

Bicycling Boom in Germany: A Revival Engineered by Public Policy

Bicycling has increased dramatically in German cities over the past two decades, not only absolutely but even as a proportion of total travel. Overall, the bicycle share of urban trips in western Germany rose by 50% from 1972 to 1995. In many large cities, bicycling doubled or tripled, while the modal split share of auto travel fell, thus mitigating roadway congestion and pollution problems. The resurgence of bicycling as a practical mode of daily urban travel is due almost entirely to public policies that have greatly enhanced the safety, speed, and convenience of bicycling while making auto use more difficult and expensive. The bicycle has triumphed in Germany in spite of rapid suburbanization, rising auto ownership, increasing trip lengths, and rising per capita incomes. This article shows that, with the right set of public policies, bicycling can be increased almost anywhere.

by John Pucher

The impressive victory by a German cyclist in the 1997 Tour de France is perhaps symbolic of the increased importance of bicycling in Germany. Whereas the proportion of urban travel by bicycle has fallen in many countries, it has risen dramatically in Germany over the past two decades. As shown in this article, the revival of the bicycle as a practical mode of daily urban travel is due to public policies. German cities have adopted a wide range of measures that have made bicycling faster, safer, and more convenient while simultaneously restricting auto use and making it more expensive. Other countries may want to examine the German success in raising bicycle use, since the bicycle is the most energy efficient and least polluting of all transport modes.

Differences among Countries in Bicycle Use

Even among countries with similar levels of economic development and technology, there is enormous variation in the relative importance of bicycling as a means of urban travel. The European and North American countries listed in Exhibit 1 have roughly comparable per-capita incomes, similar political and economic systems, and high levels of urbanization. Yet European countries have far more bicycle use than North America. The bicycle accounts for less than 1% of all urban trips in both the United States and Canada.¹ By contrast, even the least bicycle-oriented European countries (Italy and France) depend on the bicycle for 5% of urban travel. In the most bicycle-oriented

Exhibit 1
Modal Split Distributions for Urban Travel in Europe and North America
(1990 or latest available year)

Country (ranked by bicycle use)	Percent of Trips by Travel Mode (all trip purposes)				
	Bicycle	Walking	Public Transport	Auto	Other
Netherlands	30	18	5	45	2
Denmark	20	21	14	42	3
Germany (Western)	12	22	16	49	1
Switzerland	10	29	20	38	3
Sweden	10	39	11	36	4
Austria	9	31	13	39	8
Germany (Eastern)	8	29	14	48	1
England and Wales	8	12	14	62	4
France	5	30	12	47	6
Italy	5	28	16	42	9
Canada	1	10	14	74	1
U.S.A.	1	9	3	84	3

Source: Ministries of transport and departments of transport in each of the individual countries.

countries, bicycling exceeds public transport in the proportion of urban trips served. Bicycling accounts for 30% of all trips in Dutch cities and 20% of trips in Danish cities. The Netherlands and Denmark are perhaps extreme examples, but even German, Swiss, Swedish, and Austrian cities rely on the bicycle to handle about 10% of all trips, more than 10 times the level in North America.

What accounts for the far higher level of bicycle use in Europe? It is not due to a lack of alternatives. Auto ownership levels among the European countries listed in Exhibit 1 are among the highest in the world. Moreover, the public transport systems in Western Europe are the most extensive and highest quality in the world, with the possible exception of Japan. Nor do Europeans cycle out of economic necessity: per-capita incomes in Sweden, Switzerland, the Netherlands,

and Denmark are as high or higher than in the United States and Canada.²

Climate and topography do not account for the differences between Europe and North America. The climate in Europe is worst precisely where bicycling is the most prevalent. The Netherlands and Denmark have maritime climates with frequent rain, drizzle, and fog. With the exception of the Pacific Northwest, the climate in the United States should be far more conducive to cycling. The flat topography of the Netherlands, Denmark, and northern Germany obviously make cycling easier, but most of the American and Canadian populations live in areas that are relatively flat as well, especially on the Atlantic and Gulf coastal plains and the Great Plains of the Midwest. Moreover, Switzerland and Austria are mountainous countries; yet 10% of travel there is by bike. The topography of

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urban areas, of course, is the crucial factor, and in almost every country, that is usually quite flat or only moderately hilly, thus making bicycling quite feasible in almost any city.

