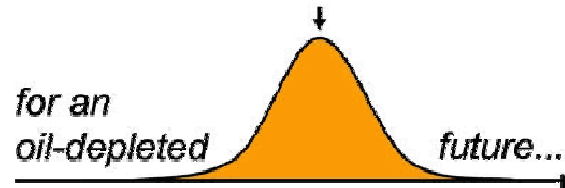




City of Oakland

Prepare now



*Solving
Transportation, Land Use,
and Energy Issues
with Solar Powered
Personal Rapid Transit (PRT).*

Robert Baertsch
UC Santa Cruz / NASA
Ron Swenson
APSO-USA

2007 July 19

What is PRT?

- Personal Rapid Transit (Pod cars)
- Created in 1970s, Morgantown, WV
- 1-4 passengers
- Driverless
- Solar powered, electric drive
- Non-stop to destination
- Vectus, Sweden, 2007
- ULTra, London Heathrow, 2008

Freeway at Capacity

PR1
PERSONAL RAPID TRANSIT
International Conference



Vehicles Removed

PR1
PERSONAL RISK PREVENTION
International Conference



PRT Passengers

PRT
PERSONAL RAPID TRANSIT
International Conference



PRT System

PRT
PERSONAL RAPID TRANSIT
International Conference



Personal Rapid Transit (PRT)



www.SolarEvolution.com/PRT

**Viability of Personal Rapid Transit
In New Jersey
FINAL REPORT**

February 2007

Presented to:

Governor Jon S. Corzine and
The New Jersey State Legislature

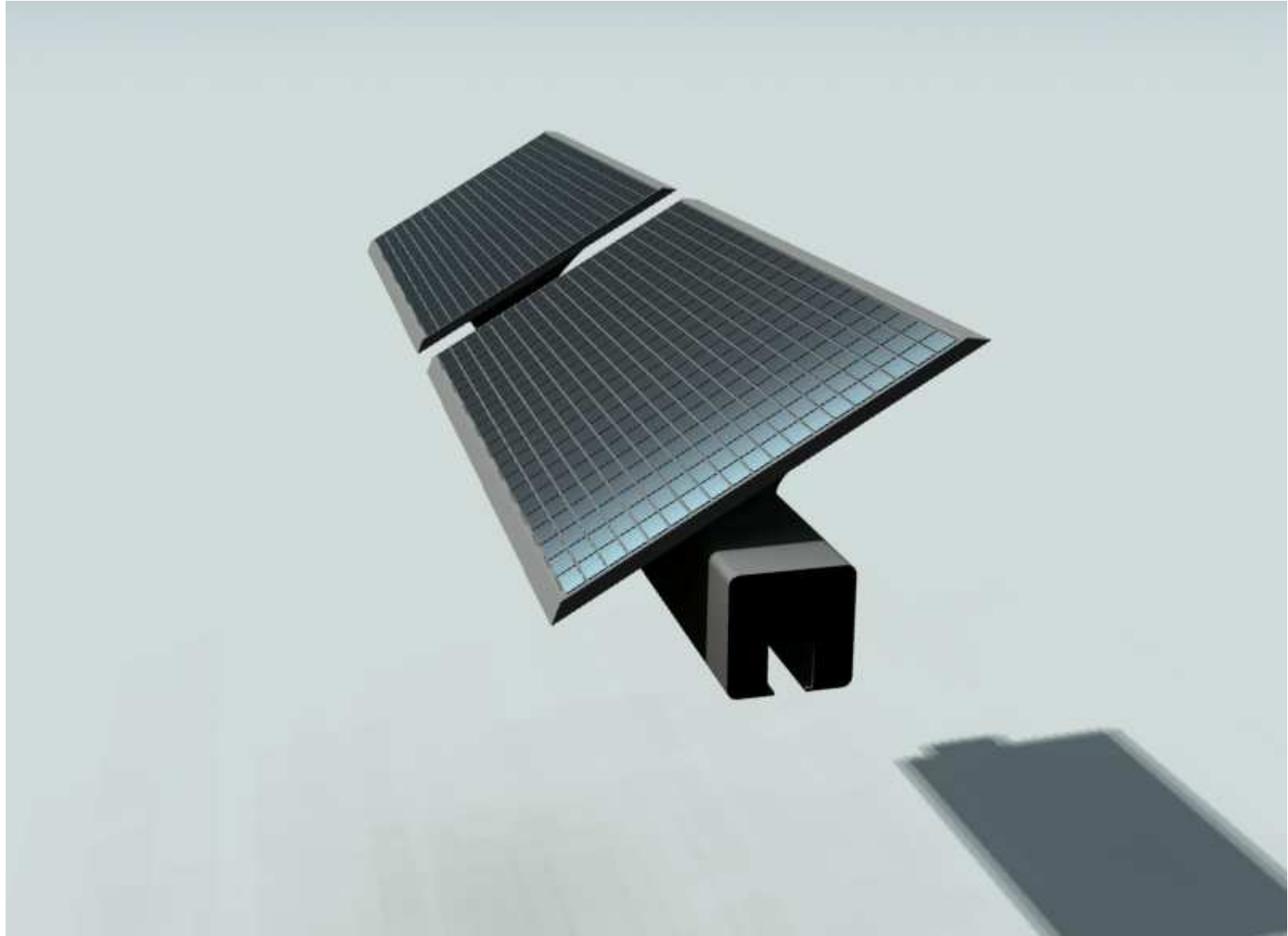
Prepared for:

