Florida Renewable Energy Technologies
Grant Program Application

RENEWABLE ENERGY PROJECTS
PART I – COVER LETTER

SKY TRAIN CORPORATION
Transit Consultants and Engineers

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To: Florida Department of Environmental Protection
Renewable Energy Projects
2600 Blair Stone Road, Room 649 (MS-19)
Tallahassee, FL 3299-2400

October 17, 2007

Re: Grant Program Application for the **Next Generation Solar Powered Monorail**

Dear Reader,

Sky Train Corporation was incorporated in the State of Florida on October 9, 1995 as a private for profit Corporation, licensed in 1997 in Florida as EB-0007852, an engineering firm, also approved by the Florida Department of Transportation (FDOT) for conducting transit projects.

The staff of STC brings professional qualifications and career experience in the field of business management and steel-wheel railroad and transit engineering and operations. Together the staff and 23 stockholders have a patent of (3) three Overhead-Suspended Light Rail (OSLR) transit systems: STC 100 that is modeled and presented to many transportation engineers and shown by the news media, such as Fox 13 movie clip with highly positive reactions. STC is ready to advance to the specific designing and constructing such a system on the 74 acres of Florida's Museum Of Science and Industry, $2 million had been included in the last Florida budget to be repeated this session with an expected $8 million follow-on.

The STC 300 is designed to have the Lowest-cost Structure and Energy Consumption reduced by 40% to 70% compared to existing rail type systems (vendor letter on file). System improvements like better switches, crossover; disclosed to the patent office in 2003, need to be funded.

Wide exposure to transportation design and automation allowed the discovery of "DOUBLE SUPERELEVATION" using controlled centrifugal force. This allows the elimination of a *tilt trains complex mechanism* producing limits of 15 degrees, compared to STC's improvement of 32 degrees. This translates into exceeding speeds of in-the-street rail by 300%, and that of tilt trains up to .33 %. An example from "Florida's High Speed Rail Interstate 4 Corridor Study": Tilt Trains, because of a curving environment are limited to a top speed to 160 mph, whereas Sky Train's limit would be 212 mph! STC's "Double Superelevation" is a free byproduct it increases passenger comfort and component life. Closer vertical proximity of a suspended system to intermodal connections reduces transfer time and station costs, other features make this a "natures fury" solution of the 21st century. This focus on energy consumption is shown in STC's computerized model demonstrating its low use through regenerative stopping. Also, the simple structure of STC 300 is designed for automated off-site construction, attaining the lowest costs.

We respectfully submit for your approval,

Karl W. Guenther – CEO – Sky Train Corporation

PROPOSAL INFORMATION					
Proposal Title:	**Next Generation Solar Powered Monorail**				
Proposal Area(s): (check all that apply)	☒ Hydrogen ☐ Biomass ☒ Solar	☐ Geothermal ☐ Wind ☐ Ocean	☐ Waste Heat ☐ Hydroelectric ☒ Other		
Project Type:	☒ Demonstration Project ☐ Commercialization Project ☒ Research Project ☒ Development Project				
Project Location:	The Museum of Science and Industry Tampa, FL				
Proposer (Organization):	Sky Train Corporation (STC)				
Proposer FEID No:	59-3396667				

TECHNICAL CONTACT INFORMATION					
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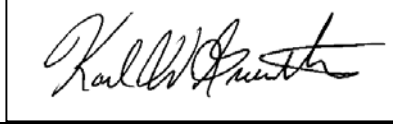
FUNDING REQUEST AND COST SHARE	
1. Total Amount of Grant Funds Requested: $7,500,000 in 3 years	$2,500,000
2. Total Cost Share (Provided by applicant and project partners):	$ 833,000
3. Total Project Cost (Add amounts in 1 and 2):	$3,333,000
4. Cost Share Percentage (Divide amount in 2 by amount in 3):	25%

CERTIFYING OFFICIAL	
Certifying Official's Signature	
Certifying Official's Name (printed):	Karl W. Guenther
Title:	Chief Operating Officer
Organization:	Sky Train Corporation

PART II – PROJECT NARRATIVE**;**

Section I: Project Summary/Abstract: This is a request from Sky Train Corporation; Primary Investigator, in collaboration with Tampa's Museum 0f Science and Industry, Florida's Solar Energy Center, University of South Florida, and Florida Atlantic University, and other Partners for a grant of $7.5 million within a three year period, for a clean cities exhibition embracing the "Next Generation Solar Powered Monorail". It will encompass the Design Phase, and start of construction. We estimate being able to design, vendor select and price the elevated track, and fund the monorail car construction. The project will implement an innovative approach for integrating 1) Smart Growth statewide transportation, 2) renewable energy 3) regenerative braking into A) a new design of onboard energy storage B) a new design of stationary energy transmission C) that allows reduced size of energy conductors that better utilize a Solar Collector and its storage system 4) environmental planning/programs/transportation bills 5) the exhibition at a major Florida-based science museum seeks to fill a critical information gap for decision makers, suggesting optimal investment in clean energy transportation technologies to help achieve clean-air quality Regional Greenhouse Gas Initiative (RGGI) and Transit Oriented Development (TOD) goals.

Sky Train Corporation wishes to work collaboratively to encourage smart policy investments. Funding is requested for the Museum of Science and Industry (MOSI, a 501 C3 Organization), to create a Solar Powered life-size OUTREACH and ANALYSIS monorail exhibit within the science museum environment; which includes an "interactive display" for educational purposes to demonstrate power demand and energy of solar arrays, long-term battery storage, short-term flywheel or capacitor energy storage, powering a robust steel wheel monorail in public service. We will include Fuel Cell technology if the manufacturers donate research.

This 7/8-mile long ride-able display will be a research and teaching aid to practitioners and the public alike, demonstrating renewable energy as it applies to public transportation. It will enhance public and professional interest in the national mission of developing the first major improvement by rearrangement of the steel wheel rail system in 50 years: MOSI, Sky Train's staff, Clean Cities Coalitions, and major Florida universities, have partnered to make this happen. We will showcase state-of-the-art technology in reducing greenhouse gas emissions with improvements effecting DOE, DOT, EPA, and NASA objectives; it will serve as a test bed to demonstrate solutions to Climate Change.

The STC monorail is not only a people mover but also accommodates the needs of Freight Container Ports, where pollution is of great concern. We expect this important exhibit to gain exposure to over one million present visitors per year. The monorail will become a permanent fixture that will expand its route to USF, Busch Gardens, and other locations as outlined in the Hillsborough County long range Transportation Plan.

The solar arrays, evaluated by the Florida Solar Energy Center are already installed at MOSI; modifications will be made with their involvement that are part of this proposal. They designed the nearby solar array at USF. Incorporation of regenerative braking technology into the design demonstrates recovery of kinetic energy; saving 40% in energy demand. Also, this is a display of a new suspended monorail technology, identified and funded in part by Florida's Technological Research and Development Authority (TRDA) and design input of NASA's SATOP design program to be an energy efficient, multipurpose monorail to carry passengers and freight. Timing of this request is synchronized with the proposed expansion of MOSI. MOSI is known as the "Largest Interactive Children's Museum in the USA." The educational directives have formed a foundation for which media (WEDU; PBS) can interplay disseminating to a regional and national audience. (A NSF grant to create a PBS Documentary).

Section II: Project Background:

The Primary Investigator and CEO of Sky Train had early training in aviation, always interested and involved in applications of transportation and automation. Education in Engineering Physics, Industrial Engineering, Value Engineering, licensed as an Instructor in the application of Motion Time Standards having his own company in design and supply of military certified work.

Sky Train Corporation because of its location and skills started evaluating technology and energy in a pristine marina environment..

After a critical review with some noteworthy Universities it reorganized from a, for profit 'Design and Build' into a 'Research' Company.

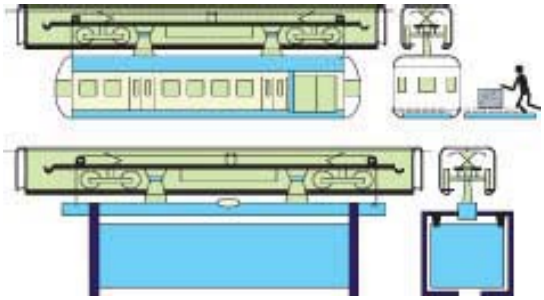
A lifetime spent in learning and teaching about transportation and collaboration helped define what is also accepted by the public and many of its representatives: That Energy is a limited entity and often the generation of usable forms and its destruction avoided; implementing means to reusable forms should be encouraged.

His co-patent partner and Sky Train's CEO worked 11 years together to quantify by models, computer simulations, and physical testing any questionable innovations defining limits.

A 12-year collaborative effort resulted in the construction of a computerized 1/6th-operating model demonstrated at FDOT's Transplex 2003 event in Orlando shown in the lobby of FDOT District 4 lobby.

This system has traveled the state from Fort Lauderdale to the Senate Capital Rotunda in Tallahassee Florida, riding the public and shown on Television news clips.