The last "excuse" for the minimal role of bicycling in North America is that average trip distances in U.S. and Canadian cities are too long to be covered fast enough by bike. There is, in fact, some truth to this, as various studies show that, on average, urban trips tend to be about 50% longer in the United States than in Western Europe.³ The far more decentralized, lower-density urban areas in the United States obviously lead to longer trip lengths. Longer average trip distances in U.S. cities would explain a somewhat lower bicycle use than in Europe, but hardly the current level of less than 1%. Even in the United States, 49% of all urban trips are 3 miles or less, 40% are 2 miles or less, and 28% are 1 mile or less, and thus easily covered by bike.⁴

The main reason for differences in the level of bicycle use is public policy. In the United States, very little has been done to promote bicycle use. The few bikeways and bike lanes in U.S. cities are, in general, uncoordinated, poorly maintained, and—because they are usually not separated from auto traffic—dangerous for bicyclists. Even more serious, most American motorists seem to have no respect for the legal rights of bicyclists to share the same streets they drive on; the police and courts do very little to punish auto drivers who kill and injure bicyclists, even in cases when motorists are clearly at fault.⁵

In the Netherlands, Denmark, Germany, and Switzerland, by contrast, various levels of government have constructed extensive systems of

bikeways and bike lanes with completely separate rights-of-way. Moreover, bicyclists are increasingly given right-of-way priority over autos; the police and courts actually enforce bicycle priority in urban traffic.

In short, bicycling has been thriving precisely in those countries that have adopted policies to make bicycling faster, safer, and more convenient. Bicycle use has been falling in those countries that have been neglecting the needs of bicyclists. Thus, the bicycle modal split in England fell from 12% in 1975 to 8% in 1991; in France, it fell from 10% in 1978 to 4% in 1990. Both England and France have largely neglected bicycling as a practical mode of urban travel, no matter how much interest they may have in bicycling as a sport.

This article focusses on the western portion of Germany as an example of a particularly successful public policy shift that has favored increased bicycle use over the past two decades.⁶ It examines in detail how German cities have made bicycling more attractive relative to other modes and thus have greatly increased the percentage of travel by bike. Of course, Germany is not the only country that could have been chosen for such a study; Denmark and the Netherlands have also been at the forefront of efforts to promote bicycle use. Germany is particularly interesting, however, precisely because it was not one of Europe's most bicycling-oriented countries in the 1970s. Moreover, increased bicycle use in Germany has been achieved in spite of extremely high auto ownership (second highest in the world after the United States) and rapid suburbanization around German cities in recent years. Bicycling has triumphed in Germany in spite of all the land-use,

income, trip distance, and time factors used as excuses for the low level of bicycling in the United States. With the right set of policies, bicycling can be greatly increased almost anywhere.

Bicycling Trends in Germany

As shown in Exhibit 2, there is considerable variation among German cities in the relative importance of bicycling for urban travel. Muenster, in northwestern Germany, tops the list with 32% of all trips by bicycle, followed by Bremen (with 22%) on the North Sea coast and Freiburg (with 19%) in the Black Forest of southwestern Germany. Even in Munich, Germany's third largest city, 15% of all trips are by bicycle. In Cologne, the fourth largest city, 11% of all trips are by bicycle. The lowest bicycle use is found in the

industrial cities of the Ruhr region (Essen, Bochum, Wuppertal), where bicycle modal split is only 5%, partly due to severe air pollution, noise, and congestion.

One could hardly claim that Muenster and Bremen top the German cycling list due to their weather. Both cities have rainy, drizzly, and foggy climates. Indeed, it rains in Muenster an average of 238 days a year! Yet, in both cities, the almost completely flat terrain obviously makes bicycling easier. Things are a bit hillier in Freiburg, which is surrounded by the mountainous Black Forest region, and in Munich, which lies in the foothills of the Bavarian Alps, but most development in those two cities is on level terrain. Moreover, the weather in those southern German cities is not nearly as extreme as in northern Germany.

Exhibit 2
Modal Split Distributions for Selected German Cities

City (year) (ranked by bicycle use)	Population (000)	Percent of Trips by Travel Mode (all trip purposes)			
		Bicycle	Walking	Public Transport	Auto
Muenster (1994)	270	32	22	10	37
Bremen (1991)	554	22	21	17	39
Freiburg (1992)	179	19	21	18	42
Hannover (1990)	524	16	23	22	39
Munich (1995)	1,257	15	23	25	38
Cologne (1992)	961	11	30	17	41
Nuremberg (1995)	500	10	24	21	45
Dusseldorf (1990)	578	9	30	18	42
Kassel (1994)	192	7	28	19	45
Stuttgart (1990)	599	6	28	23	43
Essen (1990)	627	5	27	15	57

Sources: Werner Broeg and Erhard Erl, "Can Daily Mobility Be Reduced or Transferred to Other Modes?" European Conference of the Ministers of Transport, OECD, Paris, France, Roundtable 102, March 1996; and U.S. Department of Transportation, *Nationwide Personal Transportation Survey*, Washington, DC: 1992.

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Perhaps one reason for the differences in bicycling among cities is the presence or absence of a large student population. All of the cities listed in Exhibit 2 have universities, but students make up a particularly large proportion of the population in Muenster and Freiburg. Muenster, for example, has the fourth largest university in Germany (with 45,000 students) and a population of only 270,000. Since students in Germany are the most frequent cyclists, that probably helps explain Muenster's position as the premier cycling city. The larger universities in Munich and Cologne are less dominant in the overall population due to much larger city sizes.

