Abridgment

Integration of Public and School Transportation: Hohenlohe, Germany, Case Study

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The rural public transportation demonstration ongoing in Hohenlohekreis in the Federal Republic of Germany is described. Hohenlohekreis is roughly the equivalent of a small county in the United States. It contains an area of 775 km² (300 miles²) and is essentially rural. The demonstration in Hohenlohe appears to be a unique effort in that it integrates public school traffic into public transportation to achieve the goals of reducing the overall cost and making transit more useful and attractive to users. What has been accomplished is the coordination of all rural public transit (regular-route transit, school bus, intercity bus and rail, and elderly and handicapped services) into one geographic area under one coordinated organizational strategy. The demonstration will not end until August 1982, but it shows that integration of rural public transportation and school transportation works in the physical sense; that cooperation of school officials is essential; that planning for this type of service takes a lot of time, is very difficult, and involves considerable planning at the tactical level; that coordination of rural public transportation services can only be realized if there is an institution to provide for the coordination; and that there is significant room for more innovation at the planning level in paratransit services, both in Europe and in the United States.

In September 1980, transportation officials from the state of Minnesota traveled to Stuttgart in the Federal Republic of Germany to complete the second phase of a project between the German government and the state of Minnesota by exchanging information on rural public transportation. The project was sponsored by the German Marshall Fund of the United States, a private U.S. grant-making foundation, which was established by a gift from the Federal Republic of Germany as a memorial to the Marshall Plan.

In the first phase of the project during July 1979, a German team visited Minnesota to examine innovative transit services in small communities and rural areas of the state. The German officials gathered information on the Minnesota Department of Transportation Paratransit Program--at that time the first statewide paratransit program in the United States--to encourage all forms of paratransit and the largest statewide commitment to paratransit nationally.

The purpose of this paper is to describe the rural public transportation demonstration ongoing in Hohenlohekreis, about 64 km (40 miles) northeast of Stuttgart in the state of Baden-Wuerttemberg. The German demonstration in Hohenlohe appears to be a unique effort in that it integrates public school traffic into public transportation to achieve the goals of reducing the overall cost of transportation and making transportation more useful and attractive to all potential users. What has been accomplished is the coordination of all rural public transit (regular route, school bus, intercity bus and rail, and elderly and handicapped services) into one geographic area under one coordinated organizational strategy. The demonstration is being conducted by the Kommunalentwicklung Baden-Wuerttemberg, a community development organization in Stuttgart. This paper provides a general overview of the Hohenlohe demonstration.