It will serve as an applicable technology reducing greenhouse gas emissions with improvements effecting DOE, DOT and NASA as a test bed to demonstrate solutions to Climate Change, accommodating Natures and Terrorists Fury and the needs of Freight Container Ports see picture on the left.



Combination car adapted for automated small container loading on the top left. The vehicle has a movable floor to become a wall allowing automated small freight loading for off peak times gaining extra revenue removing trucks from the roads.
Another major development in freight container movement - the grapple is substituted for the car shown above and reduces the amount of trucks; each doing the wear equivalent of 300 auto's.

We have been listed some 6 times on The Monorail Society's web site with *Over 5,100 members, in 83 countries, on 6 continents gaining world publicity*. STC has been peer-reviewed. http://www.skytraincorp.com/rttg1.htm by the second national Science Foundation in circa 1999. Short-listed for use at Orlando International Airport's expansion plans prior to 9-11, Grand Canyon initiatives and other publications always saw STC in a positive light. The second page of the Brochure listed below has links of TV clips that have created much publicity.
In order to detail our technology we have; using the talents of our representative in India, Thailand and South Vietnam creating a brochure available on the web at www.skytraincorp.com/STC Brochure.pdf or copy www.skytraincorp.com/STC%20Brochure.pdf into a browser for added energy information detail.

Section III: Project Objectives

Objective 1: Collaboration. Florida's interest for the new Monorail "icon" can showcase to the nation and world a leading element for sustainable cities; Smart Growth Transportation. The system is propelled by a partnership with Universities conducting transportation path evaluation and vehicle design. Sky Train consultants/designers will participate with a three Florida-based University Consortium, including the Florida Solar Energy Center. We also will be piggybacking an eventual $2,000,000 request in Florida's budget for Tampa's Museum of Science and Industry complex. MOSI had one million visitors last year. These statewide partnerships will support and stimulate state economies. Collaboration will give us input that satisfies the needs of various locations within the state. The present concern is to continue 3 patents that are pending and add others not yet disclosed like container handling which requires continuing funds. **(Month 1 to 3)**

Objective 2: Review and standardization with associates of identified methods will give the best service at reduced cost, allowing the widest use of energy sources and supplies including solar, fuel cells, and new battery technology. Sky Train works with "off the shelf components". We will evaluate tradeoffs between upgrading standard components to newer, stronger, lighter ones becoming more futuristic; saving energy as a return on initial investment. **(Month 3 to 9)**

Objective 3: Design and construction for a full size rearranged rail car technology, which has been initially demonstrated in a $1/6^{th}$ scale computerized vehicle. With our Hybrid vehicle, we plan to gain Energy Star Certification. **(Month 4 to 12)**

Objective 4. Design for construction of a full size Charging Station that "flash charges" the vehicle; generally at stations eliminating power feed lines (catenaries and insulator standoffs cost around $2 million per mile) that dissipate energy. Also, we will target reducing the cost of electrical Sub-Stations each costing around $400,000. **(Month 5 to 12)**

Objective 5: Operational Testing. To combine the vehicle and charging station, and operate the pair on standard track gathering life cycle data. We propose using existing automation software reducing operating cost by 40%. **(Conduct next year for 2 years)**

Objective 6: To design an easily detachable, lightweight composite, vehicle for passengers. Defining appropriate features for the system. This will be done through accepted methods of Value Engineering and Motion Studies including ADA needs. (Also a SATOP design with NASA)

Objective 7: Based on additional funding, integration of automatic freight loading as an added revenue source. This item **has not been funded.**

Objective 8: Based on additional funding, that we focus on the use of this suspended system to serve Sea and Airports resulting in cost savings and abatement of pollution this could include shipping container handling. This item **has not been funded** thus far.

Objective 9: Structure design is based on the previous research: weight, effect of accelerations, emergency stopping and side forces on curves. We will use data gained prior to Objective 6 to start the structure design based on wind loads and other cumulative factors. This will assure structure, safety through finite elemental analyses.

OBJECTIVE SUMMARY: This schedule will absorb the first $2,500,000 of three issued and assess overall system cost. Matches are from MOSI using land for the system of $625,000; STC overhead $207,000; and $2,000,000 on Florida's Budget not included in the calculation. To provide information and tools to enhance education produce energy literate citizens and lawmakers/policy-makers with emphasis on reduction of automobile traffic through use of public OSLR (Overhead Suspension Light Rail) transportation. This Sky Train will apply to Destiny on 41,000 acres and other Livable Smart Growth Communities that are in the conceptual stage.

Section IV: Project Description

Code: Quantity/Class of person (2/C1=$50/ hour, C2=$40 & C3=$30) Time on job in weeks (i.e.=1.5w), Note Sky Train Corp. (STC), travel & lodging (T&L)

Task 1: Mobilization: From out of the identified individuals add 4 (2/C1+C2 &C3) personnel and consummate a joint venture contract with Doug Tobin PE Airport Master planner in 2 weeks hire two for design and manage project (13.2w2C1, +11wC1 hire one 11wC3)

- Create Master plan of action STC personnel (2w3C1)
- Continue advancing patents already approved and pending in the US and other countries, In 2002 patents in Europe's 24 Countries where seen as important. The next patent after the US will be pursued in India, Russia, Taiwan and Oil exporting countries. This group is focusing on many tens of miles of elevated systems for each country where we are the best fit (30wC1)
- Requirements are also cash flow to the patenting Agency of $1,750 every month
- Meet with MOSI and Architects regarding initial route and permitting (.4w2C1) Arch charge
- Travel to visit 26 identified vendors in Czechoslovakia, England and India to establish a cost basis for establishing a base cost for the system. (3w3C1) T&L
- Compile database (3w3Ci+1C3)
- Travel to Alcoa for material evaluation (.6w2C1) T&L Collaboration; visit the Florida Solar Energy Center (FSEC) to discuss best use and modification to add a transverter and battery to the existing solar arrays at MOSI and USF. To discuss best operating voltages and current draws. Overall our staff (2w2C1) T&L, FSEC charge (3wC1)
- If test track is built at Solar Energy Center (10wC1 & C3)
- Select Rail track supplier and also Construction company (.5w2C1)
- Invite political display or Legislative presentations (1wC1)
- Meeting at MOSI or USF boardroom with University, FSEC, MOSI, ARC personnel 2 days 8(.4wC1) T&L for 4

Task 2: Review and standardization of project as to selection criteria. Example; minimum engineering cost; 1- use standard subway type of technology using 700vdc or 2- use and cost a parallel system to the patent pending concept of charging at stations.

- Visit with two additional sites Funded by Investors; Destiny and UF in Florida, possibly Watkins Company in Illinois as to their vision, Destiny would like the option of charging at stations using <u>any type of energy</u> such as solar, fuel cells or the grid. (2w2C1)
- Collaborate with the Senior Scientist Dan Simpson - Chief Research Scientist collaborating since 1995 now at UTC's Energy Center. Dan has always been on the leading edge of energy evolution and they are building a test track for cars at their facility. Our preference is to build it at the Solar Energy Center or other location in Florida. Collaboration will be on a continuous basis (15w2C1) for each year of 3 years.
- Meeting at University of Tennessee Chattanooga (UTC) Advanced Technologies for Transportation Research Program (ATTRP) (.4w3C1) travel & lodging

Task 3a: Design for Construction for a full size rearranged rail vehicle:

- Design chassis to hold components mechanically at three vendors 3(1.2wC1) T&L

- Design chassis to hold components electrically at three vendors 3(1.2wC1) T&L
- Meeting at University of Tennessee Chattanooga (UTC) Advanced Technologies for Transportation Research Program (ATTRP) (.4w3C1) travel & lodging
- Mid year team meeting at MOSI or USF Boardroom with University, FSEC, MOSI, Arc personnel 2 days 8(.2wC1) T&L for 4

Task 3b: Construct full size rearranged rail vehicle:

- Negotiate with Alcoa or vendor for material out of Alloy or Composites or both let Purchase Order (1wC1 & C2) T&L Legal costs Down Payment of $25,000
- Let purchase order for down payment of $100,000
- Visit Vendors and material suppliers for quality audits 2(.4wC1 & C2) times 4 T&L
- Final payment of $200,000

Task 4a: Design for Construction for a full size power rail unit with fixtures: $120,000

- Design charging station to hold components mechanically - three vendors 3(1.2wC1) T&L
- Design charging station to hold electric components - three vendors 3(1.2wC1) T&L
- Inspect vehicle for performance and acceptance, accept 3(.4wC!) T&L Pay vehicle plus Inbound freight

Task 4b: Construction for a full size Charging vehicle terminal (in place of Sub Station@ $300,000) fixture qty 2: $50,000

- Meeting at University of Tennessee Chattanooga (UTC) a (501-C3 organization) Advanced Technologies for Transportation Research Program (ATTRP) (.4w3C1) T&L
- Design enclosure and remote contact device to hold components mechanically at 2 vendors 2(1.2wC1) T&L
- Design contact components over the rails to hold electrically at two vendors 2(1.2wC1) T&L Progress payment of 25,000 each
- Visit with electrical components manufacturers to gain final approval (1.2wC1)
- Operated a final test at vehicle to show charging (1.4w*2C1+2C2,C3) pay final bills

Task 5: Operational Testing; to combine the vehicle and charging station, and operate the pair on standard track gathering life cycle data. **This starts second year.**

- Locate site for test track (2wC1) Florida Solar Energy Center is our pick
- Customer selection for construction of test track components (3wC1) 4T&L
- Purchase, sequence for construction at site relocate to site (5wC1)
- Move Assembled vehicle to site with charging station and connect electronics to power plant (3wC1) T&L Payment to System operator expected for 1.5 year operation
- Meeting at Solar Energy or other second choice location with University, FSEC, MOSI, Arc personnel 2 days 12(.4wC1,2C2,C3) T&L for 12 **Grand opening and news announcement of operation in test mode, an International event!**
- Run in test until elevated structure is built for relocation.

