to global implementation of Evacuated Tube Transport (ET3). The major technical risks of ET3 development have been surmounted. We are half way through the “valley of death” (the gap between the R&D phase and profitable commercialization). All our performance and value claims are conservatively based on solid scientific facts and ample empirical measurements of the various and highly proven key elements. We have identified areas where early-stage high-risk expenditures to improve key technologies will further improve ET3 cost, efficiency, and performance. For example; high temperature superconductor improvement is attracting a lot of high-risk R&D because of the quantum leap gains enabled in diverse fields. The immediate potential exists for the cost of ET3 capsules to be cut in half by judicious investment in further improving the already proven High Temperature Superconductor Maglev (HTSM) invented in China (and licensed for ET3 use).

In spite of the obvious green nature of ET3, government agencies impose the same expensive EIS (Environmental Impact Statement) process required for dirty status-quo transportation modes like road, and rail. A studious review of ET3 will reveal that the environmental impact is a quantum level improvement over status-quo modes in almost every measure. ET3 technology represents obvious environmental advantages. For example;

- ET3 will be virtually silent (sound cannot be transmitted in a vacuum).
- ET3 will not cause ground vibration like trains (an advantage of the light weight).
- The path of ET3 capsules is fully isolated within the tube guideway, and therefore it is impossible for birds, animals, or people to be in conflict with the path of the capsules.
- ET3 power supply requirements are advantageous by several orders of magnitude. Once the ET3 capsules reach top speed, they coast without further power application. By contrast, high-speed-rail requires 12MW for the entire trip.
- Much of the electrical energy used to accelerate the capsules can be recovered when the capsules slow down (Energy Recovery System).
- Because ET3 uses electrical energy and the consumption per passenger/mile is less than 1% of an electric train at the same speed, ET3 will not have a negative impact on air quality. There will be a positive effect from reducing automobile and aircraft pollution and GHG. In fact, ET3 can play a key role to meet Kyoto Protocol. No such high energy saving technology has been proposed in the past.

Transportation safety is a matter of controlling all travel variables. Only ET3 offers the ability to tightly control them. Conditions inside the guideway tubes are absolutely governed at all times so that optimal conditions for efficient travel always exist. By comparison, trains, cars and aircraft travel in the natural environment where the existence of adverse weather conditions, obstacles to travel (like animals or pedestrians, etc.), cause frequent safety problems.

Flying in a commercial airline is about 18 times safer than driving the same distance by car. Let's compare the safety of ET3 with jet aircraft. The greatest risk factor of aircraft accidents is human error. ET3 virtually eliminates this problem through automation. The second largest safety issue with aircraft is bad weather, also mitigated by ET3. The third major cause of air accidents is mechanical failure. Some of the more common causes are: engine malfunction, fuel system problems, fouled controls, structural and landing gear failure, instrument errors, and loss of pressurization. Because ET3 is less complicated by several orders of magnitude, mechanical failure risks are virtually eliminated.

The most significant risk that applies to ET3 and aircraft is pressure loss (or gain) in the capsules (or tubes). Sudden loss of pressure in an aircraft will cause loss of consciousness of the crew within a few seconds. This is known to have been the cause of at least two aircraft accidents. Aircraft are at far greater risk of sudden pressure loss than ET3. Aircraft pressure-holding structure has many points of likely



failure, such as: extreme and variable aerodynamic forces, temperature extremes, vibration, air turbulence, bird strikes, hail storms and ice formation, high G force loading, hard landings, etc.. In the rare event of cabin pressure loss, aircraft must descend thousands of feet before enough air is available for survival. With ET3, air can be admitted into the tube in a fraction of the time it takes an aircraft to reach safe conditions. This air (administered only in emergency), quickly slows the capsules and cushions any collisions.

Maglev: ET3 can use any type of maglev. The cost will be less than 1/10 the cost of using maglev to levitate 100-ton trains. ET3 capsule weight per unit of length is less than 1/15th that of a train so much less material is needed for ET3.

The High Temperature Superconductive Maglev (HTSM) used in ET3 has many safety and cost advantages compared with other maglev systems. HTSM is not reliant on motion, external or internal power, or electronic control to maintain stable levitation. The capsule will levitate indefinitely as long as the material (bulk crystals – not wire) is kept in a superconductive state by coolant. The record holding Japanese superconductive maglev system relies on liquid helium temperatures of only a few degrees above absolute zero. By contrast, the proven HTSM preferably used by ET3 requires only common (and safer) liquid nitrogen temperatures. Liquid Nitrogen is less than 1/100th the cost of liquid helium. The cooling requirements for ET3 are met by carrying enough coolant to keep the HTSM cold enough to levitate during the entire trip, plus a reserve for safety.

The first passenger HTSM developed in China is safely and reliably carrying thousands of passengers without failure. The HTSM prototype will maintain levitation for more than 6 hours of continuous operation on a single coolant charge. It takes less than \$5 worth of liquid nitrogen to charge the prototype. The ET3 cooling system is critical and designed to be fail-safe. The complexity of HTSM is an order of magnitude less than any other maglev system in operation. Because ET3 operates in a vacuum, the HTSM material will absorb less heat and require less coolant than the HTSM developed in China.

Automation has been largely responsible for most of the productivity and quality gains made in the last 20 years. Consider one electronic control system - the one used to levitate the world's first maglev train in revenue service in Shanghai China. The system turns an inherently unstable magnetic attraction into a stable one. Controlling the position of the train within a millimeter in mid air (by rapidly changing the magnetic force) is something no human could manage for a few seconds, let alone for an entire trip. Many aircraft also rely on ultra-fast sensing and decision making computer capabilities to achieve stability (also impossible for human operators). Technology capable of controlling ET3 is a commodity.

The ET3 control system is very simple by comparison and can be implemented without computer control (although computers will be used to enhance safety and add functionality). ET3 functions like an industrial or amusement park conveyor system on a larger linear scale. The system will be wired so that out-of-time launch of capsules is not possible. Our computer simulations operate reliably. There is little reason to expect that the actual system will function differently. ET3 can be viewed as a simple conveyor inside a tube with maglev replacing the rollers, and linear motor replacing the drive belt.

Vacuum production is a well developed industry. Vacuum flask insulation bottles that keep liquids hot or cold for long periods of time have a thin shell containing a medium grade vacuum; they function for years if not damaged by abuse. Televisions and CRT screens require much higher vacuum quality than ET3. If all the TVs, CRTs and vacuum flasks in the world were lined up in a row, they would circle the globe and be able to function for years without additional evacuation pumping. The ET3 tube structure has a more favorable volume to surface area ratio than vacuum flasks or TV tubes. Coating and sealing technologies have developed to the point that leakage is virtually eliminated. Particle accelerator experts agree that the vacuum requirements for ET3 are easy to achieve and maintain compared with the high grade vacuum needed by linear accelerators or cyclotrons.

ET3 capsules carry no propulsion fuel and have no lubrication needs. The chance of an ET3 derailment is virtually zero since the guideway is fully constrained. In the unlikely event that cargo contaminants are released from a capsule, the tube guideway structure provides a secondary containment barrier. Compared to typical HSR, the contamination possibilities of ET3 should prove 2 or 3 orders of magnitude less.