New Jersey Department of Transportation Bureau
of Research and
NJ TRANSIT

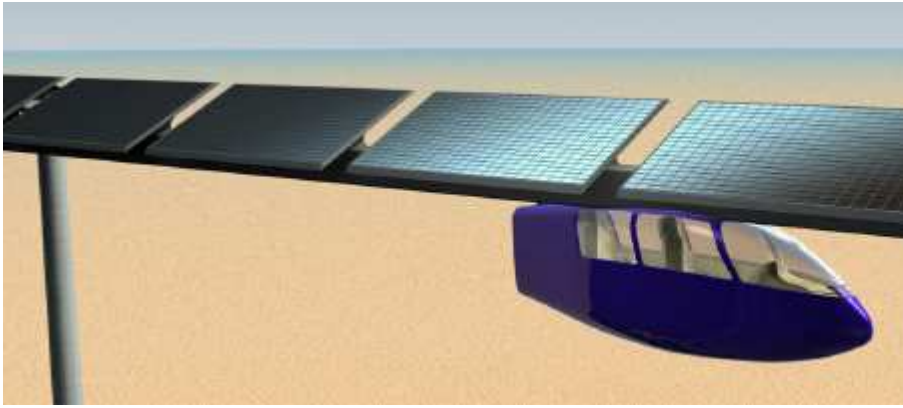
Prepared by: Jon A. Carnegie, AICP/PP Alan M. Voorhees
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And Paul S. Hoffman Booz Allen Hamilton, Inc.

<http://faculty.washington.edu/jbs/itrans/big/PRTfinalreport.pdf>



www.SolarEvolution.com/SkyTran



Solar SkyTran, with
aesthetics emphasis and
added power at stations



Similar Solar Systems Exist



Calculate Solar size, cost per Mile

30	mph, operating speed
x 2	sec (vehicle interval)
= 88	ft between vehicles
= 60	vehicles/mi, separated by interval specified
x 2	kw @ operating speed
= 120	kw needed in a mile stretch
10	hrs at peak operation equivalent
÷ 4	hrs of peak sun equivalent (Coast = 4, Desert = 6)
= 2.5	solar factor
120 x 2.5 = 300	kW/mile
x \$6.00	/watt
\$1,800,000	/mi
16	watts / sq ft, SunPower, most efficient on market
3.5	ft wide solar panel to meet requirement

Compare Solar to Gasoline at \$2.50/gallon

25	mpg, average fleet mileage
27,000	passengers per day to match
2.0	people/vehicle
13,500	vehicles/day
x \$2.50	/gallon fuel price
= \$33,750	Cost to travel fleet mileage daily
\$ 12,318,750	Annual cost to travel fleet mileage
\$ 45,000,000	Cost of solar to cover fleet mileage
= 3.7	years, Payback for solar system to offset gasoline

PRT advantages

1. Faster
2. Safer
3. Quieter
4. Cheaper
5. Less energy
6. Zero emissions
7. Helps transit-oriented development
8. Driverless = enjoyable commute time

PRT considerations

- Requires government approval
- Sometimes obstructs views
- Upfront investment => long-term savings
- Complex software ~ air traffic control
- Overcome entrenched interests



Transportation Energy for 100 People

	Battery Electric	PRT
Vehicles	100	20
Total weight (tons)	200	5
Battery weight (tons)	25	1
Recycle batteries	? %	99%
Embodied energy ratio	50	1
Battery losses	15%	<1%
Rolling Resist. (60 mph)	5000 watt	500 watt
Aerodynamic Resistance (60 mph)	7000 watt (cd=0.2)	750 watt (cd=0.1)
Parasitic energy Consumption	275	6
Energy use (watt-hr/mile)	~150	~50 (skytran)
Safety	≈two 747s/week die	Very safe
Quality of life	1 hr per day lost	Quality time in transit 17

“Back of the Envelope” Cost of PRT in Oakland

- 400,000 population in 78 sq. miles
- 500 miles of PRT track @ \$5-10m/mile
- 40,000 pod cars @ \$10,000 each
- Total cost \$7,500-\$14,000 per capita
- **\$60-120 per month** (financed over 20 yrs.)
- << \$400 cost of driving per month

Questions