Task 6: To design an easily detachable, lightweight composite, vehicle for passengers. Defining appropriate features for the system.

- Get quotes from Clearwater Disney type vehicles manufacturer AAR. Get other competitive quotes if too high over our comparative costs. Attempt to follow Made in USA mandates (1wC1) T&L
- Work with Universities, MOSI at potential locations and Investor's planners as to expected visual and seating capacities. USF and CUTR adjacent to MOSI that is located on the long-range plans for Hillsborough could be involved to do a student semester design project as they have done in the past.
- We have been involved with the inns and outs of composites and would develop a design based on a presentation to the student design group; it would be a very popular event.
- We have gone through SATOP NASA Design iteration and plan to do at least two more. We qualify for one every six months to verify designs in parallel to the manufacturers Finite Evaluation of the vehicle (4C1.C2)
- Let orders after assurance that funds are available for the structure for two or more vehicles based on need of other locations per quoted numbers (.5C2)
- Receive at MOSI and connect to vehicle in Structure

Task 7: Based on additional funding, integration of automatic freight loading as an added revenue source. This item has not been funded.

- .N/A

Task 8: Based on additional funding, integration of automatic freight loading as an added revenue source. This item has not been funded.

- N/A

Task 9: Structure design; based on the previous research: weight, effect of accelerations, emergency stopping and side forces on curves. We will use data gained prior Objective 6

- Gather parameters required to satisfy design criteria for the structure and its ultimate location.
- Design using a collaborative effort to input the best ideas as to structure and tooling for construction of the structure that will be continuously reused as new locations are populated
- Gain competitive quotes and deliveries of manufacturers, steel erectors and riggers for assembly. After commitment of funds implement contracts. Deliver and erect on site
- Grand opening start of system testing in this new location.

No.	Task/Activity Description	Start	Complete	Deliverables/ Outputs	Deliverable/ Output Due Dates
1	Mobilize Collaborate	Month 1	Month 3	Defined goals	Within month 4
2	Compare technology	Month 3	Month 9	Bill of materials	At month 10
3	Rail vehicle	Month 4	Month 12	Drawings building	Month 12 complete
4	Charging Stations	Month 5	Month 12	Drawings Build	Month 12 test
5	Operation testing	Month 13	Continues	Gain cycle info	Semi-annual review

Section V; Review Criteria Discussion

Economic Development: This "Planned Community" or Transit Oriented Development (TOD) project offers a means of transportation for intra-city and inter-city travel with significant lower consumption of energy compared to current transportation systems. The monorail will accommodate an expandable system to connect locations such as the proposed SIS Intermodal center(s), the USF campus, VA hospital, Busch Gardens, the Intermodal Bus Terminal and following the present Hillsborough County "Long Range Plan". This would be the most viable system to connect across bridges to the cities of St Petersburg and Clearwater; both are located in Florida's Pinellas County, containing the state's densest population. The overhead suspension provides safety and speed and complete grade separation not conflicting with other modes of transportation or existing land uses on the ground below. As the State of Florida continues to grow, the stress on the state's current transportation system will correspondingly grow. Therefore, the state needs to explore and promote alternative mass-transportation. The project will promote Economic Development by constructing routes to vital areas, at first, emphasizing interaction from the museum to USF, where parking facilities will be shared and students will have better access to MOSI's learning centers and vice versa. Job creation will be increased around the route and including operation of the monorail itself. Installation of the monorail will boost the local and state construction industry commercial market, and as for the for renewable energy business, The Florida Solar Center will be involved, and will also boost Fuel Cell Tech Industries. Sky Train has conducted laboratory testing for rail car tilt coefficients or wheel to rail adhesion, and studies the coefficient of friction for steel wheels on steel rails. We concluded a reasonable acceptance for tilt of 16 degrees.

Technical Feasibility: Sky Train has demonstrated a 1/6th Scale Model of the Sky Train Monorail to the lobby of District Four, FDOT, in Ft. Lauderdale, and also to the Public Presentations Committees evaluation committee, to the Tallahassee Senate Building Portico, in the walkway for Senators, and to the Great Explorations Children's Museum in St. Petersburg, Sky Train has also demonstrated concepts to the International Space Development Conference in Washington, D.C. 2005 and California 2006

The installation utilizes modern light rail technology and components, simply re-engineered into this overhead-suspended system. Detailed explanations have been shown for both US and foreign patents. Grants for patents have been received and accepted in confirmation of technical feasibility. The concept is simply taking the fully developed and proven technology of modern and light rail vehicles and transposing the tracks, the power supplies, the trucks and motors, automation systems and car bodies into an overhead-suspended transit system, thereby adding the advantages of overhead suspension to the proven advantages of light rail technology. This rearrangement allows doubling of super-elevation. The Sky Train innovation improves safety by removing the rails from public access and designing the structure so that the vehicle above cannot derail. **Innovation**: The Sky Train innovation derives from the new thought of incorporating modern light rail technology into an overhead-suspended mode. This must be compared to more expensive monorail systems; mostly bottom-supported, applying pneumatic rubber tires, with costly proprietary components, requiring high consumption from high rolling resistance, lower speed, precision tolerances, and short tire life.

SOLAR PANEL ENERGY TO MONORAIL Metrics: At MOSI, Panels produce 18 KW combined with University of South Florida's 20 kilowatts which equals 38 kilowatts solar power to battery/capacitor storage potential (stored energy to accelerate our system to speed, enabling a constant stream of energy stopping and starting). STC will match the motors to push a load requiring some expected 42-horse power. It takes only 4 pounds per ton to move steel wheels whereas monorails with rubber tires or buses require 40 pounds per ton for movement. The Capacitor interface can be charged in much less then a 1/2-minute as the monorail rests at a

station. STC will match the motors to push a load requiring some expected 42-horse power. It takes only 4 pounds per ton to move steel wheels whereas monorails with rubber tires or buses require 40 pounds per ton for movement. The Capacitor interface can be charged in much less then a 1/2-minute as the monorail stops at a station.

STC envisions sizes up to multi-car trains of a 40' by 8' – 10’ wide vehicle for MOSI that should weighs 20 tons, to move this load requires the force of 80 lbs for steel wheels - if it were on rubber tires it would require 800 lbs. If we use high-torque motor wheels, our vendor specifies that their rail car moving tug's use 5KW per each wheel or 4 wheels or 20KW. Since station stop to stop is only 1/2 mile, the vehicle draws power to get to speed, coasts and returns power to the storage system. Station to station time with loading will be about 3 minutes while the vehicle only draws power out of about 1/2 minute. This means that it uses power from 17% of the input cycle of the solar array; remember it gives 40% of the power used back to storage on stopping.

Production Potential and Innovative Technology: The MOSI Monorail project generates its needed power by means of two Solar Arrays which will feed into a Charging Cell called a Sub-Station. The Sub-Station "Flash Charges" the on-board capacitors on the monorail, which assures that batteries stay up to full-charge, in less than a minute. Passenger load time is 1/2 minute, so this will work well. Combined with Brake Reclamation Technology which saves 40% in energy demand, the system will operate flawlessly, especially when considering Florida's status as the Sunshine State. Also, **The Florida Solar Center,** our partners, will conduct a preliminary study on Fuel Cell sub-station potential. Sky Train has been talking with a number of Fuel Cell manufacturers to help with the design. These systems together represent substantial long-term production potential.