ET3 value will produce profits high enough to guarantee private investment. The benefits will compound for generations. Collectively, companies have invested billions developing ET3 (though most are yet unaware of it). For example; present companies are independently producing almost all of the hardware and software necessary to build and automate ET3 using assets that are mostly paid for, yet may be underutilized. The technology is owned by et3.com Inc., an open and growing consortium of licensees. The licensed companies and individuals collectively network, and leverage their assets to implement, manage, and improve ET3, while putting their laid-off labor forces back to work. The need for international cooperation in a collective effort will help re-establish global growth through scientific leadership of this “mega-project.”

For example, private investment of \$500B in optimally placed ET3 routes in the US will displace over a third of US transportation in less than 10 years. The manifold annual return on this investment will include; direct energy and labor savings of \$1.4T, time savings of \$625B, environmental benefits over \$200B, security savings of \$70B (saves cost of protecting oil assets), 20,000 lives saved, and reduces uninsured losses. This totals almost \$2.3T/yr in direct benefits. Secondary benefits include; economic expansion, better distribution of commodities, improved global standard of living, and accessibility to education and markets, to mention only a few.

At the same time the US grid is built, other nations will implement ET3 networks. The first nations to implement ET3 can lead in the construction of a 14,500 mile (23,500 km) ET3 backbone from New York to London (via Alaska, China, India, and Europe). The cost would be less than \$1T, and soon capture 10% of the \$8.5T global transportation pie by connecting major population and production centers. Traveling from New York City to Beijing in two hours on ET3 (with a comparable fare to flying) would yield 90% profit margin and never be subject to rising petroleum prices. This allows greatly reduced transportation cost. In less than a generation the ET3 network expansion could capture a majority of earth transportation, with potential to reach \$30T/yr. present value.

China recognizes the immense value of ET3 and holds a five-year advantage in its implementation. Three years ago a major Korean institution started a five-year program to implement tube transportation. ET3 is now the top-rated contender of several technologies that they originally invited to



compete. The first nations to commercialize the potential that ET3 offers will lead the world out of the present global economic crisis. We can create unprecedented environmental, social, and economic returns through ET3. This will usher in an age of global prosperity for many generations. The leading nations in this field will enjoy enormous profit by providing ET3 transportation technology and production to the world, like Saudi Arabia sells oil.

Transportation is the cornerstone of the economy and the master key to survival. During the 1800s, muscle powered transportation was displaced by steam engine powered boats and trains because they offered far greater transportation value for most people. Much of the world is still following America's bold train lead. The US again set a new lead by developing cars and aircraft as trains had reached their limits of sustainability. In the 1900s American cars and aircraft offered vastly superior benefit



to cost ratio transportation than did trains. Cars quickly displaced trains as the major mode of transportation.

In 1916, trains had an intercity passenger market share of over 90%; today it is less than 1%. *This is in spite of passenger trains in the US receiving about 40 times more government "investment" per passenger-mile than cars and highways.* A better word than "investment" in this case is "subsidy" since unlike road investments, for the last 50 years US passenger train "investments" yielded a negative return – costing more than they earned.

By the late 1900s, another level of efficiency was achieved in the USA by containerizing marine, rail and truck cargo transportation. Containerization has yielded impressive returns for investors by reducing labor and logistics costs. The ET3 capsule functions as a "pallet-at-a time" container that promises huge productivity gains in origin-to-destination logistics. Workers displaced from logistics will have ample opportunity to apply their skills to the tens of thousands of direct jobs that will be created by implementing the ET3 network; this includes jobs in the construction of ET3, and countless cascading opportunities.

Restoring Science Leadership: One thing is certain; nations cannot assume a global lead in transportation by following the leaders. Why then do so many seek to follow the followers? To truly lead, we must boldly invest in transportation infrastructure (like ET3) which is scientifically proven to offer the highest possible transportation value. Steam power created such value for transportation in the late 1700s as containerization did most recently.

ET3 uses less than 1/50th the energy per passenger-mile (or ton mile) of transportation than electric cars or trains, **and** ET3 costs much less. When funded to the point of initial implementation, ET3 will gradually displace cars and jets by creating a quantum leap in transportation value. Because ET3 is so efficient and ultra clean, it can sustainably (and profitably) reduce transportation GHG emissions to 90% below 1990 levels, by the year 2020 (this achievable goal is much more ambitious than the UN and IPCC stated objectives).

ET3 is an ideal platform for solar and wind energy collection, storage, and distribution, (ET3 functions as a linear flywheel). This will help ensure that at least 25% of our electricity comes from renewable sources before 2025.

Within 10 years, national and global ET3 networks will greatly enhance energy security by eliminating most need for fossil fuels and oil for transportation. ET3 offers true economic recovery by creating tens of thousands of new green jobs and reducing costs. The foundation for the future of the world lies in our ability to shift our production capacities from supporting an aging paradigm with *negative* returns, to a totally new one with **exceptional** returns.

Jobs: Depending on the route, it will take approximately 100 skilled workers 2 years to construct a 30 km ET3 demonstration. Many more jobs will be created (or preserved) in the many industries that produce components for ET3. Operation and continual expansion of a global ET3 network will provide a continuing stream of green jobs. Low transportation cost will invigorate the economy, resulting in secondary and tertiary job creation. Transportation represents nearly 20% of the economy in developed nations, and much of that money is to purchase fossil oil based fuels. ET3 offers the opportunity to use our money to create jobs. Those extra jobs represent a larger domestic economy with cascading effects and even more jobs will result. If half or more of the money spent on oil were circulated several times per year, instead of burnt up in internal combustion engines, how many businesses and jobs could that create?

Other economic impacts: ET3 will create favorable economic benefits that invariably result from transportation advances. Increased development, appreciating land values, and access to expanded markets are examples of the many economic benefits. When made available to the nation, and networked for seamless point-to-point use, ET3 will more than double the standard of living (just like the last three quantum leaps in transportation advances did in the US). This increase in economic activity will result in reduced governmental deficits for several reasons; less demands for subsidies, increased tax base, less maintenance costs, etc..

The Eisenhower highway system in the US was built to greatly enhance military logistics. Likewise, ET3 will enhance national emergency preparedness, defense capabilities, and border security for



all nations who implement it. A national ET3 network will have the capacity to quickly move millions of civilians out of the path of hurricanes, and undetectably rush troops or supplies to protect from terror threats. ET3 will become one of our most valuable global security investments. ET3 passenger and cargo movements can be internally tracked from origin to destination in real time. Because the entire path of travel is always secure, there will be much less risk of covert invasion by organized terrorist groups.

ET3 also invigorates the intellectual R&D realms for devising and testing the software elements that unique logistics require for command and control centers, operations, communications, and geo-sensing.

