By 1970, after the development of superhighways and commuter railways of varying design, U.S. transportation systems left much to be desired, both within and between cities. Congestion on the nation’s highways (and increasingly in the air as well) led to calls for new modes of transit that would satisfy the needs of a region and anticipate the future needs of a growing population. The solution, said John E. Gibson in an IEEE Spectrum article entitled “Planning the coordination of ground transport” (October 1970, pp. 79–86), was high-speed ground transport (HSGT).

Gibson, then dean of the engineering school at Oakland University, Rochester, Minn., noted that creating a good fit between a transit system and a city (or a megalopolis like the Northeast Corridor that stretches from Boston to Washington, D.C.) depended on the ability of its planners to be, in a sense, mystics who would make predictions about the transformation of cities over 20- to 30-year periods. Only the failure to apply the nation’s resources toward the realization of these predictions would prevent them from coming true.

To ensure that cities are well served, Gibson said, city planners, technologists, and politicians would have to “shift the emphasis from specific [types of vehicles] to determining how [transportation systems] may fulfill a continuing function for society.” He warned that excessive concern for maintaining the modes of transit then in use might cause city planners to “overlook a revolution taking place right under their noses.” The revolution he had in mind was HSGT—a series of multi-passenger travel units whose maximum speeds would approach 480 km/h. Gibson was careful not to refer to these units as trains or say whether they would run on rails because it was unclear what form the system would take.

Gibson asserted that the crystal ball through which the future of mass transit could be seen was a coherent set of national goals. If plans for HSGT were implemented immediately, he said, much of the highway and air traffic that was draining the nation’s energy resources and polluting the environment would give way to “a ground mode that will save time, be lower in cost, and is generally safer due to its absolute constraint to fixed guideways.”

Gibson divided the initiatives needed to introduce HSGT into three parts: near-term (within five years), medium-term (three to 15 years), and long-term (10–25 years). For the near term, he suggested that national transportation policy focus on the more efficient use of existing facilities. One example, he said,
would be increased use of U.S. railways (used mainly for hauling freight) for pas-
senger travel. The goal in this case would be putting the railways on par with rail
systems of Europe and Japan. He urged policymakers to resist investing the
nation’s resources in a network of new
airports because they would be under-
used once HSGT became available.

The Oakland University dean also
advised against spending huge sums of
money to build intra-city rapid transit
systems, citing the failure of the new sub-
ways in Toronto and Chicago to lure
people out of their cars and into public
transportation. High-speed ground trans-
port, he predicted, would some day be
able to move residents of a metropolis
80 km long from one end to the other
within 20 minutes—enough of a conve-
nience to make up for the loss of the free-
dom associated with driving.

To better coordinate intra-city trans-
portation, said Gibson, the Federal gov-
ernment needed to focus its resources on
the rebuilding of cities in preparation for
their roles as centers of communication
(as opposed to their late-19th and early-
20th century roles as centers of industri-
more worthwhile than diverting the best
technical talent in the U.S. for a decade
in the glittering but essentially trivial
occupation of placing a man on the
moon would it be to extend ourselves to
construct one truly habitable city within
the United States.”

In the medium term, said Gibson,
effort should be focused on the rail lines
made redundant by the consolidation of
rail traffic onto fewer but more efficient
lines and retrofitting them to accommo-
date “automatically-controlled, medium-
speed, inter-city passenger service.” Data
provided by the designers of two of
Japan’s passenger rail lines indicated
that if the turning radius of tracks was
2500 meters or greater and the maximum
banking grade was set at 1.5 percent,
these medium-speed trains could be safe-
ly operated at up to 210 km/h—three
times faster than then-prevailing operat-
ning speeds on U.S. railways. (The fastest
Japanese bullet trains in service today can
go 300 km/h. Those carrying passengers
average 275 km/h, and can make the
402-km trip from Tokyo to Osaka in
less than 3 hours.)

Gibson admitted that the project
would be expensive, but argued that it
would be a bargain even if it cost as much
as highway construction, which averaged
more than $10 million per mile. His rea-
soning was that “a medium-speed rail line
requires less land… is quicker and simpler
to build…and a double-track rail line
under automatic control can carry more
than five times the traffic of a typical
expressway.” Gibson noted that a line
stretching from Boston to Washington,
D.C., would cost less than NASA’s annual
budget of $5 billion.

As a long-term goal, Gibson—who
was the founding director of Purdue
University’s Control and Information
Systems Laboratory, West Lafayette,
Ind.—advocated the development of a
national high-speed ground transporta-
tion system. R&D work on such systems
had begun in earnest, he said, but needed
to be conducted on a much greater scale.
“It should be the aim of new city planning
to provide; by the year 2000, an HSGT
link between all major cities less than
800 km apart.” To ensure the effort’s
success, he proposed that “the magnifi-
cent technical team assembled by NASA
be unleashed on this task.”

Gibson envisioned transportation units carrying between 50 and 100 passengers and running underground under continuous computer control at speeds averaging 400 km/h. Such a system, he said, would easily compete with airplanes over distances of 1200 km or less. Terminals would be at least 160 km apart, and small units carrying as few as 20 passengers could be operated at off-peak hours or between infrequently used stations.

To woo people from their automobiles, incentives like an economical family-fare plan and more baggage space would be necessary, said Gibson. To prevent a glut of traffic on the new system, he suggested that business travel be eliminated, on the grounds that it was usually for the purpose of communication. His plan: people who would normally travel on business could take advantage “of wide-band communication systems [then] under development.” He said that much of the deal making and fact finding that takes place on business trips could be handled by videophone conferencing. The control systems expert conceded that conducting business this way would be awkward at first, but predicted that executives would force the transition through once they realized how much money their companies could save by limiting travel.

Gibson acknowledged that a great deal of thinking about the effects of such a system on the nation (and vice versa) was still necessary. He concluded the article with an anecdote that served as a warning to policymakers who might be quick to implement this or any other plan without input from systems engineers. He said:

“Kenneth Boulding, the articulate economist, recently discovered what he calls the real name of the devil. It is not Lucifer, but suboptimization. ’Boulding defines suboptimization as that plan or program which, by concentrating exclusively on a narrow goal and ignoring subsidiary or ancillary effects contributes overall evil rather than good. Such narrow artifacts as DDT, the Aswan Dam, and deep-well dispersion of atomic wastes, not to mention urban superhighways and ‘low-cost’ mass housing, are in this category.”

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