PANEL ONE:
Sustainable Transport in Germany and the USA

Transatlantic Urban Climate Dialogue,
Workshop "Sustainable Mobility"
28 November 2012

Ralph Buehler and Wolfgang Jung
Virginia Tech and Karlsruhe Institute of Technology

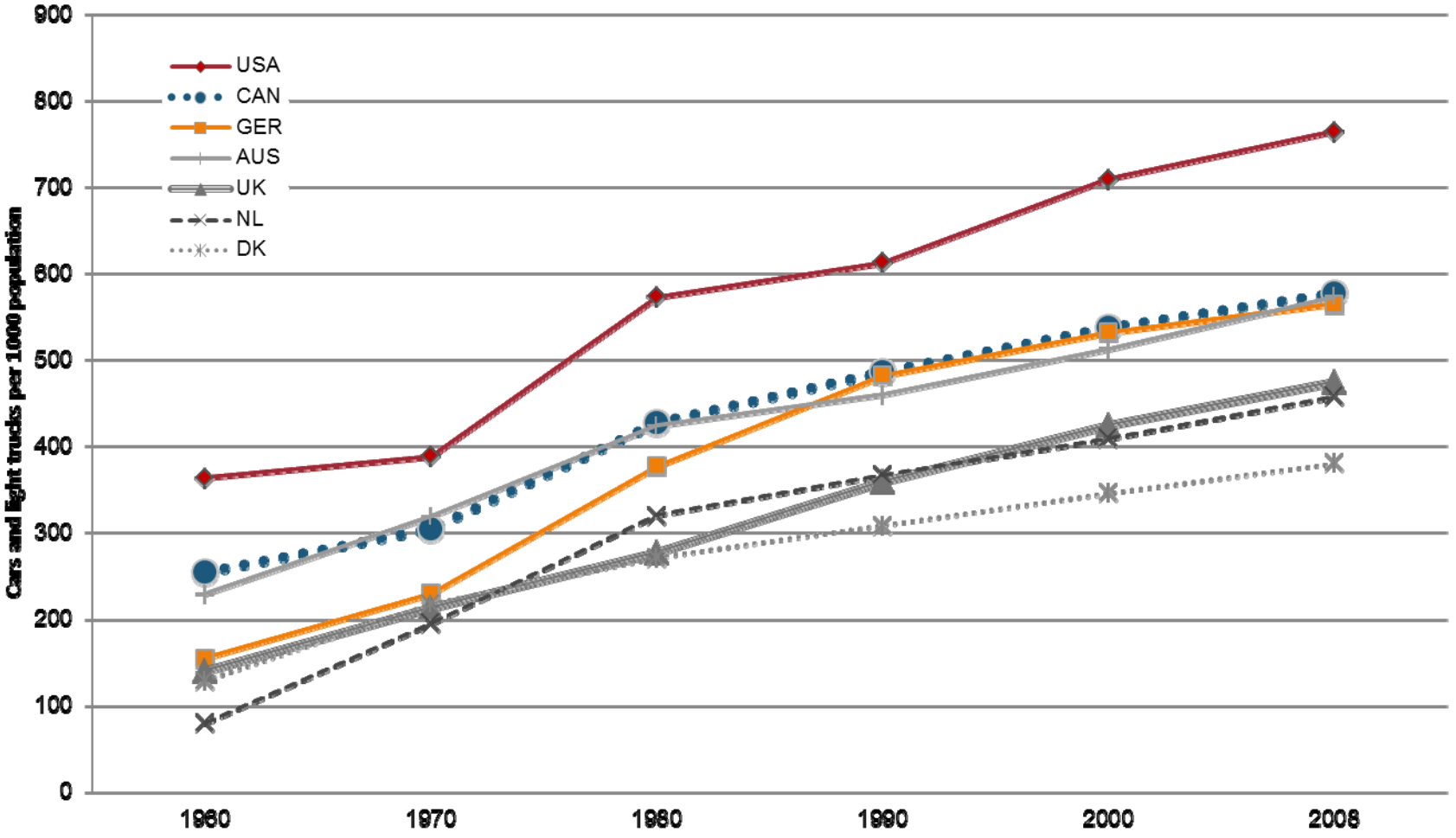
Similarities between Germany and the USA

- Federal systems of government, local self-government
- Strong economies, high standards of living
- Important automobile industry
- Highest levels of car ownership in the world
- Most adults have a driver's license
- Extensive road networks
- Much urban & suburban (re) development since WWII

New Jersey Turnpike, 2007

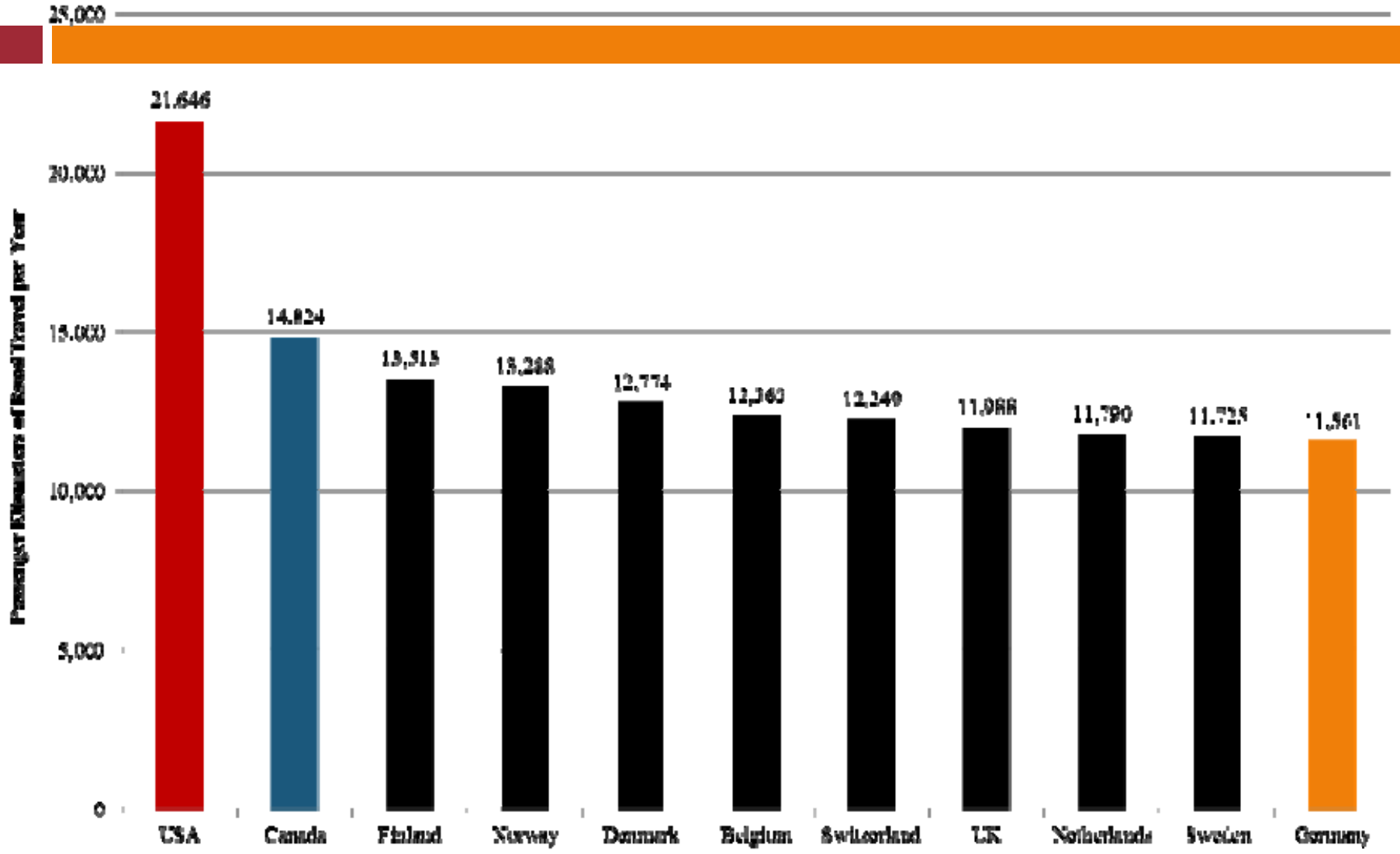
First "Autobahn" , 1931, (Source: BMVBS, 2007)

Trend in Motorization per 1,000 Population



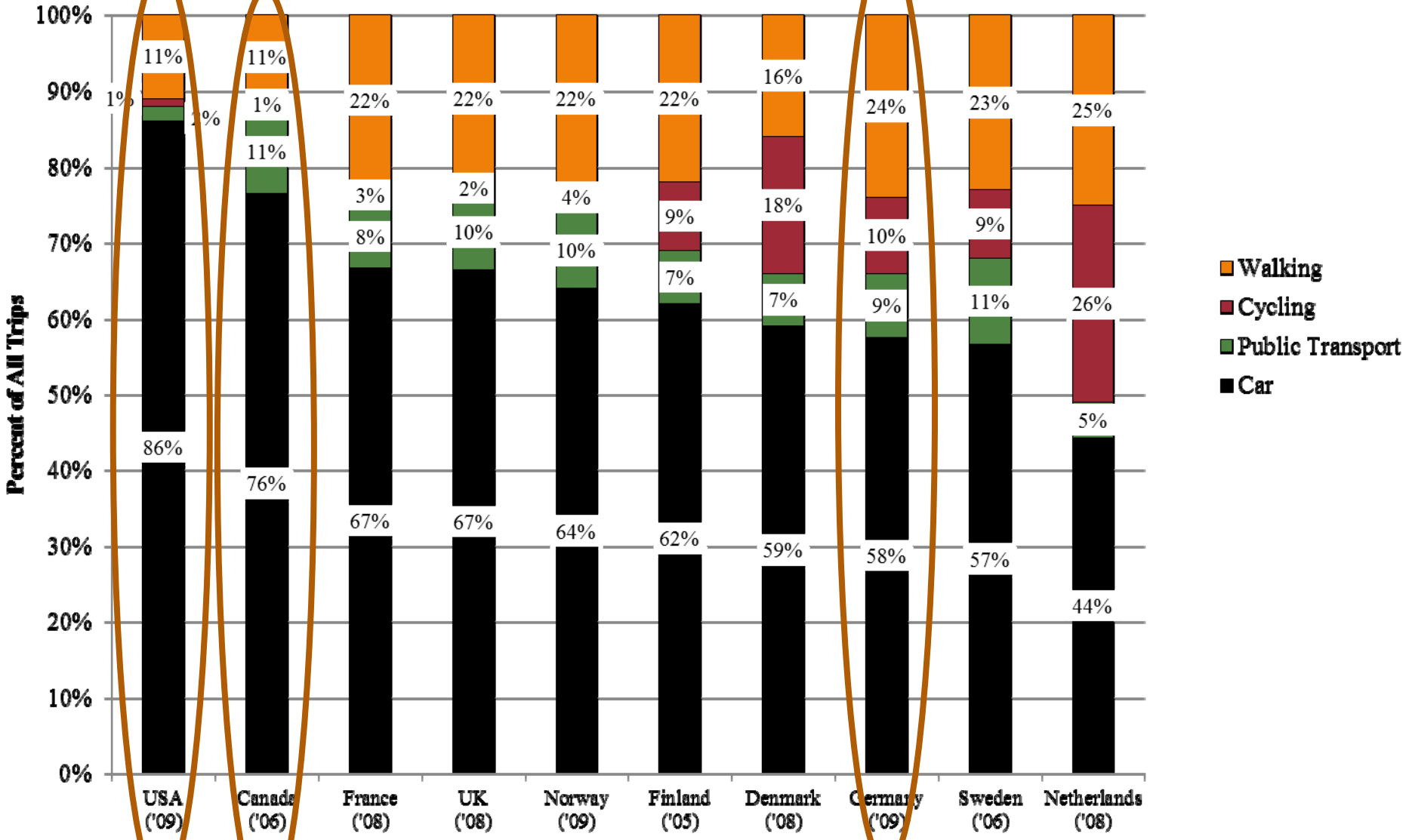
Source: Buehler, R., Pucher, J. 2011. "Sustainable Transport in Freiburg: Lessons from Germany's Environmental Capital," International Journal of Sustainable Transportation, Vol. 5, pp. 43-70.

Annual Km of Car Travel per Capita, 2010



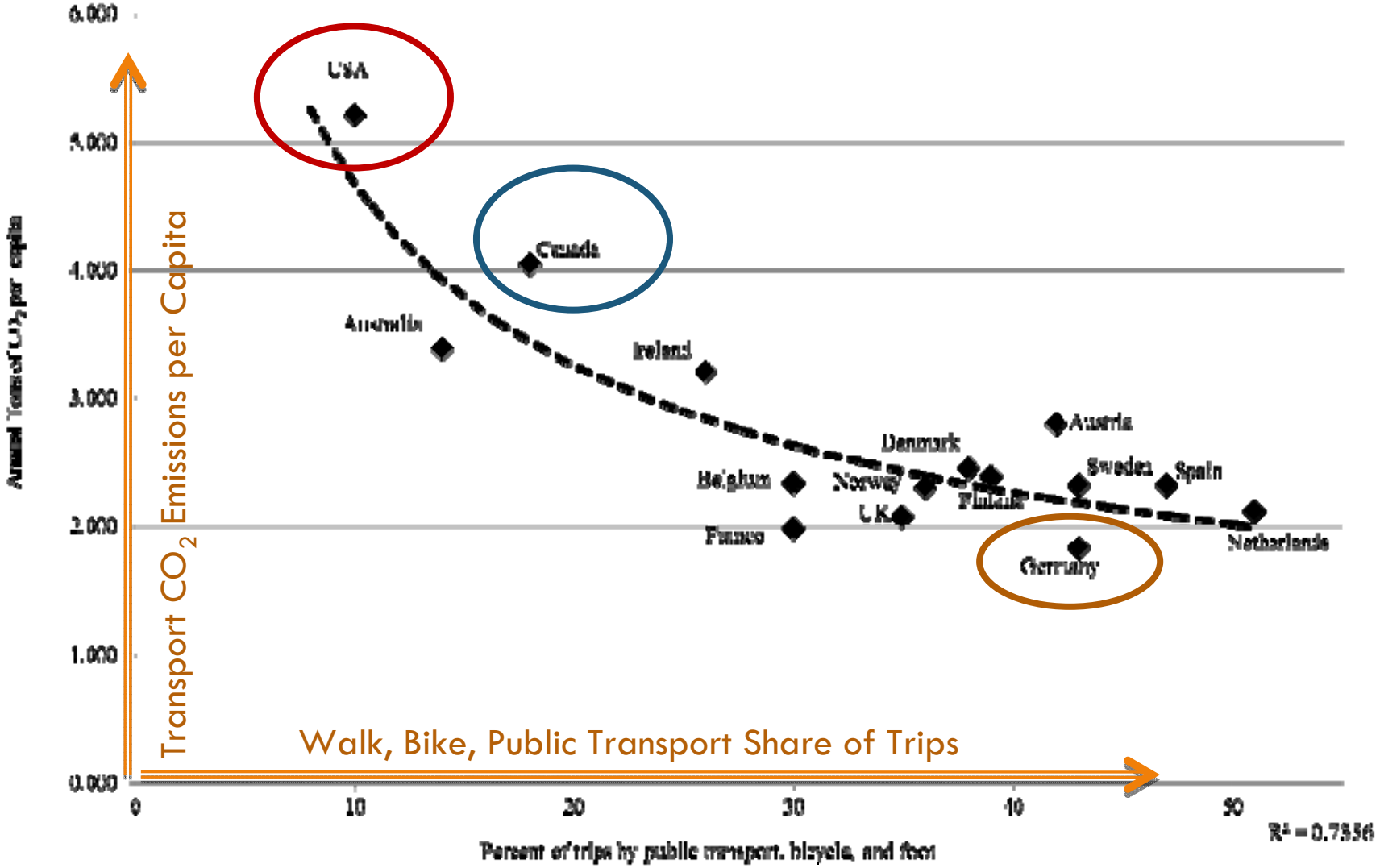
Source: Buehler, R., Pucher, J. 2011. "Sustainable Transport in Freiburg: Lessons from Germany's Environmental Capital," International Journal of Sustainable Transportation, Vol. 5, pp. 43-70.

Percent of Trips by Means of Transport in the USA and Western European Countries



Source: Buehler, R., Pucher, J. 2011. "Sustainable Transport in Freiburg: Lessons from Germany's Environmental Capital," International Journal of Sustainable Transportation, Vol. 5, pp. 43-70.

