The Ruhr District has a long history of creative transit approaches. The Schwebebahn (literally, hover train) is a century-old mode in the valley city of Wuppertal.
ON AN AUGUST MORNING COOL enough to signal an early au-

tumn, Bernd Knüttel ignites his minivan's engine and pulls away
from his house. His hour-long commute to his job as a digital

designer in Frankfurt's city cen-
ter hasn't changed for nearly five
years. It's been multimodal from
day one.

As always, the first leg of the trip takes
Knüttel from the calm of his quaint vil-
ge to the rush of the German autobahn
and eventually to the parking lot of a com-
muter rail station. He parks his minivan and
then hauls his bicycle out of it. From here
he cruises along greenways, under highway
and railroad overpasses, and eventually to
the promenades of the Main River and to
his office building. He'll reverse course at
the end of the day, again either using or
passing elements of infrastructure that to-
gether form one of the world's most envied
multimodal transportation networks.

German transportation planners and
policy makers continually pioneer innova-
tive ideas. The notion of Gesamtmo-
bilität—or "full mobility"—stands to revolu-
tionize the meaning of public transportation, while
modern technology is opening the doors to
new types of electronic transit tickets. These
changes mean new and expanded mobility
options for Germans like Knüttel, who may
soon find a reason to tinker with his tradi-
tional commute.

Transportation as a priority

By its very nature, Germany must give pri-
ority to an efficient transportation network.
The country's roughly 80 million citizens
live in an area about the size of Montana.
Also, Germany sits in the center of Europe,
literally at the continent's crossroads. Bol-
stered by these circumstances, Germany's
federal government supports the view that
economic and social prosperity necessitates
a transportation network that permits the
smooth flow of people and goods.

"It is the goal of the German federal
government to facilitate safe and affordable
mobility to the people and to create reli-
able and competitive transport conditions
for the economy," says Wolfgang Küpper,
head of the German Federal Ministry of
Transportation, Building, and Urban De-
velopment's railway policy section. "The key
factor toward this goal is in turn optimally
linked and developed infrastructure. The
federal government has the task to make the
required investment funds available."

To this end, the 2013 federal budget
allots €10.7 billion ($14.2 billion U.S.)
to selected transportation infrastructure
projects, which represent a portion of the
Federal Transport Infrastructure Plan. A
Greenways, like this one in Münster, act as an integral part of Germany's intermodal transportation network. These kinds of trails exist in most towns and cities, and it's not uncommon for greenways to connect rural villages.

roughly 10-year plan, the FTIP acts as a planning tool and investment strategy for the construction and maintenance of federally funded rail, road, and waterway infrastructure.

Additional federal funding comes in the form of so-called Regionalization Funds, which annually provide around €7 billion ($9.2 billion U.S.) collectively to Germany’s 16 federal states for use at their discretion on public transportation, and from various competitive grant programs. This approach to federal-level funding and planning clearly displays the priority placed on the country’s transportation network and the acknowledged significance of a multimodal one.

“This foundation renders possible an integrated transportation policy that doesn’t rely solely on one mode of transport, but rather uses the strengths of each individual mode,” says Küpper. “Especially in light of the expected additional volume of traffic no one mode of transport can be set aside or overlooked.”

Perhaps due to this lengthy practice of integrating transport modes, Germany has created a novel approach to public transportation.

**Gesamtmobilität: full mobility**

In transportation planning circles around Germany, a new buzzword has emerged: *Gesamtmobilität*. The term full mobility has come to denote the concept of combining bike-sharing, car-sharing, and traditional
public transit into one coordinated network.

Over time many German bike-sharing and car-sharing systems eventually partnered with local transit agencies to provide discounts for their users. Full mobility, however, transforms these partnerships into integrated models. The coordinated network eliminates the shortcomings of each of the three modes and allows them to complement each other.

For example, a bicycle may provide the most economic option for short-distance trips, but it’s not as practical for transporting groceries as a car. Likewise, a car may provide greater mobility than transit, but using the latter during rush hour may bring the traveler to his destination more quickly. From the user’s perspective, personal mobility and convenience both increase when three independent systems begin to connect.

Take, for instance, the commuter from the Frankfurt region. If during his lunch break Knüttel needed to run an errand across town, he could easily check out a car using his full mobility card; that could be a better option than bicycling or taking transit. Similarly, if a sudden thunderstorm were to roll in at five o’clock he could stay dry by taking transit back to his car using the same card.

