Automated Transit Network Demonstration Project for the City of San Jose

RFI Response

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Overview

General Transportation Fund (GTF) believes the most exciting and profitable aspect of this RFI is how the City of San Jose can build a vibrant technological and industrial base for the developing Automated Transit Network (ATN) market worldwide. San Jose is ideally suited to be the international center for ATN industrial firms. San Jose has a long history of supporting innovative development, and a highly educated population with technology companies that the ATN field needs to engage with. San Jose also has a strong venture capital community that is well suited to funding this start-up industry. GTF views the RFI as the catalyst to bring this industry to San Jose. This RFI provides the impetus for investment in this industry and the development of ATN-related skill sets in San Jose. As Uppsala City in Sweden has shown, a government-led initiative can grow into a technological magnet drawing worldwide attention. Uppsala has shown leadership by taking risks which led to important investments being made in their city. This can happen in San Jose. We plan to utilize all that has been learned in Uppsala as a base to build the next generation of ATN systems and the business skill sets right in San Jose. Other transportation regions throughout the world will come to San Jose to see the ATN system, to license Silicon Valley technology, and to hire the San Jose–based firms that developed and built this project.

Our response to the RFI is divided into four primary sections: Technology and Industry Development, in which we describe how GTF can help San Jose develop the ATN industry in the city; Scope of Feasibility Study, which describes what we will complete in the feasibility study; Financial Model, in which we describe the funding for the RFI, and a sample cost for a small ATN system; and Relationships and Experience, which describes why GTF is in a unique position to work with the City of San Jose.

If the City of San Jose chooses to work with GTF, we will not only build the next generation of ATN together, but we will establish San Jose as the international center of the ATN industry.

Technology and Industry Development

Consortium

GTF will assist the City to bring together and help finance a multi-company/institutional partnership which will be headquartered in San Jose. This consortium, in collaboration with independent institutions, will develop the first true commercial ATN system in the country, and ensure that San Jose becomes the national and international center for ATN design and development. GTF will bring in technology partners, including some already situated in the Bay Area, and help them adapt their technologies for ATN systems. We will use the San Jose ATN project as the impetus to form this consortium, but we expect its breadth and depth to grow as more transportation districts look to develop ATN projects. (See “Phase 1: Form Consortium,” page 3.)

Market San Jose as International ATN Technology Center

Currently there are no ATN technology hubs in the United States. Using Uppsala, Sweden, as our model, we plan to augment that model with Silicon Valley’s strengths to ensure that the City of San Jose becomes the national and international center for ATN. This will bring

clean tech jobs, businesses, and business tourism, and will continue to cement San Jose as the innovation hub of the United States. GTF has extensive experience at marketing ATN. Christer Lindstrom, president of GTF, was instrumental in bringing ATN to Uppsala. He also organized the first ATN conference in Uppsala last year and the second in Ithaca, NY, in September of this year. (See Attachment 5, NY Times PodCar II Article.)

University and Independent Research Involvement

GTF personnel have coordinated research activities with Swedish Universities and at the University of California, Santa Cruz. Additional research efforts are under consideration. Building upon the ATN initiative of the City of San Jose, GTF will engage local universities and coordinate support for ATN research from government agencies, industry, and private parties.

Scope of Feasibility Study

Expected ATN Development Path

We foresee construction of an ATN system in San Jose starting with a sub-system several miles in length that provides transportation for the airport. Once the initial system is successfully running, we expect the next phase to include service to downtown, sports facilities, population centers, and connectors to light rail and Caltrans (and BART, if applicable).

Further installations on the order of 50 miles and then scaling up to hundreds of miles are envisioned after completion of the initial system, providing San Jose with an integrated public transportation system that will take residents and visitors directly to any destination within city limits, without stops or transfers.

Feasibility Study

GTF will determine the feasibility of the initial sub-system serving the airport, as well as the second phase of the system that will serve downtown, sports facilities, population centers, and connectors to the various rail systems.