Walking, Cycling, and Public Transport contribute to Reduced CO_2 Emissions Per Capita



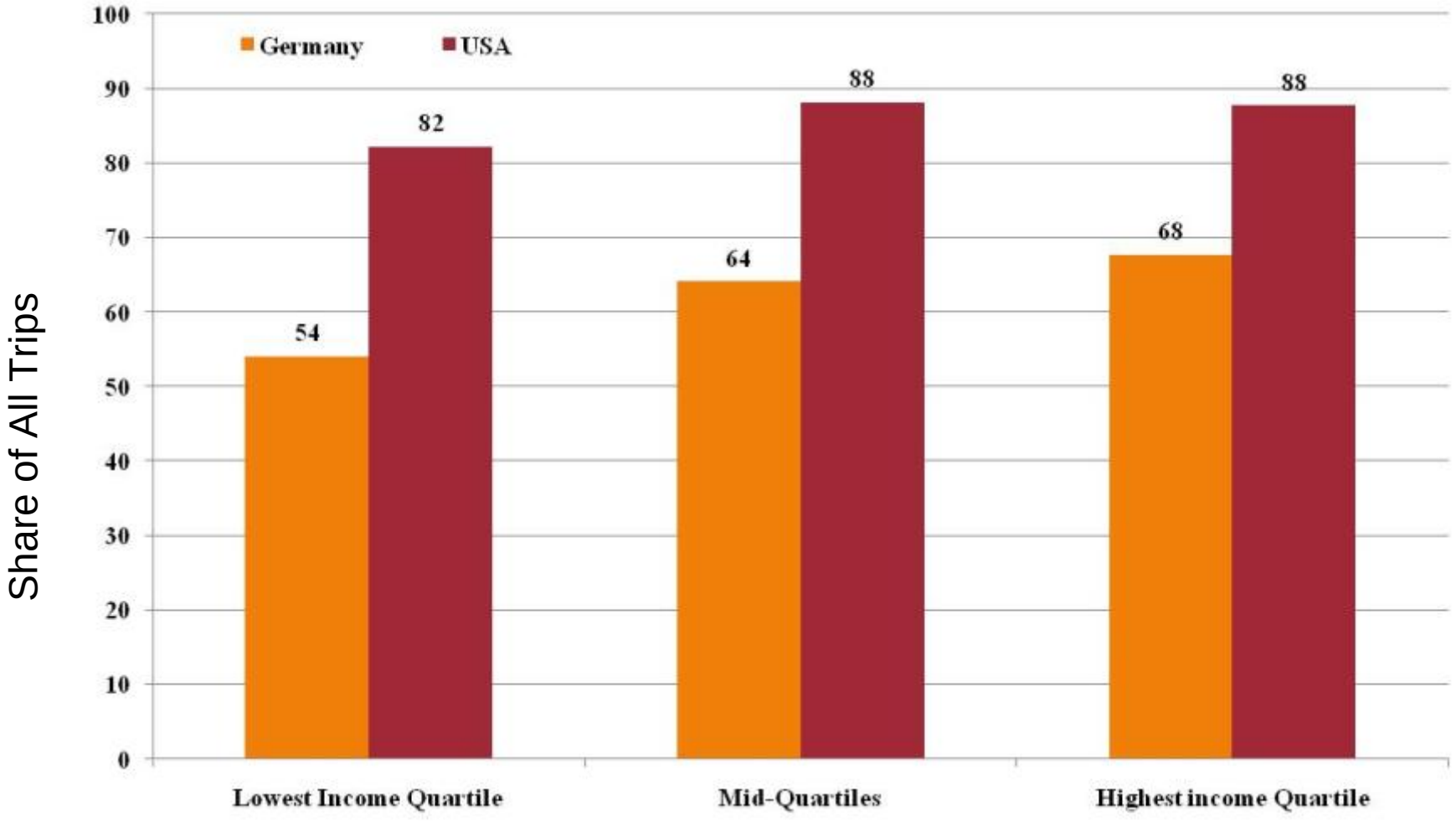
Source: Buehler, R., Pucher, J. 2011. "Sustainable Transport in Germany: Lessons from Germany's Environmental Capital," International Journal of Sustainable Transportation, Vol. 5, pp. 43-70.

More Sustainable Urban Travel in Germany than in USA

- ~3 times more CO_2 emissions and energy per capita in USA (German vehicle fleet 40% more fuel efficient)
- 2.2 times more traffic fatalities per capita in USA
  - 3x and 5x greater fatality rate per km cycled/walked
- U.S. households spend more for transport (17% vs.14% or $2,500 per year)
- Higher annual per capita government expenditures for roads and public transport in the USA ($625 vs. $460)
- Much larger subsidy required for public transport in USA than in Germany (65% vs. 25% of operating cost)
- Obesity rate more than twice as high in USA

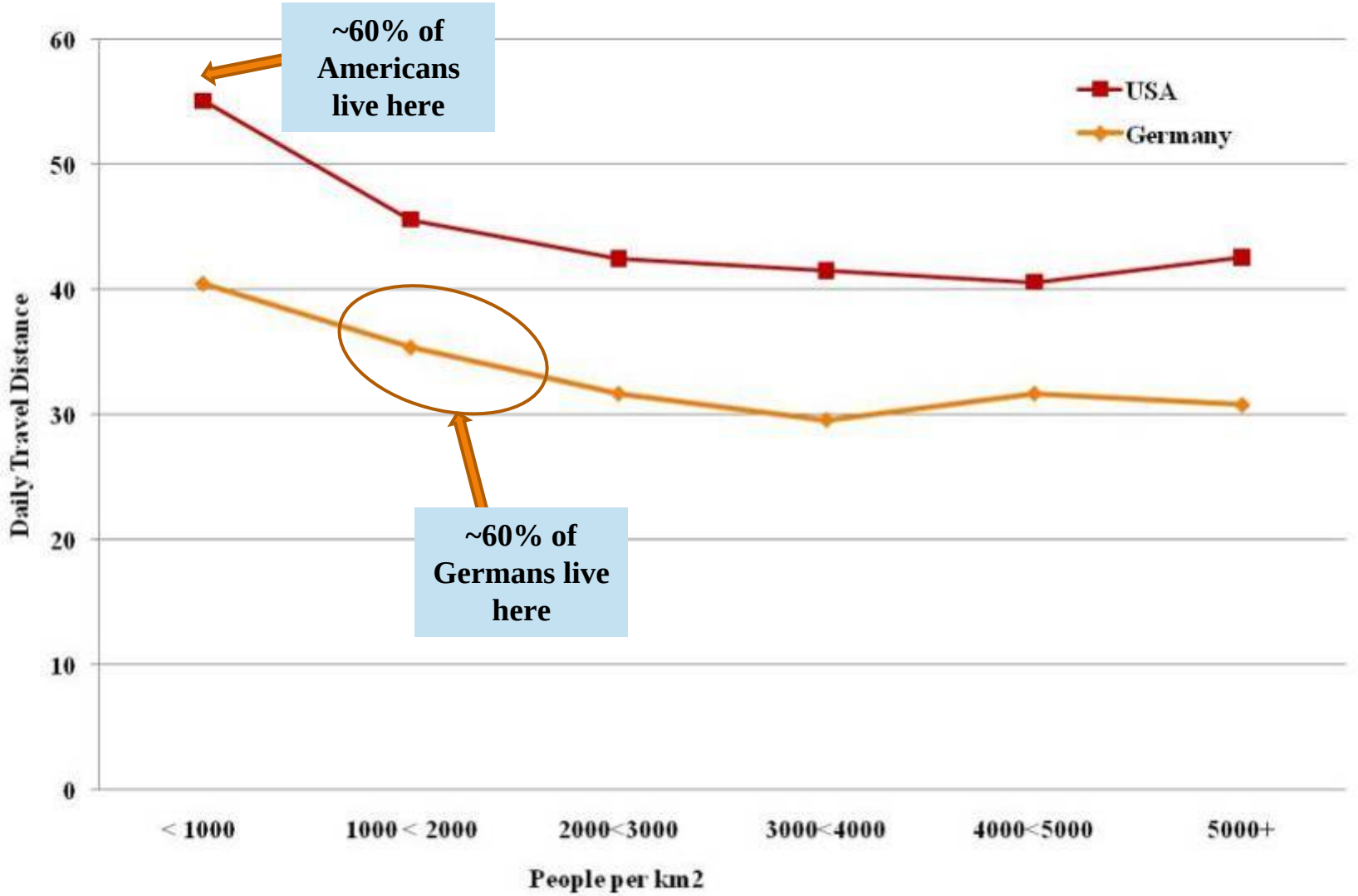
Source: Buehler, R., Pucher, J. 2011. "Sustainable Transport in Germany: Lessons from Germany's Environmental Capital," International Journal of Sustainable Transportation, Vol. 5, pp. 43-70.

At all income levels Germans drive for a lower share of trips than Americans



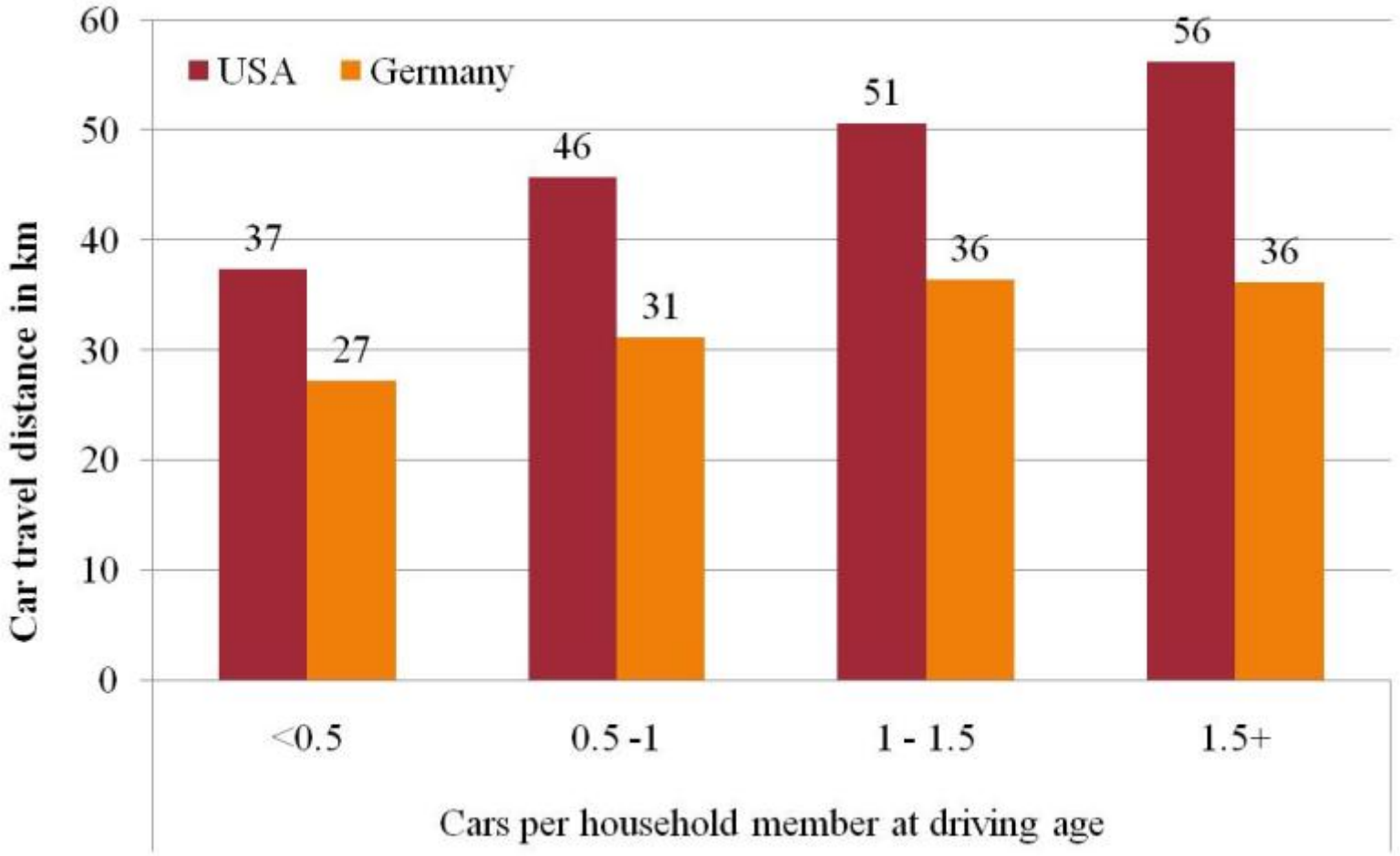
Source: Buehler, R. 2011. "Determinants of Mode Choice: A Comparison of Germany and the USA," Transport Geography, in press.

Americans drive more than Germans at every population density



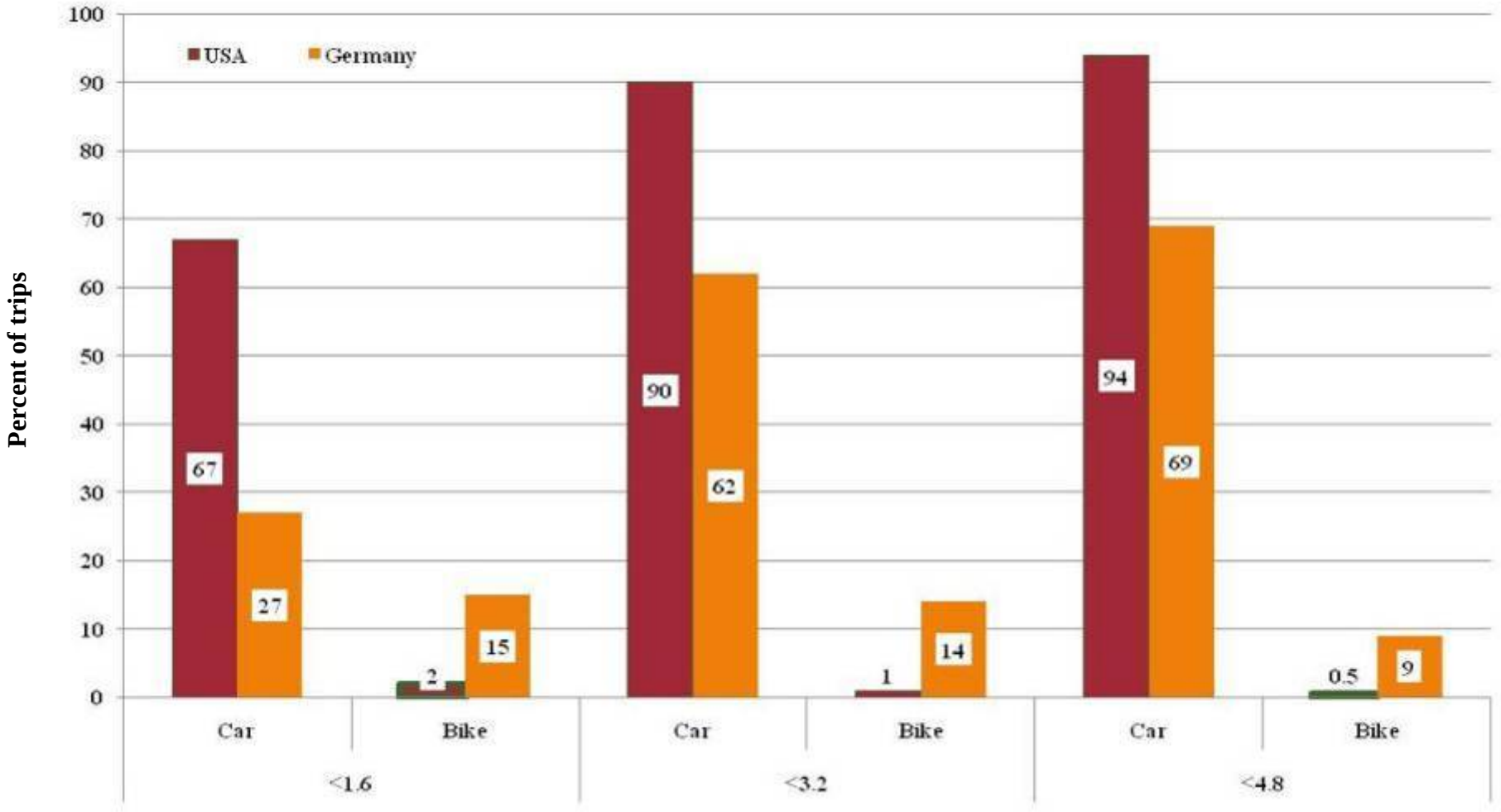
Source: Buehler, R. 2010. "Transport Policies, Automobile Use, and Sustainable Transportation: A Comparison of Germany and the USA," Journal of Planning Education and Research, Vol. 30, 2010, pp. 76-93.

Americans with limited car access drive as much as Germans with easy car access



Source: Buehler, R. 2010. "Transport Policies, Automobile Use, and Sustainable Transportation: A Comparison of Germany and the USA," Journal of Planning Education and Research, Vol. 30, 2010, pp. 76-93.

Americans drive for most short trips

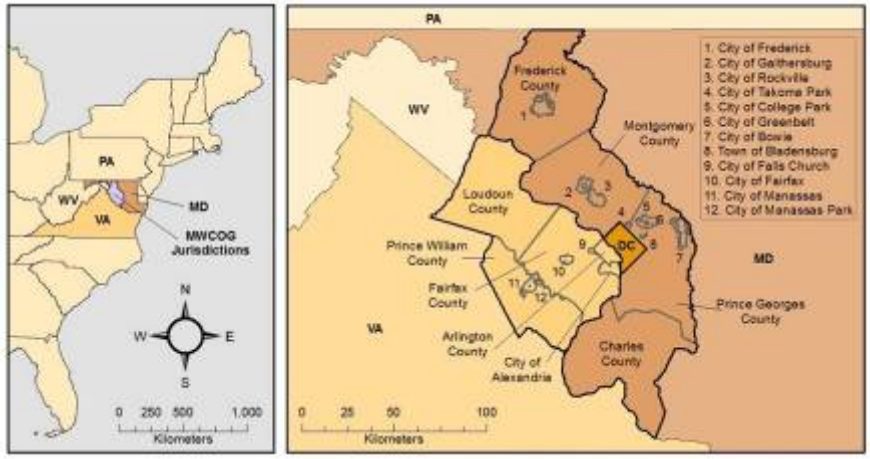


Source: Buehler, R. 2011. "Determinants of Mode Choice: A Comparison of Germany and the USA," Transport Geography, in press.

