RESPONSE TO AIA HONOLULU (Jeffrey Nishi, Sidney Char)
RE. AT-GRADE VS. ELEVATED TRANSIT TECHNOLOGY

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By Roy Reynolds, Managing Director, PRT Strategies

Gentlemen, we've been closely following your city's light rail project and noted the position AIA Honolulu took this week (mid-April, 2009) re. **at-grade vs. elevated** technology. Per the attached from this year and last, we believe we've offered a reasonable argument to a number of your electeds and local activists for pursuing **Personal Rapid Transit (PRT)** as an alternative, or perhaps as a compromise to light rail (LRT).

PRT is elevated for specific design reasons, but better and very different ones compared to light rail:

- As rides are point-to-point with *no* intermediate stops, PRT truly advantages an elevated infrastructure as it occupies *its* ***own*** *space*, free from *any* interaction or interference with other traffic, surface congestion, parking, traffic signaling, bicyclists and/or pedestrians. A PRT ride is then always non-stop – expected to average 35mph as the current generation of technology matures. Research indicates that, at best, LRT averages 21mph (streetcars average even less, usually in single digits).

- Offline PRT stations can be of *any* reasonable size, accommodating as few as one vehicle, or as many as a usage model might dictate. Stations could access multiple guideways and unlike LRT, do not need to be as long as the longest train. Stations may be designed to allow vehicles to depart in any order, not just serially.

- Elevated stations *will* require elevators for ADA compliance, BUT stations built INTO the second floors of buildings as we suggest for Public/Private Partnerships (imagine a hotel with a dedicated portal) are reached via the structure's internal stairways, escalators and elevators and are then also unaffected by inclement weather.

- Modern PRT systems (please see http://www.vectusprt.com/) that employ magnetic linear induction propulsion and braking are virtually **silent** in operation. Ordinary wind noise would actually be louder than the vehicle's composite wheels on its rails. Vectus' technology has no metal on metal contact in its propulsion or braking systems to eliminate the brake squealing that can be common with light rail and buses.

- With its much smaller footprint compared to LRT, PRT can be routed far more flexibly and more **opportunistically** – your city and island transit needs would be better met and the system should be much more widely accessible, especially downtown, at the airport and on the naval base. Your proposed LRT system is designed for a strict linear alignment, severely limiting its accessibility.

- Per our website, you'll note in our various illustrations and videos that PRT guideway is **FAR less visually intrusive** than LRT. Designed in a series of interconnected loops, it's also more flexible as both a single guideway alignment can completely service an area, or a dual alignment can mounted on "Y" pylons can accommodate multiple tracks (thus doubling capacity at no additional cost or use of surface area).

- PRT turning radii is much much tighter than LRT, offering greater design flexibility and use in, e.g., non-traditional right-of-ways like alleys, flood control channels and river banks. Elevating a PRT guideway only requires two-foot diameter pylons about 90 feet apart. The guideway would not usually be built more than 15 feet above ground.

- Vectus' lean guideway design is not conducive to mounting display advertising. LRT guideway presents large flat concrete surfaces which would prove *irresistible* for advertising as revenue is always critical, and with LRT, the farebox never covers costs. On-vehicle display advertising with either system would be purely the city's option. PRT vehicles can offer in-vehicle advertising via flat panel display screens.

- PRT vehicle, station and elevator security is offered via integrating video and audio feeds from in-car and station cameras, routing them as practical or on an alarm indication to local law enforcement via the same secure wireless technology that controls system operation. This technology is inexpensive and readily implemented as we know from common consumer Internet applications.

- PRT requires no catenary (overhead) power cabling. Power is supplied from an enclosed third rail via brush contacts. As well, with the guideway's flat exposure to the sun, it's very realistic that photovoltaics could be employed to partly power the system, offsetting energy consumption by selling **solar**-generated power back to your local utility. In Honolulu's climate, we could expect all or most of the system's daytime energy consumption could be offset from solar power derived off the guideway and station roofs.

- PRT vehicles can operate 24/7/365 and are stored at stations when not in use. Small depots are required only for maintenance. LRT will require a massive support at an offline storage facility requiring very costly track switching arrangements.

We agree with the city's position that an elevated system is simply safer. Our long experience in southern California confirms that – Los Angeles County Metro's Blue Line (Long Beach to downtown LA, about the same distance you're planning) has unfortunately accumulated over 90 fatalities in less than 20 years due to its mixing with surface traffic and many street crossings (millions have gone into gate and signal improvements over the years). You'd also be aware our Metrolink commuter rail system has a dismal safety record (note this recent Los Angeles Times article – the Times has followed this system's difficulties for years). At-grade systems will *forever* suffer these tragedies and expensive liabilities where they *must* be integrated with automobile and pedestrian traffic. Loss of life and injury is avoidable with elevated technology. America's first and oldest PRT system, built at the University of West Virginia over 30 years ago, has *never* had a serious injury or fatality.

As you've documented, **no** elevated rail system has been built in the US in a generation. We believe this is primarily due to the *extraordinary costs* of raising very heavy steel and cement infrastructure above ground and supporting large vehicles designed for maximized loads (whether they're carrying them or not).