The feasibility study will be completed in the following overlapping phases to produce several model layout choices. We expect the entire feasibility study to take approximately one year.

Phase 1: Form Consortium

GTF will form a corporation to be based in San Jose that will bring together the best possible mix of technology, construction, engineering, and project management skills. This corporation's goal will not only be to successfully develop and construct the San Jose ATN project, but to form a long-term development company with strong political support and market penetration. The final membership of the corporation will be determined at the time of incorporation by the requirements stipulated by GTF, the City of San Jose, and the other participants. For more details about companies that GTF recommends, see "Proposed Team Members," page 6.

Phase 2: Raise Financing for Feasibility Study

Once GTF has been chosen by the City of San Jose to perform the feasibility study for this project, GTF will secure financing from grants, corporations, and private investors. We expect the overall cost of the feasibility study to be in the region of one million dollars. In the spirit of a public-private partnership, the City of San Jose will not be required to provide primary funding for this study. The City's participation will be primarily through staff time to help specify requirements and parameters for the project, working in conjunction with the other consortium members to clarify and define the final model outcomes.

Phase 3: Basic Requirements

The consortium, working with the City and its other members, will generate a chart of requirements for a successful ATN project. This list will include, but is not limited to, the following requirement variables:

- Capacity
- Optimal Land Use
- Energy Usage/Energy Production
- Social Aspects
    - Safety Issues
    - Alarms
    - Rescue Procedures

These requirements will be appended and further refined with input from participants. We expect additional requirements will include photovoltaic energy production and on-board access to live data from other transit modes, such as airport data and bus and train data.

Phase 4: Selection Process

Once the requirements of the system are determined, we can build a number of possible models based upon variable parameters. These parameters include:

- Station Number and Location
- Rail Pathway
- Target Markets Served
- Development Timeline and Benchmarks

Phase 5: Initial Modeling

The models that the consortium decides to develop will be analyzed further with the Encitra suite of software. This software package will provide an interactive visual simulation of a proposed ATN system, including stations, traffic flows, and impact on existing traffic modes. The viewer will be able to enter an ATN vehicle, travel to a destination, and exit the vehicle, much like in a video game. However, in this case, the environment surrounding the vehicle will be a realistic representation of a specific geographic location, including buildings, greenery, and other true-to-life features of the area. Existing traffic patterns can also be programmed in and visualized, making it easy to see the effect the ATN system has on existing traffic patterns.

This real-time modeling will allow the design staff, architects, and engineers to analyze the requirements and parameters to optimize each model. Further peak load and financial analysis will round out the models so that they can be comprehensively compared. (For more discussion on Encitra software, see "Marketing and Modeling: Encitra," page 6.)

Phase 6: Selection Reiteration

After an initial analysis of the models is complete, new refined modeling will be used to pare down the options. This process will rotate the team back through Phases 3, 4, and 5 until a

few final models are selected as being optimal in regards to all set requirements and parameters.

Phase 7: Final Models

These final models will be further refined and packaged to present to all city-wide stakeholders. The visual modeling will clearly show all interested parties from the general public up to the mayor the routes, impacts, and experience of riding the ATN System.

Feasibility Study Deliverables

By the end of this exhaustive, iterative, multiple input process, the consortium with provide the City with the following deliverables:

- Model Visualizations
- Simulation Data
- Financial Data
- Ridership Data
- Industrial Development Data
- Employment Data
- Environmental Impact Data

Financial Model

The consortium will develop a business model to meet the San Jose requirements based on experience from earlier models in Sweden. GTF envisions a privately owned and operated ATN project in San Jose. This will relieve the City of San Jose of upfront capital investment. The consortium will require that the City guarantee a minimum ridership level. The key to success is to generate a large enough customer base for ATN, with smart system route design, incentives to use the system, and selection of reasonable traffic densities as the ridership base. This will help reduce the financial risk to both the consortium and the City. Other financial structures are possible and can be developed through the feasibility study process.