HOHENLOHE RURAL PUBLIC TRANSPORTATION DEMONSTRATION PROJECT

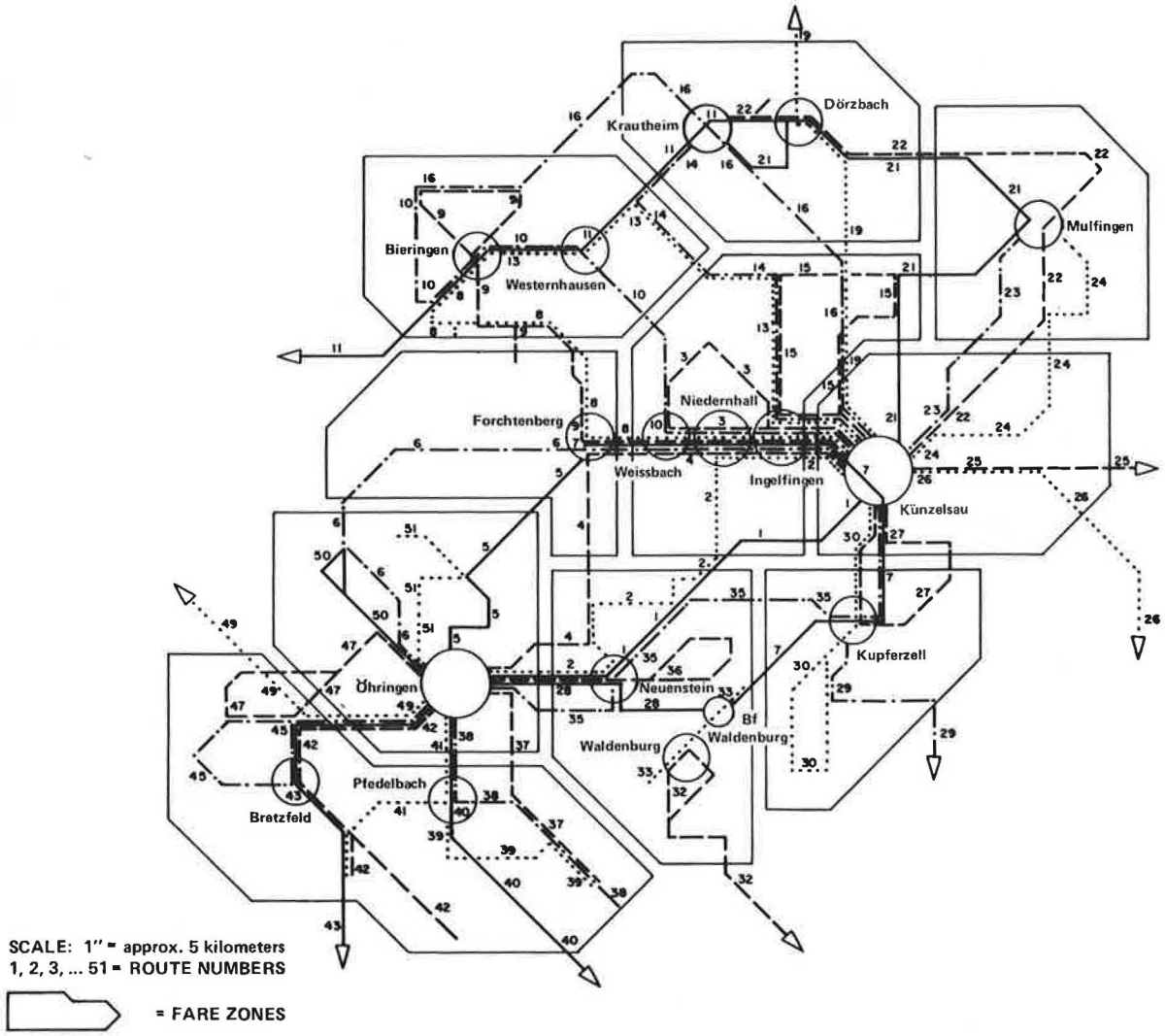
Hohenlohekreis is roughly the equivalent of a small county in the United States. It contains an area of 775 km² (300 miles²). Hohenlohekreis is essentially rural: Approximately one out of four of the 83 000 people work in agriculture. The two biggest communities are Oehringen (population 15 850) and Kuenzelsau (population 11 800). It is about an hour's drive from Stuttgart on the Autobahn.

Before the Hohenlohe rural transportation demonstration began, the area was serviced by traditional, uncoordinated services, including public bus transportation provided by private operators between major towns on major highways and only in peak hours, regular school bus service, intercity bus service, and some special services. Before the demonstration, the mobility and transit coordination problems were not unlike those in most rural areas. As Horst Krautter, the director of Kommunalentwicklung Baden-Wuerttemberg, pointed out, "People used to quarrel about which routes were profitable and which were not and about who was to get what municipal subsidies, licenses, parallel lines and restricted areas...." Many regular-route, public transit services were suffering from low productivity and were subject to being dropped.