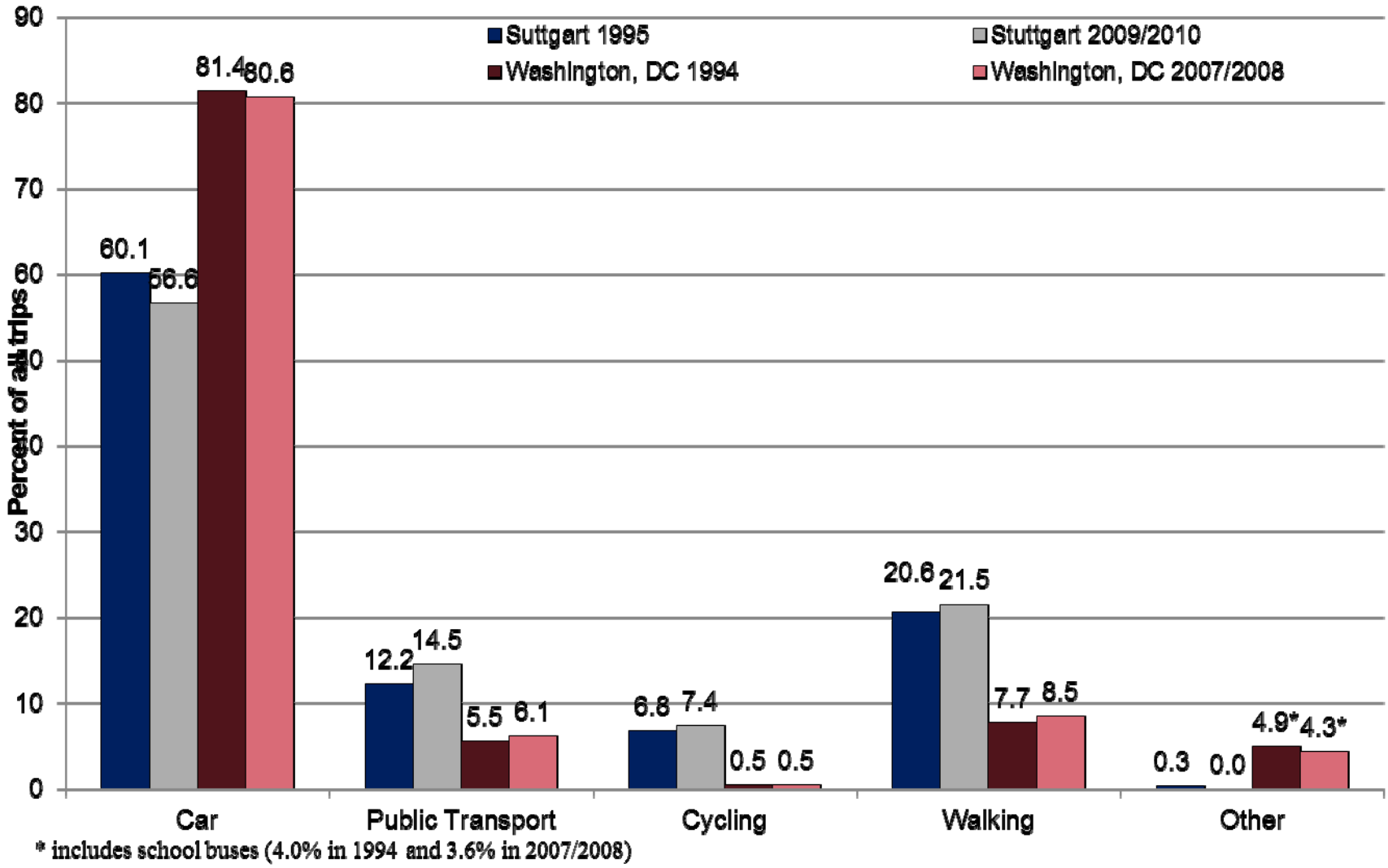
Stuttgart and Washington DC Metro Region

- Stuttgart Region
- 2.67 Mio EW
- 3.65 sqkm

- Washington DC Region
- 5.3 Mio EW
- 10.27 sqkm



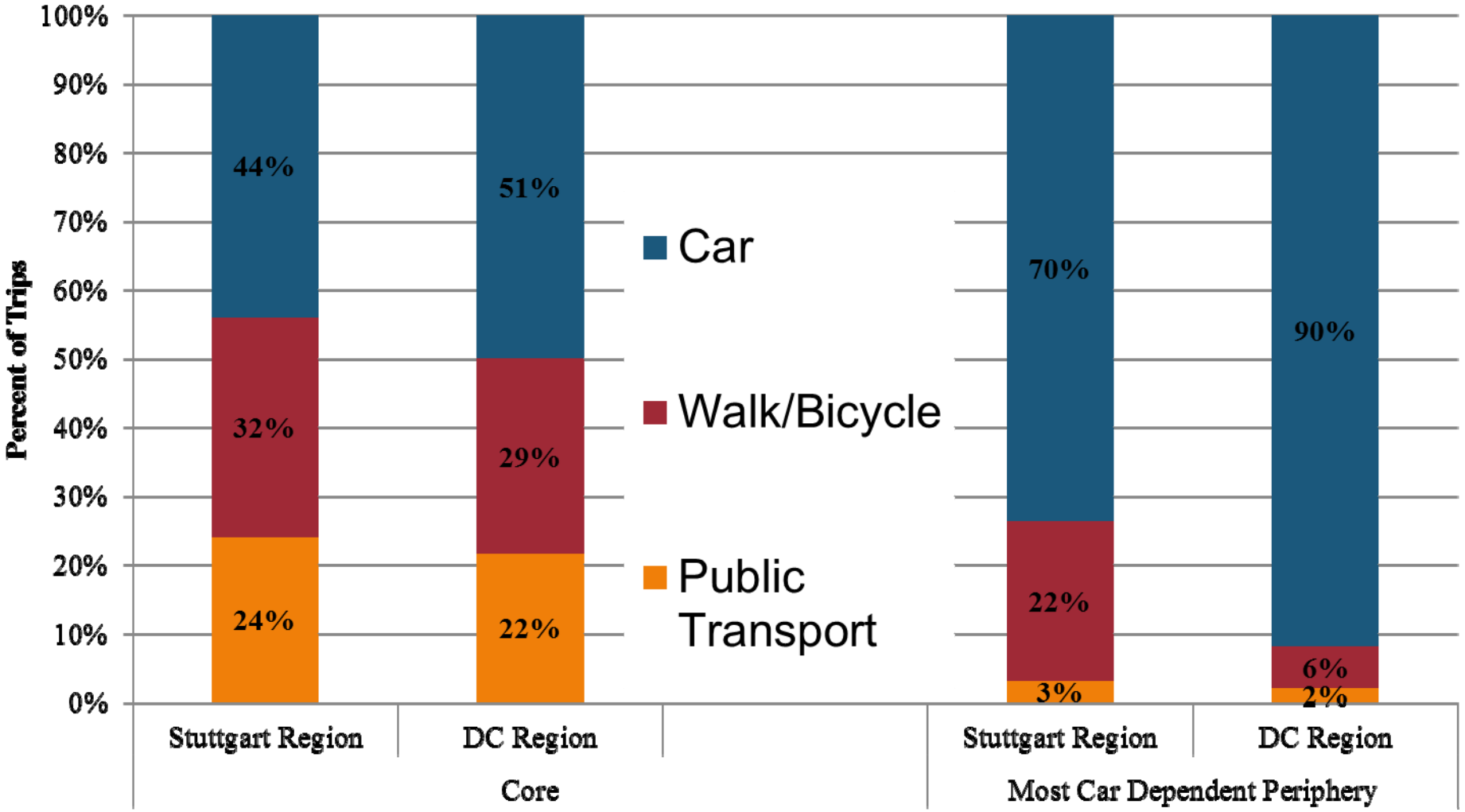
Percent of Trips by Means of Transport in the Stuttgart and Washington Regions



Key Mobility Indicators for the Stuttgart and Washington Regions, 2008/2009

- More trips per person per day in DC (3.9 vs. 3.5)
- Longer daily travel distance per person in DC (44 vs. 40km)
- More minutes spent traveling per day in DC (80 vs. 75)
- Similar average trip distance: ~11km
- Average trip speeds similar (~28km/h)
- Distribution of trips similar, but more car use in DC
  - (<2km 25%/29%; <5km 50%/47%)
- More cars/SUVs in DC (744 vs. 544 per 1,000)

Much More Car-Dependent Suburbs in the DC Region

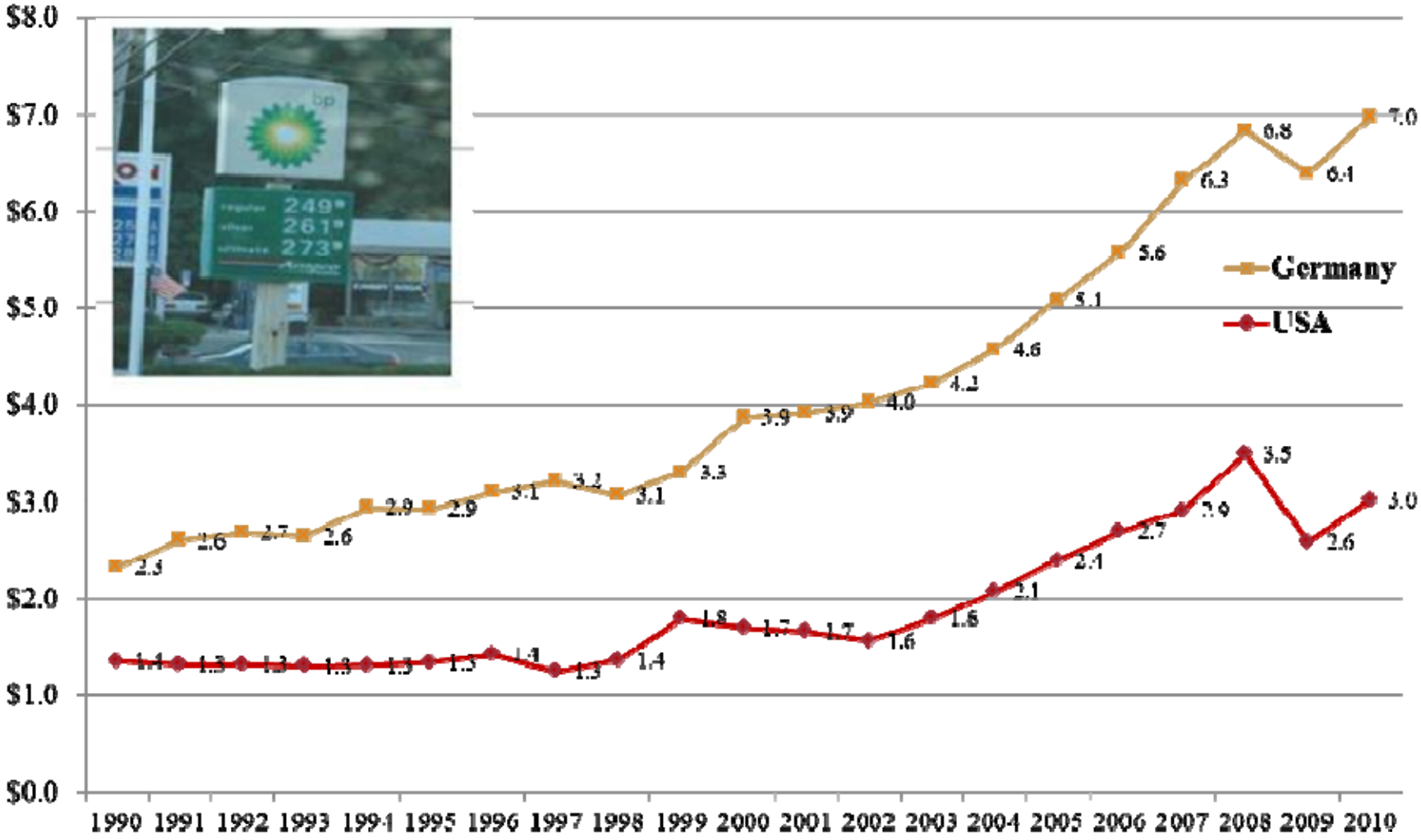


*Nuertingen and Geislingen vs. Fauquier, Prince William, Prince Georges. Anne Arundel, Fairfax, Charles Counties

Framework: Federal Policies in Germany

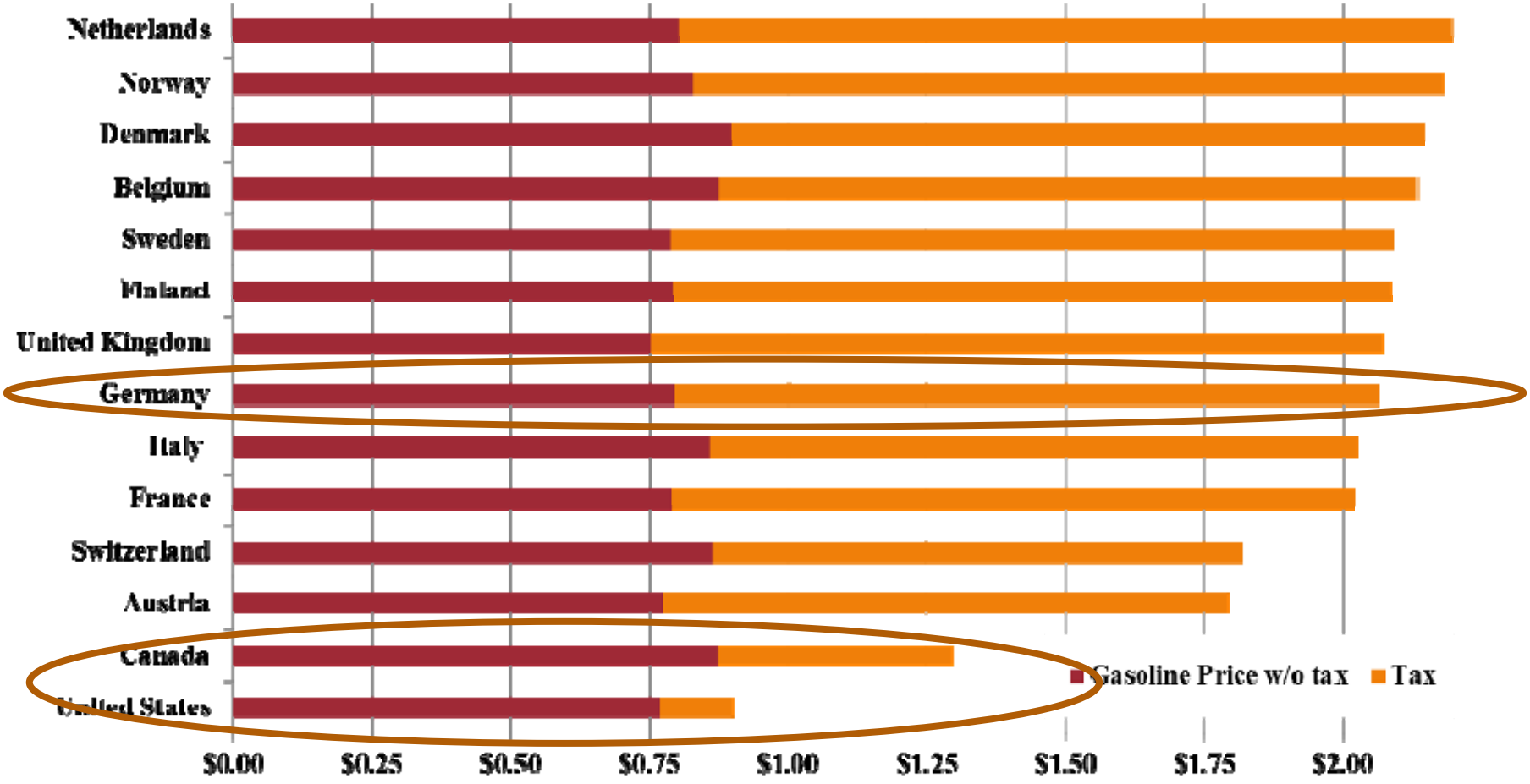
- **Taxes** and **regulation** make car use more expensive
- **More funding** for walking, cycling, and public transport
- **Land-use planning** is **stricter** and **requires cooperation** among levels of government
- **Strategic leadership** through national transport and land-use plans at the **federal level**
- **Specific policies** developed and implemented at the **local level**

Unleaded Gasoline Prices per Gallon in the USA and Germany, 1990 - 2010 (in U.S. dollars, using PPP)



