

PRT - Personal Rapid Transit

GTS = PRT + freight

GTS - General Transport System

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for

California Air Resource Board

ETAAC

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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 RAIL TRAVEL
International Conference



Vehicles Removed

PR1
PERSONAL RAPID TRANSIT
International Conference



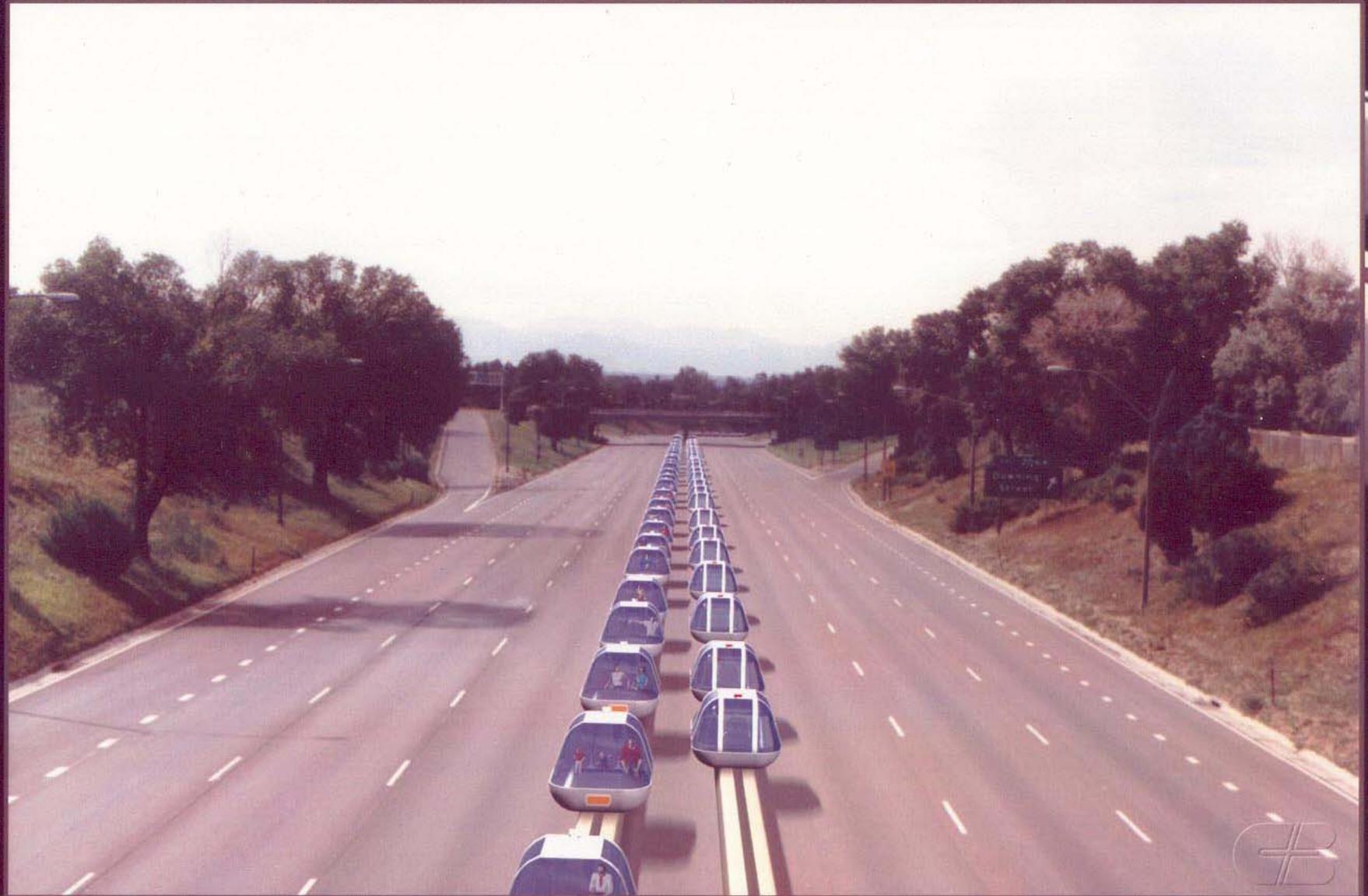
PRT Passengers

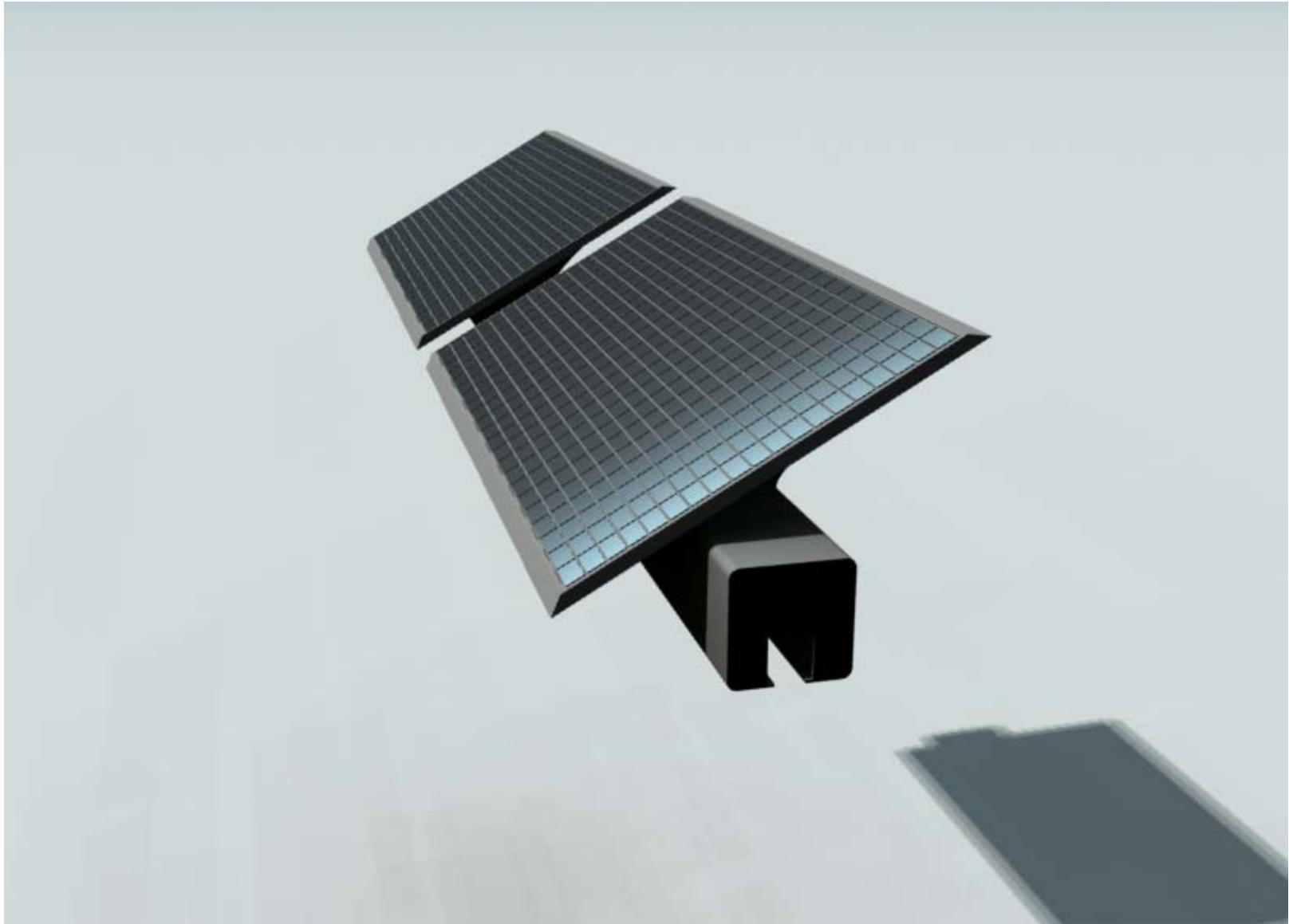
PRT
PERSONAL RAPID TRANSIT
International Conference