In Conclusion ET3 can enhance the economic and energy security of the world by:

reducing our reliance on peaking oil production: More than 90% of global transportation relies on oil. ET3 uses electricity – not oil. Since ET3 will improve the market value (benefit to cost ratio) of most transportation by more than ten times, it will eventually expand to displace more than 90% of transportation. The remaining 10% of transportation needs can be met with electrification, and biofuels without stressing power grids and agriculture, or disrupting global food markets.

reductions of energy related emissions including greenhouse gases: Our electric grids are stressed to their limits. Most electricity is generated by coal that emits GHG, and less than 10% is generated by renewable means such as hydro-electric, wind, and solar. To electrify all cars, trains, and buses would take more than double the amount of electrical energy that our grid is supplying, and likely increase GHG production. ET3 can accomplish 50 times more transportation per kWh of electricity than electric cars or electric trains. This 50 to 1 advantage can allow existing renewable sources to accomplish 90% or more of transportation with a global ET3 network having the convenience of cars, yet faster than jets.

improvement in the energy efficiency of all economic sectors: Transportation is deeply tied to all economic sectors. Transportation on average accounts for about 1/5th of the cost of everything in developed nations. ET3 is all about maximizing transportation efficiency; not only energy efficiency, but also labor efficiency, and materials-use efficiency.

ensure a lead in advanced technologies: The et3 consortium was one of 20 proposers who qualified to submit a proposal to the Florida High Speed Rail Authority (FHSRA). We (et3.com Inc.) submitted one of four proposals received by the FHSRA in 2003. The engineering firm hired by the FHSRA to evaluate the 4 proposals did not find technical fault with our proposal and noted that our bid price appeared credible. Our bid was by far the lowest and our guaranteed performance was much better. (the bid of \$253M for 96 miles at 350mph (565km/h) design speed ET3, from Tampa to Orlando is a matter of public record available from the FHSRA, not including: permitting, EIS, right-of-way, bonding, and insurance expense). Our proposal, however, was rejected because our technology “was not yet in revenue service.” It is tough to lead in public transportation when government imposes a policy of only considering 30 year old technologies (like HSR) from other nations that achieved their standard of living by following the US. At this juncture we accepted China's invitation to co-develop ET3-HTSM. China started academic R&D on ET3-HTSM in 2003, and now have working prototypes. Korea is about 4 years behind China in ET3 R&D, but it appears that their plans are directed more toward commercialization. We believe it is important to maintain a globally competitive balance of capacity to produce and implement ET3 in all nations.

Use of Funding: One primary reason that ET3 needs seed funding is to mitigate the developmental restraints of government. Much of the “valley of death” remaining for ET3 to cross is meeting costly government requirements that do not produce direct returns. For example: expensive permitting requirements such as an Environmental Impact Study (EIS), bonding and insurance requirements, increasing tax rates, right of way issues, and laws that favor the status quo at the expense of innovation.

It is understood that with a conditional investment memorandum of understanding in place, AND conditional invitation to submit a formal proposal on a particular route by an official governmental authority, that a one page summary of direct costs including major expected outlays will be transmitted within 48 hours, and within a week a detailed report supplied reflecting the investors choice of a 36 month



phased approach, or a parallel (accelerated) 24 month program. We believe that some of the investment could be government funded under existing programs, and / or past government investments.

The minimum initial proof of concept should be at least 30km to have practical use, and attract passengers and cargo away from other modes. In two to three years time from funding date (and permit date), a functional 30 km tube-line with substation activity and fully usable control system for the line to operate with an initial quantity of 8-10 capsules. Our previous bid work shows that this will cost about \$100M (more or less depending on route specific requirements, and government requirements imposed or relaxed), and take 24 months from the time of permitting and funding (not including time for ROW prep).

Phased Development of the minimum 30km will reduce investment risks, but require an additional 12 to 24 months, and may not represent sufficient private sector commitment to induce government cooperation. With a first phase minimum of \$1M of seed funding and cooperation of a land owner or right-of-way holder on the proposed route, a 3rd generation production ready prototype HTSM levitated capsule, and 25m section of single tube with a working switch section can be built and tested. With successful testing, the second phase requiring an additional \$30m will allow construction and testing of a 5km segment with linear motor proving the high speed capability prior to releasing phase three funds to total the \$100M commitment for the initial 30km two-way system with simple airlocks and switch and operating at a design speed of at least 600km/h.

This three phase approach will reduce risks and unknowns sufficiently to secure private funding. Construction on the routes identified by the authority will be in stages to be eventually networked into a global ET3 system. Note that the initial 30km segment may not initially be profitable if built in a location with limited transportation demand. However the route will be capable of generating revenue, and prove the value improvement can support rapid expansion. In addition there are many additional revenue and value capture opportunities such as real estate value appreciation, and amusement park potential.

The high cost variability for the total system for a national system is from physical differences in the routes we have identified as being "shovel" ready on right-of-way already owned (or proposed) by the government). We cannot rely on this, yet our understanding is that most governments have sufficient bonding and insuring capacity, and could waive requirements and offer indemnity at little or no cost. Compared to the private sector, this indemnity will be a key to attracting private sector funding. We believe that a government endorsement of this generic ET3 proposal will enhance our ability to attract private funds. The ET3 proposal can be carried out with little or no public investment required! (Compare this with the multi billion dollar minimum governmental investment required for HSR on the same routes). Using this low risk phased approach, the stage will be set for rapid implementation of ET3 throughout the world.

"First, I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the Moon and returning him safely to the Earth." JFK

John F. Kennedy's bold move of putting mankind on the moon created vast wealth through cascading benefits as the required technologies were commercialized. Since 1993, US intellectual property (IP) value exceeds the worth of tangible assets. Although manufacturing has shifted to Asia, half of global IP licensing income flows to the US. ET3 is efficiency improving technology that will greatly leverage and extend NASA developments. Because of exorbitant costs, only a few astronauts experience frictionless travel in orbit. By contrast, ET3 will offer the enormous benefits of frictionless "Space Travel on Earth"™ for everyone.

The value of ET3 implementation will dwarf the wealth created by NASA inspired IP and hardware. The first nations to implement ET3 will initiate a new wave of unprecedented global prosperity. ET3 will eliminate reliance on oil for transportation, enhance global security, green the earth, invigorate stagnant industries, and net millions of high paying jobs. Most importantly, ET3 will stimulate the global economy by availing an extremely high return on investment (ROI) for companies who build it. The enormous time savings will produce compounding effects by freeing up time for people to be more



productive and enjoy life. As licensed companies implement ET3 globally, an extraordinary growth in trade for both import and export will develop. A future possibility for ET3 is ultra low cost access to low earth orbit. This would further the Kennedy space initiative which indirectly stimulated the global economy.

Transformational paradigm shifts in transportation which affect the entire planet rarely occur. Our planet is in a state of depleting oil reserves, environmental challenges, and deepening global economic crisis. The “silver bullet” that our world is so desperately seeking is ET3.



We look forward to your assistance and participation with us.

B) Some suggestions for government authorities:

Government and industry should achieve public purpose at minimum cost and environmental impact. Innovative transit proposals must be compared on a benefit to cost basis with cars, trains and planes. Comparisons should include initial and operating costs, and environmental impact for low, medium, and high use factors. This will show relative risks if use fails expectations. Many peer reviewed rider studies overestimate usage and typically neglect to examine a wide range. Like a horse with blinders on, a narrow focus risks being blind sided.

Failure to implement safe, sustainable, and high value technologies will eventually result in: moribund economies, degrading environment, starvation, and terror of war. It will be a struggle to survive without cheap energy which current transportation depends on.

For a sustainable transportation plan to succeed short term it must offer improved: convenience, capacity, and speed but at lower cost with greater safety. For long term it must specify systems that offer a tenfold improvement in energy efficiency, and improve environmental conditions with tenfold reduction in emissions.

Outmoded rail systems, mega airports, hydrogen powered cars, and massive paving efforts have reached the limits of sustainability. Planning, funding, and building a sustainable transit initiative using the appropriate application of high cost to benefit technologies like ET3 will yield the highest returns for the environment and future generations.

