The Oil Drum
DISCUSSIONS ABOUT ENERGY AND OUR FUTURE

What is Planetran?

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There was some discussion in the comments on Ianqui's post on air travel that relate to a relatively old idea that is not really Science Fiction. However it is quite "old fashioned" in the sense that it was largely developed in the days before the Internet, and readers may not have therefore heard much about it. The concept was called Planetran and it was a high-speed underground train, capable of going from L.A. to N. Y. in 54 minutes. There is now the occasional reference back to articles such as appeared in the LA Times back in the 70's when the idea was first getting column inches. My own encounter came when it was written about in the Science and the Future Series put out by the Encyclopedia Brittanica. It was in the first one we bought, in 1980, as part of the whole EB package we got for the Advocate and the Engineer to help them through their school years. (Interestingly the advent of the Internet meant that they never needed the detailed reports from EB that were part of the package back then).

Well, enough of the family history, but for those interested a short review of an old look into the future.

The EB article is about 10 pages long, so let me briefly paraphrase parts of it so that you can get some of the ideas, and I may add the odd comment as I go.

> Planetran "trains" would consist of lightweight cars which are "floated" by magnetic repulsion between vehicles and guideway. These repelling magnetic fields would be phased so as to produce a traveling wave along the guideway. This magnetic wave would provide both vehicle support and propulsion (or braking.)
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> Planetran tunnels would follow the Earth's curvature and would be generally located several hundred feet below the surface in rock structures. Besides evacuated tubes for high-speed Planetran travel the tunnels would also house conventional railroad lines and power lines, communication links, and pipelines. This shared usage would help defray tunnel costs, which are the major element in Planetran's overall expense.

At the time, in 1980, it was anticipated that the main network would cost around $250 billion and would use only a small fraction of the energy needed by aircraft and automobiles.

Originally conceived in 1957, apparently by Lockheed, and taken over at some point by the Rand Corporation. One of the initial major barriers was the safety controls and it was the advent of greater computing power in 1969 that returned the concept to the drawing boards.

To get the high speed it was intended that the trips would be made with the cars accelerating at 1 G for the first half of the trip, and decelerating at the same 1 G for the second half. This would

allow the trip to be made in 21 minutes, but they decided that the trip should pass through a Terminus at Dallas and that there would be subsidiary acceleration and deceleration phases which would stretch the trip to 54 minutes. For the scientific absent minded 1 G is the acceleration due to gravity 32 ft/sec/sec and this would allow the N.Y. Dallas stage some 1,360 miles long to be traveled in 27 minutes.

The initial network would have a link between L.A. and San Francisco, and then a line from San Antonio would go through Dallas up to Chicago, and then across through Cleveland to NYC. There would be an East Coast Corridor from Washington to Portland that it would intersect at that point.

To give some idea of local times under the same system and how life might change

> Instead of two-way local service in a four-tube tunnel, planners have consdered operating locals in one direction only. Because of the high speeds achieved, passengers could go the long way around to their destination. An example is the New York City - Boston link with local traffic to Hartford. By running local traffic only in the NYC to Boston direction, a traveler from Hartford to NYC would go by way of Boston. Hartford to Boston on the local would take 7 minutes, and Boston to NYC 11 minutes, for a total of 18 minutes.

By using lightweight materials and using mag-lev the major power required would be for motion, and a lot of that might be recovered during the braking phase, or so they claim.

Ah, an interesting quote (remember this is 1980)

> Recent analyses of the world's future energy supply stiuation forecast that the real limitation will not be on energy sources, but on the money to develop them. Studies predict that world capital accumulation of $40 trillion will be required to provide needed energy supplies by the year 2020, while only $10 trillion will be available on a business-as-usual basis. To provide adequate capital accumulation will require a 12% reduction of the share of gross world production going into energy consumption - if a start to rectify the problem is made immediately. If there is a wait of 15 years to start the cut in consumption, the rate needed will be about 24%.
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> Brookhaven National Laboratory's prediction on U.S. energy flow in 1985 indicates that 28% will go into transportation, with three-quarters of this into automobiles and aircraft.

The article claims that the Platetran system would save 10% of the total U.S. energy flow, for air passengers and when coupled with freight energy savings would raise the savings above 12% justifying the investment. Vacuum pumping stations would be located at two pumps per mile would keep the air in the tunnel as thin as that at 170,000 ft above the Earth, almost eliminating air resistance.

The concrete cost (since a special concrete would need to be developed, and my memory suggests that MIT might have been working on this in the 1990's) was estimated to be $63 billion for the 21,000 miles of shell. When the article was written NSF was still funding advanced tunneling technologies. Sigh! Those days are, alas, now long gone - I think they died with the Super

Collider.

In 1979 dollars (which were used for all costs) they estimated that the service could run at $1 per minute in the system. So it would cost $54 to go from NYC to LA. Freight costs would be $0.15 per ton-mile. With 200 passengers or equivalent freight in a train each minute, the revenue stream was anticipated at $182,400 per minute. ($96 billion per year for those like me who can't count). Energy costs would be about 1% and the major operational cost.

And a final quote

> Are there reasons to develop Planetran? To many the answer is yes- perhaps not exactly in the form of the system described above but certainly something that closely resembles it, and that satisfies Plantetran's objectives. A system having Planetran's economy of operation and potential convenience to the public is a virtual necessity in the solution of future transportation and energy-supply problems. Platetran would also relieve pressures on the environment stemming from crowded highways and polluted skies. . . . . If we wait too long, our goal will no longer be that of achieving a better society but a desperate effort to preserve that which we have.

A long time ago, and in a dream land now far, far away some of this thought this system would be an inevitable part of the future. (Which you may take as an indication of my capabilities as a prophet).