What is to be funded in this collaborative event is the continuation of a patent for three advancements in rearranged rail that has been funded in part by Florida's Technological Research Development Authority, assisted by them and NASA's SATOP design assistance: is, improvement in the use and re-use of energy plus the investigation into now used or specified rearranged standard components as to weight reduction based on the laws of safety, defining and circumventing perceived needs of ground based systems. INSTALLATION: The installation comprises a duct overhead in the form of an inverted "U" as a continuous viaduct with steel rails on the inner ledges and electric power supply strips mounted in the ceiling if not eliminated. Electric power will be received from the existing solar array or conventional electric supplies and controlled and distributed through a substation and control room, equipped with control circuits and instrumentation to inform the operators and on-looking visitors in the museum. Sub stations will be much smaller newly designed charging stations that are distributed at strategic points. Malfunction battery backups will allow the vehicle to operate with little interruption. The vehicles will be suspended beneath the duct. Each vehicle has a chassis riding on two trucks, utilizing the technology of modern light rail systems incorporating automation (intelligence), ie; no operators, saving substantially in operations cost.. Stations will comprise of platforms offering level transfer, with escalators or elevators for handicapped (ADA) access. An option exists to evaluate the savings using the STC200 motor wheel alternative, which also determines vehicle weight that is necessary for both the design of the structure and the propulsion requirements for the system.

SUMMARY: The monorail uses modern proven rail technology that can be automated; vehicles can carry passengers, freight or both, with level boarding for ADA accessibility, and capacity from single vehicles up to full-length trains at subway levels. Automation saves up to 40% on operating costs. The suspended car bodies swing out on curves, affording ride comfort and fast curve speeds **The proposed technology offers a massive reduction (as much as 90%) in energy consumption compared to gasoline consumption; by transferring transportation from automobile onto steel-rail monorail services, first within the city, then by extensions into intercity services. This greatly reduces CO2 emissions, consumption of energy and**

materials at source and improves the quality of life across the nation. Productivity improves because travelers are released from the risks of accident or death compared with other transportation modes, the tedium of sitting at the wheel driving, and affording shorter time in transit, while also allowing riders accurate scheduling which greatly increases ridership because journeys are no longer obstructed by street and highway congestion. Congestion has reached limits where the cost of expanding highway is beyond the financial and physical capacity of the developed communities to support it.

Energy Efficiency: The OSLR system being proposed uses existing suppliers and component designs currently on the market and already in standard service in adjacent transit systems. Negating the need to retool further saves energy. There are sixty-three individual portions of the concept that have supported applications for patent protection by reason of their innovative, energy efficient detail. The STC invention has been peer reviewed for its relation to Energy and Efficiency and Renewable Energy's Offices Mission and Programs. Ultimately this monorail brings direct benefits to energy and efficiency in different ways:

1.It demonstrates the application in a monorail of modern light rail technology, known to have the lowest energy consumption in transportation, removes many automotive miles from highways and streets, saving consumption of pneumatic tires, gasoline and driving time.
2. The MOSI site will be a publicity tool for education of technology, energy saving and creates incentives for youth to become educated in the Sciences, fitting our Nation's future needs.
3. This system is to be used to train future transportation professionals in rail and apply it to monorail technology, offering lower power consumption around 80%.
4. It removes air pollution in the streets from exhaust gases, ground pollution from worn pneumatic tires and carbon settling out from exhaust gases.
5. It removes road traffic from the streets, saving in collisions, deaths and injuries, and lost work time, as well as delays to other traffic whose path it crosses or the accident is cleared.
6. It expands the applications of modern and fully proven LRT technology, uses present transportation professionals and the associated supply industry; leading to increased revenue and workforce while reducing imported components and energy.
7. LRT technology that can move overhead, free from service interruptions over areas prone to flooding due to powerful storm or hurricane storm surge.

Fostering Awareness: With over 1 million visitors a year, and by being one of the leading museums in the Country, The Tampa ***Museum of Science and Industry*** will forge the way, with its ASTC credentials, to showcase the next generation Smart Growth monorail. As explained, this will be an interactive exhibit. The Florida Solar Center is also a national leader in energy efficient technologies. The effect upon the public is expected to be profound and life changing. Once there is commitment by the appropriate governmental authorities, nothing will stop the advancement from soon becoming a TOD Reality because the systems can be built quickly, using reusable tooling, given that, it can move quickly to a build solution.

Locations Served: This project would construct a necessary and useable Smart Growth demonstration project for a modern method of mass-transit at the Museum of Science and Industry (MOSI) Tampa, in the form of a suspended, light-rail monorail system. The route will include one station connecting to the MOSI children's building and another location 1/2 mile distant connecting a Large Hotel presently in the bidding process.

Public Integration: The Museum of Science and Industry working with State organizations, Clean Cities Coalitions, several prominent Universities, and the Florida Solar Center will educate millions citizens, politicians, students, and government on cutting edge Next-generation Transit Oriented Development. A PBS (WEDU) documentary series following this important history-making technology surrounding the exhibit at MOSI will educate countless millions more around the country. The Florida DEP could not get a better punch for its grant money.

SECTION VI; MEASURES OF SUCCESS

Month 3; Objective 1: Collaboration/ statewide partnerships. The measure of success will be noting that Vendors for parts has been selected, with consultations secured between the Florida Solar Energy Center, and the participating Universities.

Month 9; Objective 2: Measure of success will be the observation of accomplished review and standardization with associates for identified methods which yielded the best service at reduced cost, and which allowed the widest use of energy sources and supplies including solar, fuel cells, and new battery technology. Associations with cutting edge suppliers around the globe will be a measure of the attempt to obtain only the best and brightest innovations for renewable energy and energy efficiency.

Month 12; Objective 3: The measure of success will be to see accomplished the design and construction for a full size rearranged rail car technology, though manufacturing delays are possible. We hope that the 1/6th size vehicle will be on a temporary stationary exhibit at MOSI.

Month 12; Objective 4. The measure of success will be to see accomplished design for construction of a full size Charging Station that "flash charges" the vehicle; and that some station design has eliminated power feed lines (catenaries and insulator stand-offs normally costing around $2 million per mile). Also, we will have targeted reducing the overall cost of electrical Sub-Stations, saving tens of thousands of dollars.

2 years; Objective 5: Operational Testing. Observation that Sky Train has combined the vehicle and charging station, and operate the pair on standard track gathering life cycle data. We propose using existing automation software reducing operating cost by 40%.

3rd Year; Objective 6: To Observation that Sky Train has designed an easily detachable, lightweight composite vehicle for passengers. Defining appropriate features for the system. This will have been done through accepted methods of Value Engineering and Motion Studies including ADA requirements.

3rd Year; Objective 7: Success will be measured by additional funding for the integration of automatic freight loading as an added revenue source. This item **has not been funded.**

3rd Year; Objective 8: Success will be measured by additional funding for the focus on the use of this suspended system to serve Sea Ports and Airports resulting in cost savings and abatement of pollution this could include shipping container handling. This item **has not been funded** thus far.

3rd Year; Objective 9: Success will be measured by observation of structure design based on the previous research: weight, effect of accelerations, emergency stopping and side forces on curves. We will use data gained prior to Objective 6 to start the structure design based on wind loads and other cumulative factors. This will assure structure, safety through finite elemental analyses.

SECTION VII: Biographical Sketches: Phone information follows:
321-638-1443 - Bill Young, Senior Research Engineer, UCF Solar Energy Center
561-699-2579 - Panagiotis (Pete) Scarlatos PhD, Executive Director; University Consortium for Intermodal Transportation Safety and Security, FAU
813-974-5820 - Rajan Sen, PhD PE Department of Civil and Environmental Engineering, USF
203-544-9603 - Francis Knize, Director of Sales Sky Train Grant coordinator
727-939-2177 - Karl Guenther, CEO Sky Train
423-505-1001 – Dan Simpson, Chief Research Scientist in the Advanced Technologies for Transportation Research Program (ATTRP)
727-741-3569 - Hector Guevara PhD Manufacturing Energy Test Components for Rail Customers

William Young Jr. Senior Research Engineer *Photovoltaics*

Education:

B.S.E. Electrical Engineering

University of Central Florida, 1980

William Young is a Senior Research Engineer for the **Florida Solar Energy Center**. His two areas of primary emphasis are the use of solar energy in disasters and education surrounding the use of alternative fuels and alternative fuel vehicles. Mr. Young works closely with the Federal Emergency Management Agency (FEMA) and local emergency and disaster management organizations to promote the use of solar energy following a disaster. He represents the Department of Energy on a local level to promote alternative fuel technology acceptance and use.

Upon joining FSEC in 1990 from General Electric, Mr. Young's initial efforts involved the testing and evaluation of photovoltaic systems for commercial and residential buildings, as well as solar electric traffic devices for the Florida Department of Transportation. Based on this research, he developed and conducted educational programs to inform industry, government officials and the general public about the use of photovoltaics as a renewable energy source. Following Hurricane Andrew in 1992, Mr. Young's research expanded to include the application of solar energy in disaster response, recovery and mitigation. His current focus is on the creation of functional, disaster-resistant buildings using renewables. He has written over 30 publications on this topic.

Mr. Young serves as **Coordinator of Florida Space Coast Clean Cities Coalition** for nine counties in East Central Florida. The Coalition promotes the use of alternative fuel vehicles for energy security and emission reduction. He also served for three years on the Florida Clean Fuels Advisory Board to the Governor. In his work in the area of alternative fuel technology, Mr. Young designed and constructed several hybrid electric vehicles and served as a technical advisor for student design projects. He conducted research for the Department of Defense on proof of concept and performance of hybrid electric vehicles and light emitting diode lamps. Mr. Young created the SunDay Challenge®, an alternative energy rally and educational outreach event held several years in succession during the 1990s. Through a National Science Foundation grant, he has developed a 3-credit hour web-based course on alternative fuel and hydrogen vehicles.