University students are not only directly important as cyclists, they have also strongly influenced transport policies in German cities. In the most university-oriented cities, students have helped elect members of the Green environmental party to city governments. In Muenster, Freiburg, and Bremen, the Green Party has been part of the governing coalition with the

Social Democrats. Likewise, the Green Party has become increasingly important at the state and national levels. Environmental consciousness in Germany is high among all political parties and most segments of the population, but it is highest among university students, and through the Green Party they have supported many of the pro-bicycling and auto-restraint policies discussed below.

Exhibit 3 shows how much bicycling has increased in German cities over the past two decades. For Germany as a whole, the bicycle's share of all urban travel rose from 8% in 1972 to 12% in 1995. That represents a 50% increase in bicycle modal split. In some cities, the increase was even more impressive. In Munich, for example, bicycling almost tripled, rising from 6% to 15% of all trips. In Nuremberg, bicycling more than doubled, rising from 4% to 10% of travel. It almost doubled in Cologne (6% to 11%) and Freiburg (12% to 19%). The increase in Muenster was small (29% to 32%), perhaps because it was

Exhibit 3
Increases in Bicycle Modal Split over Last Two Decades
in Selected German Cities

City	Time Period	Change in Bicycle Modal Split Share	Percentage Increase in Bicycle Share
Munich	1976 to 1992	6% to 15%	+150%
Nuremberg	1976 to 1995	4% to 10%	+150%
Cologne	1976 to 1992	6% to 11%	+83%
Freiburg	1976 to 1992	12% to 19%	+58%
Essen	1976 to 1990	3% to 5%	+67%
Bremen	1976 to 1994	16% to 22%	+38%
Muenster	1976 to 1994	29% to 32%	+10%
Average for all urban areas in Western Germany	1972 to 1995	8% to 12%	+50%

Sources: Werner Broeg and Erhard Erl, "Can Daily Mobility Be Reduced or Transferred to Other Modes"; and supplemental data collected from individual cities by the author.

already at such a high level. Even in the industrial Ruhr region, bicycling increased from 3% to 5% of urban travel. Thus, the ascendancy of bicycling has covered the entire range of German cities.

In all of these cities, bicycling would have increased even more had it not been for the introduction of extremely low-cost semester transit passes for university students in the early 1990s.⁷ In Muenster, for example, students pay only 63 DM (\$37) per semester for unlimited travel within Muenster and its inner suburbs. In Freiburg, students pay only 47 DM (\$28) per month for unlimited travel anywhere within the large transit district including Freiburg and the surrounding Black Forest region. In the extensive Rhein-Ruhr regional transit district (Essen, Bochum, Wuppertal, Dortmund, Dusseldorf), students pay only 85 DM (\$53) per semester for unlimited travel by bus, metro, streetcar, and commuter rail over an area of 5,025 sq km. Moreover, the cost of semester transit passes is automatically included in student fees, whether the student actually uses transit or not, so that the marginal price of using transit, in effect, becomes zero.⁸

Some might argue that, in the long run, improved transit is complementary to bicycle use since it provides an alternative to the auto when bicycling is not possible. In particular, it helps avoid the need to own an automobile. In the case of Muenster, however, it is clear that some students have been shifting from bicycling to transit, especially on rainy days, in response to the extremely cheap semester passes. That is not necessarily bad, since the overall result has been declining auto use. The point is simply that the large increase in bicycling in German cities

would have been even more impressive without the deep student discounts for transit in recent years.

Policies that Encourage Bicycling

Over the past two decades, virtually every German city has been implementing a range of policies to promote both bicycling and walking. Muenster has been the unchallenged leader in bicycling policies. It has not been satisfied with resting on its record of having the highest level of bicycle use in Germany. On the contrary, Muenster has vigorously built on its past successes by expanding its system of bikeways and steadily introducing new innovations to promote more bicycle use. For example, its network of integrated bicycle paths was extended from 145 km in 1975 to 252 km in 1995, with most paths separated from both auto and pedestrian traffic. Muenster even has a tree-lined bicycle expressway (7 meters wide, 6 km long) that encircles the city center along the route of the medieval city wall. It provides direct connections with 16 major bike routes radiating to outlying portions of Muenster, its suburbs, and the surrounding countryside, which is also crisscrossed by a dense network of integrated bike paths. The same bicycle expressway also connects with 26 bike paths leading inward toward the town center and the Cathedral Square. In addition to 252 km of separate bike paths, bicyclists benefit from over 300 km of bike routes over lightly traveled roads restricted to local traffic.⁹ Finally, most residential streets in Muenster can be safely used by bicyclists, thanks to traffic-calming measures that give pedestrians and bicyclists right-of-way priority and restrict auto speeds to 30 km per hour (19 mph).

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Exhibit 4



Typical bike path in Muenster, unfortunately obstructed by overflow of parked bikes. Such bike paths are one-way only and thus on both sides of every major street. Muenster has 252 km of such bike paths.

Providing this dense network of bike paths and routes is just part of Muenster's program to promote bicycling.