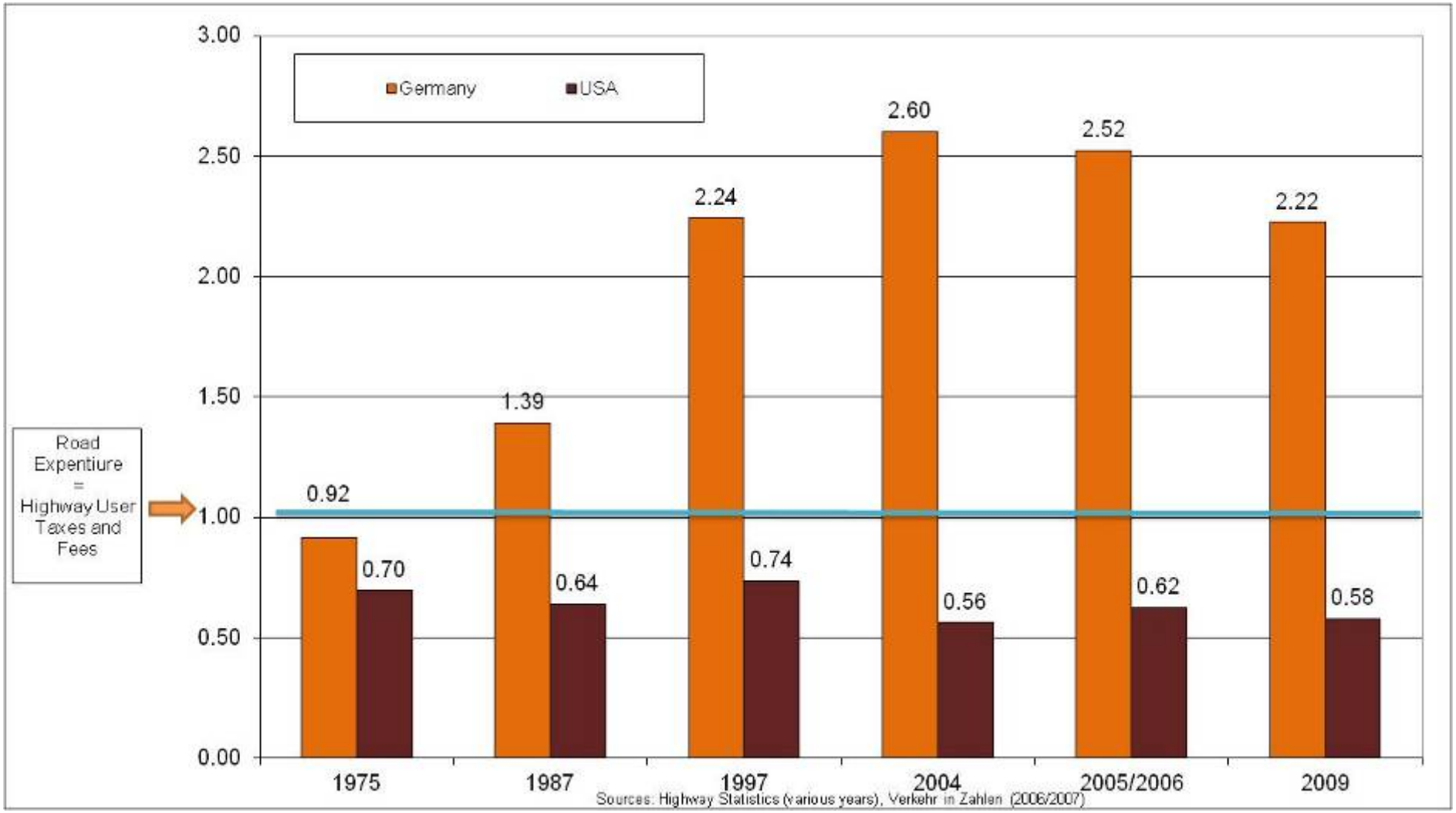
See also: Buehler, R., Pucher, J., Kunert, U. 2009. "Making Transportation Sustainable: Insights from Germany," Washington DC: The Brookings Institution, Metropolitan Policy Program.

Premium Unleaded Gasoline Prices and Share of Taxes in 2011 (Selected OECD Countries, U.S. $ per Liter)



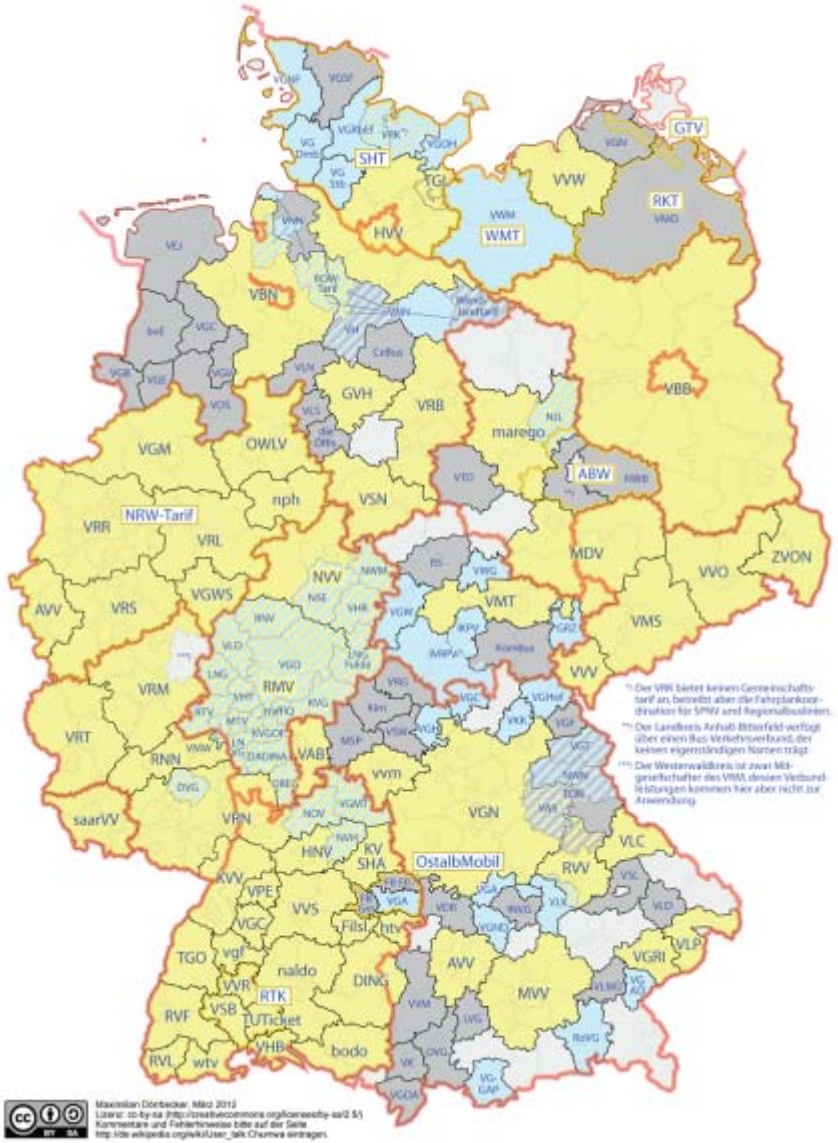
Source: OECD: Energy Prices and Taxes 1st Quarter 2011.

Highway User Taxes and Fees as Share of Road Expenditures by all Levels of Government in Germany and the United States



Source: Buehler, R., Pucher, J., Kunert, U. 2009. "Making Transportation Sustainable: Insights from Germany," Washington DC: The Brookings Institution, Metropolitan Policy Program.

Regional Public Transport Authorities

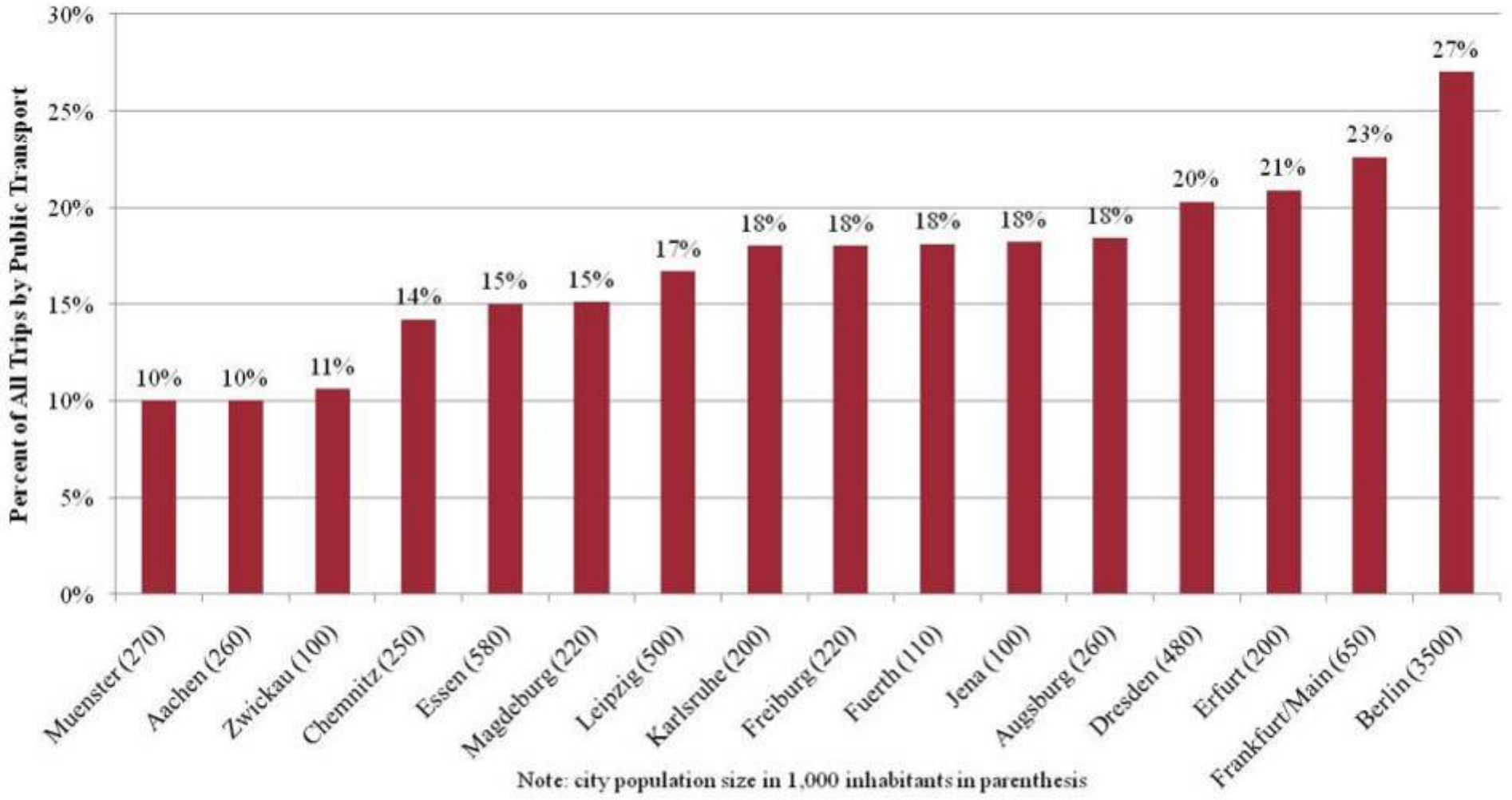


- **Integrate public transport fares and timetables**
- **Seamless transfers across operators and public transport modes**
- **Steep discounts for monthly/annual tickets, students, and elderly**
- **Goal: improving service and connectivity**
- **State-wide public transport tickets**
  - 29-37 Euros for up to 5 people for entire day, local and regional trains

By Maximilian Dörrbecker (Chumwa) (Own work) [CC-BY-SA-2.5 (http://creativecommons.org/licenses/by-sa/2.5)], via Wikimedia Commons

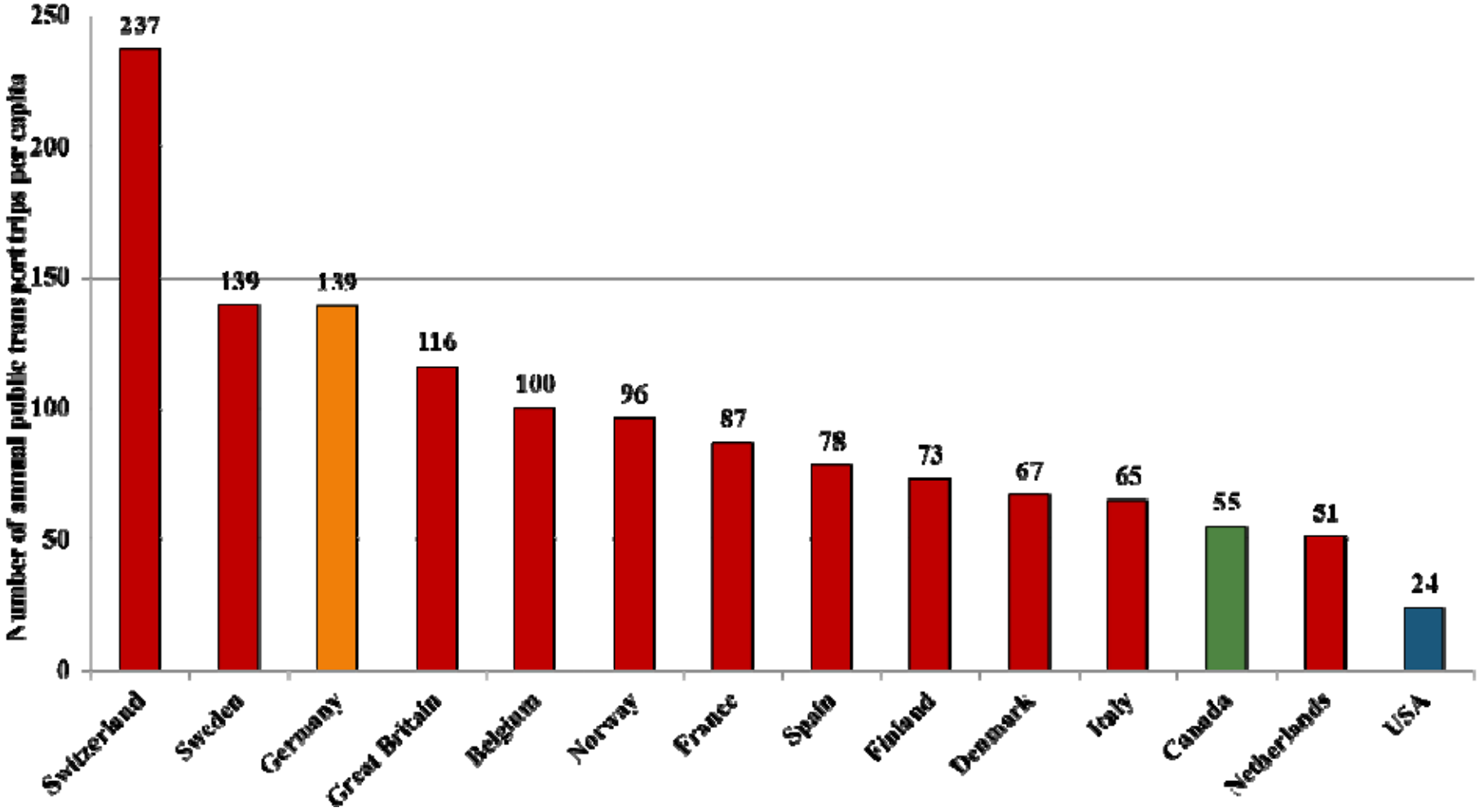
Buehler, R., Pucher, J. 2011. "Making Public Transport Financially Sustainable," *Transport Policy*, Vol. 18, No. 1, pp. 128-136.

