University of Waterloo
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An International Review and Evaluation of Public Private Partnerships

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Presentation Outline

- Infrastructure and economic development
- Extent and condition of infrastructure in developed and developing countries
- A feasible option for certain conditions: Public Private Partnerships (PPP)
- A brief history of PPP…
- …and some modern examples
- How do you know whether a PPP project can attract private investors?
- Forms of private sector participation
- Discussions

Infrastructure

- "The built environment in which we live" (Herman and Ausubel)
- "Social overhead capital" (Rosenstein-Rodan and some other development economists)
- Infrastructure includes **public utilities** and **public works**

Infrastructure

- **Public utilities:** power, telecommunications, piped water supply, sanitation and sewerage, solid waste collection and disposal, piped gas
- **Public works:** roads, dams, canals, railways, ports, waterways, airports, buildings

Developing and Developed Countries

- Developing countries include low- and middle-income economies
- Developed (advanced, industrial, rich) countries denote high-income economies
- The World Bank's main criterion for classifying economies is gross national income (GNI) per capita, previously referred to as gross national product (GNP)

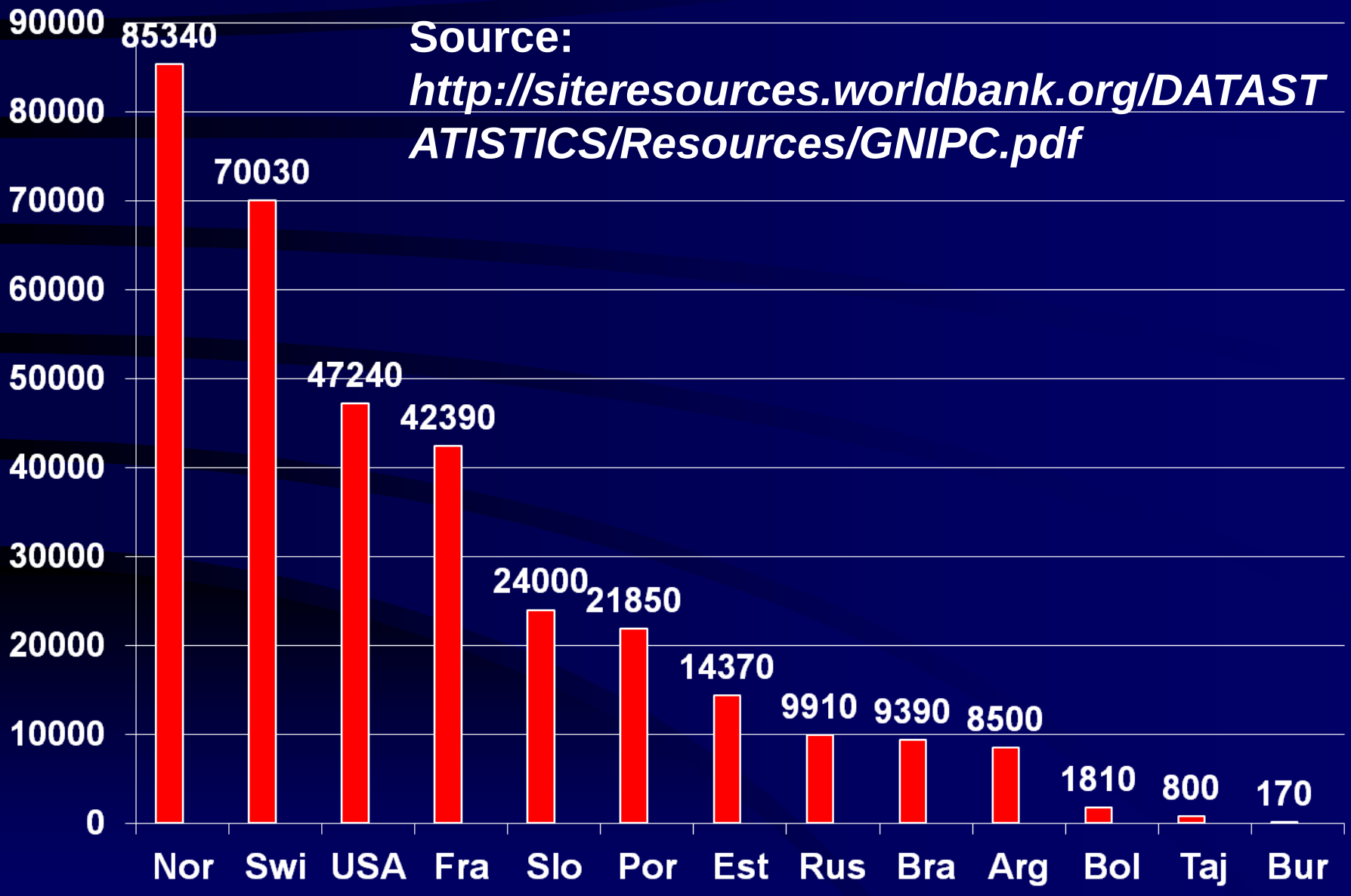
Classification of Economies

Economies	GNI per capita
Low-income	$1005 or less
Middle-Income	$1006 to $12,275
Lower	$1006 to $3,975
Upper	$3,976 to $12,275
High-income	$12,276 or more

Classifications are set each year on July 1

Source: http://go.worldbank.org/K2CKM78CC0

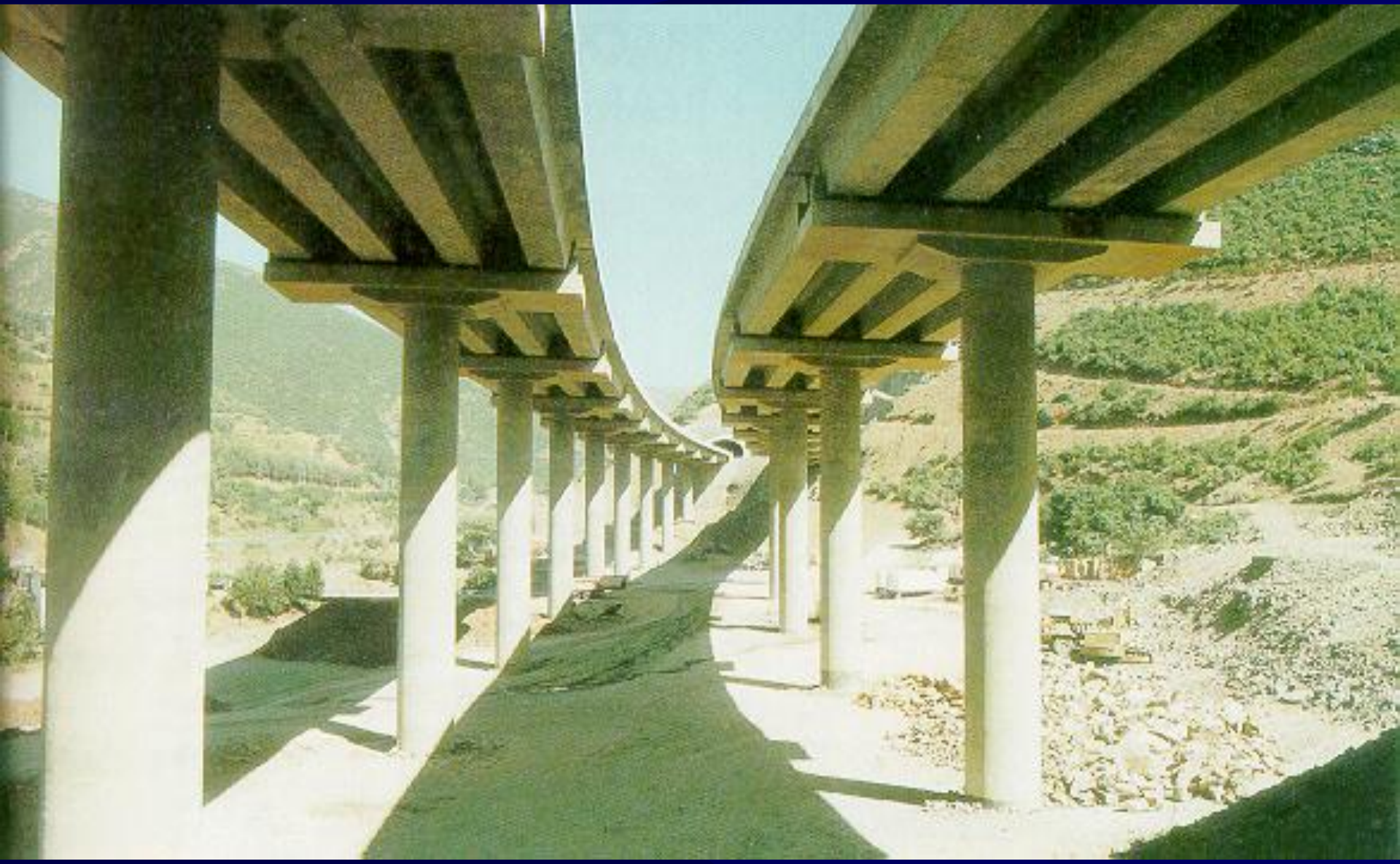
Gross National Income (US$ per Capita)