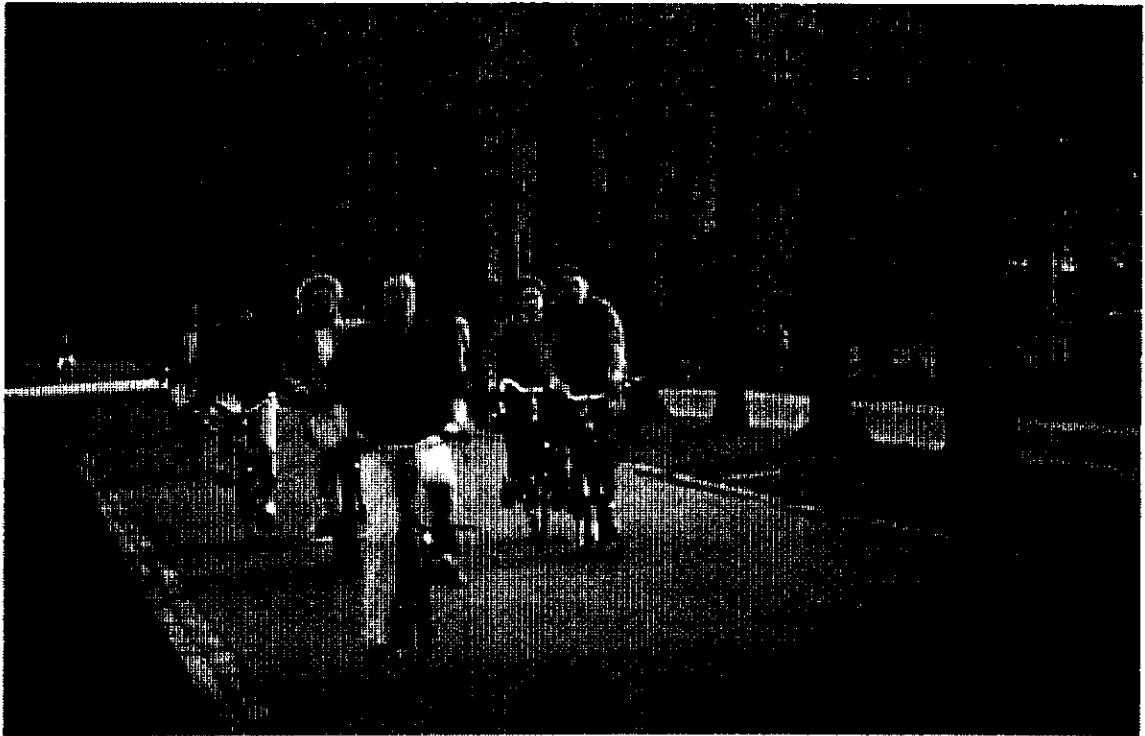
More innovative policies include:

- *Fahrradstrassen*, special bicycle streets which permit auto traffic but give bicyclists strict priority in right-of-way over the entire breadth of the street, with cars prohibited from rushing bicyclists or otherwise interfering with them.
- *falsche Einbahnstrassen*, streets that are one-way for cars but two-way for bicyclists.
- Reserved bus lanes that can be used by bicyclists but not by autos.
- Street networks with deliberate dead ends and circuitous routing

for cars but direct, fast routing for bikes.

- Permission for bicyclists to make left and right turns where prohibited for autos.
- *Fahrradschleusen*, special lanes at intersections that allow bicyclists to pass waiting cars and proceed directly to the front, while cars must stop at a considerable distance from the intersection. Indeed, bicycles fill up the roadway space between the intersection and the stop line for cars. Since bicycles also get an advance green light, they can clear the intersection before the cars get started.
- Special traffic lights for bicyclists at most intersections, usually

Exhibit 5



Bicycle expressway in Muenster, which extends 6 km and encircles the central city along the route of the medieval city wall. It connects with 16 major bike paths radiating outward toward the suburbs and with 26 bike routes leading toward Cathedral Square at the center.