With this background, research was begun by the Federal Ministry of Transportation to determine whether it would be practical to integrate all public transit services in the study area to realize the economic advantages of combining parallel vehicle routes, services, etc., by federal, state, and private providers. This research, conducted by the Kommunalentwicklung Baden-Wuerttemberg, produced a report in September 1976, entitled Alternative Models of Reorganizing Public Transit Systems in Rural Areas with Low Traffic Volumes. The study described the nature of service needs in predominately rural areas, the role of large communities as hubs or "pulse centers", the beneficial effects of higher vehicle productivity rates on operating costs, the extensive and ubiquitous nature of public school bus systems (especially here where children go home for lunch), and the problems of coordination and cooperation between transit operators, administrative officials, and neighboring governments. The study also pointed out the problems of developing a service concept that did not take away from anyone yet improved service. The study concluded by proposing a regional public transportation model (Nahverkehrsmodell) that included (a) restructuring regional public transportation networks to identify line-haul needs between major service centers (called "middle-level centers"), as well as collection and distribution service needs of the "catchment areas of middle-level centers"; (b) integrating school bus service with public transportation (probably the key to the whole concept); (c) coordinating all providers while at the same time ensuring that all private providers maintain a share of the market equal to current "licenses", and (d) reducing overall costs to both riders and government through improved coordination and consolidation.

After the completion of the study, a decision was made to demonstrate the concept in Hohenlohekreis. Although the details of the selection process are not available, it is clear that the federal government (through the Ministry of Transportation and Ministry of Education), the state of Baden-Wuerttemberg, the district parliament of Hohenlohekreis, and private providers were all involved in the decision. The financial role of the federal government,

Figure 1. Transit routes and service plan for Hohenlohe rural transit demonstration.



which guaranteed funds to cover the cost of organizing the demonstration and ensuring that transportation operators would not experience financial losses, played a key role in the decision to go ahead with the three-year demonstration project.

Figure 1 illustrates the service concept that was implemented in September 1979. The concept within the demonstration area is built around connecting middle-level centers both inside and outside the demonstration area (which receive 66 percent of the commuter traffic and 50 percent of the school traffic) as well as providing service within various zones or "catchment areas" of the centers (circled areas in Figure 1). The middle-level centers operate as pulse centers. The stated goals of the concept are to connect 95 percent of the population of the area and provide service to all communities that have more than 50 residents (provided no person is farther than 1 km or a 15-min walk from a bus stop). The basic route and schedule plan for the overall service was built around a 3-4-3 system (that is, three trips on all routes in both directions in the morning, four trips at noon, and three trips in the evening at regular intervals). Weekend and holiday service, as well as service in the fringe rural areas, varies somewhat from this. The 3-4-3 system subdivides a service day into three blocks separated by two service interruptions, one in the morning and one in the early afternoon, when traffic volume is low. The service interruptions give drivers a break, as specified in collective-bargaining agreements.

A uniform zone fare system and schedule ("the little red book") are two other features of the project. All middle-level centers are linked to the national railroad system. A large amount of time was spent actually planning routes, stops, and waiting times. The implementation of the demonstration was delayed a whole year because of the extra time requirements of coordinating schedules and contracts. One important point is that school starting times were changed (by as much as 30 min) to optimize scheduling for the bus.

The implementation of the concept has required unusual cooperation between school administrators, private operators, local transit administrators, and municipal and regional governments. All of these people who were interviewed in the fall of 1980 were highly complimentary.

A key to the demonstration is the funding. Overall, it is estimated that the total cost of the project services will be 10 million DeutschMarks (DM), or about U.S. $6 million. The project planning called for 80 percent of the cost of the proj-

ect to be covered by fares and federal funds and the remaining 20 percent to be shared by federal, state, and local subsidies. Apparently, 60-70 percent of the project costs will come from school traffic, which comes from both fares paid by students (unlike in the United States) and school district subsidies [estimated at 3.5 million DM (U.S. $2 million)].

Unfortunately, there are no specific financial and ridership data on the first year of operation. The first progress report envisioned that total system mileage (bus kilometers) would increase about 20 percent but the number of drivers and vehicles would not change. It is estimated that the system will carry about 10 million riders (66 percent school trips, 14 percent work trips, and 20 percent miscellaneous). It was assumed that the demonstration area had a 25 percent modal split (transit versus private car) for commuter trips, in spite of the fact that automobile ownership in the region is quite high.