Share of All Trips by Public Transport in Selected German Cities, 2003-2007



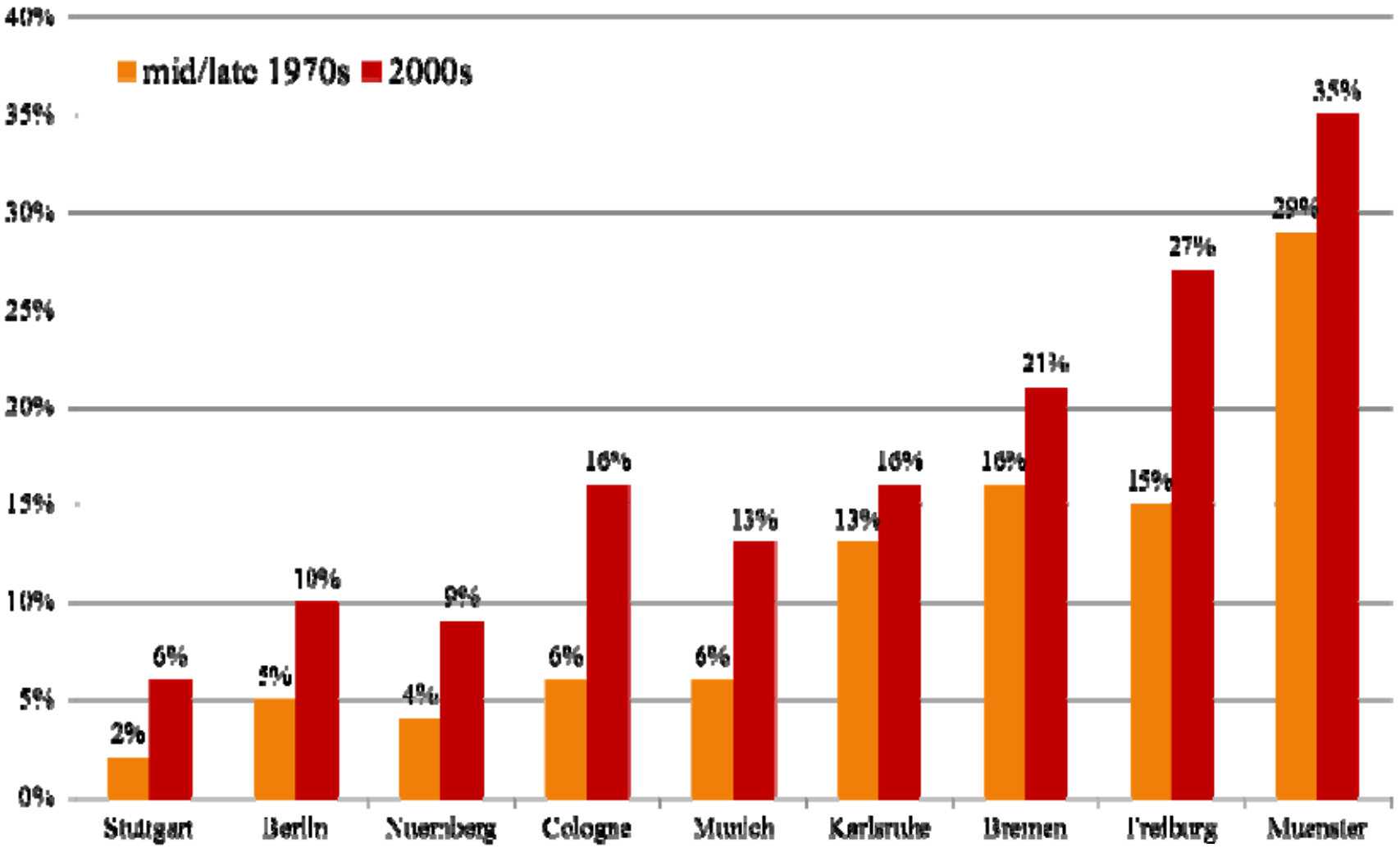
Source: Buehler, R., Pucher, J. 2011. "Making Public Transport Financially Sustainable," Transport Policy, Vol. 18, No. 1, pp. 128-136.

Number of annual public transport trips per capita in Europe and North America, 2005-2010



Buehler, R., Pucher, J. 2012. "Demand for Public Transport in Germany and the USA: An Analysis of Rider Characteristics," *Transport Reviews*, Vol. 32, No. 5, pp. 541-567.

Increasing bicycling levels in Germany since the 1970s

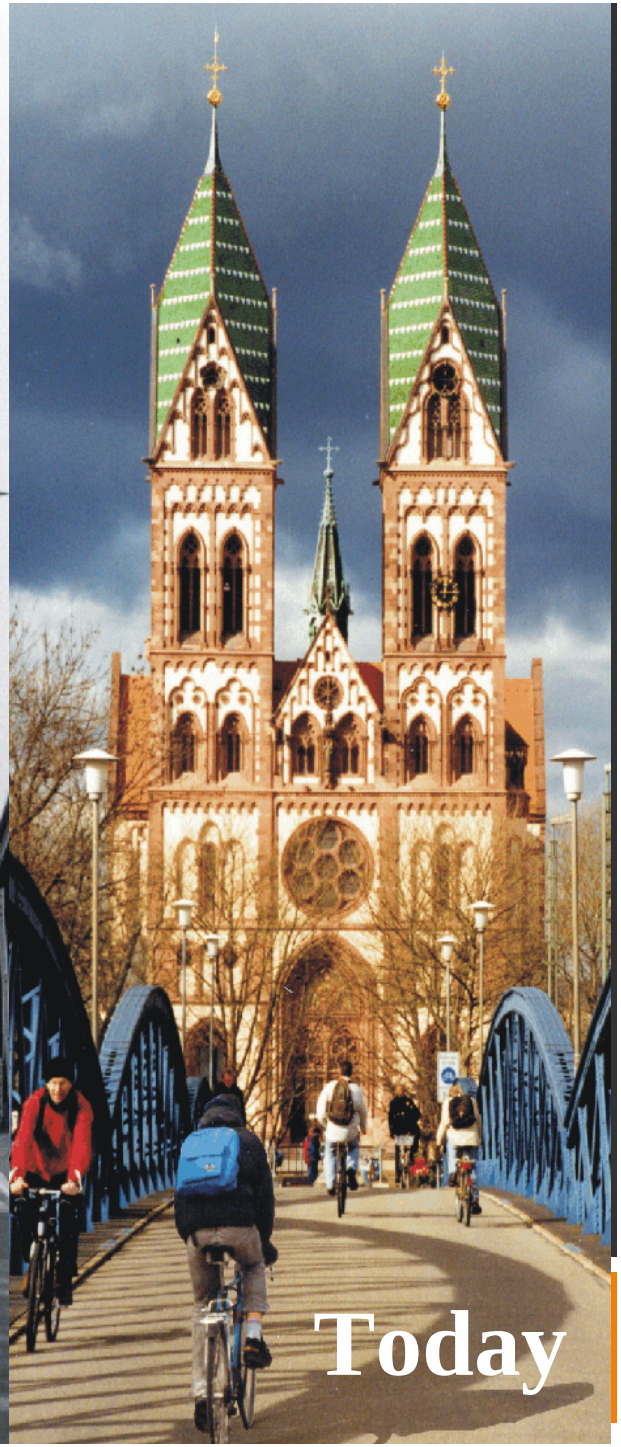


Sources: Pucher, J., Buehler, R. (eds). 2012. City Cycling. Cambridge, MA: MIT Press

1,100 km of bicycling facilities in Berlin plus 3,800 km of traffic calmed streets = 10% bike share of all trips