We are concerned that some government Request For Proposal (RFP) language is contrary to the most important desires expressed and agreed on by the public:

- the RFP language is sometimes worded to encourage a minimum, rail specific solution,
- the RFP often makes demands that produce no value, but increase cost and work,
- specific measures of safety are not called out – only archaic rules applicable only to old modes,
- the focus is on rail rules more than transportation goals, and on structures instead of results,



- emphasis is on company size and political power instead of on company stability and proposal benefit to cost ratio measurement.

We believe that the “lobby efforts” of the powerful rail industry is responsible for much of the skewed language of the typical RFP. They wish to make sure their 40 and 50 year old technology (that has failed in the open market) is selected. They seek to lock-out innovative solutions that threaten their last stronghold – government funded projects.

Many governing bodies receive “free” help from rail experts to draft their RFP for high speed transportation solutions. AMTRAK is in shambles, even with free Right Of Way (ROW), free guide-way, and billions in subsidy, the “high speed” Acela brand train sets are a failure on the most lucrative route in America. There are no HSR implementations that are capable of recovering even the interest on the capital expense of construction. Only one system in the world (Japan) is recovering the operating expense in fare box revenue (but none of the immense construction cost). We hope that some will realize “expertise” that results in failure cannot be trusted. We ask that the transportation authorities of government insist on public transportation solutions that offer the greatest benefit to cost ratio (instead of deferring to the status quo that is a proven financial failure).

The rail industry “free” help costs many cities and governments the world over billions of dollars in lost value to the tax payers and citizens. The website www.publicpurpose.com points out the huge waste on rail. Passenger rail systems are proven to be miserable financial failures. Many rail authorities ignore prudence. In desperation they adopt a lowest common denominator solution. Rail industry consultants cloud the important issues. They use reams of paperwork, and suggest lengthy specifications and requirements . The resulting rules serve to to lock out innovation that would displace them.

Increasingly the public is demanding that public officials:

- seek innovative solutions to Design Build, Operate, Maintain, & Finance HSGTS,
- be fair and impartial in the selection of the best technologies,
- insist on technical validity and scrutiny of the proposed technology,
- get the most value for public investment,
- and protect the public from loss.

We believe that after examining all alternatives, the Authority will agree that ET3 is the best solution offered for any route over 20 miles in length that has sufficient traffic volume to justify a 6 lane freeway.

There are many areas were this generic ET3 proposal fails to meet minor technical requirements of many RFP documents some are:

- ET3 is not a rail system, therefore cannot meet the scores of rail specific requirements.
- Often audited financials are requested, we certify that et3.com Inc. is debt free, and has been operating at a meager profit every year since inception, and we have enough reserves to continue operation at the present intensity for a minimum of 5 years. We are a privately held company and do not make financial information available for non-shareholders.
- We have not included financials, audited reports, D&B etc. of our major project technical and supplier partners in China and elsewhere, we suggest looking up the financial information on the government of China. They enjoy a GDP of over \$5.7T USD per year. Those resources back the institutions that have committed to the ET3 license and have provided written interest in participating in the first ET3 projects.
- We are not including multiple paper and CD copies of our proposal, but we want to make the information available to everyone. We publish our generic proposal on our website, just like many government authorities make bid and proposal information available to bidders. Printed copies of this generic et3 proposal will be made available at the cost of reproduction, as per typical government practice.



- We are not ISO 9001 certified, nor do we desire to be. ISO certification cost is included as an optional item on our proposal. ISO certification does not guarantee high quality; it only certifies that a system for consistent quality is in place.
- Our bonding capacity is not established. If bonding remains an absolute bid requirement, add the full cash amount to the firm price of our proposal, and we will put the money in escrow to be returned to you if construction is not completed. We anticipate the ability to attract partners who are able to meet the bonding requirement if our proposal is identified as the preferred proposal. We agree to meet the bonding legally required by the governing entity in the event our proposal is selected; however it would be far lower cost for the government agency to supply the bond and self insure. If a government cannot self insure, what use is government?
- Our proposal does not include the Right-Of-Way (ROW) cost. ROW appraisal and acquisition is another function that government is best equipped to accomplish. The main technical issue with respect to ET3 ROW requirements is a minimum curve radius of 2000 feet.

C) Business Entity Information and Proposer Qualifications

Principals and Team Organization

Proposer business entity
et3.com Inc. a Florida Corporation
Mailing address: P.O. Box 1423 Crystal River FL 34423
Registered Agent physical address: 441 NE 1st Street Crystal River, Florida 34429
e-mail: et3@et3.com CEO: Daryl Oster
websites: www.et3.com, and www.et3.net
Phone: (352) 257-1310

The company is owned and operated by licensees of the company's Intellectual Property (IP). To date there are more than 100 licensees, in 7 countries. The websites have more information on the business structure, the operating plans, and license agreement.

Any of the licensees are consorted with et3.com Inc. with respect to any ET3 project or work, and more licensees may be added as time goes on. All the licensees listed on the website, (and several who have not been added yet) have signed an agreement associating them with ET3 with respect to any ET3 related project. The license agreement is included herein as reference. We are not including a comprehensive list of all licensees and their skills, assets, and personal information. We are happy to bring the actual signed agreements to show the authority, if requested to do so for any oral presentation.

Our team is currently comprised of et3.com Inc. licensees and some non-licensees, many of whom have indicated an interest in entering into the license agreement in the event an ET3 project starts. See the letters of commitment included herein.

Select licensees (see website for full listing):

Professor Wang Jiasu – Inventor of the HTSM – See agreement, photos and video enclosed on CD

Barry Baker – Industrial Control Expert

Dr. Yaoping Zhang – PhD. Transportation Engineering

Professor Mei Shaozu – School Of Management, Beijing

Gary Promhouse – Chief Scientist, OpenText.com PMS

Randy Oehmig – Insurance industry advisor

Graham Kaye-Eddie – Master Urban Designer

Sterling Powell – P.E.

Dr. Masayuki Kumada – CTO, Feynman Co, Japan

J. “Yon” Friedmann, MBA (Managing Director Aqua=Terra Project)

Key Material Suppliers:



Ductal - Vic Perry - letter and support materials enclosed
GRINM dep't. Of superconductivity –letter enclosed
USMMM Nd Magnet Manufactures – letter enclosed

Key Consultants and Advisors:

NJTU school of Transportation Engineering – letter enclosed
Dr. Vincent Bourquin – see correspondence enclosed
Frank P. Davidson – founder and Chair of the English Channel Tunnel Study Group.

Experience and History

Financial

We are a small company, our resources are limited, but there are many powerful members on our team. The two major transportation universities in China have commitment to support ET3 and our Florida proposal. The agreement to supply the HTSM technology and the vast resources of material supply resources committed to supporting the ET3 proposal are backed by several institutions owned by the P.R.C. All the institutional team members in China are financially backed by the government of China. While this is not a guarantee of the amount of resources that will be allocated for ET3 related projects, it is a record of long term financial stability. The likelihood is that our institutional team members in China will remain viable. China needs supply no proof of financial ability, it is virtually assured.

Experience with transportation projects

China Transportation projects are now the most advanced in the world, SWJU, and NJTU are the primary transportation engineering Universities in China, training many of the leading engineers of transportation projects throughout China.