Except for students, the fare system is as follows (1 DM = U.S. $0.6):

Type of Ride	Fare (DM)	
	Adult	Minor
Within a town	1.35	0.90
Between towns	1.80	1.35
Between several towns	2.25	1.80

Apparently, handicapped persons ride free.

One of the unique aspects of the demonstration is the treatment of private operators. A total of 18 private and public operators held licenses (much like the operating authorities under the Interstate Commerce Commission in the United States for common carriers) that had to be dealt with during the demonstration. Each operator was guaranteed a share of the market equal to that before the demonstration. Each operator was guaranteed his or her original license back after the demonstration (assuming it was not continued). It is important to note that the equipment used for school buses is equivalent to the highest-quality intercity coaches in the United States. A ride on the school buses revealed no graffiti or torn seats, in spite of the daily busing of school children.

COMPARISONS AND CONCLUSIONS

The Hohenlohe demonstration is not complete; it will end in August 1982. Complete data are not available to evaluate the specific accomplishments of the demonstration. There are some breakthroughs here that could potentially be considered in the United States. There are also aspects of the demonstration that are not comparable to the United States. The following section compares the two environments and provides some conclusions:

1. The demonstration shows that integration of rural public transportation and school transportation works. There are no data on costs, so we do not know "how well", but our visit indicated no serious problems. This example shows that physically the two systems can be put together.

2. The key conclusion from an examination of the demonstration is that the cooperation of school officials is essential. While the demonstration was concerned about maintaining starting times and school activities, the school schedules and the role of school transportation were a variable in setting up the demonstration. It was pointed out that it would not be possible to successfully carry out the demonstration in a large rural area without coordination of school buses because no regular-route system is economically feasible without the income from the school traffic (which at this point is estimated to be 60-70 percent of the total fare revenue). The state of Minnesota spends more than $120 million/school year transporting school children, plus $9 million for handicapped persons. Combining the current public paratransit demonstrations in Minnesota with school-system transit service could potentially create a much more extensive overall rural public transportation network in Minnesota.

3. Probably the most significant difference between the background transit environment in the United States and in Germany is the density of population. People live much closer together in Germany. The average farm size in Hohenlohekreis is 4 hm^2 (10 acres) whereas the average farm size in Minnesota is 117 hm^2 (290 acres). The population density in Minnesota is 10 persons/km^2 (25 persons/$mile^2$), without the Twin Cities metropolitan area population, whereas in Hohenlohekreis it is 106 persons/km^2 (275 persons/$mile^2$). However, the school bus service must still cover all of these areas.

4. A key conclusion from the demonstration is that planning for this type of service takes a lot of time and is very difficult. Planning for implementation involved a lot of "nitty-gritty", tactical-level planning of routes and schedules; integration of school activities; integration of public, private, and federal operations; and financial planning. In many cases, this is why separate school transportation systems and separate public transportation systems are more common. Putting these planning activities together is very difficult and time-consuming. But there is a big payoff--significant savings in operational costs--as well as an overall improvement in coverage of the network.

5. The coordination of rural public transportation services can only be realized if there is an institution to provide for the coordination. It appears that the German government exercises far greater control and regulation over transit and urban planning than does the federal government in the United States. It is apparent that some mechanism to encourage this larger role in pulling together the diverse interests of school transportation and public transportation would be needed if this demonstration were to be implemented in the United States. In Minnesota, for example, existing state law prohibits nonstudents from riding the bus with schoolchildren. The United States has institutionalized the separate school transportation system in rural areas. The identification of a coordinative agency, or "broker", is a significant barrier to overcome. It is interesting to note that, where good urban public transit exists, school transportation and public transit have already been successfully combined.

6. The Europeans are ahead of the United States in bus upkeep and maintenance. They have put the highest priority on system quality, maintenance, and appearance. There is also a major difference between the two countries on the treatment of the safety issue. The United States has placed special emphasis on safety through the use of color, lights, signing, and stopping regulations, which are not used in Germany. These U.S. conventions accomplish the safety objectives but create barriers to integration with public systems.