Exhibit 6



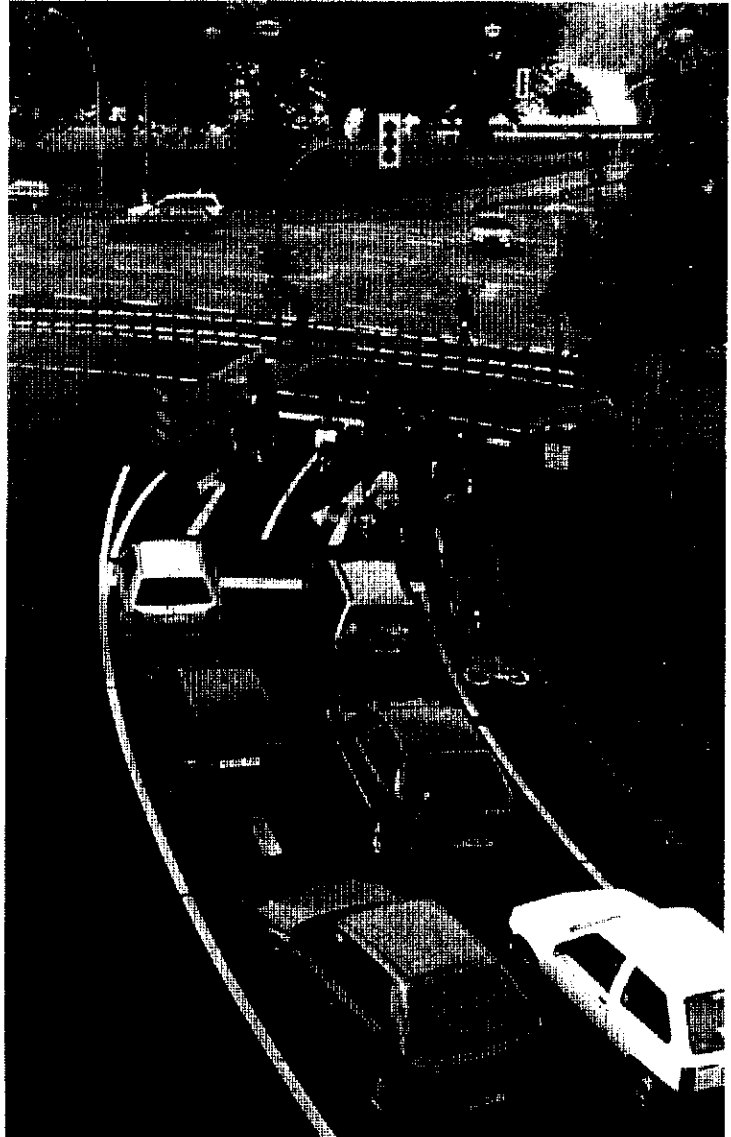
A bike route on one of the 300 km of lightly used roads restricted to local traffic only. Note the sign indicating the direction and distance to the town center.

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with priority signaling for bikes.

- Permission for bicyclists to ride in auto-free pedestrian zones at certain times of day when they are not too crowded (but required to travel slowly and yield right-of-way to pedestrians).
- Comprehensive training in bicycling safety for all school children.
- Frequent surprise inspections by plainclothes police to check for safe working condition of bicycles (lights, brakes, etc.), to intercept stolen bikes, and to enforce traffic laws for bicyclists.
- Bike rental facilities at all train stations and many other transport nodes throughout the region.
- Integrated system of well-marked, color-coded bicycle routes for the city and the surrounding region, with detailed route maps widely available. Signs throughout the network indicate the direction, distance, and best bike route to key destinations.
- Annual bicycling festivals that promote the environmental advantages of bicycling, display the latest bike models and accessories, and disseminate various

Exhibit 7



Bicyclists have right-of-way priority at almost all intersections in Muenster. Shown here is the design that allows bicyclists to proceed directly to the traffic light at the intersection, while cars must remain much farther behind. Bikes are thus enabled to clear the intersection before cars, raising safety and speed of bike travel.

other relevant information for bike enthusiasts.

- Annual awards to firms that do the most to increase bicycling among their employees by providing showers, bike lockers,

bikes to borrow, bike racks, and a flexible dress code.

- Reflecting its key role, the bicycle was chosen as the official symbol of the city during the recent celebrations marking the founding of Muenster 1,200 years ago.

The success of bicycle policies in Muenster has promoted their spread to other German cities. There is a regular exchange program among cities to share knowledge and experience with bicycle policies, and Muenster is generally seen as the model to follow. Freiburg, for example, has adopted many of the innovations pioneered in Muenster: falsche Einbahnstrassen, Fahrradstrassen, and various traffic-priority measures for bicyclists at intersections. Moreover, Freiburg has

also invested considerably in its ever-expanding bikeway network, which currently includes 145 km of completely separate bikeways and bike lanes, supplemented by 120 km of bike paths through adjacent woods and agricultural areas, and 130 km of bike routes on local streets with minimal traffic. All residential streets in Freiburg have been traffic calmed, which enhances bicycle use.

Bremen, the second most bicycle-oriented city in Germany, has continuously extended its network of bikeways over the past four decades: from only 92 km in 1950 to 750 km in 1996. Virtually every major roadway in the city has bike paths on both sides (usually grade-separated from car traffic), and minor roads have either bike lanes or various restrictions on auto use to