Sample Financial Model for ATN Sub-System

The sub-system will consist of a short commercially viable track. For simplicity, we consider here a two-mile track that supports circulation at the airport. Below we provide an initial cost breakdown for this system. Combined capital and operations costs are estimated to be on the order of $10 million per year when spread over a 15-year period. This is not taking into account possible inflation adjustments, and it is based on a peak hour capacity of 500 people.

Breakdown of Key Variables:

Estimated Cost per Mile, no vehicles or stations	$40 million (any vendor)
Cost per Vehicle	$0.1 million
Length	2 miles
Vehicles	12
Maximum Seating Capacity	6 (3 if SkyTran)
Average Load Factor	50%
Headway	3 seconds
Speed	25 miles per hour
Average Trip Time	6 minutes (including enter & exit)
Number of Stations, 3 car capacity	4
Average Cost of Operations per Year	$3–4 million

We do not anticipate that the selection of ATN vendor will greatly affect costs under prototyping conditions. Again, critical to the success is the expected ridership of the system. We do not provide any expected costs per trip, only maximum capacity and overall costs. Once we work with the City, together we can formulate expected ridership and determine more precise ridership costs. We anticipate cost per mile to decrease as system size increases and technologies mature.

Relationships and Experience

The implementation of an ATN system is a larger undertaking than any single entity or organization can achieve on its own. GTF proposes to form a team of organizations and companies that will in sum provide all the knowledge, financing, and experience needed to optimally build the ATN system. Below are companies that have the necessary expertise, as well as the long-term commitment needed to make San Jose a successful ATN international leader. The partners and team members suggested below are independent entities and GTF has not formalized these relationships except for Encitra Inc., which is a subsidiary of GTF Inc.

Partners

Project Developer: Barry Swenson Builder

Barry Swenson Builder (BSB) is a leading Real Estate Developer in San Jose, with strong and long-lasting relationships with the City. Key to the success of a transit system implementation are land use and real estate issues, two areas in which BSB is a proven leader. Additionally, BSB will be a strong player in maximizing return of investment for the City and all other stakeholders. (See Attachment 1, BSB Letter, and Attachment 2, BSB Qualifications.)

Marketing and Modeling: Encitra

Encitra is a company specializing in dynamic visual modeling of traffic systems. Real streets and buildings are rendered in a three dimensional graphic world. The existing car, bus, train, bicycle, and pedestrian traffic flows can be programmed in and visually represented. As viewers interact with the model, their actions affect the flows of all other objects in the model. This allows for a clear and simple analysis of the impacts that a superimposed ATN system can have on existing traffic flows.

The Encitra modeling technique offers a unique opportunity for the entire sales process and entitlement process — from early evaluation and internal discussions of possible solutions and their alternatives, to a full-blown public presentation of ATN for residents, business owners, media, and key decision makers. Visit www.encitra.com to see a sample modeling visualization. (Also see Attachment 3, Encitra Presentation.)

Photovoltaic Integration: EcoSage Inc.

EcoSage Inc. is a photovoltaic (PV) integrator that has developed large commercial PV projects in the Bay Area. They have also co-developed innovative commercial racking solutions, and Ron Swenson, CEO, has developed a model characterizing the feasibility of powering ATN systems with PV attached to the rail structure. EcoSage's constant innovations and experience make them an ideal partner to work with local PV manufacturers to design and specify a PV generation plant for the San Jose ATN system.

Proposed Team Members

Our suggested team members are determined by a number of factors, including technological capabilities, depth of experience, previous collaboration experience, and location (with preference being given to local operations). GTF has had only cursory conversations with the following firms to gauge their interest in participating in the consortium. Once the City of San Jose has agreed to work with GTF, we will enter into talks with the chosen parties and form partnerships or strategic relationships.

ATN System: Vectus/Beamways/SkyTran

We have identified three likely contenders to be the ATN system vendor: Vectus, Beamways, and SkyTran. All three represent investment opportunities and job creation in San Jose far bigger than the need for the local system itself, as they all are focusing on creating a large-scale industrial presence in the US. We will work with the City to develop a process whereby the contenders will be fully vetted and the selection will be made based on well-reasoned criteria. (See Attachment 6, Vectus Brochure, Attachment 7, Beamways Brochure, and Attachment 8, SkyTran Brochure.)