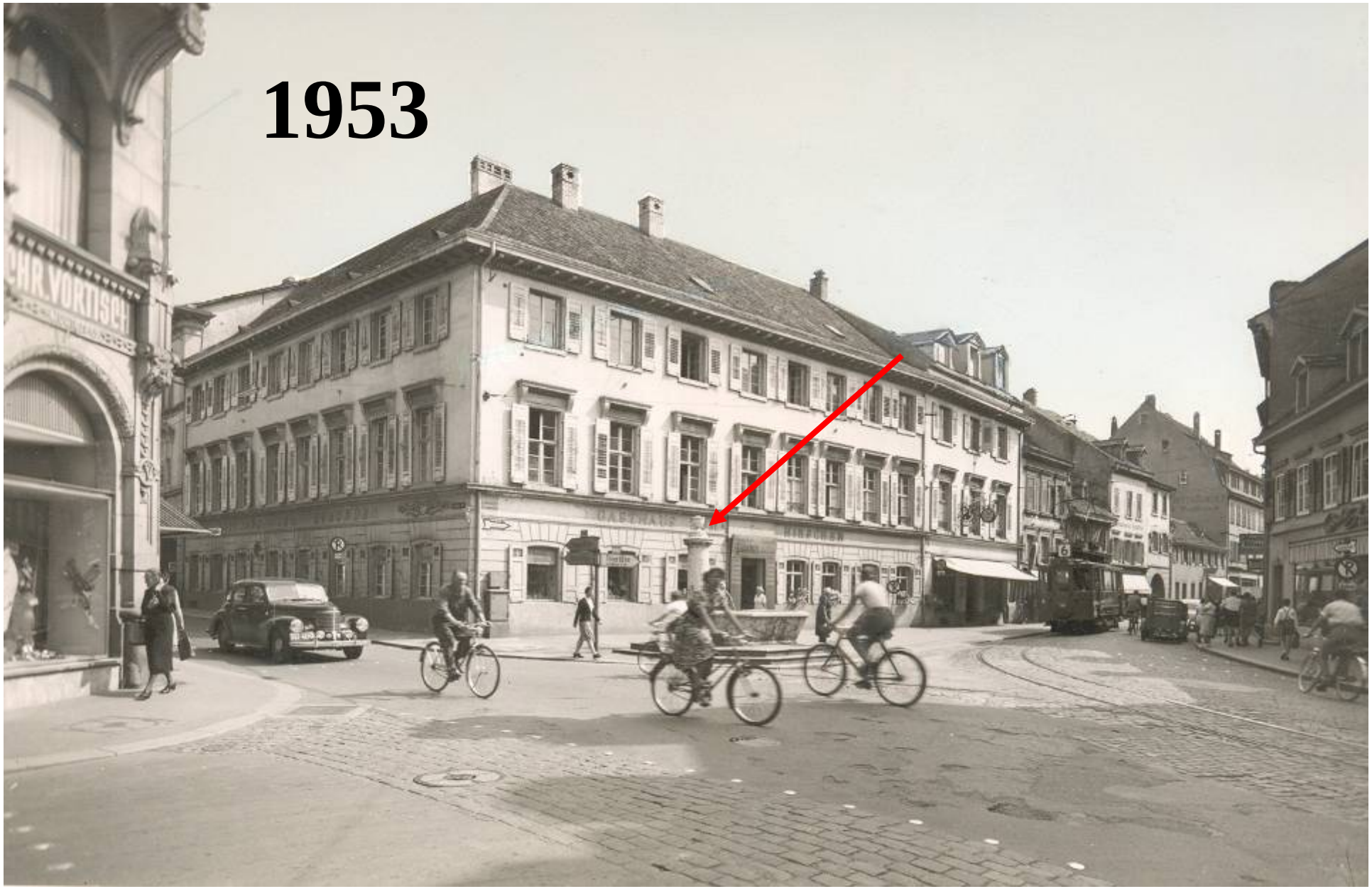
1950s

1960s



Today

Source: City of Freiburg



Source: Archives, City of Lörrach

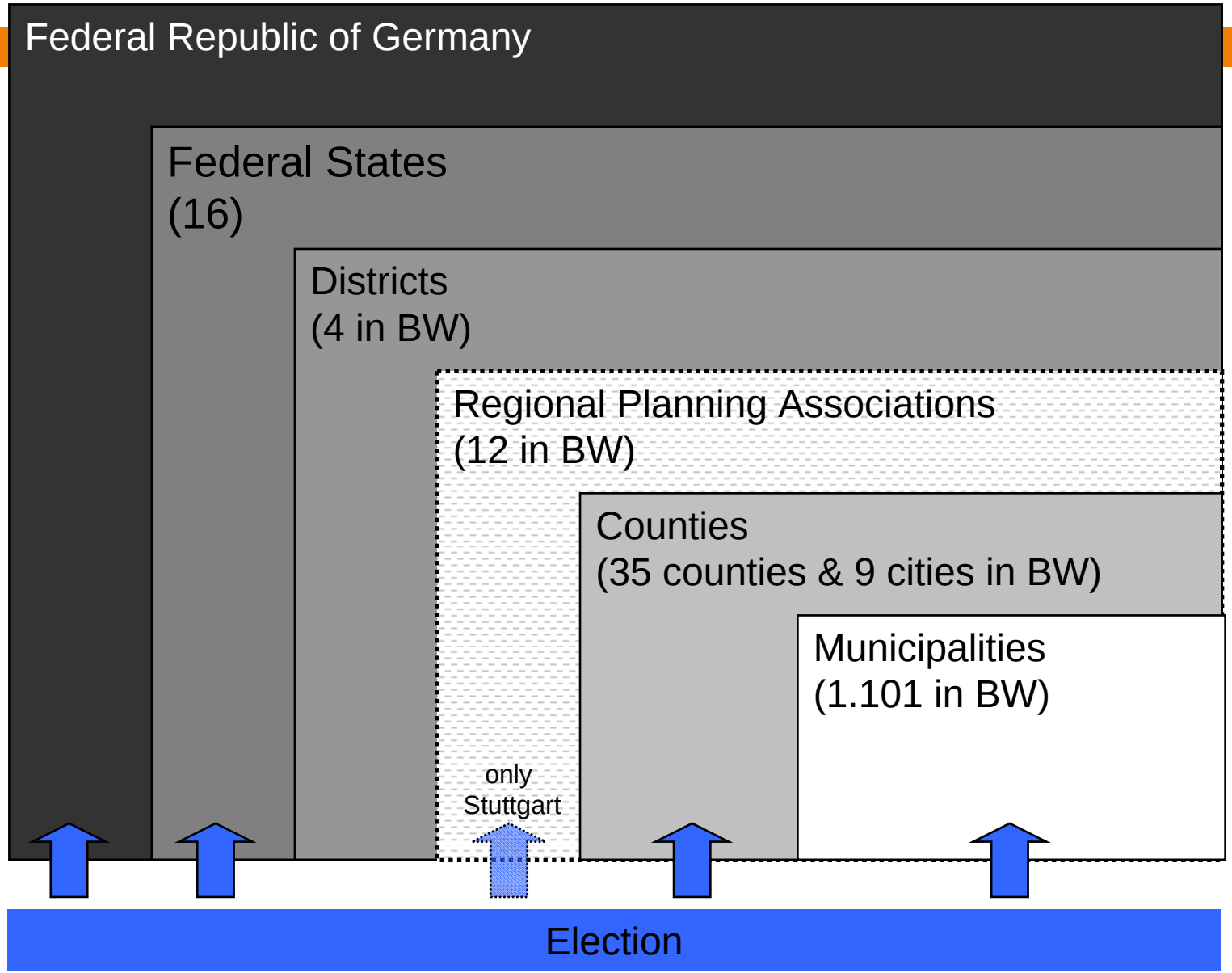
Lörrach, Turmstrasse 1953

Source: Archives, City of Lörrach

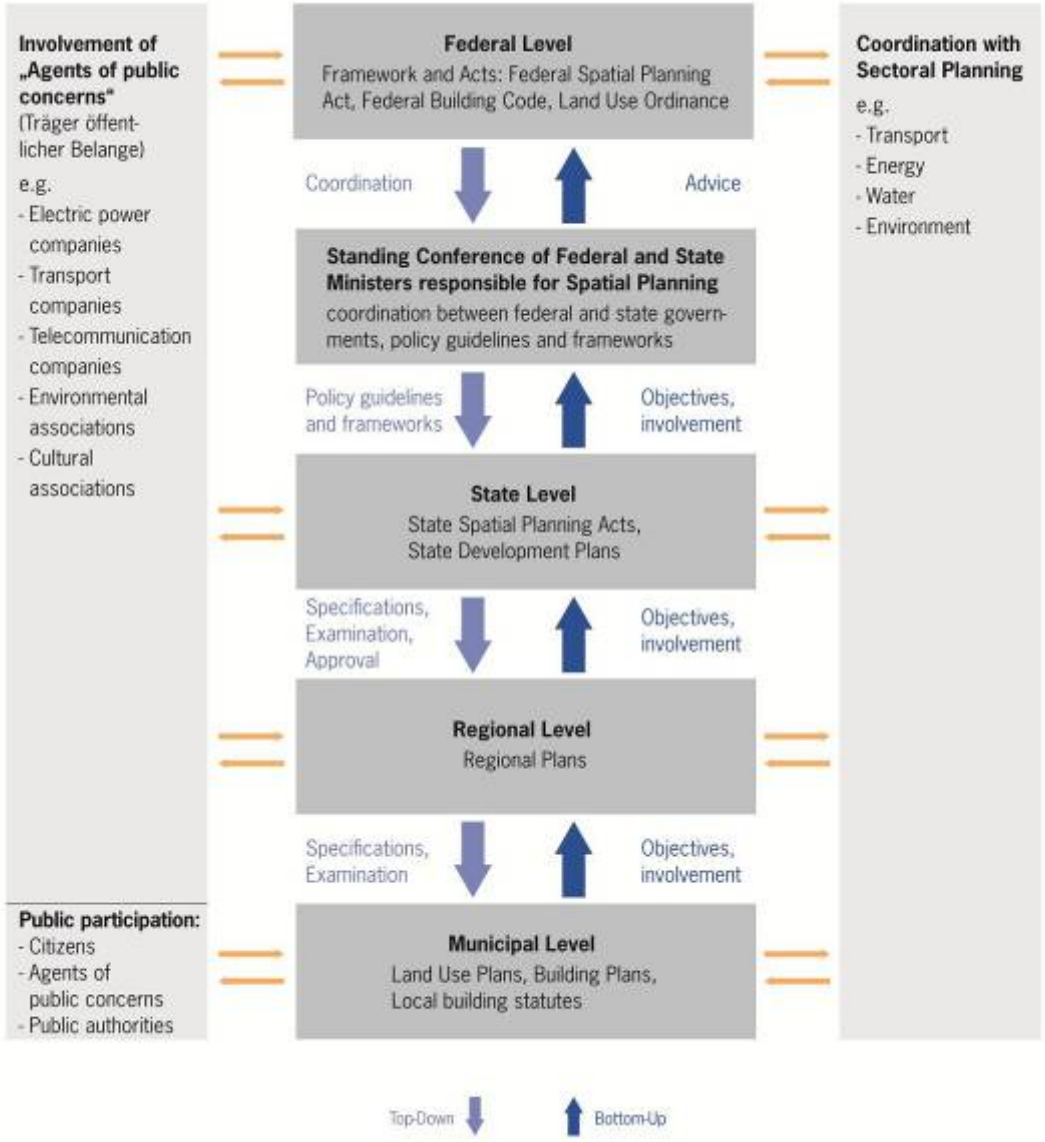
Lörrach, Turmstrasse 1972

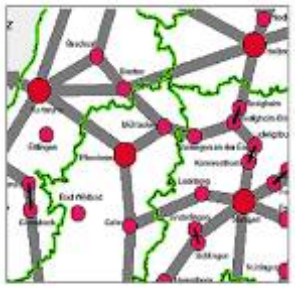

2011

Administrative System of Germany



Reciprocal Land-Use Planning in Germany





Landesentwicklungs-plan

Beispiel: Baden-Württemberg

Regionalplan

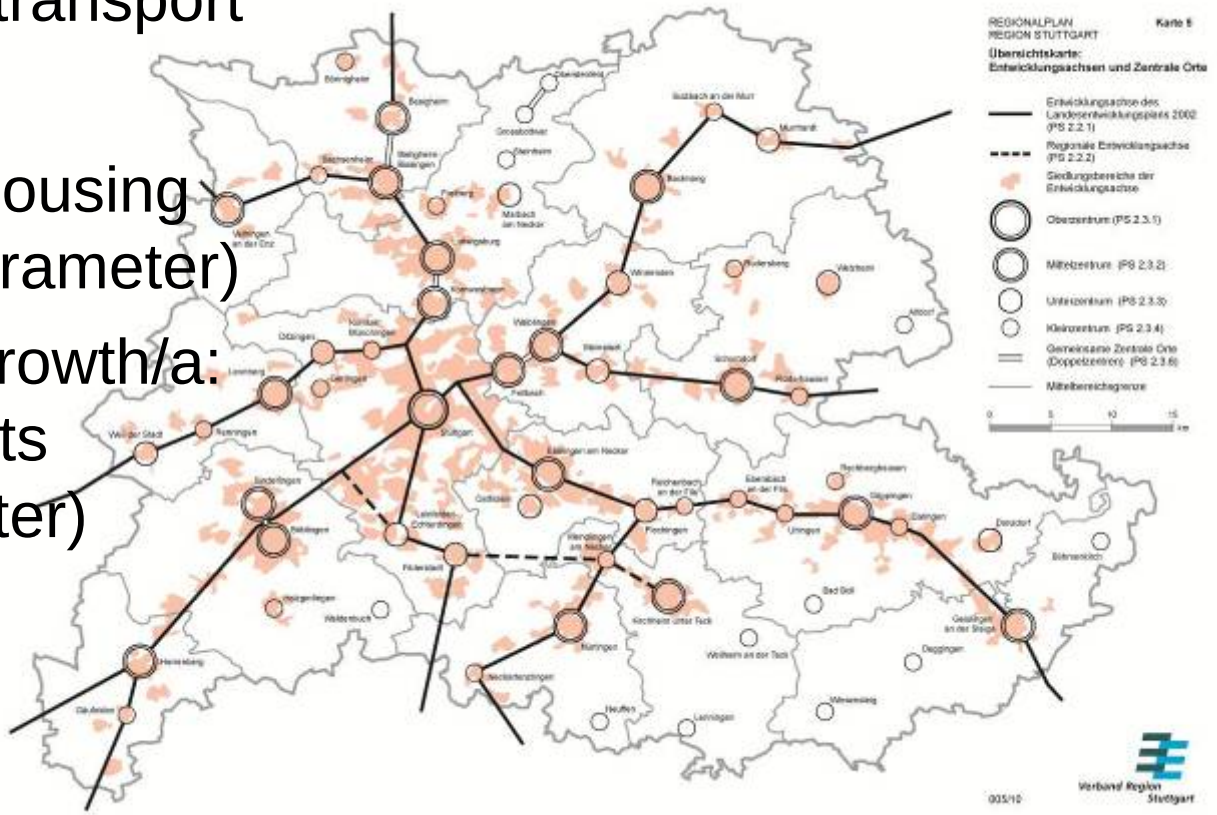
Beispiel: Stuttgart

Flächennutzungsplan

Bebauungsplan

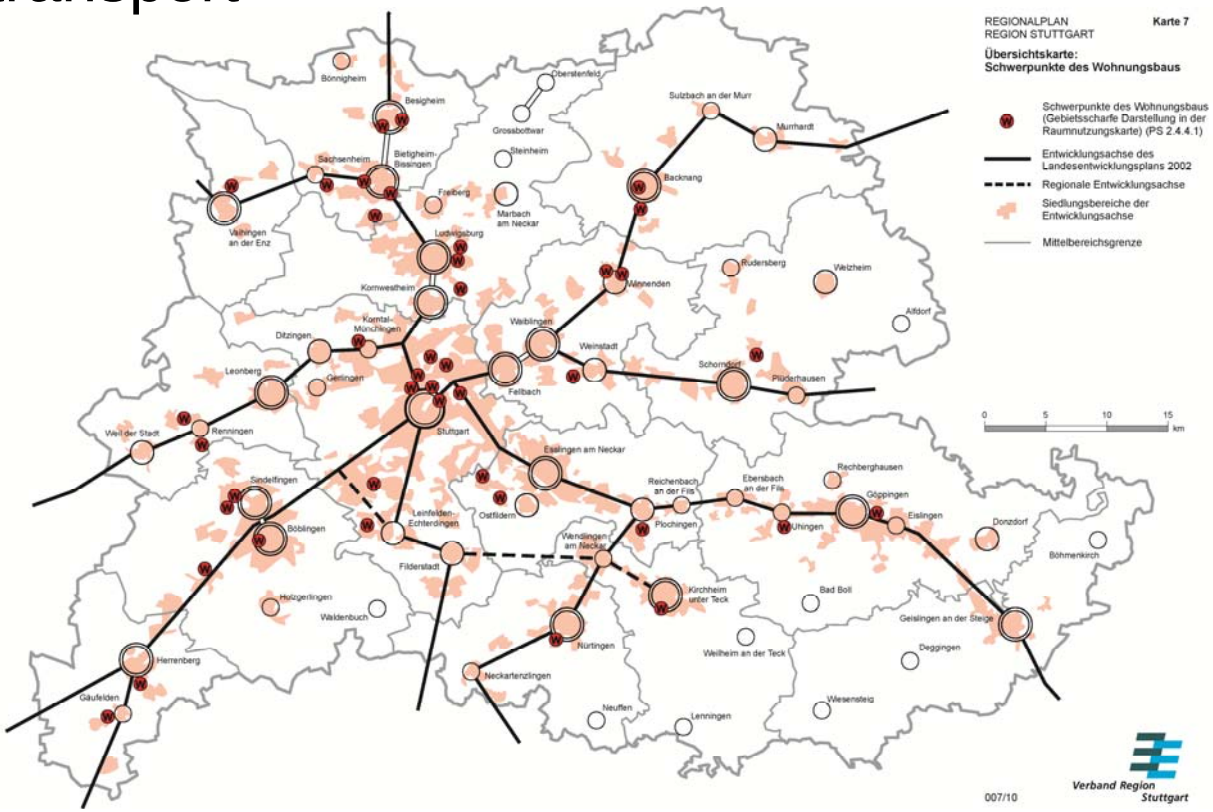
Regional Planning Stuttgart Region

- **Growth poles for settlements (Siedlungsbereiche)**
- Bound to central places
- At/in axes of public transport
- Density: 60 EW/ha
- Growth/a: 0.3% of housing units (orientation parameter)
- Inhabitant based: Growth/a: 0.2% of housing units (orientation parameter)



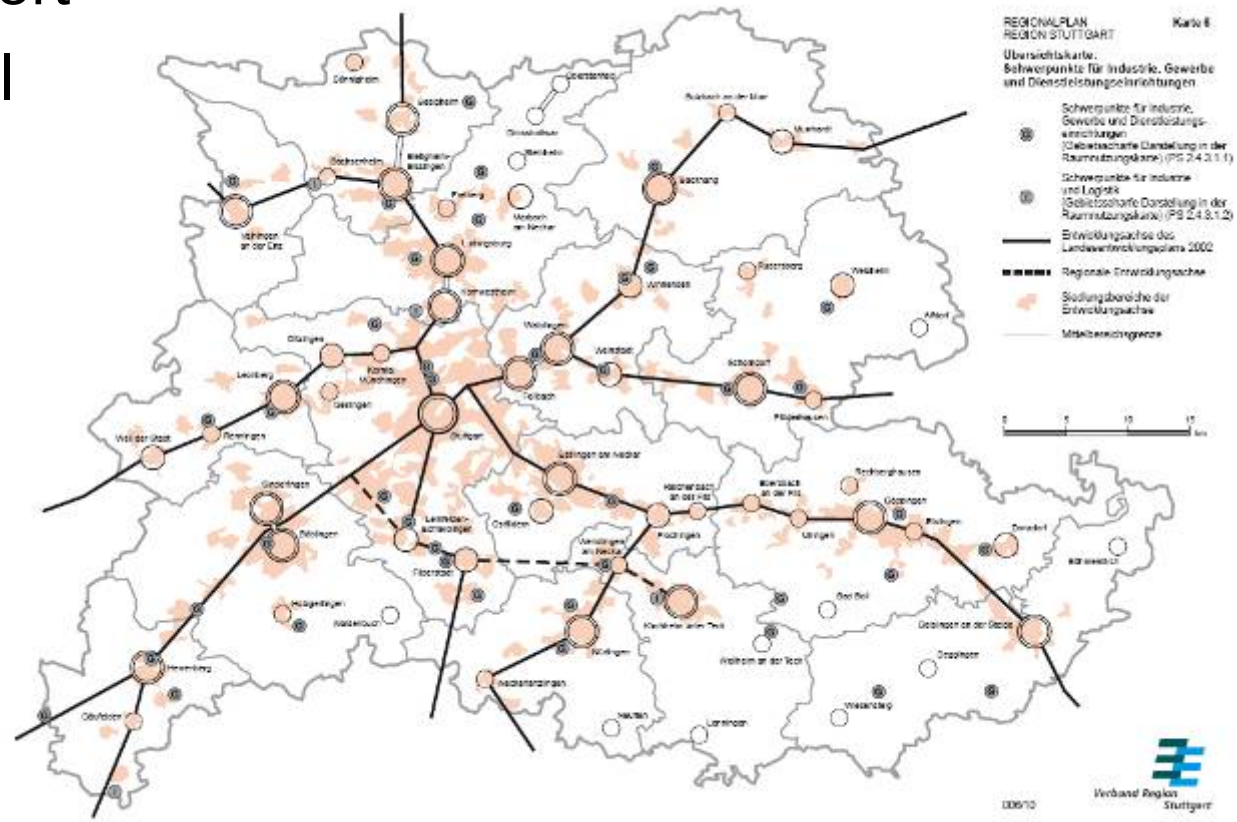
Regional Planning Stuttgart Region

- **Regional centers for housing (Schwerpunkte des Wohnungsbaus)**
- At/in axes of public transport
- Density: 90 EW/ha



Regional Planning Stuttgart Region

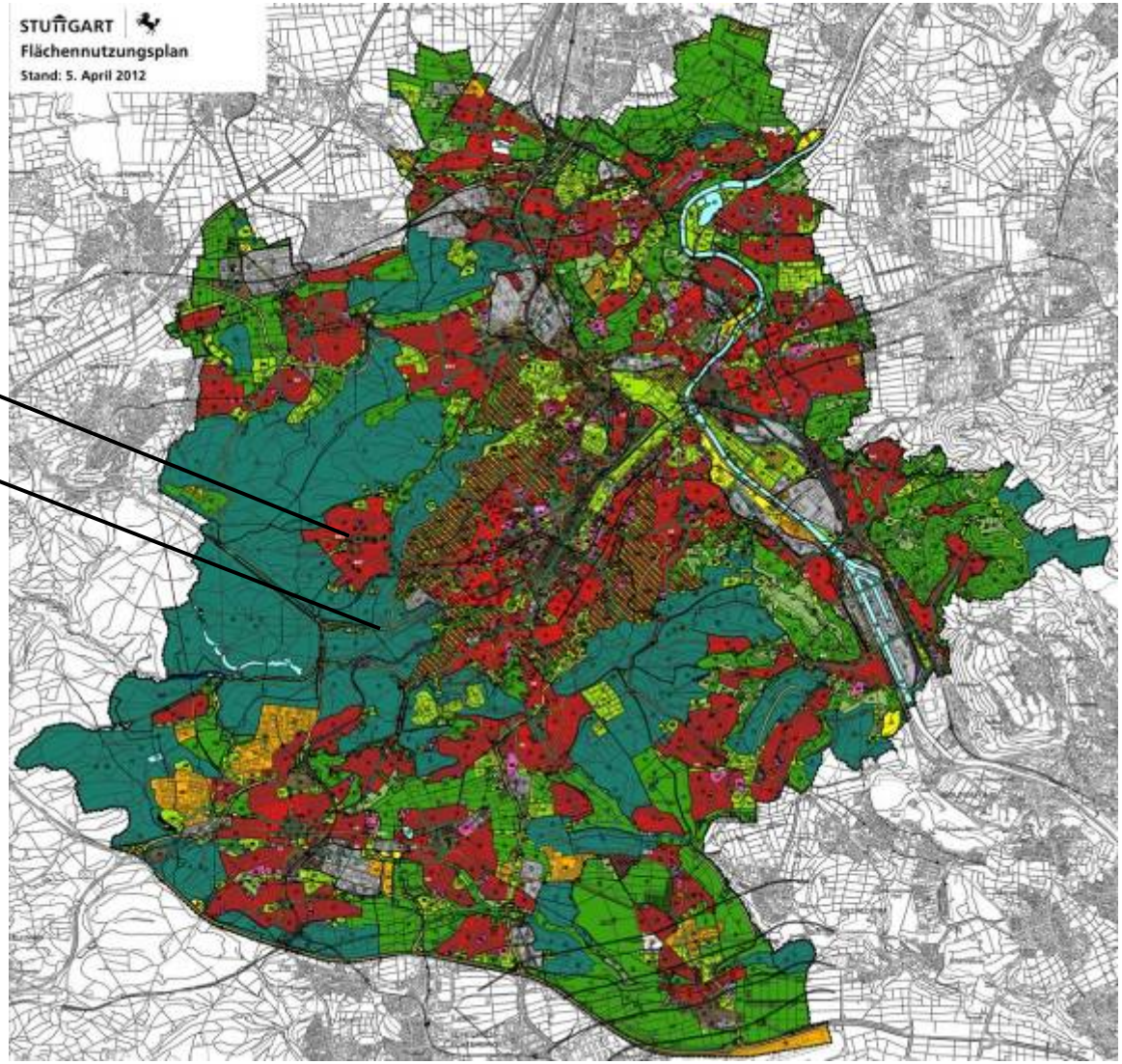
- **Regional centers for industry (Schwerpunkte für Industrie, Gewerbe und Dienstleistungen)**
- At/in axes of transport
- No large scale retail