BRIEF RESUME

Dr. **Panagiotis (Pete) D. Scarlatos**
Chair & Professor, Department of Civil Engineering
Director, Center for Intermodal Transportation Safety and Security
College of Engineering and Computer Science
Executive Director, University Consortium for Intermodal Transportation Safety and Security
Florida Atlantic University
Boca Raton, Florida 33431-0991, USA
Tel: (561) 297-0466 Blackberry: (561)-699-2579 Fax: (561) 297-0493 E-mail: scarlatos@civil.fau.edu
Citizenship: USA/Greek **http:**//www.civil.fau.edu

Education

Dr.-Eng., Civil Engineering, Aristotle University, Thessaloniki, Greece, 1981.
Dipl.-Eng., Civil Engineering, Aristotle University, Thessaloniki, Greece, 1972.

Professional Experience

2006-* Exec. Director, University Consortium for Intermodal Transportation Safety and Security, FL.
2006-* Director, Center for Intermodal Transportation Safety and Security, FAU, Boca Raton, FL.
2005-* Chair & Professor, Dept. Civil Engineering, Florida Atlantic University, Boca Raton, Florida.
2004-05 Interim Chair & Professor, Dept. Civil Eng., Florida Atlantic University, Boca Raton, Florida.
2001-04 Professor, Dept. Civil Engineering, Florida Atlantic University, Boca Raton, Florida.
1996-01 Professor & Coordinator, Civil Eng. Grad. Program, Dept. Ocean Eng., Fla Atlantic U., FL.
1989-96 Assoc. Prof. (tenured), Water Res./Environmental Eng., Florida Atlantic Univ., Boca Raton, FL.
1989-* Engineering Consultant, Boca Raton, Florida.
1985-89 Staff Water Res, Eng., South FL Water Mgmt District, West Palm Beach, FL.
1984-85 Post-Dr. Res. Assoc., LA Water Resources Research Inst., LSU, Baton Rouge, LA.
1983-84 Engineering Consultant, Water Resources, Baton Rouge, LA.
1982-83 Post-Dr. Res. Assoc., Coastal Ecol Lab, Center Wetland Res., LSU, Baton Rouge, LA.
1981-82 Lecturer (tenured) Hydraulic Structures Lab., Aristotle Univ., Thessaloniki, Greece.
1978-80 NATO Scholar, Dept. Eng. Science, Univ. of Florida, Gainesville, FL.
1975-81 Asst. Engineer, Hydraulic Structures Lab., Aristotle Univ. Thessaloniki, Greece.
1976-77 Instructor, Center of Higher Tech. Education (KATE), Thessaloniki, Greece.
1974-77 Engineering Consultant, Structural Engineering, Thessaloniki, Greece.
1974-75 Civil Engineer, Greek Railways Corp., Thessaloniki, Greece.
1972-74 2nd Lieutenant, Corps of Engineers, Greek Armed Forces, Greece.

Registration and Affiliations

Member of: American Society of Civil Engineers; American Water Resources Association; American Geophysical Union; International Association for Hydraulic Research.
Professional Eng. (Reg # 1298) Greece (EU).

Areas of Expertise & Research

Infrastructure Systems; Natural and Man-Made Disaster Mitigation; Water Resources Systems; Environmental Engineering; Computer Modeling.

Courses Taught

Undergraduate: Statics & Buoyancy; Strength of Materials; Dynamics; Physical Oceanography; Applied Hydraulics; Fluid Mechanics; Hydrologic Engineering; Environmental Engineering and Aquatic Pollution.
Graduate: Open Channel Hydraulics; Groundwater Flow; Dynamic Hydrology; Mechanics of Sediment Transport; Water Resource Systems Engineering; Water Quality and Treatment; Air Pollution and Control; Stream, Lake and Estuarine Pollution; Mechanics of Coastal Processes; Advanced Modeling of Environmental Processes, Advanced Ocean Wave Mechanics; Advanced Engineering Analysis.

Honors/Awards

NATO Science Scholar, 1978-79; Outstanding Achievement & Performance Award, FAU, 1990; Fulbright Research Scholar, 1992; FEEDS Exceptional Professor Award, FAU & HRS, 1994; Teaching Incentive Program Award, FAU, 1995; Dean's Faculty Award, 2003; Nominated for the Fulbright Aegean Initiative Fellowship.

Publications

More than 100 research articles published in referred journals, conference proceedings and technical reports.

Dan Simpson Currently, employed by the College of Engineering at the University of Tennessee in Chattanooga (UTC) as their **Chief Research Scientist in the Advanced Technologies for Transportation Research Program (ATTRP)**; a non-profit organization; experience of reporting to a board of trustees and also overseeing numerous individuals in various engineering disciplines, i.e. civil, mechanical, electrical, computer and environmental engineering. We are expanding our program of testing of new energy storage technologies. We are also building a test track for vehicle testing.

Prior to coming to UTC was the Director of Laboratories at the Florida Institute of Technology. During a 15-year successful tenure at Florida Tech responsibilities as an executive engineering manager was to manage multiple programs and projects, oversaw a technical support team and the technical operations for the entire university campus, coordinated all facilities planning and maintenance activities; lab upgrades and initiated new lab development activities for 162 multifunctional engineering and science laboratories. Duties also included managing all aspects of a Technical Service Team consisting of 40 employees and 4 operational budgets, interfacing with numerous departments, local, state and federal agencies to facilitate prioritized laboratory expansion, implementing a safety program to meet OSHA requirements and created an emergency management plan for the college of engineering.

Skilled, creative and resourceful management professional, successes over the years have been built upon a strong foundation in effective communications, diplomacy, integrity and relationship building. In addition to these valuable attributes; brings to the table is a list of celebrated accomplishments achieved while working in various areas of project management, construction management, engineering design/application, and business development

Additional strength in marketing has lent itself on many occasions to provide meaningful inputs in achieving targeted goals. One highlight of development activities includes assisting with courting the Olin Foundation to grant Florida Tech $64million to construct two 70,000 sq. ft. engineering/science, teaching and research buildings; involved in all phases of planning, construction and setup for these projects. Dan personally brought into Florida Tech millions of dollars worth of resources to supplement the university laboratories; created successful recruiting strategies to attract Engineering students; managed the College of Engineering web content and took the lead in laying out ideas for printed marketing materials.

Dan has been the key spokesman for my organizations, creating and giving many presentations to a significant number of international dignitaries, local, state, federal agencies, industry executives and the general public. Dan held a Manufacturing Engineering Certification; NASA Flight Hardware Engineering Certification, have been presented the Society of Manufacturing Engineers Presidents Award three times and have received multiple prestigious awards for exemplary and extraordinary contributions to the success of Florida Tech, Dan currently holds a DOD Security Clearance and worked with Homeland Security on national security issues.

Jan Zicha is a Professional Engineer for Sky Train Corporation with career experience in most technical aspects of rail transportation systems. He will be responsible for the technical aspects of transposing the technicalities of LRT systems into an overhead-suspended form. Jan H. Zicha PE Director, Operations. He is a multidiscilined individual following two major leadership roles. The first is in Rapid Transit And High -Speed Rail, detail follows West Bank-Gaza Connector, Israel, Railway Infrastructure Specialist. Client: Louis Berger International, October 2005 to March 2006. Shenzhen Metro, China, Phase II. Rail Technology Specialist. Client: Louis Berger International, August 2003.

Honam High-Speed Railway Project, South Korea. Project Manager. Client: Louis Berger International, July 2002 to January 2003. The work included high-speed technology updates, design criteria selection for track, alignment design, and structures. Buenos Aires, Light Rail Project Line 5.

Feasibility Study. Railway technology specialist Client: Louis Berger International, September 2001 to June 2002.Depot Design. Development of Specific Criteria for Upgrading Existing Track and Roadbed for High Speed Operations. Independent Consultant. Client: Federal Railway Administration in the USA. FRA Order No.: DTFR53-00-P-00377. Southeast Caracas Light Rail Transit Line Feasibility Study, 2001.

Trackwork Engineer. Basic trackwork design, specifications, quantities and cost estimates. Client: Louis Berger International. Bogota, Colombia Rapid Transit System Feasibility Study. Railway technology specialist. Innovative depot and trackwork design, quantities and cost estimates. Client: Louis Berger International, Government of Colombia, 1999 to 2000. Bangkok, Thailand Mass Rapid Transit System. Railway Technology Specialist. Client: Louis Berger International, Government of Thailand, 1998.Trackwork design and reviews. Commuter Rail System in Istanbul, Turkey. Railway Technology Specialist. Client: Louis Berger International, Government of Turkey, 1997.