More GNI per Capita

- Canada: US$41,950
- World: US$9,097
- Low income: US$510
- Middle income: US$3,764
  - Lower middle income: US$1,658
  - Upper middle income: US$5,884
- High income: US$38,658

Extent and condition of infrastructure in developed and developing countries

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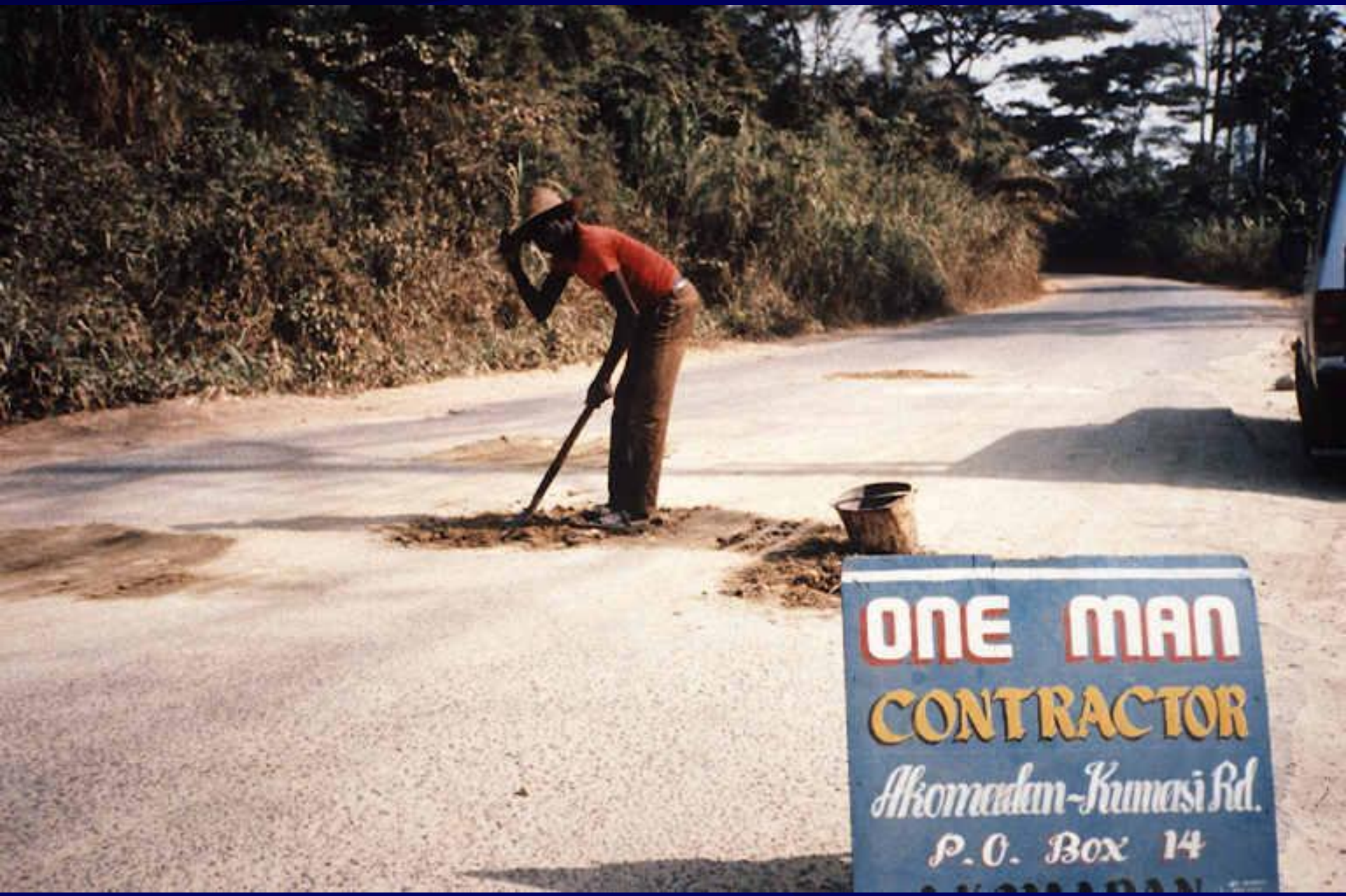
P&O