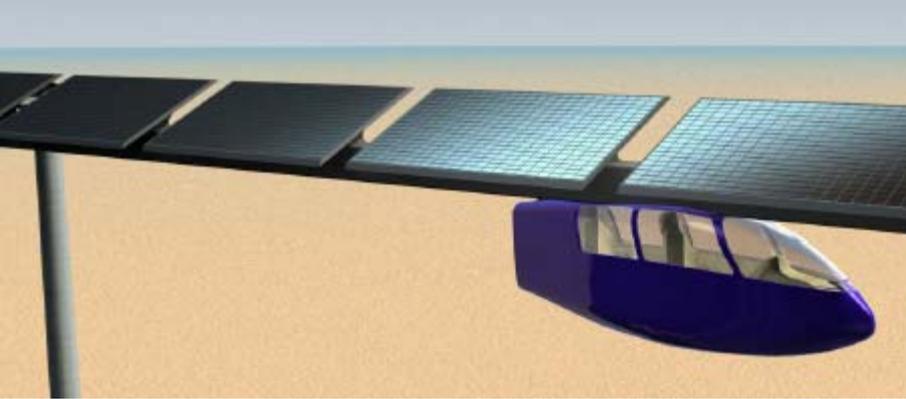
PRT System

PRT
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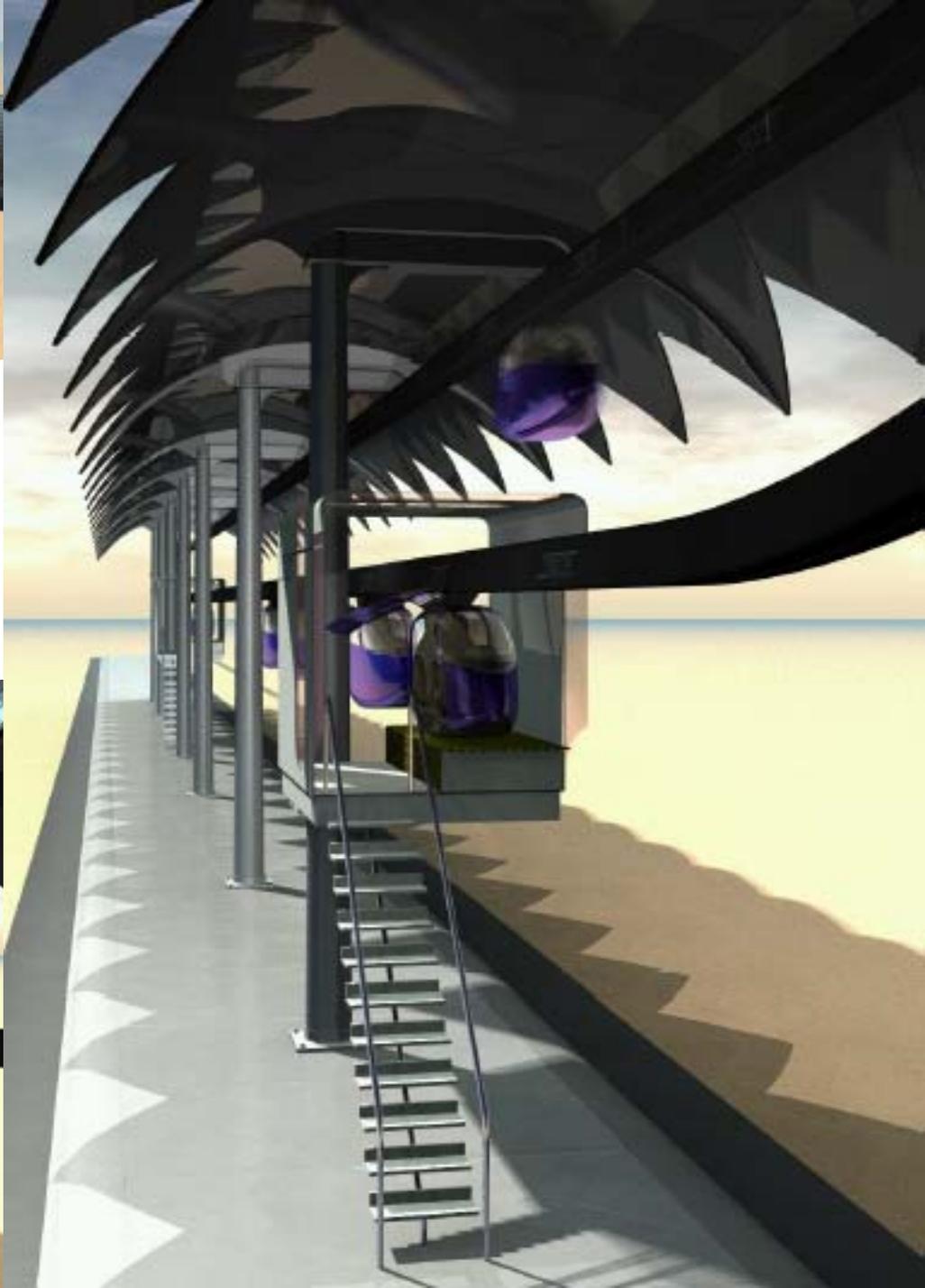
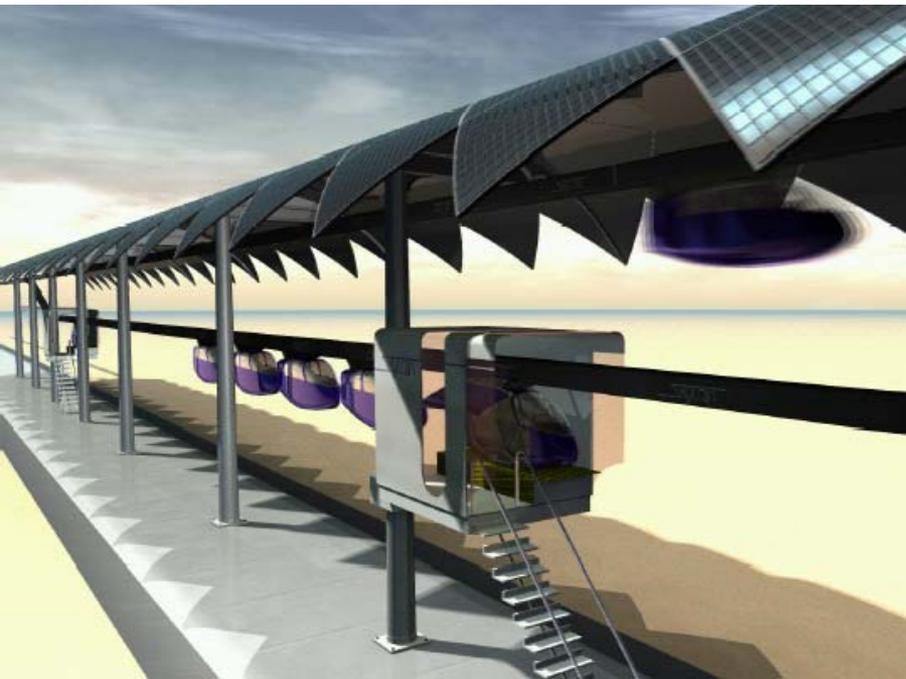




www.SolarEvolution.com/SkyTran



Solar SkyTran, with
aesthetics emphasis and
added power at stations



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 (*solves traffic*)
2. Safer
3. Quieter
4. Cheaper
5. Solar Power - zero (net) fossil fuels
6. Helps *transit-oriented development*
7. 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

	Electric Car	PRT
Number of 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

“Back of the Envelope”

Cost of PRT in a large city

- 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

Clean-tech jobs

- Electronics technicians
- Construction (guideways and solar)
- Manufacturing
- Finance
- City planners
- Civil Engineers
- Software developers
- Local operations staff
- Parking lots -> parks and dense housing