Feasibility study and preliminary design. Ankara, Rapid Transit System, Turkey. Railway Technology Specialist. Client: Government of Turkey, 1997.Investigation of intensive rail wear in the Ankara metro's mainline and yard trackage. East-West High Speed Rail Line, Seoul Kang-Neung, South Korea, Master Plan. High-Speed Rail Infrastructure Team Leader and President of Zicha Engineering Corporation. Client: Sunjin Engineering, Group of Private Investors, 1994-1995. Responsible for infrastructure aspects of the East-West High Speed Rail Line form Seoul to Kang-Neung in Korea for 188 MPH speed. 245 km long line through difficult mountainous regions.

Track Components Development, Laboratory Testing, and Special Trackwork Manufacture. Trackwork Engineer, 1996. Red Line Extension of Los Angeles Metro. Employee of American Track Systems, Inc. Test Program Manager, and President of Zicha Engineering Corporation. Responsible for structural development, qualification and production testing of direct fixation rail fasteners for rapid transit applications in Los Angeles and Taipei. Client: American Track Systems Inc., 1994-1997. Kaohsiung Metro, Taiwan Mass Rapid Transit Authority (KMRT). Client: International Transit Consultants, Ralph M. Parsons Corporation, Republic of China, KMRT, 1994-1995. Trackwork Section Head responsible for the development of trackwork design documents, trackwork manuals, specifications and drawings for the mainline track and depots. Seoul-Pusan High-Speed Rail Project, South Korea. High-Speed Rail Infrastructure Team Leader. Client: Louis Berger International, Korean Transportation Institute,1989- 1991. The line is under revenue operations at 220 Mph speed since April 1, 2004.

NAME: RAJAN SEN
ADDRESS: Department of Civil and Environmental Engineering
University of South Florida, Tampa, FL 33620-5350
Tel: (813) 974-5820; FAX: (813) 974-2957
e-mail: sen@eng.usf.edu

EDUCATION

Ph.D 1984, Civil Engineering, State University of New York, Buffalo, NY
M.A.Sc 1970, Civil Engineering, University of British Columbia, Vancouver, Canada
B.Tech 1968, Civil Engineering, Indian Institute of Technology, Kharagpur, India

PROFESSIONAL REGISTRATION

Florida, Licence Number 36886

RECENT APPOINTMENTS

Fellow, *American Concrete Institute*, 2003
Fellow, *American Society of Civil Engineers*, 2001
Professor, *Department of Civil and Environmental Engineering,* USF, Tampa FL 1993
Samuel and Julia Flom Endowed Chair*, Department of Civil and Environmental Engineering,* USF, Tampa
FL 1997
Adjunct Professor, *School Architecture and Community Design,* USF, Tampa FL 1986

NON-ACADEMIC EXPERIENCE

Department of Transport, St. Christopher House, Southwark Street, London SE1, UK
Highway Engineering Computer Branch (1972-79)
Bridges Engineering Standards Division (1979-83)

PROFESSIONAL ACTIVITIES

Member, Editorial Board*, ASCE Journal of Composites for Construction*, 2002-
External Reviewer, *Order of Ontario Award*, Canada, 2002.
Member, Awards Panel, *International Concrete Repair Institute*, Des Plaines, IL, 2003.
American Society of Civil Engineers, *Subcommittee S8 on Advanced Composites*, Secretary
American Concrete Institute, *Committee on Fiber Reinforced Polymers*, Member,
Experimental Analysis for Concrete Structures, Member, *Fatigue*
Florida Masonry Handbook Committee, Member
BS 5400 Computer Committee, Highways Engineering Computer Branch, London, UK, Secretary

PROFESSIONAL RECOGNITION

Presidential Award for Faculty Excellence, University of South Florida, 2003
Plenary Lecture, CONMAT 2003, Indian Institute of Technology, Kharagpur, India 2003.
NSF sponsored US Representative to International Conferences Belgium (1995), India (1995), Japan (1997)
Teaching Incentive Program Award, University of South Florida, Tampa, FL, 1995
Outstanding ResearcherAward, College of Engineering, University of South Florida, Tampa, 1993
Certificate of Merit, American Institute of Architects, Tampa, 1992
Authors & Artists Award, USF, 1992
Seconded to *Freeman, Fox & Partners*, London, UK, 1980
First in Graduating Class, Indian Institute of Technology, Kharagpur, India, 1968
Institute Merit Scholar, Indian Institute of Technology, Kharagpur, India, 1964, 1965, 1966, 1967

FUNDED PROJECTS: PI for 36 research projects funded by state (FDOT), federal (NSF, NCHRP, FHWA,
U.S. Army Corps of Engineers, Office of Naval Research), county (Hillsborough) and private (Florid Concrete
Products) agencies..

PUBLICATIONS: Over 180 technical publications in refereed journals, symposia, conference proceedings etc. Also over 100 technical presentations at national and international conferences, workshops, symposia. Co-editor of one book. Over 35 invited presentations.

HECTOR M. GUEVARA, PH.D.

BIOGRAPHY HIGHLIGHTS

Hector is the founder, chairman of the board, and president of various corporations, including Nu Energy Group, Inc., a public company, previously trading on the OTC and now being held inactive (operations/trading stopped). In January of 2006, Hector created **Nu Dimensions Group, Inc., a Florida corporation,** which is now being primed to replace the operations of all of Hector's previous Long Island, New York operations.

In July 1986, Hector founded Hytech Industries Corp., with its last manufacturing facility located in Bohemia, Long Island, New York. Hytech was a minority-owned design engineering and contract manufacturing company, which primarily serviced the passenger rail transit industry for the past twenty years, e.g., Long Island RR, MTA NYC Transit, Metro North, Amtrak, etc. with millions of dollars in annual revenues. One of Hytech Industries' most notable completed projects in the rail transit industry was having co-designed and manufactured the hybrid control system for Amtrak's new Acela high-speed locomotives and power cars.

Hytech Industries also became recognized for developing and marketing renewable energy systems throughout the world. Prior to founding Hytech, Dr. Guevara was the founder and president of Alternate Energy Industries Corp. in New York City. Beginning in 1976, Alternate Energy developed an international market in solar products, with annual revenues that reached approximately $5,000,000. In 1979 the President of The United States, Jimmy Carter, wanted a solar system installed and Hector's company, Alternate Energy, was chosen to install the solar system in the White House.

Dr. Guevara has devoted the past 30 years to research and development of renewable energy systems. Dr. Guevara's companies designed and or produced many of the most notable solar, wind, and hydroelectric systems deployed throughout the world. The results of his research and development have been assigned to his new Florida Corporation, Nu Dimensions Group, Inc.

Dr. Guevara attended the University of Maryland with studies leading towards a B.S.M.E. from 1967 to 1970. In 2001/02 Dr. Guevara also attended the State University of New York (SUNY) with matriculated course work leading towards an Engineering Management Degree Program. While on this program, Dr. Guevara participated in SUNY's mentor protégé program. In 2002 SUNY's Small Business Development Center selected Dr. Guevara as the Hispanic Entrepreneur of the Year.

Dr. Guevara was conferred with a Ph.D. in Mechanical Engineering by Shaftesbury University (London) in January 2002; Dr. Guevara also holds an MBA and a BBA.

AFFILIATIONS, HONORS, & LANGUAGES

- Member The Institute of Electrical and Electronic Engineers
- Member American Society of Mechanical Engineers (ASME)
- Member of The American Public Transportation Association
- Member of Solar Energy Industry Association
- Member of US Hispanic Chamber of Commerce
- Member of Latin American Manufacturing Association
- Member of National Minority Business Council
- Member Regional Alliance for Small Contractors
- HISPANIC HERITAGE AWARD BY TOWN OF ISIP, NY OCT. 2001
- HISPANIC ENTREPRENEUR OF THE YEAR 2002/ STATE UNIVERSITY OF NY
- HISPANIC BUSINESS ICON: THE MEN 2003/ LATIN LONG ISLAND MAGAZINE

FLUENT SPANISH, ENGLISH, & WORKING KNOWLEDGE OF GERMAN

Douglas J. Tobin, PE, RA President & CEO of **ARC International Associates Inc.**
Registered Architect
Professional Engineer
Brief Resume

1.0 AREAS OF EXPERTISE

- Project Director, Program Management, Construction Management
- Transportation Terminal Design and Planning
- Building Architecture, Electrical, Fire-Protection, HVAC, Structural Engineering
- Airport Master Planning & Design
- Cargo Handling Systems Design and Engineering
- Baggage Handling Systems Design and Engineering
- Concessions Master Planning & Design
- System and Building Interface Architecture and Engineering
- Cargo/Warehouse Facility and Material Handling Systems Architecture and Engineering

Mr. Tobin has vast experience in airport master planning & design, baggage handling systems design and engineering, building and facility architecture, electrical, fire-protection, HVAC, structural engineering. He has provided technical services for cargo handling systems design and engineering, concessions master planning & design, package handling systems design and engineering, system and building interface architecture and engineering, and warehouse facility and material handling systems architecture and engineering. His professional expertise extends from architectural, structural, mechanical, electrical, fire protection building systems planning, design and engineering to specialty baggage handling, cargo, freight handling systems design and engineering. Mr. Tobin has provided architecture and engineering services for major airport cargo and passenger terminals projects located throughout the US, JFK; PIA, MIA, DFW, SFO, etc. Internationally at the Dubai International Airport, New Quito International Airport, New Athens International Airport, Greece; New Seoul International Airport, Korea; Changi International Airport, Singapore; Kuala Lumpur International Airport, Kuala Lumpur Malaysia; HACTL Cargo Terminals 1 and 2, Tai Tak International Airport, Hong Kong; Milano Linate and Milano Malpensa Airports, Milan Italy...etc. Projects include numerous Baggage, Cargo, and Material Handling Systems. Mr. Tobin has developed over US $2.5 billion worth of projects within the U.S. and internationally on commercial and industrial projects.