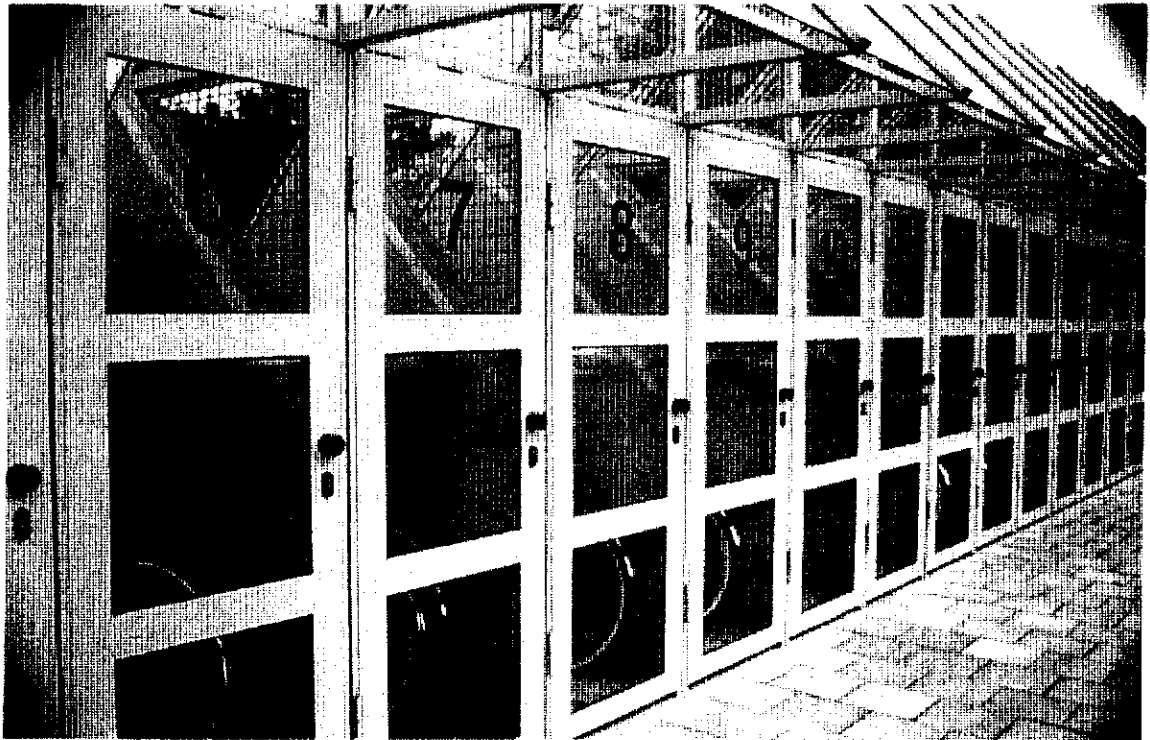
Exhibit 8



These are some of the 10,000 bicycles parked each day within a few blocks of the main train station in Muenster. Currently, the city is building a 3,000-bike parking garage to alleviate the bike parking problem.

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Exhibit 9



Modern bicycle lockers in Muenster are fully sheltered from the weather and are vandal- and theft-proof.

promote bicycling. Traffic calming has turned almost all streets in residential neighborhoods into potential bike routes.

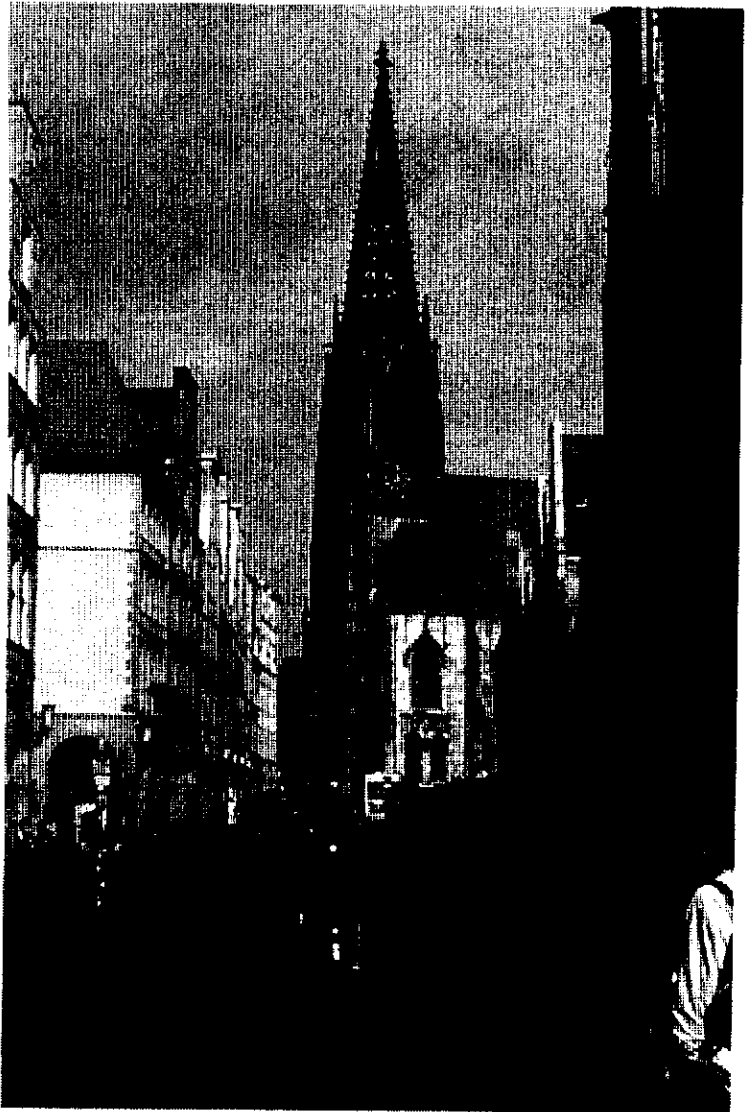
Perhaps the most impressive development has been the huge increase in bicycle use in the Bavarian metropolis of Munich. As noted previously, bicycle use there has almost tripled since 1976, with modal split rising from 6% to 15%. The length of the bikeway network was more than doubled in that period, with the current system extending 644 km and including 456 km of grade-separated bike paths along streets (313 km double-sided; i.e., with paths in both directions), 51 km of bike lanes on streets, and 137 km of separate bike paths through parks and woods. As in Freiburg, all residential neighborhoods in Munich have been traffic calmed, thus provid-