7. The demonstration points out that there is significant room for more innovation at the planning level in paratransit services, both in Europe and in the United States. It suggests the need for more trained transit planners in rural areas. This will require a strong commitment in the United States and Europe to greater investment in the training and

education of transit planners. In these economic hard times, however, the concern is to reduce costs. The planning resources needed to consider these kinds of system changes often do not exist. Why do we need to do planning when we have to cut back? is the concern of the budget maker. So much of the implementation of these systems will involve the foresight of investing in this type of planning, which is much like convincing the farmer not to eat the seed corn in times of famine.

8. Hohenlohekreis is apparently demonstrating one example of the "try it, you'll like it" approach to transportation. The Germans have established a small project that emphasizes software rather than hardware or large capital-intensive answers to problems. This demonstration, the battery-powered standard bus, the Duo-bus, and the O-bahn concept all indicate the Germans' feeling that you should begin small and change or adopt other systems or ideas should the demonstration prove impractical.

The Hohenlohekreis demonstration is a significant contribution to the rural public transit experience. The lessons to be learned in this demonstration should be a good lesson in times of increasing governmental costs, skyrocketing fuel prices, and the resultant demands for reducing costs through innovation, coordination, integration, and combination of public services.

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Abridgment

Swiss Postal Passenger Service

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Solutions for public transportation in less populated regions are considered with respect to (a) region size and topography, (b) the national political structure of the country, and (c) population density and standard of living. The Swiss transportation system is characterized by a very wide range of transportation opportunities, operational factors, and financial aspects. The postal passenger service is the result of a long-term evolution that attempts to offer a satisfactory response to mail and passenger transportation needs in rural resorts. This response emphasizes efficiency for both the users and the collectivities. The organization of the service, the network structure, service quality, tariffs, and the financial situation of the companies involved are analyzed. Long-term experience has resulted in the following measures: (a) adaptation to a diffused demand with the highest possible flexibility and spirit of creativity, (b) integration of the transportation operations of all private and public companies in order to take advantage of their common resources, and (c) sharing the responsibility between regional and local authorities in order to ensure a budgetary balance between the operating companies.

This paper discusses some general aspects of land use and transportation systems, public transportation policies in rural and mountain areas, some characteristics of the Swiss postal passenger service (PTT), and some lessons to be learned from past experiences. The scope of the paper is limited to Switzerland.

LAND USE AND TRANSPORTATION SYSTEMS

The topography of Switzerland is characterized by two mountain ranges, the Jura and the Alps, bordering a plateau. The Jura Mountains are approximately 3300 ft in altitude; numerous Alpine summits are above 13 000 ft. The average altitude of the plateau varies between 1300 and 1600 ft. The Alpine area is cut by numerous longitudinal and transversal valleys.

The following comparative data on population density and employment for Switzerland and the state of California provide a context for the issues discussed in this paper:

Item	Switzerland	California
Inhabitants (000 000s)	19.2	6.3
Area (miles^2)	158 700	15 900
Population density (inhabitants/mile^2)	120	400
Employment (% of inhabitants)	42.4	46.8

A fundamental objective of land use policy in Switzerland is to reinforce the decentralized structure in order to ameliorate living conditions, especially in regions that suffer regional disparities (especially the mountain regions). Such disparities are the cause of migrations from economically weak regions into developed areas.

When the net population remains constant, the attraction of population centers causes a migration from other areas. Among the measures implemented to combat such a trend are the efforts of federal and local authorities to increase accessibility to small or medium-sized urban centers in areas of low population density.

Switzerland, which is located in the heart of Europe, benefits from very heavy tourist traffic, either in transit or terminating in plain or mountain resorts.

Management of the transportation system is strongly influenced by the federal structure of the Swiss Confederation. The 23 cantons and their numerous towns and cities have great political and financial power. Moreover, financial resources per capita are of the same order of magnitude at the