Experience with HSGT

See letter from the China Ministry of Rail Design Institute.

Ability to supply

The ability of China institutions to supply materials and components is legendary.

Management experience

One of our key licensees is a professor of management at the University of Science and Technology, Beijing. We believe the management ability of the Chinese is readily apparent in their growth in the last decade, and their ability since ancient times to carry out complex civil projects of gigantic proportions.

Ability to meet schedules

The recent revenue maglev project in China (the worlds first) was completed on a very impressive time frame of just 22 months form contract signing. Wile we are not connected with this project, we believe this ability is present in the institutions that are in support of ETT.

Bonding and Insurance Capacity

Our bonding and insurance capacity is not established. If bonding is absolutely required, please add the face amount of the bond required to the firm price of our proposal. We will put the money in escrow to give back to you if we default. Compare this scenario to the one where the authority uses tax payer money for a significant amount of the transportation system, and only recovers a bond of less than half the amount paid in the event of failure. We anticipate attracting major contractors as licensees who are able to meet reasonable bonding requirements if our proposal is selected. We agree to post any legally required bonding in the event our proposal is selected. We will update this proposal as new team members commit to supporting it.

We believe government is far more insurance worthy and can get a better price on insurance than virtually any contractor. We believe the lowest cost to the taxpayer is for the state to self-insure. In the long term this represents the minimum cost to the taxpayer. Please add the cost of insurance to our price in the event the state decides not to self-insure.



D) System Requirements

General Description of ET3 HSGTS

ET3 HSGTS Definition

The Evacuated Tube Transport Technology (ET3) High Speed Ground Transportation System (HSGTS) proposed is designed to meet the need for high speed ground transportation at minimal or no cost to the government or taxpayer. We are not aware of government rules applying to ET3. Our opinion is that ET3 HSGTS meets government requirements. We are committed to maintaining the highest standards of safety. If this means deviating from any government rules that apply to automobiles, roads, aircraft, or trains it must be done. After all, aircraft and automobiles are not required to be equipped with: mouth bit, reigns, stirrups, and saddles!

Approach to ET3 HSGTS

Considering that ET3 HSGTS is not certified by any transportation equipment authority, there are three approaches to consider:

- 1) The Authority could modify the contract to allow deeding the ROW and system to the proposer. With ET3 constructed on private ROW, and operating as an amusement park ride (subject to safety standards of amusement park rides) would meet government requirements, and not fall under transportation authority jurisdiction.
- 2) The Authority could wave the requirement of meeting any rules that do not apply to ET3 HSGTS, and make request that the transportation authority do the same.
- 3) The government could assume responsibility for working with the transportation authority to propose appropriate rules for ET3 HSGTS.

The ET3 technology (see patent document included):

ET3 is capable of exceeding 170 mph (270km/h) on all segments of any route alignment having a minimum curvature of 2,000 feet (600m), and 350mph (550km/h) for a minimum curve radius of 9,000 feet 2.8km and on all tangent alignments. A spiral length of (2 seconds / lateral "g") time interval at the curve design speed is preferred.

ET3 is not a rail system and should not subject to rail authority jurisdiction. We are happy to demonstrate that ET3 is safer than HSR systems. We will assist the any transportation authority in drafting rules appropriate for subsequent ET3 systems. Alternatively we are happy to adjust the terms of the contract so that transportation authority jurisdiction is not involved.

The material included with this proposal demonstrates that all technical aspects of ET3 are proven, and ET3 has less financial and physical risk than HSR. We own the ET3 patent (copy available on website). The inventor of the worlds first passenger carrying High Temperature Superconductive Maglev (HTSM) is a licensee, and agrees to the use of the HTSM technology for any ET3 project (see agreement and photos included on website).

Route Alternatives for ET3

The governing Authority must supply sufficient ROW to allow for 2000' (600m) minimum radius curves and 300' (100m) minimum spirals on all curves currently under the 2000' (600m) minimum. A generic proposal like this cannot not include route specific special structures or tunnel borings that may be required to achieve the minimum curve radius in difficult topography or urban environs.

Preconstruction Activities (based on a commitment of 100 miles (160km))

ET3 component level design is sufficiently complete to start construction on 12 month notice, with a 36 month construction time. The most critical element in the time line is building the maintenance / construction facility. This will be the most time critical to acquire property for, as the tube manufacture schedule will take the longest to complete. Permitting will be the responsibility of the Authority. The Authority should be able to obtain waver of drainage and water treatment permitting for all sections of elevated ET3 guideway, since ET3 adds no measurable impact to storm water, or water quality. Theportal permitting will be supplied by the Authority. Since the ET3 will be of regional significance it may require regional planning hearings to be scheduled according to law, in addition to local processes.



Construction schedule

Construction of ET3 guideway structure takes place mostly at the construction facility (not on the ROW). ET3 construction requires much less earth work (especially for tunnels or construction access).

Coordination with concurrent construction will be much easier than HSR options.

The number of tools is selected to meet the construction / erection schedule of 9 spans per work day, with 300 work days per year. It will take 14 months to build the tooling, and production facility.

Concurrently, portal design will take 9 months, and construction less than 18 months. Capsule production can take place using only one set of tooling in less than 2 years. Maglev and motor component manufacture will take place in locations with low labor cost using existing capacities.

The ET3 hover stock

The capsules used to allow safe, high-speed travel through vacuum conditions are sized according to the overwhelming preference of the public. Cars are proven to be the best balance of economy and utility for most transportation needs. ET3 capsules have more interior volume than all but the largest 3% of automobiles available in the US, the cargo capacity exceeds most SUV's abilities. ET3 capsules are able to accommodate specially designed small road vehicles (privately owned and operated).

Testing and Commissioning

A six month period is allowed for a thorough system testing program prior to commencement of revenue service (cargo use could start earlier).

Maintenance plan

Maintenance of ET3 capsules is highly automated and takes place within the station, on a continuous basis, all capsules are inspected every cycle using automated means outlined in the ET3 patent document. Any part or component not meeting specifications is refitted with a spare replacement. The number of capsules is 20% greater than the number to meet capacity, so if a major component fails inspection, a replacement is immediately available. The cleaning of vehicles uses waste heat from the acceleration system, and all capsules are cleaned every trip.

Operating plan

ET3 operates on a continuous demand basis – no schedules. The system operates like a conveyor system. All trips are direct, no stopping needed. Capsules may be “virtually linked” to allow inter capsule communications for use by larger groups to preserve the cohesiveness of the group in route. See the ET3 patent document for additional operation information and optional plans.

Performance Standards.

Trip time

The speed for all curves using a spiral of at least 250', and a radius of at least 2000' is 170mph. The maximum initial design speed on tangent and all curves exceeding 9,000 feet radius is 350 mph. (See the supplied curve acceleration spreadsheet included in this proposal). Spirals shall be sufficient to allow 2 seconds for each g of lateral force component to optimize the speed potential within the confines of the ROW.

Passenger capacity

The capsules (6 seats each) initial maximum capacity schedule is to be one capsule every 43 seconds. This provides a per hour capacity of 500 per hour; or the same as 2 trains per hour having 250 seats each. So the maximum daily capacity is the same as 48 trains per day. The capacity may be increased more than 10 fold by reducing the interval between capsules and by adding more portals. With 240 access portals, the capacity of a single tube at 350mph (550k/h) design speed can exceed 200,000 passengers per hour.