Municipal Planning, Stuttgart

Inner zone

Outer zone



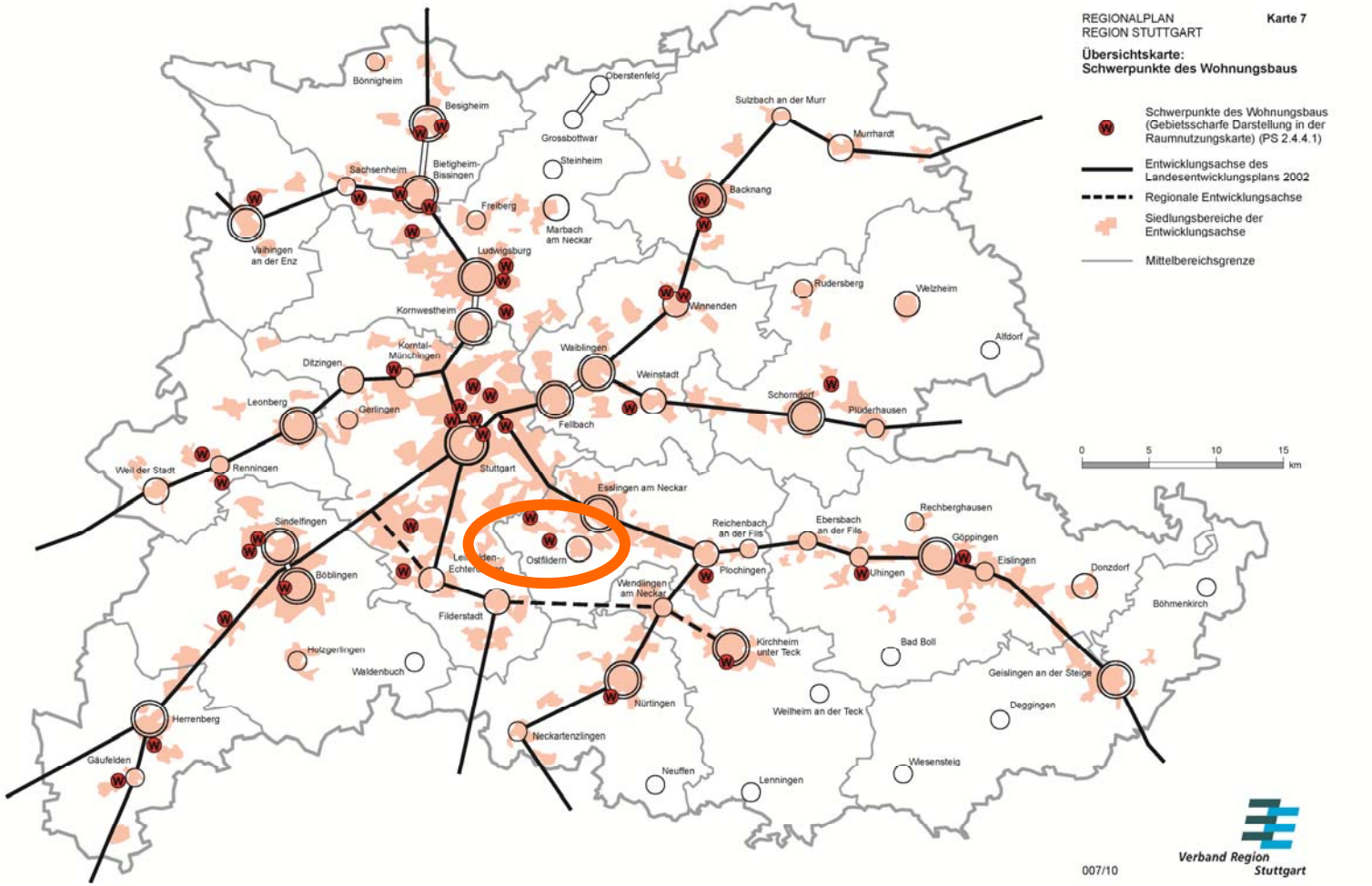
Land-Use Plan Stuttgart

Differences in Zoning and Implications for Travel Behavior

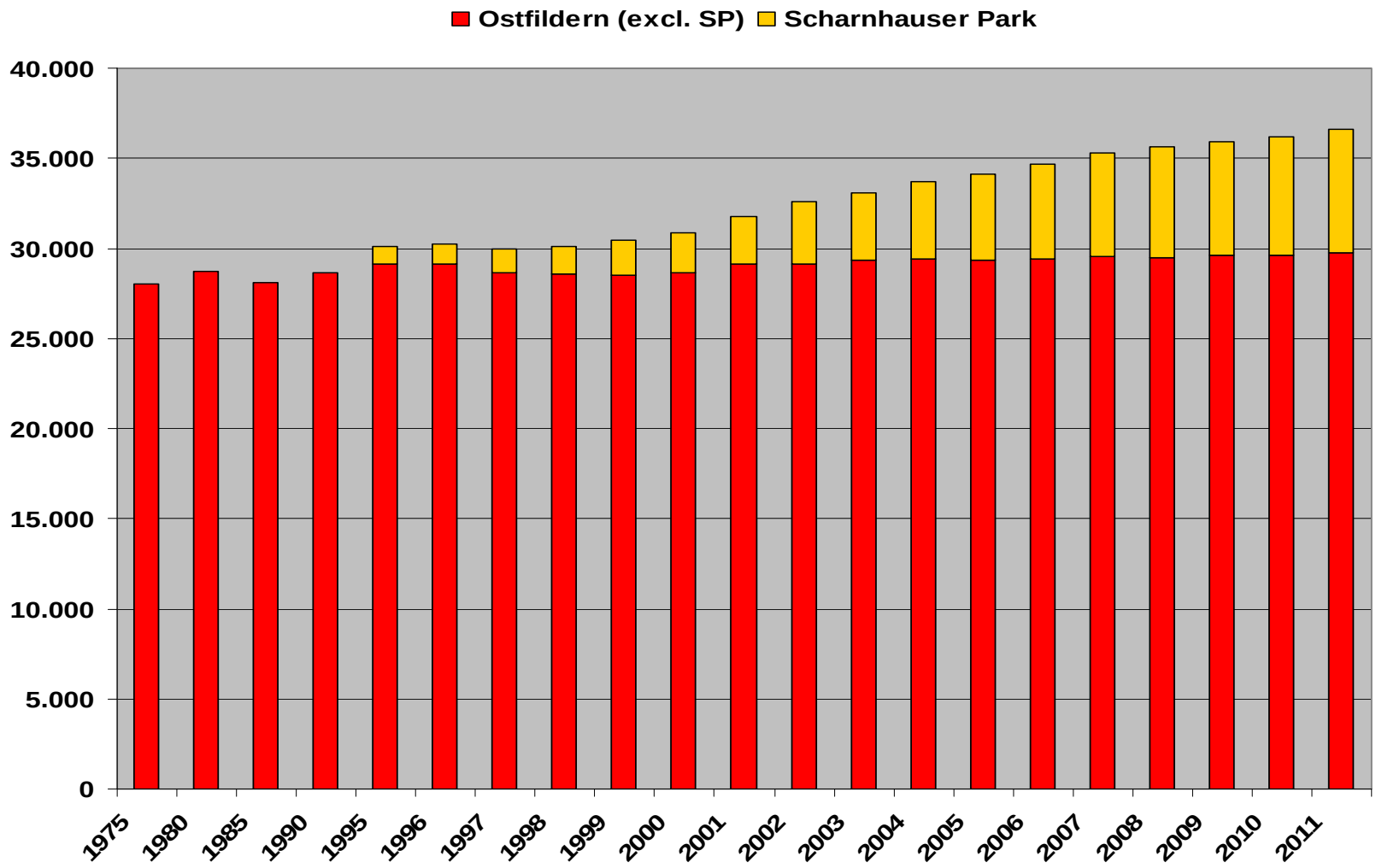
- Separation of land uses is stricter in the U.S.
- Zones cover larger land areas in the U.S.
- Strict separation of land uses, including exclusion of apartment buildings, doctor's offices, corner stores, and small businesses from single family residential zones, and larger areas of single use zoning result in longer trip distances in the United States
- Germany's practice of zoning for smaller land areas and the more flexible zoning code has helped to reduce trip distances and car dependence - even when planners did not explicitly coordinate transport and land use