ing hundreds of kilometers of additional bicycle routes.

Virtually all German cities have been expanding bicycle parking facilities, especially in city centers and at transit stations in the suburbs. In Freiburg, for example, the number of bike racks in the city center rose from 2,200 in 1987 to over 4,100 in 1996. Since there are more bicycles than people in Muenster, it would not be practical to provide bike racks in the city center for all bicyclists, and most bikes are simply parked in any way possible (*wild abgestellt*). Nevertheless, the city already has 6,226 bike racks in its center and is currently building an underground 3,000-bike parking facility at the main train station, which is now hopelessly inundated by over 10,000 bikes parked there each work-day. Some new bike racks have been

sited in former auto parking lots and decommissioned car lanes, thus further removing roadway and parking capacity from cars. Muenster has also been introducing other innovations in bike parking, including special bike rack designs, sheltered racks, theft-proof bike cages, and spacious bicycle lockers at key transport nodes that can be rented on a monthly or annual basis and provide room not only for bikes but also for changing and storing clothes. Bike repair and rental services are provided at some large parking facilities. Most public transport systems in Germany are also adding bike-and-ride facilities to help bicyclists integrate their bike ride to and from the transit station with the line-haul transit ride to cover longer distances. In Munich, the number of bike racks at stations is now 28,000 and steadily increasing. In Freiburg, over 1,500 bike racks are available at LRT stops, and bicycle parking at the main train station can handle 850 bikes.

Exhibit 10



The Prinzipalmarkt is the main street of Muenster. Off-limits to private cars, it is primarily used by bicyclists and pedestrians, but buses are allowed here.

Policies to Restrict Auto Use

At the same time German cities have greatly improved public transport and facilities for bicycling and walking, they have restricted auto use and made it increasingly expensive. That has provided a double incentive to use the so-called "environmental modes."

As already mentioned, traffic calming has been implemented in most urban residential neighborhoods in Germany. Since 1980, most cities have reduced speed limits to 30 km per hour (19 mph) and have further discouraged auto traffic by narrowing streets, increasing curves, setting up roadway bottlenecks, and installing speed

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bumps, ornamental posts (bollards), concrete planters, wider sidewalks, and bicycle lanes. These measures encourage bicycle use on residential streets. Moreover, in virtually all German cities, there is an extensive interlocking network of streets in the old town center and main shopping district that is completely off-limits to private cars.¹⁰ Most such zones enhance pedestrian and bicycle access to the very heart of the city while keeping cars at a distance, forcing them to park in fringe lots and garages.

One of the most important necessities for auto use is parking, and German cities have both decreased its supply as well as increased its price, especially since 1980.¹¹ In most cities, the price of on-street metered parking increases considerably with proximity to the center. The largest cities now charge 5 DM (\$3) per hour for parking in the city center, roughly equal to the price of a round-trip by bus, tram, or metro. In Freiburg, a medium-sized city, metered parking costs 4 DM per hour in the historic city core, 3 DM per hour in the zone just outside the core, and 1 DM per hour in the outlying districts. Special parking meters prevent long-term parking by commuters. Most free, nonmetered on-street parking has been eliminated, except for residential areas, where such parking is generally restricted to residents who purchase auto decals entitling them to park in their own neighborhood. In Muenster, all free parking has been eliminated in the city core, and the total number of auto parking places has been reduced, thus forcing auto drivers to park their cars in peripheral lots and to walk, bike, or take public transport for the trip to the center. Special bicycle parking, loan, and service facilities have been established

adjacent to the fringe parking lots to encourage bicycle use in particular. The overall impact of all these policies has been to make parking a car more expensive and more difficult, at least in the city center.

Local policies making auto use more expensive have been complemented by national policies that make owning and driving a car about three times as expensive as in the United States. Germany imposes considerable taxes on cars. Even in 1989, before various tax increases, total roadway user taxes at all government levels were more than double the total public expenditures on roadway construction, maintenance, and administration.¹² The gasoline tax was last raised in 1994 by 0.16 DM (\$.10) per liter, bringing the total tax to 0.98 DM per liter (\$3 per gallon). That tax rate is about six times higher than in the United States, leading to gasoline prices more than three times as high (\$4.20 per gallon in Germany vs. \$1.22 in the United States).¹³

Finally, most cities have a virtual moratorium on new roadway construction, especially where the Social Democrats and Greens are in power. Roadway congestion is a serious problem in many German cities, but the approach in most cities is not to increase roadway capacity but to allow the congestion to discourage even more auto use, while simultaneously setting aside special express lanes for buses. Similarly, buses and streetcars benefit from priority traffic signaling at shared intersections, so that lights automatically turn green for oncoming transit vehicles and red for cars.