Infrastructure Consultants and Systems Integrator

We have had preliminary discussions with highly qualified candidates for this significant portion of the implementation and will make recommendations during the feasibility phase.

Finance and Industrial Development: Montgomery & Hansen LLP

Montgomery & Hansen LLP (M&H) is one of the most prestigious and successful law firms in Silicon Valley for startups in the green technology arena. Their commitment and achievements represent the kind of strength that the San Jose RFI needs for maximizing success. They have access to a vast array of financial resources and venture capital for the ecosystem and industry spawned from ATN development. A key issue will also be recruitment of executive professionals within the new ATN companies in the San Jose area, an undertaking well-suited to M&H and their affiliates.

Other Relationships

Systems Engineering: Aerospace Corporation

Aerospace Corporation (ASC) is one of the most unique centers for systems integration and systems knowledge in the world. A company renowned for its sense of integrity, few organizations have such comprehensive and long-term experience in systems planning as ASC. We strongly recommend that the City of San Jose initiates talks with ASC, listens to their advice regarding the San Jose ATN initiative, and invites them to consider participation in the team as independent advisors.

Institute for Sustainable Transportation

GTF is also in close relationship with the Institute for Sustainable Transportation (IST) in Sweden, the main force behind the implementation of the Uppsala test track for Vectus. IST has previously executed two international conferences on the topic of ATN technology and their place in urban settings, Podcar City I (Uppsala, Sweden) and Podcar City II (Ithaca, NY). Both conferences produced considerable interest at the local, state, and federal level in the European Union and the United States, with the recent one in Ithaca being covered by almost all major news networks in the US. It is the intent of Christer Lindstrom, CEO of Encitra and board member of IST, to initiate the next Podcar City Conference in San Jose in cooperation with the City and IST. (See Attachment 4, IST PodCar I Brochure, and Attachment 5, NY Times PodCar II Article.)

Kompass/GTS-X

GTF representatives have participated in two other important initiatives: Kompass, the international association of cities engaged in Podcar (ATN) development, and GTS-X, the international organization (currently forming) that will develop standards to interface ATN systems from competing vendors. During the feasibility phase, GTF will provide introductions to these organizations and encourage the City of San Jose to participate.

About GTF – General Transportation Fund

GTF was founded in 2008 by Ron Swenson and Christer Lindstrom as a vehicle for creating an ecosystem around ATN systems. GTF has been a co-sponsor of the successful Podcar City Conference in Ithaca, has initiated the Encitra modeling technology and company, and, in an effort to initiate a new ATN industry in San Jose, is the main author of this RFI response. GTF acts as a powerful catalyst and broker, with strong local, state, and federal political leverage in California, the United States, Sweden, and the European Union. Mr. Swenson and Mr. Lindstrom are both active entrepreneurs and have extensive political experience in turning ideas into reality.

Ron Swenson

Mr. Swenson is president of Swenson Ventures. He is co-founder and investor in a number of ventures in the green technology space. He has extensive experience developing and implementing wind energy technologies, as well as commercial and remote photovoltaic systems. He has completed alternative energy projects in California, Mexico, Bolivia, Ecuador (Galapagos), Bhutan, and Peru. He co-founded Mexico's solar race car team, which competed in the World Solar Challenge (1996) and SunRayce (1995), and has built numerous specialized electric vehicles.

Christer Lindstrom

Mr. Lindstrom is the founder of IST, the Institute for Sustainable Transportation in Sweden, and an active member of the Swedish Centre Party. He is also the CEO of Encitra Inc., based in Irvine, California. Mr. Lindstrom is currently working on several projects looking into ATN implementations in the United States and Sweden, and is working as a consultant for the Swedish government Institute SIKA in the creation of long-term research and funding for ATN technology between the US and the EU.