2.0 Architectural Registrations

- Connecticut, Florida, Georgia, Kentucky, Illinois, Mass, New Jersey, New York, Pennsylvania, Texas, Virginia

3.0 Professional Engineer Registrations

- Connecticut, Maine, New York, Pennsylvania, Vermont

4.0 Professional Organizations

- NCARB Registered Architect
- New York Society of Professional Engineers

5.0 Education

- New York Institute of Technology - Bachelor of Architecture (5-year)
  Graduated - 1980 - Magna Cum Laude
- Norwalk State Technical College
  Norwalk, Ct. - Associates Degree in Architectural Engineering (2-year)
  Graduated – 1976 – Summa Cum Laude

Karl W. Guenther is the Chief Executive Officer of Sky Train Corporation who will be responsible for the business aspects of the project. He will apply his business knowledge and credentials to those aspects of the project. He is the Chairman and Chief Executive Officer and also President of SkyRail UK Limited, the joint venture in the UK. Mr. Guenther has driven much of Sky Train's growth to its current stages of development since he first envisioned it in 1987. Mr. Guenther is a generator of ideas and organization towards team building, and is considered an industry growth expert using suppliers and his innovative tooling and communication skills. The US division of the German American Telephone Manufacturing, needed to grow in sales from 6 million to 22 million in six months (GTE contract). Mr. Guenther implemented assembly lines, mold and automation equipment design in order to accomplish this. Aluminum Fabricated Products needed to double in sales from 4 million within one year; a plant addition, new equipment and workflow solved this. Mr. Guenther spearheaded projects for such major vendors as Honeywell, General Defense, Spartan Electronics, Conax, Univalve Division of Allied Signal, and attained goals within time constraints and on budget.

Mr. Guenther is listed in the, "Who''s Who" national directory of executives and professionals. Mr. Guenther began pursuing Physics at University of Illinois and completed his BS in Engineering at the Illinois Institute of Technology. He is working on his MBA and is also a licensed MTM Instructor from The University of Michigan. Mr. Guenther is working with Universities such as: Center for Urban Transportation Research (CUTR); University of South Florida (USF); Florida Institute of Technology (FIT) in Florida and Illinois Institute of Technology (IIT) to verify new futuristic concepts to further upgrade these systems in the future. As a panelist in the 24th International Space Development Conference he has developed a following and is an officer in the local Chapter of the National Space Society.

Leaving the corporate world to buy and expand his own business in Florida; Six years purchasing a Machinery Wholesalers franchise having the second highest profit margin and sales of 36 National Offices, also forming a Consulting Company called American Manufacturing Services, Inc. Here he was involved in more then doubling manufacturing capability of some 5 clients. Next came the purchase of a Marina Complex housing amongst standard fare a Marine repair shop, a Design and Build Machining operation and commercial seafood business, restaurant. In generating their long range plan the need for additional boat storage space created the start of a design of a novel boat crane system that could supplement their lift truck operation allowing high & dry storage of boats into a remote location.

This has evolved over the last 14 years into two system designs, one using standard technology, and the other requiring testing and research. This technology has been transferred to a renamed company called Sky Train Corporation. Innovation in this project is ongoing, driven by some 8 members with stock options.

SECTION VIII: Budget Summary

Summarize the project budget by Funding Category and Project Task using the format in the following two tables. Project Tasks should correspond to the "Project Description" section.

Funding Category	Grant Funds Requested	Cost Share: Matching Funds and Other In-Kind Contributions	
		Funding	Source of Funds
Salaries:	$649,840	***28% In kind** and MOSI Property $625,000 match	*Added potential funding
Fringe Benefits:	Part of Over Head		Presently listed on
Equipment:	$39,400		MyFlorida web site
Travel:	$96,300		$2,000,000 ok next year **see sec IX**
Vendor Shops Contractual:	$1,118,200		Link regarding MOSI
Supplies/Other Expenses:	Part of Over Head		www.skytraincorp.com/links.htm
Total overhead:	$831,795		See http://www.flsenate etc
Totals:	$2,735,535	$833,000	$2,208,000
Total Project Cost:	$2,947,949	= Grants Funds Requested + Cost Share	
Cost Share percentage:	28%	= Cost Share / Total Project Cost	

	Project Task*	Grant Funds Requested	Cost Share: Matching Funds and Other In-Kind Contributions	
			Matching Funds	Source
1	Mobilize Collaborate	**$789,432**	$113,408	STC - MOSI is land at
2	Compare technology	**$673,085**	$60,800	$625,000 not shown
3	Rail vehicle	**$686,370**	$25,062	Same STC
4	Design & Build	**$586,649**	$8,540	Same as STC
	Totals:	**$2,735,536**	$207,810	
	Total Project Cost:	**$2,947,346**	= Grant Funds Requested + Cost Share	

* Should match the list of tasks identified in **Section IV: Project Description**.

SECTION IX: Budget Detail

Personnel					
Salaries (Name/Title/Position)	Hourly Cost ($)		Hours		Totals ($)
C1 work grade = CEO, Director rating	$50.00	*	7816	=	$390,800
C2 = Professional Engineer, Designer	~~$40.00~~		~~4184~~		$167,360
C3 = Coordinator, Electronics Technician	~~$30.00~~		~~3056~~		$91,680
			Total Salaries	=	$649,840
Fringe Benefits (Rate% * Total salaries applicable)	Rate (%)		Salaries		Total ($)
		*		=	N/A
			Total Personnel Expenses	=	

Equipment					
Description	Unit Cost ($)		Quantity		Totals ($)
Work Stations	$1,000	*	5	=	$5,000
Structural Software	$10,000	*	2	=	$20.000
Autocad Software	$3,056	*	4	=	$14,400
			Total Equipment	=	$39,400

Travel									
Purpose/Destination	Days		Per Diem		Fare/Rate ($)		Mileage		Totals ($)
Spreadsheet Total	(	*	)	+	(	*	)	=	$96,300
	(	*	)	+	(	*	)	=	
	(	*	)	+	(	*	)	=	
							Total Travel	=	$96,300

Contractual					
Name or Services	Fee/Rate ($)		Hours		Totals ($)
Patenting/Legal		*		=	$46,000
Architect		*		=	$26,000
MOSI Donate Land & Permits					$15,000
Florida Solar Energy Center					$67,600
UTC Research Center					$13,000
Manufacturing Costs		*		=	$950,600
			Total Contractual	=	$1,118,200

Supplies and Other Expenses					
Description	Unit Cost ($)		Quantity		Totals ($)
Part of FDOT Overhead		*		=	
		*		=	
		*		=	
			Total Supplies and Other Expenses	=	

Overhead/Indirect					
Base of Calculations	Rate (%)		Base ($)		Total ($)
FDOT one OH Calculation	1.28	*	$649,840	=	$831,795

Total Budget			
	Total Budget	=	$2,735,536

		Salary		071017 Project detail							
	GRADE CI	GRADE C2	GRADE C3								
CEO/Officer/Director	**$ 50.00**										
Professional Engineer, Designer		**$ 40.00**									
Coordinator/Electronics Tech			**$ 30.00**	SUPL	SUPL	SUPL	SUPL	SUPL	SUPL	Travel	
REFERENCE #/ORGANIZATION WEEKS	KS	KS		Patent/Legal	MOSI	ARCH	FSEC	FAU, USF	Builder	Food	
Sky Train Corp - PI ORGANIZATION										Lodging	
TASK 1 mobilize including ARC INT	8	16	8						39400		
Manage project	26.4	11	11								
CR Master plan	8										
CO Patenting drawing	30		30								
RE patent agency				21000							
ME Meeting & Arch Review	0.8				8,000	15000					
TR Vendor visits	9									27300	
CO Database Construction	9		6								
TR Collaboration Alcoa, FSEC	6						600				
TR Review solar and voltages	4						4000				
IF Build test track (year 2)	10		10				20000				
SE Select Rail Track	1										
IN Legislative Presentation	1						1000	2000		6400	
ME Meeting & Arch Review MOSI	1.6		3		12000					11200	
TASK 2 Standardize project outline	4		8								
VI Visit Investors	4									400	
CO Collaborate & Design	45	45					42000			3800	
ME Meeting for review of technology	1.2							5000		1200	
Task 3a: Design rail vehicle	2	8									
DE Vendor qualification	3.6	12								3600	
MA Manufacturing Deposits									150000		
ME Meeting UT at UTC	1.2									1800	
MI Mid year meeting	1.6				6000					6400	
TASK 3b: Manufacture Rail vehicle(s)	4	4									
NE negotiate Alcoa & composites legal	1	1		25000						2600	
LE Purchase down payment									100000		
VI Quality Visits	3.2	3.2								12400	
FI Final payment									200000		
TASK 4a: Power unit for rail vehicle									120000		
DE Design Power unit	3.6	3.6								400	
IN Quality audit	0.6									900	
TASK 4b: Construct Vehicle Charging									50000		
ME Design review at UTC meeting	1.2							6000		14200	
DE Design and visit vendor enclosures	2.4								50000	600	
DE visit vendor electronics		1.2									

