

people, when they think of having a transit line come right through, next to their bedroom, they shiver in horror from the idea. So there is a general popular opinion that forces the separation of transit systems. They want to get them away from where they live, but not so far away they can't walk to it in the morning.

But this is one whole system, an interweaving of housing, business, and transportation, so they are connected in some logical pattern.

Now, going ahead with the description of the system, it is quite clear that all modern, new mass transit systems are going to be automated. The reason for this is that a computer can handle the job so much better than can any traffic dispatcher or any team of men.

For example, in a complex transportation system, there will be demands—certain industries with shift times, there will be recreational events—parades, and one thing or another—and all these events require a shifting of cars and routes on a transportation arrangement to handle the loads. A computer can do that and can do it well.

In other words, for example, one might have something like this—every time somebody puts a fare in a fare box, he would punch his destination. The computer would take his data and process it. It would program the cars on the tracks so that they are diverted to pick up the person and all the other people in the most convenient manner. There will certainly be a need for individual response.

In other words, when you indicate your idea, your desire to travel somewhere at a certain destination, most systems would probably then call cars, so a normal commuter can be assured that a vehicle will arrive there within a certain time, like 2 or 5 minutes. The computer will handle his request and direct a car there.

Now, computers can do that kind of job and they can do it well.

We are handling today far more complex jobs than that with computers, but we are not handling them in a transportation system. This is what we mean by systematizing the whole arrangement.

There are other concepts, for example, in connection with the economics of a project. Route location is one, where the route should be placed for greatest benefit to the people and for greatest income. This is a complex system that interweaves physical and social science. This is a complex system. It is a very broad topic but it has an awful lot to do with transportation.

Mr. MOORHEAD. How do systems engineering and the computer help us in the making of the decision as to what kind of a rapid transit system to use or where to locate it? This is a process which is very difficult for us to comprehend.

Dr. STELSON. This is another system and this is what we normally call optimization, and decisionmaking.

In other words, you have got to decide what kind of system you want to build, where you want to put it, and so on and so forth, rather than making these decisions on an inadequate basis, the computer can compile all the tremendous number of variables—the balance between costs and desirability. The balance between attractiveness and response, the balance between competitive routes with automobiles and with mass transit, and evaluate all of these various aspects of a system.

Then it can determine what system is the most likely to be successful—what system will use the least in resources—both human and