In theory, full mobility could create a synergy that increases transit ridership and both bike- and car-sharing. City residents—though not necessarily suburban commuters—might decide to forgo car ownership entirely. With these possibilities in mind, transportation planners and agencies across Germany are trying to put theory into practice.

**Full mobility trials**

Several German cities have attempted pilot projects of full mobility networks. Hamburg’s transportation association is bringing the city’s transit agency together with the car rental and sharing companies Europcar and Car2Go to establish “mobility service points” where users can find the providers’ services and information. The bike-friendly community of Münster is implementing a mobility card that will act as a transit ticket and access card to the local car-sharing program, parking garages, and charging columns for electric bicycles.

And in Berlin, Deutsche Bahn, the German railway company, is testing the extension of its customer discount card as a ticket for local transit and as an access card for its own bike-sharing and car-sharing companies, Call a Bike and Flinkster.

In Germany’s rust belt, the regional transportation association, Verkehrsverbund Rhein-Ruhr, is committed to full mobility. VRR is betting that the term public transit will soon imply cars and bicycles along with traditional buses and streetcars. The organization has been testing its ideas in Dusseldorf since March 2012. For €74.90 (about $100) a month, customers receive a ticket card that includes a monthly pass for local transit, 90 minutes of Car2Go usage, and four hours’ daily usage with nextbike. Users can purchase additional credit as needed.

In another effort, VRR is more closely integrating its own bike-sharing system—called metropolradruhr—with its transit services. Considering that its bike-sharing program is also Germany’s largest (300 docking stations and 2,700 bicycles), VRR already finds itself in an advanced position. As of this summer, all subscribers to VRR transit passes who pay an optional charge of €1.50 (nearly $2) a month receive 30 minutes of credit daily with metropolradruhr, with additional charges applying thereafter.

Two cities profiting from VRR’s full mobility offerings are Gelsenkirchen and Bochum, both of them served by the transit agency BOGESTRA. Elke Einhäuser, a geographer in the agency’s transportation management and quality department, supports this integrated approach.

“Inexpensive, flexible, and good for the environment: All of that is what a good mix of diverse mobility forms can mean,” she says, “particularly when one decides against the car in the transportation choices of everyday life, and instead embraces alternatives like the bus, train, or bicycle.”

In the future, she adds, “a further integration of diverse mobility services will be important. Thus, our commitment will be to offer perceivable, one-stop mobility.”

Whereas German full-mobility projects typically involve the challenging integration of preexisting systems, many American communities would have the advantage of integrating new systems on the front end and learning from entities like VRR. In that vein, VRR itself and its mission deserve an explanation, as they shed light onto another German innovation in transportation planning.

**One ticket, one network**

In the mid-1960s the stakeholders of metropolitan Hamburg’s disorienting public transit network convened to find an alternative to the jumble of redundant routes, conflicting schedules, and confusing fares. Like most German metropolitan areas, Hamburg’s was served by multiple transit providers, each with its own interests and concerns. The solution worked. The idea’s originators called their concept a transportation association, or, in German, a Verkehrsverbund.

“We can, in principle, declare that a Verkehrsverbund is a model of success,” says Ralf Dammann, director of VRR’s transit service procurement section. “Virtually all German metropolitan areas and cities are now integrated into a Verkehrsverbund.” The number of such associations between even small municipalities is continually increasing, notes Dammann, and the idea has long since spread to Switzerland and Austria.

At first glance a Verkehrsverbund may seem like a simple oversight or funding authority for public transportation in a given region. However, a Verkehrsverbund performs much of the nitty-gritty work necessary to merge the region’s multiple transit services into a coordinated network.

“The essential advantage of a Verkehrsverbund is how it improves the attractiveness of public transportation,” says Dammann. The basic deliverables for the customer include “the potential availability of all transit services, a unified fare structure—indeed from the transit provider,” and coordinated timetables and routes between providers to reduce wait times, redundancy, and service gaps.

Riders need only one ticket for a journey involving multiple providers (such as a suburban transit agency, a commuter rail authority, and the core city’s transit agency), and can transfer freely between services. This greater convenience has not only led to increased ridership and revenue, but also to a seamless travel experience for riders.

While a Verkehrsverbund’s required activities or methods may vary from state to state, the association usually acts as the central administrator of fare collection. Disbursement of the revenues to the transit members of the association involves a complicated formula that incorporates various performance measures. Aside from handling farebox revenue, the Verkehrsverbund often has the additional task of disbursing...
public subsidies from local and state governments. This collective fiscal oversight also opens the door to competitive bidding from public and private companies on the rights to operate specific routes.