Intercity service

All trips are direct – non-stop this is one of the many benefits by using vehicles that duplicate the carrying capacity of the automobile. portals can be added anywhere they are needed along the ET3 route according to demand, (just like exits on a freeway). This will not limit the trip speed as with trains that stop at every station.

Hours of operation



The ET3 system will initially operate 23 hours per day, 7 days per week, to attract the most users, and establish an optimal operation schedule and split between offering freight service and passenger use to maximize profitability and load factor.

Expansion

More portals may be added where they are most needed. The maximum ultimate capacity of the system is more than 100 times initial capacity, achieved by adding more portals and capsules. A 30 month lead time is needed for additional portals, a one month lead is needed for additional vehicle capacity. Portal granularity is 10 times finer than HSR portals, and capsule granularity is 30 times finer than the granularity of train capacity.

Cargo

Most public RFPs do not call for cargo service, but we have determined cargo service is a significant source of revenue that can reduce passenger cost (or pay for infrastructure quicker). Time sensitive cargo movement is a high demand field. Approximately half of the \$8.65 Trillion US dollars spent globally on transportation is for cargo service. ET3 can move cargo much faster and efficiently than trains, trucks or aircraft. Granularity is more than 30 times better for pallet-at-a-time ET3 capsules, than truck, train, or cargo aircraft loads.

Implementation Schedule

See the spreadsheet titled schedule of events for a three year implementation schedule for a 100 mile route. Faster implementations are possible (at greater expense).

Quality Control Plan

Our quality assurance program is modeled on the principals of ISO 9001, but we see no value to the high cost of certification. We are happy to certify if the high cost we anticipate is paid in advance by the Authority.

E) Environmental, Community, and Growth Management Impacts ET3 Draft Environmental Impact Statement (DEIS)

Introduction

The environmental impact of ET3 is less than 1/50th the impact of HSR. We request a waiver of any Environmental Impact Statement (EIS) process due to the many obvious environmental advantages offered by ET3. Any EIS (or ISO 14000 certification) cost shall be borne by the Authority requiring the EIS.

Noise And Vibration Assessment

Vehicle: Electric linear motor powered, High Temperature Superconductive Maglev (Mesnner effect using Nd PM guide-way, and melt-textured YBCO bulk super conductive material vehicles. The vehicles accommodate 4 to 6 depending on arrangement, and can accommodate 900lbs (400kg) of cargo, the gross vehicle weight is not to exceed 1200lbs. (550kg) This is less than 1% of the weight of a typical HSR Train.

Guide-way: The guide-way consists of two Ultra-light Weight ultra high strength concrete tubes approximately 5' (1.5m) in diameter. The two tubes are joined together one above the other with shear connection to form an ultra-rigid figure-8 beam structure. The entire guideway structure is elevated on concrete pier type foundations, the standard foundation pad is 3'X5' (1mX2m), and the support structures range from 8' to 20' (2.5m to 6m) high. The standard span will range from 50' to 100' (15m to 30m), with 82' (25m) the preferred span. An alternate structure for the pads (at extra cost) includes a 3" (75mm) deep recess to retain storm water. Holes through the pad to slowly admit storm water to the earth under the pad. The circular section less than 6' (2m) wide does not concentrate or inhibit natural rain fall.

Operation: The guideway is evacuated to the sub-Torr range at all times that vehicles will be operating in the tube guideway. Sound cannot be transmitted in a vacuum. Also, the path of the vehicles is fully controlled, and it is impossible for insects, birds, animals, or people to be in conflict with the path of the vehicles. The total dead load per span is less than 17tons, or less than 5% of the load of typical HSR elevated structure. Due to the depth of the beam, and the ultra-light loads, the deflections, and vibrations will be virtually undetectable.



It is anticipated that the amplitude of noise and vibration will be substantially less than one-hundredth of typical HSR systems. If power supply is self generated, there will be localized noise at the portal associated with the operation of a power generator, this will also occur during power outage, for back-up power production.

Energy (propellant) requirements

The energy and power requirements are the lowest of any form of transportation for distances over 10 miles (16km) or so. The energy use per passenger is substantially less than walking. The reasons are: light weight vehicles and elimination of most resistance and friction normally associated with travel through the atmosphere. A satellite will orbit the earth for decades, until it enters the atmosphere, and then in less than an hour the speed will decrease to zero. The energy required to maintain the vacuum in the ET3 system is less than 1% of the energy normal vehicles use to continuously push air out of the way for normal travel. Since the ET3 vehicles weigh less than 1% of the weight of a train, the power required for acceleration is much less. Once the ET3 vehicles reach top speed, they coast – using no additional energy, so most of the guideway does not need significant power supply. Much of the electrical energy used to accelerate the vehicles can be recovered when the vehicles slow down to reach the destination.

Air Quality Impact Assessment

Since ET3 uses electrical energy, and the energy use per passenger is less than 1% of the use of an electric train at the same speed, it is anticipated that ET3 will not have any measurable impact on the air quality, other than a positive effect of reducing automobile, train, and aircraft trips along with the large amount of pollutants they emit.

For comparison

Electric HSR typically require 12mW of power to accelerate and maintain top speed. ET3 only uses 0.5mW average power during acceleration; it takes less than 20 seconds to reach 350mph, and the same time to stop. There is an energy use overhead for ET3 to maintain the vacuum in the tubes, and to recharge the HVAC equipment, etc. The total energy use is less than 2% of typical HSR systems on a per passenger basis.

The biggest air-quality concern of the ET3 proposal is the impact of possible food cooking at portal locations – this has not been fully investigated, but is anticipated to be no different from the other proposals except that it is likely that more people will be using the facilities.

Electro-magnetic fields

Since the power requirements are less than 1/12, and the maglev suspension system less than 1/16, the field intensity will be reduced accordingly compared to other electric trains, and maglev systems. Also, the rapidly changing fields normally associated with exposure risk are only present during acceleration and deceleration, or less than 10% of the trip time, compared with 90% of the trip time for typical HSR.

Visual impacts

The visual impact of two 5' (1.5m) diameter tubes elevated above the ground is considerable. The sides of the guideway structure intend to be fully exploited for advertising use. While many may consider this objectionable, the benefit is that preliminary estimates indicate that the advertising income, (if the market is large enough to support it without saturation) can partially or fully pay the cost of the guideway without public money being spent. In environmentally sensitive areas, and in areas where the local public votes to bear the cost of construction, no advertising will be used, and the guideway structures will be camouflaged to blend in with the environment. The cost of underground construction is more than 3 times the cost of elevated structure, but has no visual impact in areas where visual impact is of much greater importance than cost. Note that typical underground ET3 is still less than 1/4th the cost of typical above ground HSR.

Job and Employment Opportunities

It will take between 100 and 200 skilled workers 3 years to build 100 miles of ET3 system. Operation and continual expansion will retain a high percentage of the job count. Note that this is a small



fraction of the jobs said to be created by HSR. Many existing industries already produce components for ET3, and employment in these many industries will increase with ET3 implementation. We believe it best to use as much local industry and labor as is capable of meeting the standards of quality required for safe and efficient operation. The very low construction and operating cost of ET3 will produce high return on investment (ROI) and greatly stimulate the economies where it is implemented, creating many more productive jobs without taking tax money.