The end result of all these auto-restraint policies is to make auto use more expensive, more difficult, less convenient, and slower than it used

to be. That has increased the competitiveness of alternative modes such as public transport, walking, and bicycling. This is perhaps the most crucial aspect of the German approach to taming the automobile. Without restricting auto use, policies to encourage walking, bicycling, and taking transit would have been far less effective. Conversely, only restricting auto use would not have worked either, since travelers obviously need an alternative mode of travel if they are expected to drive less. The combination of the carrot-and-stick approaches has produced very impressive results in German cities. Not only has it shifted modal split in favor of public transport and bicycling, but the increased taxes on auto drivers have been the ideal source of revenues for financing improvements in public transport, bicycling, and pedestrian facilities.

Conclusions and Policy Implications

The dramatic increase in bicycling in German cities over the past two decades has been almost entirely the result of public policies that have encouraged more bicycling while discouraging auto use. Those policies have, in fact, had to counter trends toward decreases in bicycle use in other European countries such as England, France, and Italy. Even in Germany, the aging of the population, high and growing auto ownership, high per capita income, and increasing suburbanization would lead one to expect, if anything, a decrease in bicycle use.

The German lesson is that bicycling can be increased even under quite unfavorable circumstances, provided the right public policies are implemented. By expanding bikeway networks,

increasing bike parking and service facilities, and giving bicyclists right-of-way in mixed traffic, German cities have greatly enhanced the advantages of bicycling. Restricting auto use and increasing its cost have been the perfect complements to those policies.

To what extent could such policies be adopted in other countries to increase bicycle use? Although there may be political opposition, probicycling policies have the potential to increase bicycling almost anywhere. As already noted, Germany managed to increase bicycling in spite of unfavorable underlying trends such as increasing auto ownership and suburbanization.

Even in the United States, there is much potential to increase bicycling. With 28% of all urban trips shorter than a mile, distance is hardly an insurmountable obstacle to bicycle use, and it certainly does not explain why the bicycle's share of urban travel has remained stuck at less than 1% for over two decades. Bicycling remains at low levels in U.S. cities because cyclists are treated as second-class travelers, somehow not worthy of their legal right to share streets with cars. At the same time, there are few separate bikeways where bicyclists would be better protected from inconsiderate motorists.

The result is that bicycling is very unsafe in the United States. There are over 800 bicyclist fatalities a year. With bicycling accounting for 2.0% of all traffic deaths but only 0.2% of all passenger miles, the fatality rate per passenger mile traveled is 10 times higher for bicyclists than for auto occupants!¹⁴ That obviously discourages many potential bicyclists. Constructing separate rights-of-way for bicyclists would be one solution, and the other would be strict enforcement of the existing, legal right of bicyclists to use roadways.

Endnotes

1. The Nationwide Personal Transportation Surveys conducted by the U.S. Department of Transportation in 1969, 1977, 1983, and 1990 consistently found that bicycling in the United States accounted for only 0.7% of all trips in urban areas.
2. In fact, the exact ranking of countries by per-capita income depends on the method used to convert currencies and reflect real purchasing power. But the Western European countries are always ranked among the richest countries no matter what method is used.
3. J. Kenworthy, F. Laube, P. Newman, and P. Barter, *Indicators of Transport Efficiency in 37 Global Cities*. Washington, DC: The World Bank, 1997.
4. U.S. Department of Transportation, *Nationwide Personal Transportation Survey*. Washington, DC: 1992.
5. Tri-State Transportation Campaign, "Death on the Streets," *Mobilizing the Region* (July 18, 1997), p.18.
6. Eastern Germany is not included in this analysis because of the very different situation there and the discontinuity in transport statistics and policies before and after reunification with West Germany in 1990.
7. J. Pucher and S. Kurth, "Making Transit Irresistible," *Transportation Quarterly* 49, no. 1 (Winter 1995), pp. 117-128; J. Pucher and S. Kurth, "The Success of Regional Public Transport in Germany, Austria, and Switzerland," *Transport Policy* 2, no. 4 (March 1996), pp. 279-291.
8. The "marginal price" is zero because it costs a student nothing to make any individual trip. All of the price is a fixed-cost fee added on to student fees regardless of whether the student actually uses transit. Students making 100 transit trips a month pay the same as those making no trips at all. That obviously is a strong inducement to use transit.
9. These are mostly agricultural roads (*Wirtschaftswege*) within the city limits of Muenster. Unlike U.S. cities, some German cities have considerable areas devoted to agriculture as a deliberate policy to preserve farms, orchards, and vineyards in close proximity to the city.
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