ONE MAN
CONTRACTOR
Akomadan-Kumasi Rd.
P.O. Box 14

Some Measures of Infrastructure

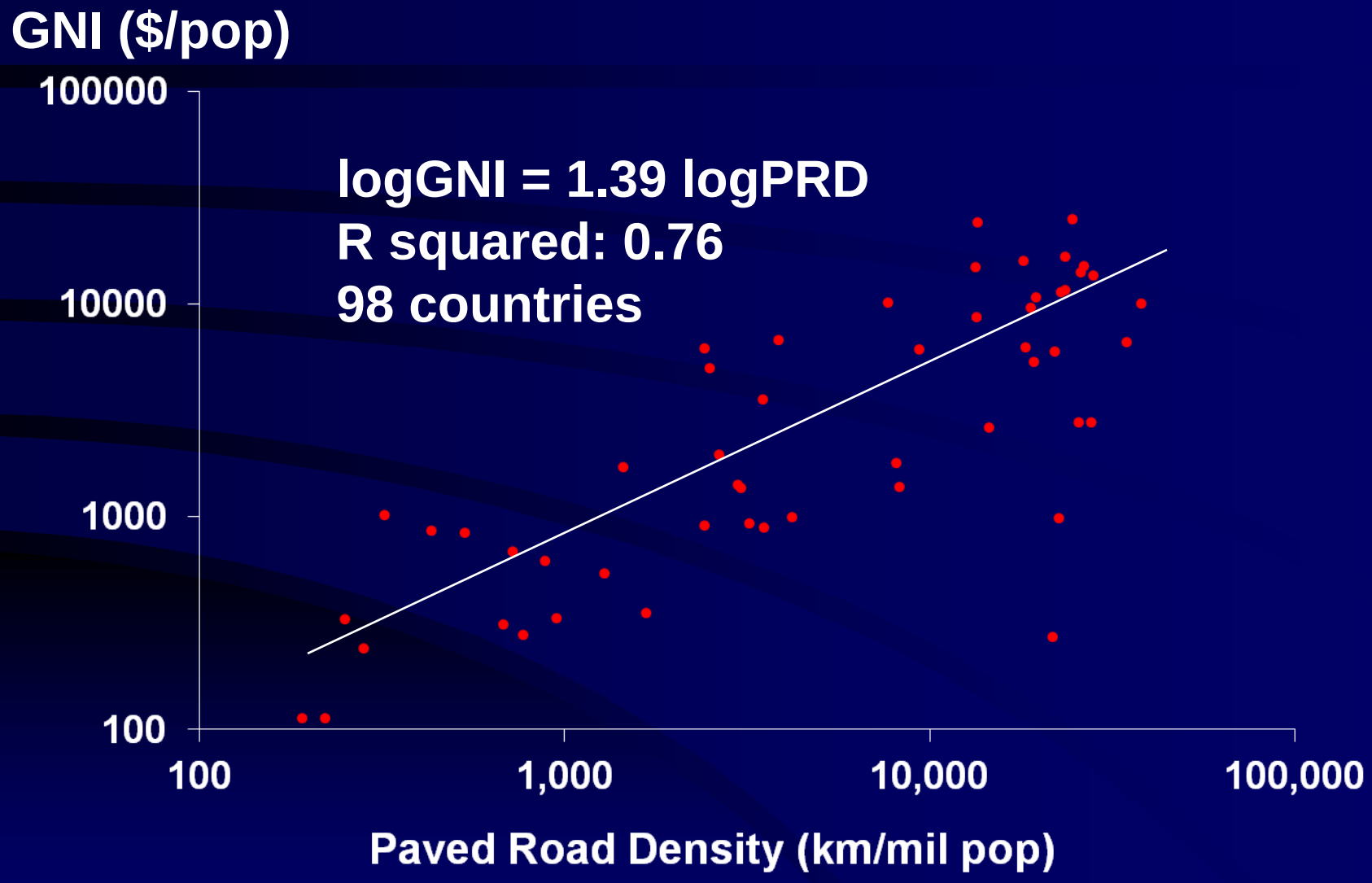
- Paved road density (PRD), in km per million persons
- Electricity-generating capacity (ELE), in thousands of kilowatts per million persons
- Number of telephone connections per million population (TEL)
- Railroad tracks (RWY), in km per million population