By contrast all HSR investments have proven to produce highly negative ROI. In fact over 95% of the construction cost of HSR systems must be subsidized by tax payers. HSR advocates say the jobs created by HSR are high paying jobs (typical estimates indicate double the average pay). If a typical tax payer pays 35% tax, every HSR job created will soak up the tax revenue from 5 or 6 productive jobs. Every HSR job created will be a drain on the economy, and divert tax money away from important government functions such as schools, police, and fire protection.

Economic impacts

Other than the job creation, ET3 will have many favorable economic benefits that always come from transportation advances. There will be a minority of businesses that may eventually experience negative impacts, (for example locomotive producers). Increased development, increased land values, and access to expanded markets are just a few of the many economic benefits of ET3. When expanded to the nation, and networked for seamless point to point use, ET3 has the potential to completely eliminate reliance on oil imports; and more than double the standard of living (just like the last 3 quantum leap transportation advances). This places ET3 on the list of the most valuable investments that can be made.

Contamination Impacts

ET3 capsules carry no fuel, and the only liquid needed for operation is non-ozone-depleting refrigeration liquids that become gas in the unlikely event of leakage. All refrigeration systems are designed to minimize the opportunity of leaks, and if a capsule cooling system should leak, the materials are not considered an environmental risk, although the freezing potential may result in moderate risk to occupants, as with any refrigeration system materials. The amount of coolant material need per capsule is anticipated to be less than 8 lbs. The capsules have no lubrication needs, although one design embodiment specifies a small amount of vegetable-based hydraulic fluid (less than 1lb per capsule). It is also important to consider that ET3 chance of derailment is virtually zero, since the guideway is full constrained. In the unlikely event that cargo contaminants are released from a capsule, the tube guideway structure provides a secondary containment structure.

If power supply is self generated, there will be some localized risk of fuel spillage near the portal locations if the energy source used is diesel.

Compared to typical HSR, the contamination rate of ET3 should prove 2 or 3 orders of magnitude less.

Right-Of-Way Impacts

To minimize cost and system complexity, the preferred ET3 capsule design specifies a maglev system that is not articulated, and with a small levitation gap. Tight curves take up normal suspension gap due to the zero-cant bank angle of the capsules. As in any transportation system, minimum curve radius is the main constraint on ET3 speed potential. To preserve the high-speed potential of ET3 infrastructure, and keep cost low, the minimum curve radii is specified at 2000 feet (600m). There are curves on many existing ROW alignments where a minimum radius of 2000ft (600m) would require additional ROW. On existing ROW it is required of the authority to acquire additional above ground or underground ROW to allow increasing the radii of the all curves to a minimum of 2000ft (600m). This will allow a maximum speed on the curve of 170mph (270km/h) without increasing the suspension gap limits. Since the bank angle would be limited by suspension considerations; the use of a 1000 foot (300m) radius would cut the curve speed to 60mph (100km/h) and double the magnet cost in the curve.

Using a 500' (150m) minimum radius would limit speed to about 45mph (70km/h), and triple the magnet cost in the curve. Also there will be a higher cost associated with the acceleration and deceleration equipment needed on both sides of low radius curves.

Permits



We are not experts, or even knowledgeable in the intricacies permitting (especially in other countries) and must rely on the authority staff to provide, and expedite (or waive) permitting of our proposal.

Environmental Compliance

We are not aware of any adverse impacts of ET3 that would require mitigation. Since ET3 will not impact drainage and storm water the way HSR would, are proposal requires the mitigation credit ET3 earns for not creating impervious surface that is already assumed to be in place along much of the ROW to be credited to et3.com, in the event overlooked mitigation is needed elsewhere, or for a potential revenue source of sale of the credits to 3rd parties who may need them.

Transportation planning

We request that future highway planning projects plan ahead and increase the minimum design radii and spiral lengths of curves to a minimum of 1000ft (300m) lengths, and 9000 ft (2.8km) radius in an effort to preserve the ability to maximize the ROW use for eventual expansion of 370mph (600km/h) design speed (local use) ET3 HSGTS. Growth management of ET3 will be appropriately planned in accordance with local, regional, state, federal, and even UN plans

F) Financial Proposal

Consistent with the RFP, et3.com Inc. will identify sources of private financing that have the potential to offset some or all of the need for public funding. With the Authorities assistance we will be able to construct ET3 using a combination of existing funding, and private investment, without government funding, or issuing government bonds.

The Authority is to provide exclusive unimpeded use of the ROW, and the full unimpeded and exclusive right to advertise along the both sides of the guide-way as it is built, and during the 100 year operating life. In addition the Authority shall wave all surety bond requirements, and assume the liability exposure of construction and operation (or pay the cost of the bond, and insurance). Also the Authority shall grant a first right of refusal to extend the ET3 network to all cities over 50,000 population. Additional concessions of the Authority are: ROW engineering documentation, full environmental mitigation, credit for the reduced environmental impact verses standard at-grade high-speed-rail; and to provide barrier protection from all vehicular road traffic.

The guide-way cost is estimated at 5 million per mile, and is to be paid in part by selling exclusive advertising rights on each 82' (25m) section to any willing buyer, and co-development of ancillary uses, and land appreciation agreements with land owners whose property value is favorably impacted. One way private funding can occur is to sell each of the segments for about \$80,000 (advertising options extra). In many nations this cost is competitive with billboards on high use corridors. The maintenance costs shall be consolidated and assessed to those holding the exclusive advertising rights of each section. The choice of section location may be conducted by lottery, or first come-first serve. The total guide-way capital cost will be \$500M / 100 miles (160km). At a production capacity of 9/day it will take less than 30 months to build them all. It will take 36 molds to accomplish this at an initial upfront cost of around \$20M . Accelerated construction schedules will increase the generic cost estimate. Use of existing production capacity could reduce it.

The capsules (or "hover stock") capital price is estimated at \$48,000 per vehicle (advertising options extra), and the sale of advertising rights within the vehicles will cover capital, energy, personal, replacement, and maintenance costs. 134 are needed for initial operation to provide full portal capacity with reserve and spares. One tool can produce this number in less than two years. The total cost will be under \$5M (tooling and design cost included).

The portal sale price is estimated at \$50M each (plus land cost); and shall be paid for in part by selling exclusive merchandising, marketing, and advertising privileges within the portal confines. Each airlock has a capacity of embarking twelve passengers per minute, or 700 per hour. One portal can accommodate up to 100 airlocks, each airlock at about \$5m additional cost. Additional portals (or airlocks) can be added when and where they are needed as demand grows. At maximum capacity, each tube can



accommodate capsule flow from up to 240 airlocks (over 50% reserve). Capsule flow feeds into the tubes through capillary tubes. Freight service can provide revenue during non peak times. Private portals may be added to move freight, or passengers, this will provide additional revenue, and utilize capacity better.

It is recognized that state, county and regional laws and regulations may need to be modified to make this proposal possible, the Authority shall be responsible for securing needed rule and law changes. The time and expense to do this will add to the estimates of this generic proposal.

Revenue Sharing of profits is only offered to the extent that public funds are used, and until any bonds are retired. If the advertising income model using guide-way and capsule advertising and portal ancillary use, and land appreciation agreements proves sufficient to meet all capital cost, and O&M expense, then any fare collected is pure profit.