OP Operate at final test		0.8	0.8	0.4							28060 0	2500
First year Sub Totals weeks:		**195.4**	**104.6**	**76.4**	**Equals 4C1, 2C2 and 1.5C3's**							
C1 @ $50 per hour= 5 days =	**$**	**2,000**										
C1 @ $40 per hour= 5 days =			**$ 1,600**									
C1 @ $30 per hour= 5 days =				**$ 1,200**								
C1 in hrs		7,816										
C2 in hrs			4,184									
C3 in hrs				3,056								
First year Sub Totals:	$	390,800	$ 167,360	$ 91,680	/// $	46,000	$ 26,000	$15,000	$ 67,600	$13,000	$ 990,000	$96,300
Grand Total material and vendors:					**$ 1,253,900**							
Grand Total Labor:	**$**	**649,840**										
Overhead 1.28 per FDOT	$	831,795										
Total Cost First Year:		**$2,735,535**										
GOAL =		**$2,750,000**										
Overhead 1.6 x 20% = .32 Match =		**$ (207,949)**	**Actual overhead is 831,795 = 1.28 used for In Kind Match**									
Actual charges =		**$2,957,949**	**Note: MOSI match of land for $625,000 does not effect calculations.**									
			See comments 33B & 47B.									

SECTION X: Commitment Letters from Third Parties

Link for document on the web:
http://www.flsenate.gov/data//Publications/2007/senate/reports/budget_issues/SENReq1247FY0607.htm

Community Budget Issue Requests - Tracking Id #1247
MOSI Monorail Energy Research Interactive Display

Requester:	Dr. Judith Lombana	**Organization:**	Museum of Science and Industry (MOSI)
Project Title:	MOSI Monorail Energy Research Interactive Display	**Date Submitted**	1/11/2007 8:33:46 AM
Sponsors:	Senator Mike Fasano		

Statewide Interest:
This project would construct a necessary and useable demonstration project for a modern method of mass-transit at the Museum of Science and Industry (MOSI) in the form of a suspended, light-rail monorail system. This project offers a means of transportation for intra-city and inter-city travel with significant lower consumption of energy compared to current transportation systems. The overhead suspension provides safety and speed and complete grade separation not conflicting with other modes of transportation or existing land uses on the ground below. As the State of Florida continues to grow, the stress on the state's current transportation system will correspondingly grow. Therefore, the state needs to explore and promote alternative mass-transportation. Mass-transit by it's definition also saves in energy costs by economies of scale in transporting large numbers of people. However, there are methods of transportation that can further save energy by using alternative fuel sources (other than fossil fuels), such as solar energy. Transportation must also be desirable to the general public in order to be actually used. The creation of new means of transportation is only viable if it is found to be desirable and is ultimately used by large numbers of people. Special advantages of this Sky Train system seek to make this transportation mode desirable by having low energy consumption, comfort for passengers, speed on curves (with no lateral forces) at least three times that of light rail systems in the street and up to 44% faster than tilting bodies now used on high speed intra-city trains. Additionally, there is potential for growth to match subway carrying capacity equal to nine lanes of automobiles growing to 40,000 passengers per hour. The car bodies can be interchanged allowing for transportation of passengers or freight at will. The MOSI Sky Train project aligns with the State Department of Transportation mission of providing safe transportation system that ensures the mobility of people and goods and preserves the quality of our environment and communities. The Sky Train project will explore and promote alternative mass transportation that is considered to be premium transportation demonstrating environmentally friendly with less direct and indirect environmental impact and minimizing air, noise, and ground pollution.

Recipient:	Museum of Science and Industry Tampa (MOSI)	**Contact:**	Dr. Judith Lombana, V.P. of Research and Institutional Development
Counties:	**Hillsborough**		
Gov't Entity:	**Private Organization (Profit/Not for Profit):** 813-987-6331		Yes

Project Description:
This funding request is for Phase One of the Museum of Science and Industry's (MOSI) Sky Train Display project, which includes engineering designs and identification of potential Sky Train path, metering systems, instrument displays, power and control circuits, cab design, and preparing all architectural and build documents for the system. The Sky Train would serve as an educational demonstration project to transit professionals and museum visitors as a suspended light-rail mode of mass-transportation. It would also provide transportation service to people within the MOSI/USF area to provide short-haul service between several areas in the science museum environment and possible other nearby locations. MOSI and Sky Train Corporation are partnering on a multi-phased research and teaching project for both public and professionals in the field of mass transit: Phase I- Planning and Design, Phase II- Construction, Phase III- Research and Teaching. Current partners for this project include: Kissinger, Campbell, and Associates (KCA)- Tampa engineering firm; Tampa Steel Erecting- highest rated in Florida; USF Center for Urban Transportation Research; USF Marine Science Center for Ocean Technology Micro-Electro-Mechanical-Systems (MEMS); USF Center for Robotics, CRASAR; AAR- body construction. The Sky Train project is a multi-phased project displaying worldwide firsts: incorporation of regenerative breaking into a monorail system demonstrating recovery of the kinetic energy of motion; available energy storage and control circuits allowing changing of the sequencing of components to optimize costs between savings of energy and life performance; a display of a new suspended monorail technology, identified and funded in part by Florida's Technological Research and Development Authority (TRDA) monorail to be an energy-efficient, multi-purpose monorail to carry both passengers and freight. MOSI has agreed to construct the prototype on its property for subsequent research and development on this very important issue.

Measurable Outcome Anticipated:
The Sky Train project would serve as an effective educational tool for a modern, energy-saving mode of transportation. It would demonstrate a 60% to 80% energy savings over older, rubber-tire monorail systems. It would thereby show a reduction in the need for traditional fossil-fueled transportation by showing the viability of solar-powered, mass transportation. It would also be able to show an increased speed capability than other monorail designs, which currently have maximum speeds of approximately 60 mph. The MOSI Sky Train will also demonstrate the ability for such a system, if constructed in areas of high demand, to services as many as 40,000 people per hour, compared to a three-laned highway with a capacity of 3,600 automobiles per hour.

Comment:
Land for track est. 7/8 mile long and three station areas are match value $625,000.00

Amount requested from the State for this project this year: $2,000,000.00

City Engineers, Inc.
2421 Pennsylvania Avenue, NW, Suite 300
Washington, D.C. 20037
Phone: (240) 462-5820
Fax: 301.203.7297

Karl Guenther
Sky Train Corporation
2599 Dolly Bay Dr T308
Palm Harbor, FL 34684

October 23, 2007

Re: Grant Match

Dear Karl,

We have been following your technology development. As we are near completion of the Installation of an Automated People Transporter, in a tunnel at Dulles Airport, we see some of the savings and simplicity of your designs.

We are looking at other work and feel that we could get matching funds up to $500,000 from a client once the grant money is released for your project.

Knowing that Representatives from both houses again support the Museum Project for $2 million to start the Design, process is also a wonderful plan “B” for this Solar Powered interactive energy display. Further it would give us great pleasure to give input from our noteworthy staff, and when time comes to participate with the installation on the 74 acres of the Nations sixth largest Science Museum in Tampa.

Understanding that it would populate the routes as designated on Hillsborough County’s Long Range Transportation Plan makes this is an exiting project.

We see that it as a much safer environmental solution especially since it would not create corridors on the ground or invade the busy roads and parking lots traveled by students always in a hurry to class or on their cell phones. As you know most campus transportation systems are elevated for these reasons.

Your comment that this would connect an intermodal center, a VA Hospital to a Research University Hospital, and a major Sports Complex and is within two miles of Busch Gardens makes this an enviable system.

Your partners at UF also desiring a transportation project on Campus envisioned to be extended to other locations along with USF, UCF’s Florida Solar Energy Center and FAU will make this collaborative effort an International story.

We wish you success in starting these interesting projects.

Sincerely,
Very truly yours,
Tony Ekwenye, P.E.

President & CEO
240.462.5820 cell
CC: Jan Herman Zicha, P.E