Finally, a Verkehrsverbund performs the role of transit advocate in the region by planning for future needs, producing a comprehensive marketing campaign locally, and lobbying the state and federal governments for funding. A unified voice in these three areas, as opposed to competing cries, can only enhance the region's transit infrastructure and operations.

"Transit companies and communities should not be afraid to transfer tasks or responsibilities to a Verkehrsverbund," Dammann says. "There is no complete loss of duties or competence as these members almost always retain representation in the association's administration."

**Trendsetting Verkehrsverbund**

In the crowded field of the German Verkehrsverbünde, VRR stands out as a model not only for its unique attributes but also for its progressive approaches.

VRR's service area includes the Ruhr District and outlying pastoral landscapes, a polycentric region that covers 2,800 square miles and is home to 8.1 million residents—one of the most densely populated regions of Europe. The service area includes some of Germany's largest cities, such as Essen, Dortmund, and Dusseldorf. Unsurprisingly, VRR holds the title of Germany's largest Verkehrsverbund. According to VRR, it is also the largest transport association of its type in all of Europe.

As with any Verkehrsverbund, VRR doesn't operate transit services; rather, it coordinates those of its transit-providing members—all 32 of them. These range from municipal transit agencies to private transit companies and even to airport people movers. This far-reaching network encompasses 965 diverse routes, totaling over 7,500 miles and representing essentially all types of existing transit vehicles: bus, trolley bus, streetcar, light rail, heavy rail (subway and elevated), commuter rail, intercity rail, and monorail. With more than three million passengers a day in the network, VRR boasts an annual ridership of 1.2 billion.

One of the 32 members, the BOGESTRA transit agency, is located almost squarely in the middle of the Ruhr District.

"The eight million residents of our Verkehrsverbund are spread out over 50 municipalities," says Einhäuser. "In this part of the country one city overlaps the other, so that mobility needs are tightly interwoven. Therefore it's good to have a Verkehrsverbund that makes it possible for our customers to travel from city to city with one ticket and to be able to use the same timetable, and to benefit from the same standards in local transit."

**A ticket that thinks**

Perhaps because of the distinct conditions and demands of its service area, VRR often has no choice but to try novel approaches. While pioneering full mobility, VRR is also pursuing another ground-breaking development in German public transportation: the eTicket. VRR wants to discontinue use of paper tickets by 2020. Passengers will instead use electronic passes or their smartphones.

The passes are already widely implemented and in use by riders. All passengers who purchase any one of the assortment of monthly or annual passes offered by VRR receive a plastic card with an electronic chip. This can then be scanned by transit conductors or held up to card readers. The electronic, handheld scanning devices and the card readers on buses are already standard equipment. At the end of the month or year, riders can renew their passes. In the future, these cards will be valid for shorter periods, allowing passengers to retain the card and add credit as necessary.

With the smartphone, an app will allow customers to purchase any type of ticket available in the network and store it in digital form. The ticket will then be readable as a QR code on the customer's phone, which can be scanned by conductors and card readers. Development of the smartphone ticket app is due for bidding in 2014. VRR will also roll out a check-in/check-out strategy. CiCo, as VRR refers to it, will completely revamp the network's ticket structure. When buying a ticket, customers now must decide in how many travel zones and how often they plan to travel, but CiCo will eliminate this hassle. By 2017, riders will check in for a trip by holding their electronic passes or smartphones up to card readers in buses and on train platforms. When exiting the bus or leaving the destination platform, passengers will repeat the motion to check out. The ticket, whether an electronic pass or smartphone, automatically determines the cost of the trip and debits the rider's account.

When the total cost of travel for a given period reaches a certain amount, the ticket will cease to charge the account for the remainder of that period. Riders will receive a simple and fail-safe way to buy the cheapest tickets, and VRR likely will see an increase in ridership.

**Changes ahead**

Back in Frankfurt, Knüttel offers some reflection on Germany's transportation network and his travel habits. "Of course, the bus or train could be cheaper, and since I live in the country with my family I'll never be able to give up a car completely. But in the end I can always get to wherever I want to go, whether it's with a car, bike, or something else. If there are any better alternatives to what we have here in Germany, I'm not sure what they would be."

With their demonstrated innovation, German transportation planners will not only continue to address issues like those raised by Knüttel, but also ensure that other countries will look to Germany for alternatives.

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**Resources**

**Online**

- English-language homepage of the German Federal Ministry of Transportation, Building, and Urban Development: www.bmvrbs.de/EN.
- German-language homepage of BOGESTRA: www.bogestra.de.