If initial capacity specified is 500 round trips accommodated per hour, for a total of 12,000 round trips / day, at \$5/rnd trip, the maximum income is \$21,600,000/year. Cargo will be sent during low demand times to maintain revenue. It is desired to increase passenger and cargo market penetration and to establish use patterns, need and market cost sensitivity, that the highest fare be used that produces a load factor of at least 70%

Taxation of business must be passed on to customers and/or investors. Taxation of ET3 will slow the rate of investment, and/or the economic benefits and economic growth and activity. The use of capital funds and price is fully shown in the accompanying spreadsheet, ET3 cost.xls

A suggested flow of investment funds is:

20% immediate, 70% straight line monthly draw, and 10% holdback due upon start of revenue service. All private investment shall accrue in an escrow account and be used supply the draw account. The float of any excess funds in the private investment account in excess of the draw shall benefit the Proposer.

- 1) Infrastructure Cost -- all of the firm quote price items produce infrastructure value, the optional cost items are non-value items available at addition cost to the government, and shall not be financed by any private investments.
- 2) Environmental costs are assumed to be negative or zero with exception to portal environmental costs – which shall offset any negative cost benefiting from the guide-way mitigation credit expected.
- 3) Ongoing capital infrastructure costs shall be financed out of Fare box revenue, and be used exclusively for new portal construction, in this way, the capacity of the system will double approximately every four years. If 100% of the fare is available for the purpose.
- 4) Hoverstock is one of the lowest cost aspects of ET3, this is mostly due to the low tooling and production cost, light weight, extremely high materials utilization factor compared to HSR, and the use of mass series production methods.
- 5) Debt Service: The company et3.com Inc. will not incur any debt, all funding must be from one of two sources, the state, or private funding obtained under the combined best efforts of the Proposer and the Authority to sell: advertising rights on the guideway and support surfaces, and in the capsules; land appreciation contracts; and ancillary use contracts of portal facilities.
- 6) Operations / maintenance financing is to be paid by capsule advertising rights, failing that, a secondary source of funding is the fare box, use of fares for operating expense will reduce expansion capital availability.

To date we have no letters of credit, or offer any guaranteed financing, but we do have indications of interest from various investors with capacities in the billion dollar range.

G) Enhancements offered by ET3 to be considered in the selection process:

Speed



Being capable of achieving speeds in excess of 370 mph (600km/h) is ET3's strong point. ET3 is the only ground transportation technology proposed that offers this ability. The average speed required to make a 100 mile (160km) trip in 20 minutes excluding 2 minutes for airlock and portal time is 300mph (480km/h). To achieve this, the peak design speed for significant portions of the trip will likely need to be around 350mph (550 km/h). Alignments with a high percentage of curved guideway having a radius under 9,000 feet (2.8km) will increase trip time (and cost). Increased speed will be developed and made available at the lowest additional cost

Maximum Portal Locations and Routes

It takes about one mile for an ET3 capsule to reach 350mph (550km/h), or to normally stop (emergency stops require about 1000 feet (300m)). Therefore the closest switch spacing for ET3 is dictated by the acceleration and deceleration distance required according to the design speed of the system.

Technology

All elements of our ET3 technology are commercially available and ready to deploy. Since ET3 is not a rail system, it meets the requirements of the FRA (there are no rules at this time for Maglev – so technically ET3 meets the requirements since it violates no rules). If the authority desires, we will either assist the authority by proposing rules, and or request to make the ROW a private amusement park – the longest one in the world, with at least 2 entrance gates, one at each end. The ET3 “hover- coaster” will meet or exceed all amusement park ride safety standards. The ET3 “hover-coaster” will conform to the same route, performance, ride quality standards, and technical specifications as our transport system proposal.

The Capability of our team is enhanced by global diversification, and current momentum and lead in transportation technology relating to our proposal, several new licensees are joining our consortium every month.

Our Bonding capacity is not established, and the bonding is not a typical requirement our Key partners are acquainted with. If our proposal is selected, the Authority will become our most significant partner. We believe the Authority has the required bonding capacity, and or the ability to waive it. We have far more at stake in this project than most other HSGTS Proposers. Our entire investment of years of concentrated effort, thousands of research hours, and the success of et3.com Inc. will hinge on successful first project completion when our proposal is selected. Our proposal and approach clearly represents the lowest risk to the taxpayer.

The financial capability to carry out this project is the biggest barrier for all technologies, if this were not the case, no one would be asking for money, they would all be bidding to pay the authority for the use of the ROW, and the authority could hold a simple auction. Our financial Capability is meager, yet we have succeeded in attracting significant partners to join our proposal.

Financing Plan

Many RFPs indicate that commodity item suppliers do not have to be listed on the team; they may be added at any time. Only key or critical item suppliers and consultants must be included in the proposal to carry weight in the proposal. Money the most available manufactured commodity in the world, it is available from countless sources in many forms. Yet, the financing is one area our proposal is deficient in. The attached letters show that technical and financial viability are only two of the three elements that investors need. The third critical element is political viability of government approval, permitting, and endorsement. We believe that the Authorities preference to our ET3 proposal will be the critical element in attracting sufficient financial capability to carry out the ET3 proposal without significant public investment.

H) Contract document and Proposed Legislation.

We are not experts in the law, nor are any of our partners; we rely on the Authority to work with us to develop any and all appropriate legislation changes. Since our proposal, technology, and plan is significantly different than typical transportation infrastructure implementation, we suggest that a session be scheduled to work out various solutions of the contract, and legal requests. Since ET3 has a benefit to



cost ratio more than ten times higher than HSR, we believe any legislative changes sought for the benefit of facilitating ET3 will be better received than changes that HSR advocates may ask for.

I) Partial List of documents available to licensees on request:

DGN files: typical ET3 sections.dgn, Station.dgn, ET3 V ELHSR 2, ET3 mopod1.dgn, 6place Capsule.dgn, 4place Capsule.dgn, cargo capsule.dgn

MS Word document files: US Urban Transport Safety.doc, US Public Transport.doc, Transit stats that indicate speed importance.doc, Sustainable Safe Transport.doc, Select PRT Theory ed Anderson.doc, Resume D Oster.doc, ET3 Drainage.doc, ET3 v HSR safety.doc, **ET3GenericProposal2011j.doc (this document)**, ET3 no drain.doc, ET3 drainage summary.doc, ET3 Appendix R.doc, ET3 Appendix Q.doc, ET3 acceleration 2, Et3dotcominc Florida profit.doc, ET3 license agreement 2004.doc, Druguse policy.doc

Ms Excel spreadsheet files: ET3 v TR.xls, ET3 curve acceleration ls.xls, ET3 cost est 1500mm.xls,

Misc files: ET3 V ELHSR 2.jpg, ET3 Patent 5,950,543.pdf,

Folders: TranEnergy20 (transportation energy stats for reference)

The ET3 Team: China HTSM tech (folder with letters, video, photos), Ductal info and comit(folder with letters), GRINM(folder with letters), NJTU(folder with letters), USMMM.gif

Proof of busin (contains state documents for et3.com Inc.)

ET3 patent image files

ET3 Apend H (Contains detailed notes relating to all aspects of ET3 for chapters 1 to 13 of Apend H)
13 word files – (same format as those supplied with the RFP)