> Our PRT vendors estimate single-guideway construction at $30 million/mile, about **nine times LESS** your estimate for elevated LRT. Even though modern PRT systems are just now evolving and per the Morgantown link above are service proven in the US, we believe it's realistic that one in Honolulu could start building in just a few years (Sweden has already approved Vectus' "safety case" and will accept visitors at their testing facility outside Stockholm). You estimate LRT will require nine years to construct., and even as nascent technology, **PRT could be operational by 2015, well before then**.
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> It's also significant that a PRT system, even in a single loop, becomes *immediately* useful. For example, imagine an airport to downtown loop from which a much grander guideway grid expands over time as the technology gains acceptance. PRT doesn't need miles of guideway to be productive right away – in poker vernacular, LRT generally needs to be "all in" (substantially built out) for its best and most efficient use. We argue then that PRT is extremely "scalable" – more adaptable in your unique environment to be networked where a need is found, and NOT simply limited to a **compromised, inflexible multi-billion dollar linear routing**.

In the years my firm has analyzed and marketed PRT in California, we've learned the initial, most conventional reaction to it is uncertainty as to its capacity – how will these small vehicles possibly carry the expected load? The answer here is the sophisticated operational modeling that's available through our vendor community to analyze the number of vehicles and amount of guideway necessary to handle ridership projections, however ambitious. A *fair and impartial analysis* of PRT in your environment will find its scalability can accommodate usage with **a sufficient quantity of vehicles servicing a proper number of stations**. Put another way, city-wide PRT would be grown from a small implementation as real usage data is collected from your commuter and tourist populations to confirm where the system needs to be built (or even unbuilt should initial planning and assumptions prove incorrect or populations shift). This is especially important as we've learned from experience that ridership projections are **never** correct, and unfortunately, often politically manipulated in favor of a desired outcome. Once right-of-way is acquired, with proper planning of course, PRT guideway can be built in a matter of **days.**

PRT operates at very close headways – per Vectus, four seconds or potentially less between vehicles. This *reverses* the conventional mass transit model in that a sufficient number of vehicles (again, determined by the computer model and easily collected, and projected, usage data) causes crowds at stations NOT to form. Sufficient vehicle quantities mean NO waiting at stations and maximizes resource and asset utilization. PRT needs no schedules as the rider dictates usage and destination – alone, not according to the assumed needs of a group relegated to a fixed route. Further, with the sophistication of its control system, vehicle assets are balanced across the system – too many vehicles collecting at a particular station are identified and sent empty to other stations with too few. Empty vehicles can be accumulated at stations were need is known to occur at certain times, e.g. the end of a work shift or an event. Private vehicles might even be summoned by cell phone.

Even with the sophistication described above that's unknown in conventional transit technology, **the grander argument for PRT**, as you've also touched on, is its potential in Transit Oriented Development (TOD). PRT stations will cause development or redevelopment where they're placed simply due to the potential of commute traffic. But much more importantly, **unlike LRT,** PRT stations are "offline" to the guideway and then ANY quantity of them can be built WITHOUT diminishing overall system throughput. That is, LRT must stop at *every* station, delaying all passengers not destined for them – PRT provides a much faster trip by routing the vehicle non-stop, bypassing all stations until reaching its destination. As many stations as are practical and can be afforded can then be developed for **no** sacrifice in system performance. Obviously, more stations mean better overall performance, wider coverage, flexibility and serviceability.

> This strategy then encourages Public/Private Partnerships in that investor businesses desiring commuter and tourist traffic (e.g. Wal-Mart) can be encouraged to build their own stations at their own expense for connection to the grid network – in fact, certain operations like hotels could consider owning or leasing **their own** vehicles as their usage can be computer-segregated to serve only the owner's guests, tenants or customers. LRT can't offer these opportunities for private investment to contribute to the capital cost of the system. There's more on this strategy here. Further, please also consider the potential of stations at housing developments, especially built into condominium and apartment buildings. This could lessen certain parking requirements, encourage car-free commuting, ride sharing and increase the assessed value of the property. Schools are also excellent candidates for PRT stations as PRT is a less expensive, safer and **greener** alternative than school bus transit.

You'll also be interested that the City of San Jose, California recently declared PRT as "ready for primetime" and is reviewing over a dozen proposals to link their international airport with nearby light rail, bus stops and a future BART commuter rail station. Important to their plan is the participation of private sector employers and businesses which will add ridership and invest in the

system. The City has recently issued the first of two RFPs for $7.4 million in consulting services to research PRT.

AIA recommends streetcars in Honolulu for at-grade operation. Before accepting this technology as an effective solution, we **strongly** recommend your review of this analysis of the Portland system: Debunking Portland – The Public Transit Myth. This study not only questions the technology choice, but also covers the politics and business of TOD and its relationship to the streetcar system.

We've already posted you and Mr. Yoshioka a brochure and a CD which we hope you'll all review for its videos and PowerPoints which illustrate how we envision PRT used in our tourist-oriented economy here in Orange County.

As we previously wrote to Councilmember Kobayashi and Professor Panos Prevedouros, *we urge the City to open the competition again for this transit system before finalizing any new plans -- take another look at the options that exist for you today, not a slanted and incomplete two-year old study with questionable prejudices.* And of course, PLEASE CONSIDER the extraordinarily lower costs of Personal Rapid Transit compared to light rail.

We'd be happy to discuss this further and would welcome a call. If you'd have an interest in a visit from us or our recommended vendor(s), we'd be happy to arrange that at your convenience.

Best regards, Roy

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