Best Practice Case Scharnhauser Park

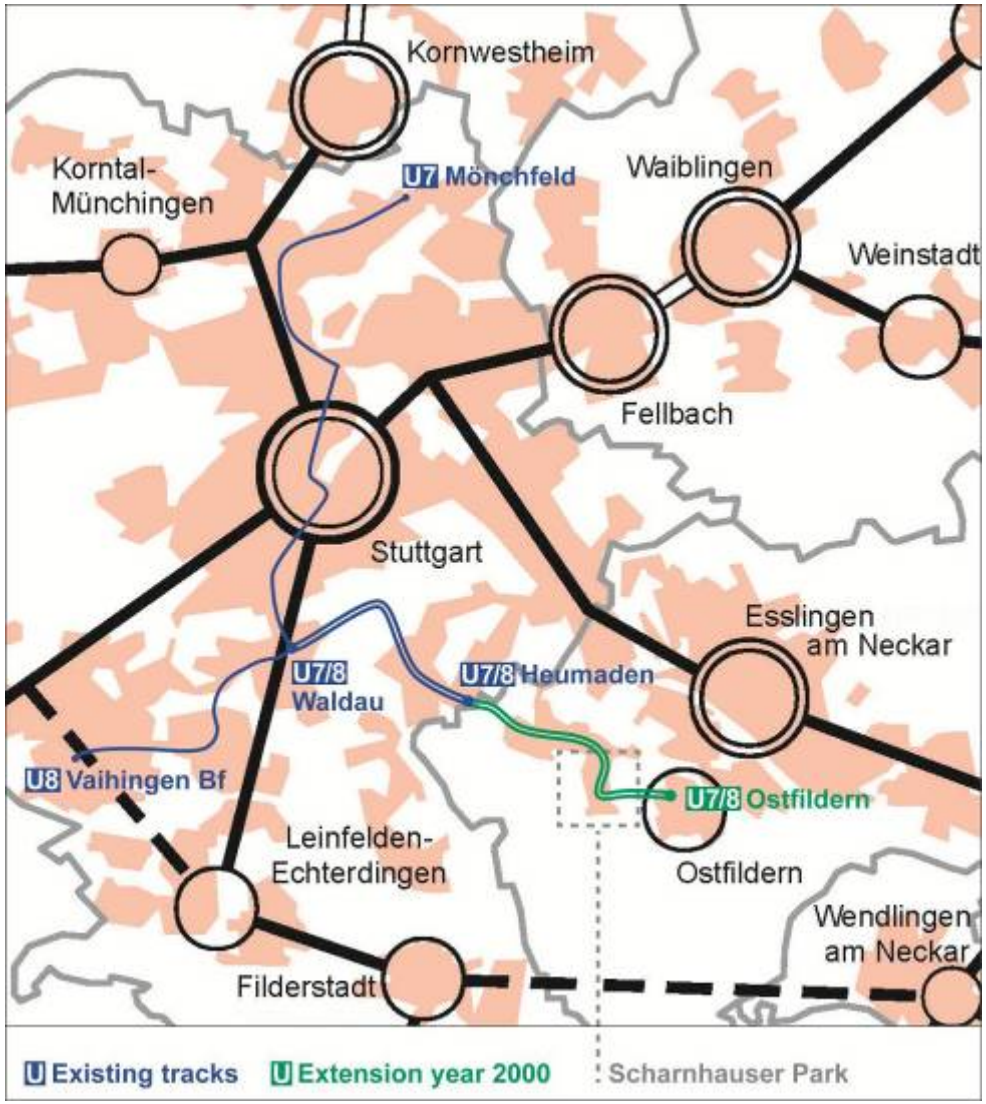
Best Practice Case Scharnhauser Park



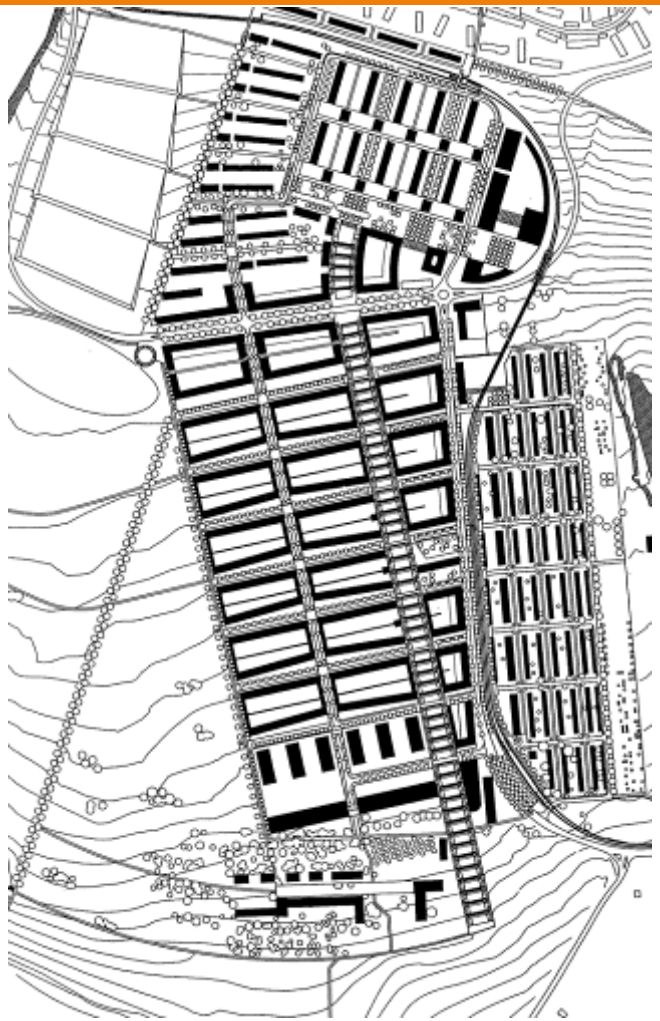
Best Practice Case Scharnhauser Park



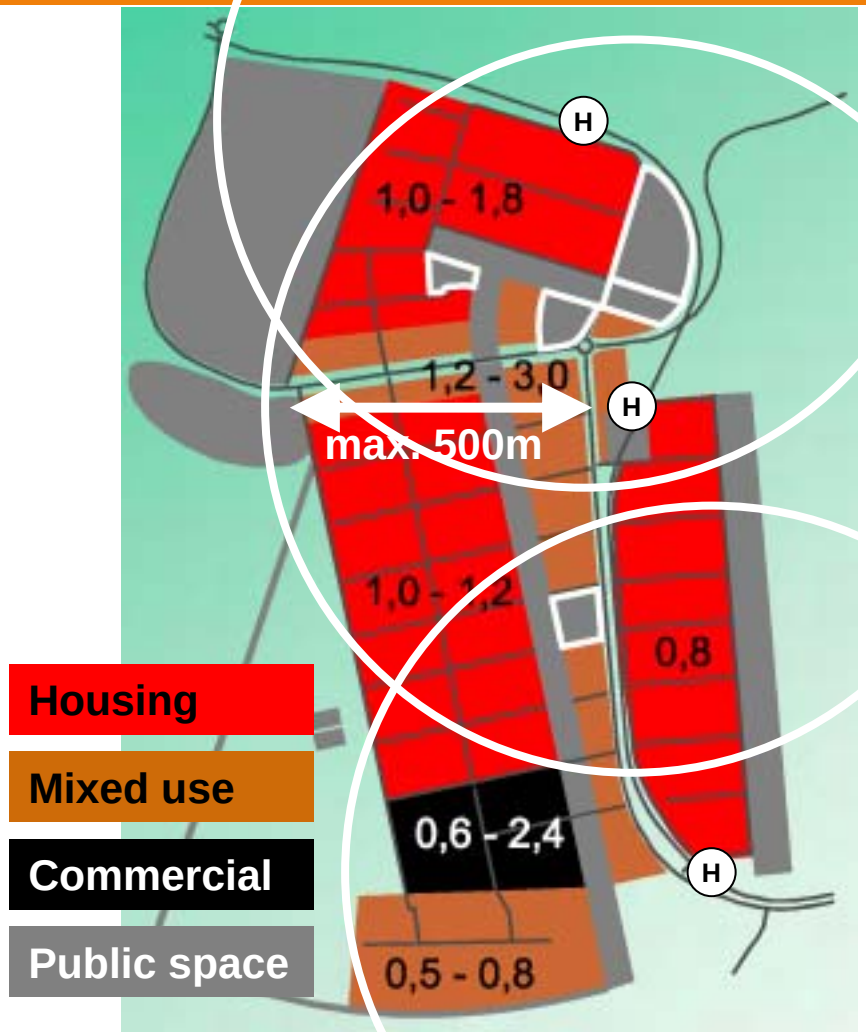
Best Practice Case Scharnhauser Park



Best Practice Case Scharnhauser Park



Master Plan Scharnhauser Park

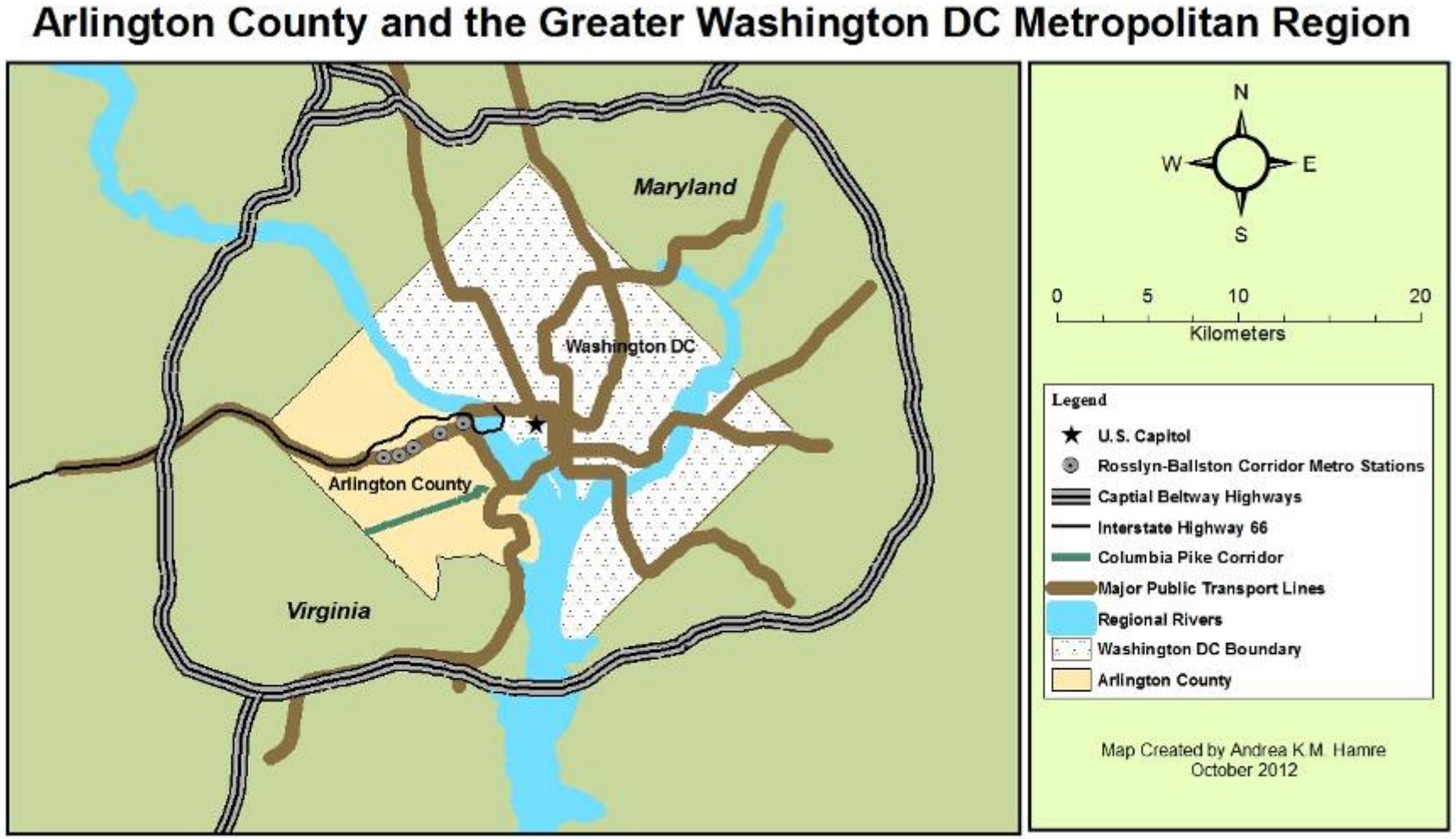


Land Use Scharnhauser Park

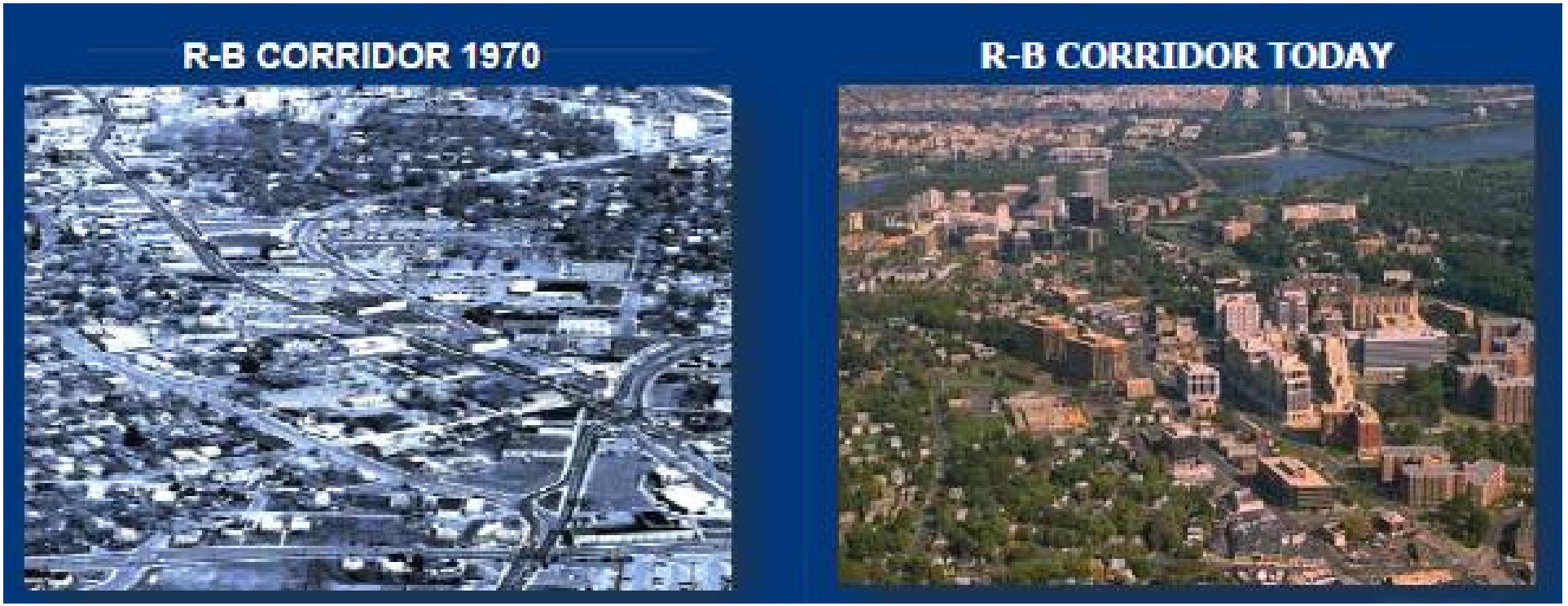
Best Practice Case Scharnhauser Park

Scharnhauser Park 2012

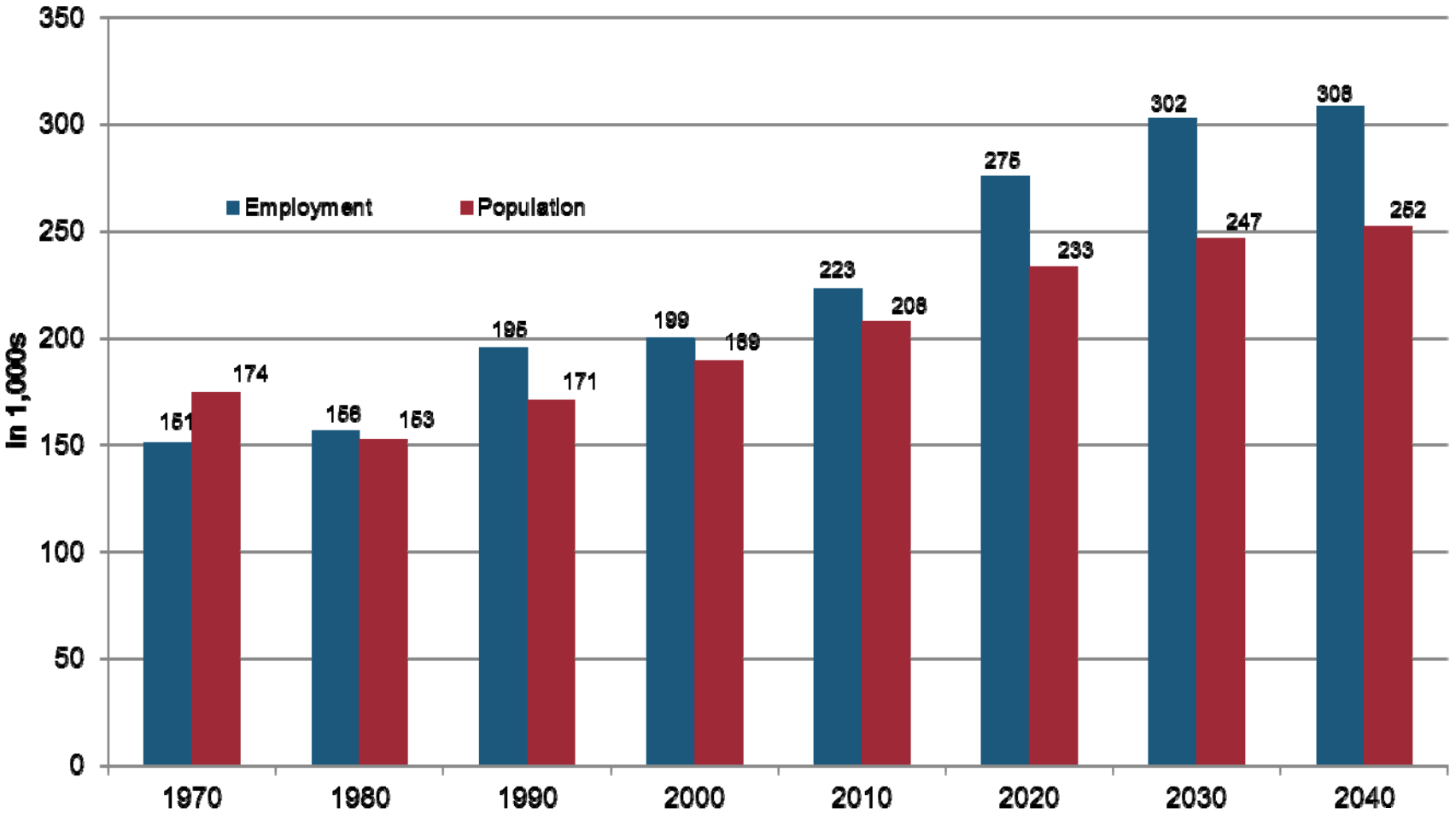
Best Practice Case Arlington County

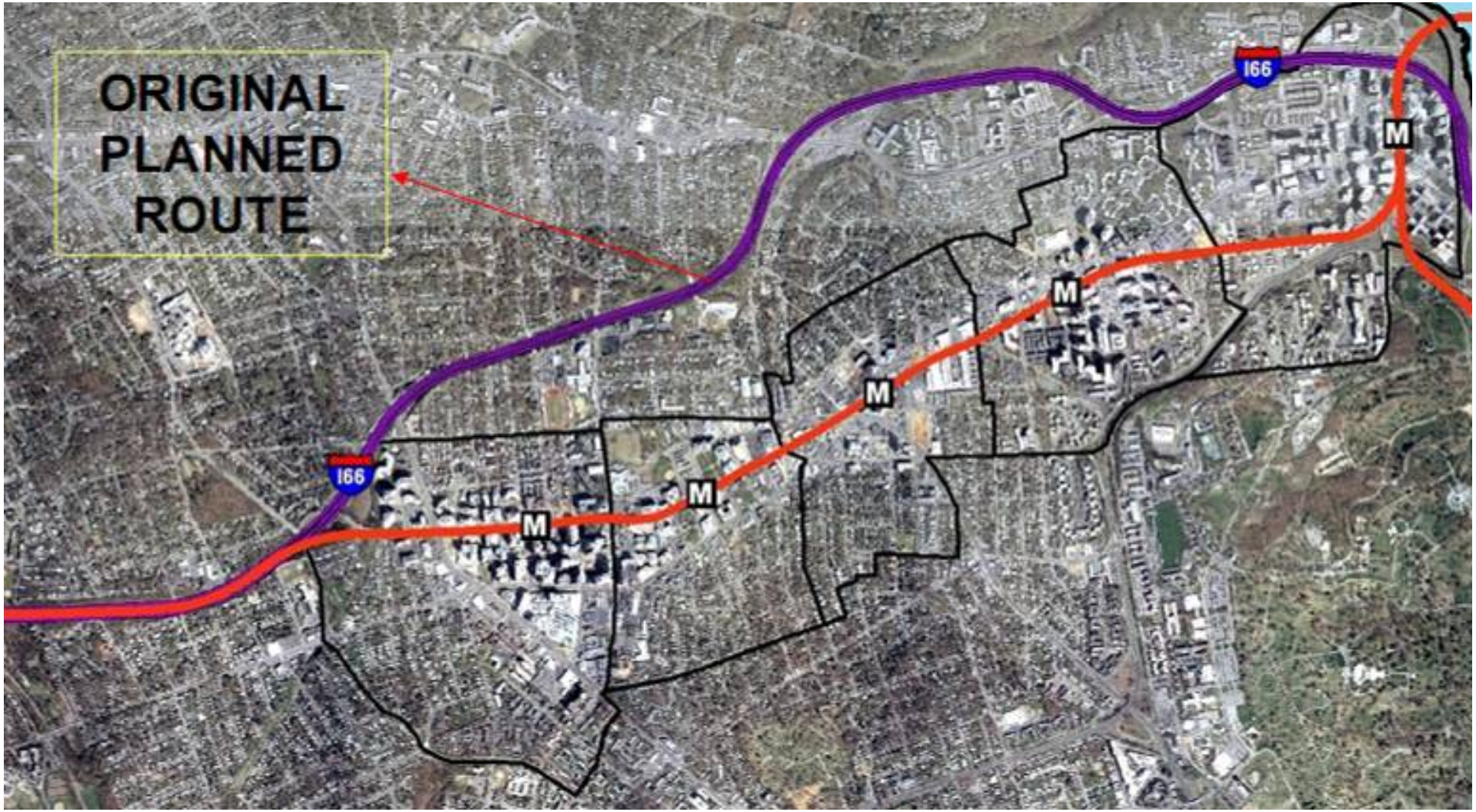


Rosslyn Ballston Corridor



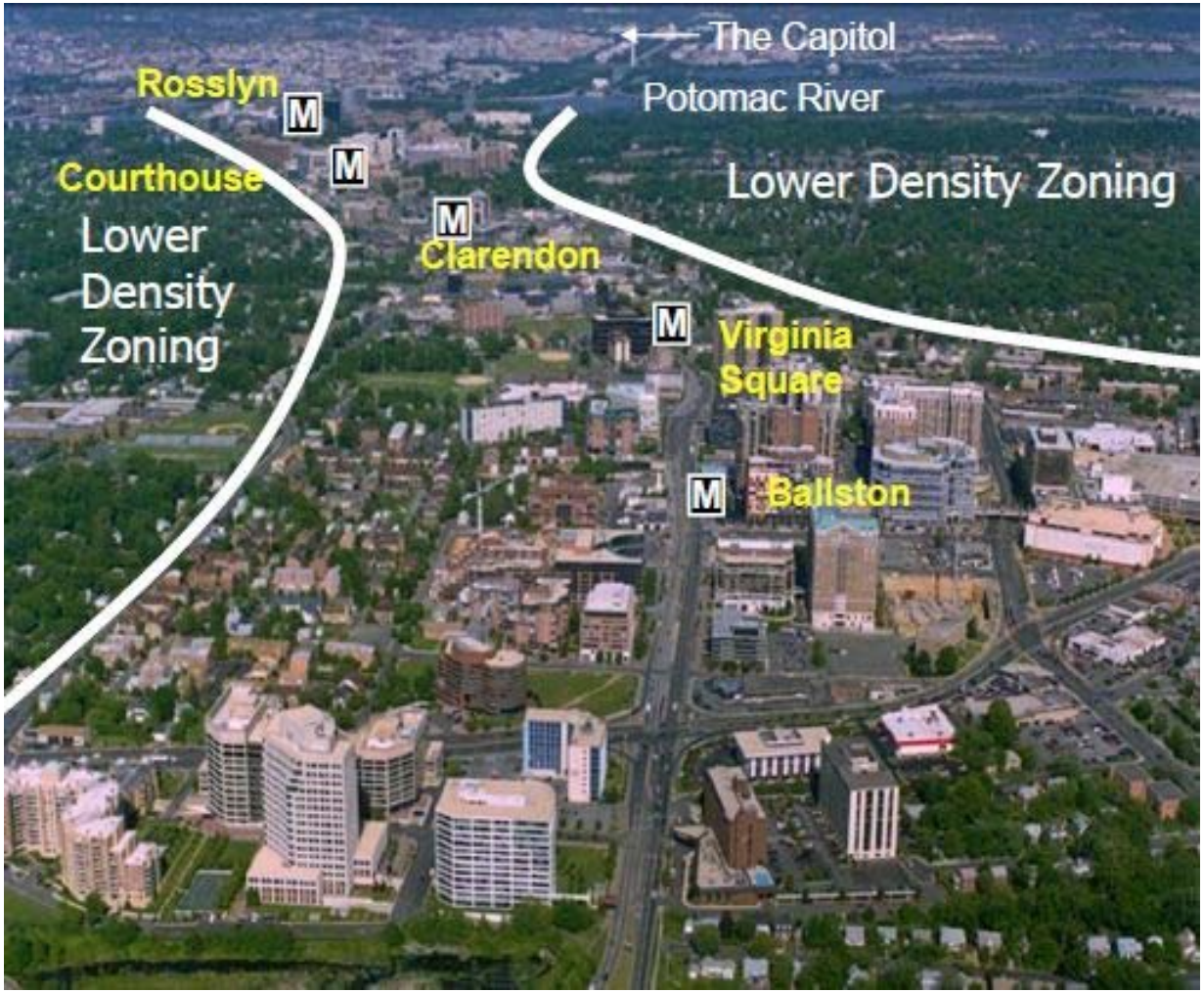
Arlington County Population and Employment (in 1,000): Historic Figures & Forecasts




ORIGINAL
PLANNED
ROUTE
I66
I66
M
M
M
M
M

Bull's Eye Concept

Aerial View


The Capitol
Potomac River
Rosslyn
Courthouse
Lower Density Zoning
Lower Density Zoning
Clarendon
Virginia Square
Ballston

Key Lessons from Case Studies

- Public transport can successfully be leveraged to catalyze redevelopment, and redevelopment can in turn support public transport use.
- A coherent planning blueprint that is developed with broad stakeholder participation can engender stable, efficient, and dynamic redevelopment.
- Involvement of different planning levels and sectors guarantees coordination of transport, land-use and financing.
- Coordinated policies to promote transportation, housing, and business choices are important to ensuring the long-term success and viability of redevelopment projects.

Summary and Conclusion I

- Ground passenger transport in Germany is less car dependent than in the U.S.
- U.S. transport system less sustainable along environmental, social, and economic dimensions
- The Washington, DC Metro and Stuttgart Regions mirror the national trends in travel behavior
  - Outlying suburbs in the DC Metro Region are much more car dependent than in the Stuttgart Region
- Compared to Germany, federal, state, and local transport policies in the U.S. during the last 60 years have been more favorable for the automobile

Summary and Conclusion II

- In contrast to the U.S., in Germany different levels of government coordinate their land-use plans in an interactive process
- In both countries federal policies build framework; but local governments determine sustainability of transport system
- Similar remaining challenges in both countries

Challenges

- In both countries, transportation should be more explicitly coordinated with land-use planning
- Planning practice and regulations in both countries still foster automobile use
- Federal and state funding can foster, counterbalance, or even block local policy choices
- Effecting changes in individual behavior, land-use and transport systems is possible, but takes time
- Planning approach that is “satisfied with partial success by individual projects, but based on an overall strategy”

PANEL ONE:
Sustainable Transport in Germany and the USA

THANK YOU FOR YOUR ATTENTION

Transatlantic Urban Climate Dialogue,
Workshop "Sustainable Mobility"
28 November 2012

Ralph Buehler and Wolfgang Jung
Virginia Tech and Karlsruhe Institute of Technology