Average Measures of Infrastructure

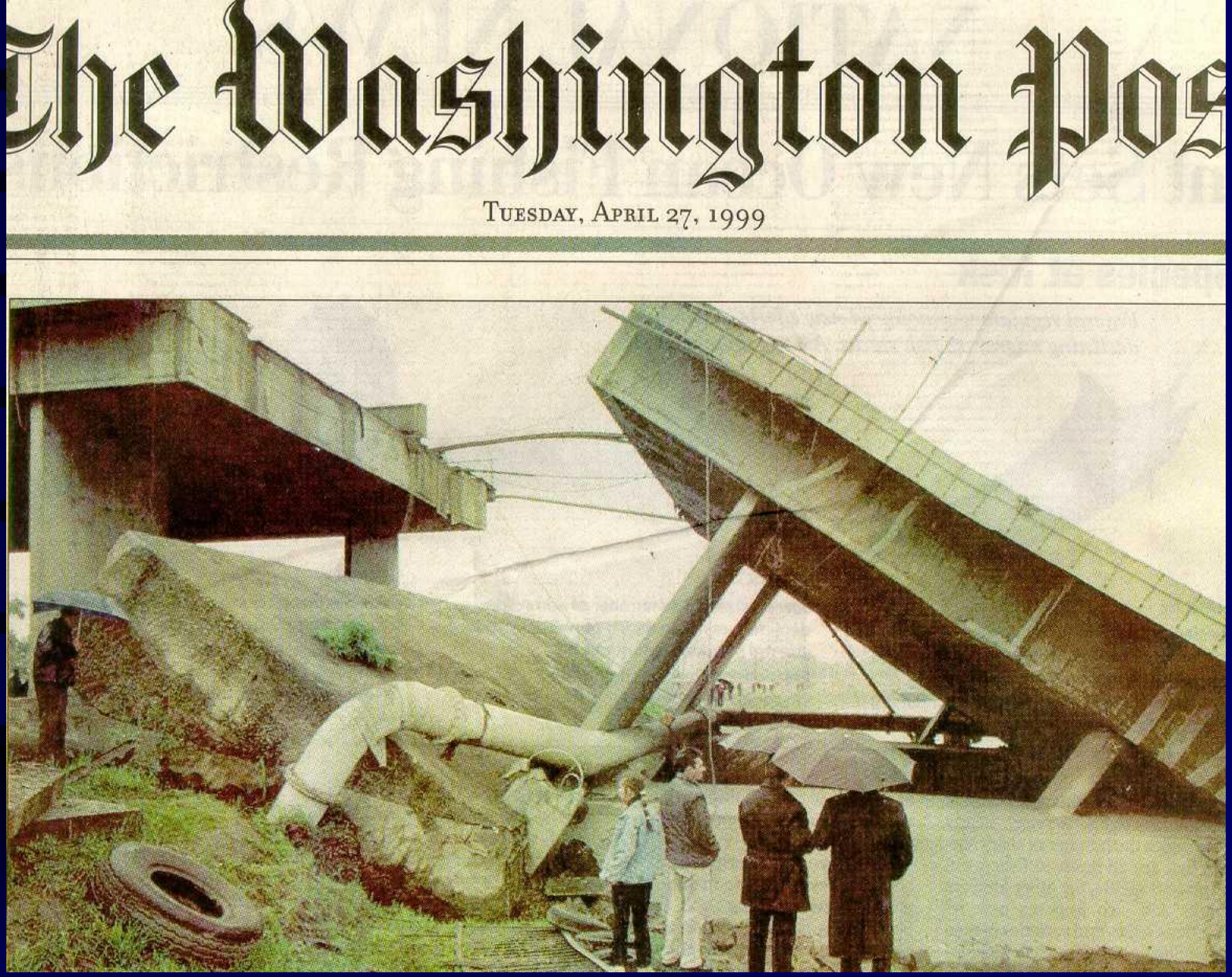
Economies	PRD (km/mil pop)	ELE (1,000's of kw/mil pop)	TEL (# of connec. /mil pop)	RWY (km/mil pop)
Low-income	410	70	7,920	70
Lower-middle Income	610	190	46,760	190
Upper-middle Income	1,950	560	154,100	330
High-income	10,150	2,070	673,000	840

Source: WB World Development Report 1994

Economic Development and Infrastructure



Source: Queiroz and Gautam 1992



Ruins of a bridge over the Danube River in Novi Sad, Serbia, targeted in a NATO strike in 1999

Infrastructure Needs

- The World Bank estimates the total demand for infrastructure in developing countries at over US$900 billion per annum
- The needs in the developed world are even higher
- Such needs are well above what can be covered by country budgets

Public-Private Partnerships

- A Public-Private Partnership (PPP) constitutes a sustained collaborative effort between the public sector (government agencies) and private enterprises to achieve a common objective (e.g., a motorway or railway project) while they pursue their own individual interests.

Public-Private Partnerships

- PPPs are forms of cooperation between public authorities and businesses, in general with the aim of carrying out infrastructure projects or providing services for the public
- PPP has been used in areas such as transport, public buildings, health, education, water and sanitation, environment, security

PPPs are not new

- Toll road at Wadesmill in Hertfordshire, UK, established in 1663 by Act of Parliament
- 19th century concessions: toll roads, bridges, tunnels in US; railways in France; subway in London
- Suez (1860) and Panama (1880) canals
- Decline around 1930 (great depression)
- Resurgence in the 1980s: perspective of reliable cash flows to private investors


GATUN LOCKS
PANAMA CANAL
1913


msc
MEDITERRANEAN SHIPPING CO
CRONOS
msc
MEDITERRANEAN SHIPPING CO
msc


ACP
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PROHIBIDO INGRESAR CON :
DROGAS
ARMAS
ALCOHOL

The Maysville Turnpike, USA, 1830

U.S. 1 in South Carolina, 1921

A toll house at the approach to a bridge

Backup at Toll Plaza

Chesapeake Bay Bridge toll booths, beach-bound traffic

August 1999

Source: The Washington Post

Riverside Freeway, SR 91, CA

- First fully automated toll road (free-flow system), 16-km long, opened on December 27, 1995
- Serves commuters on Riverside Freeway (SR 91), Orange County, south of Los Angeles
- Original developer and operator: California Private Transportation Company
- Achieved cash flow break-even in mid-1998 (can pay operating and debt expenses from revenues)

Riverside Freeway, SR 91, CA

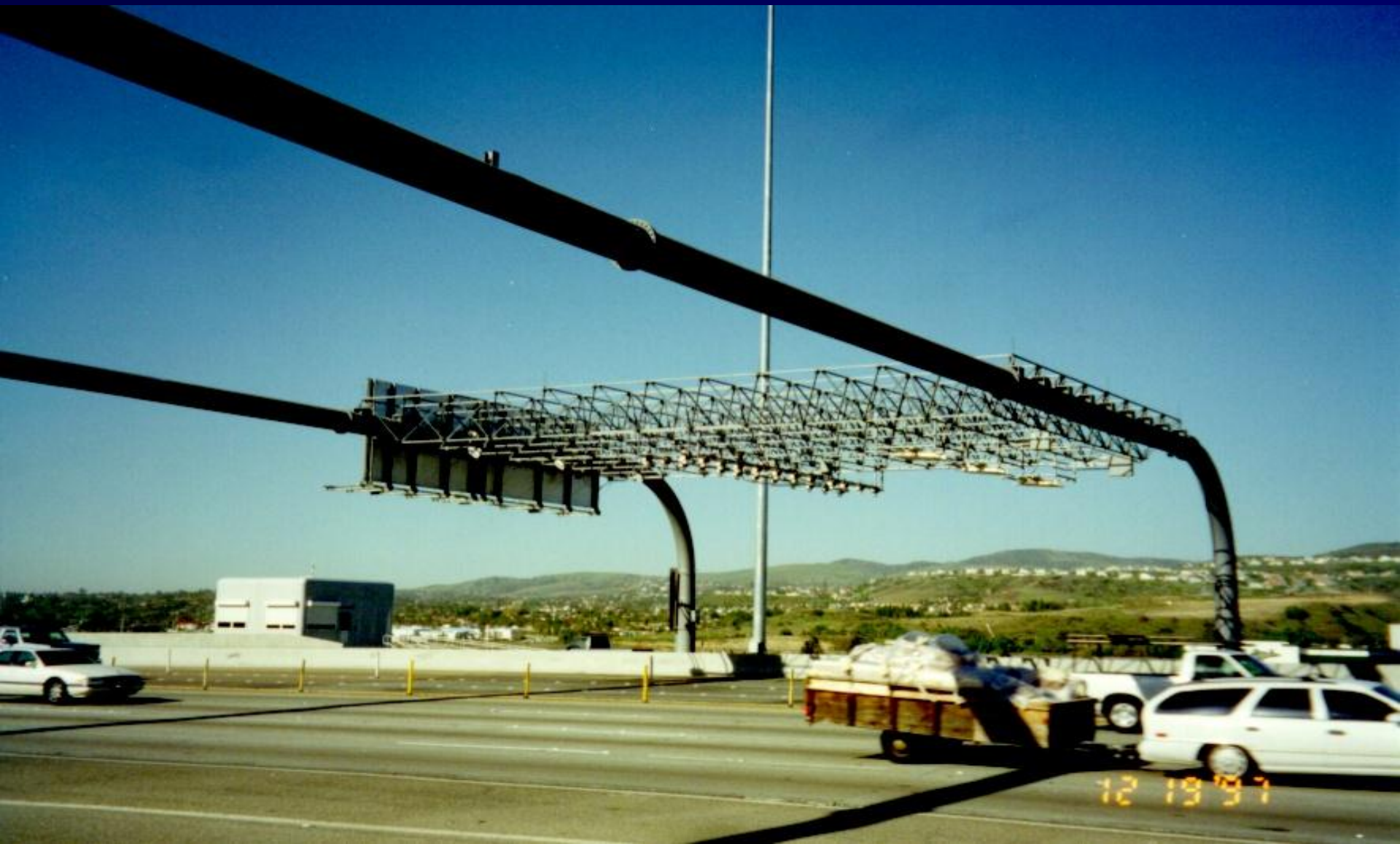
SR 91 Express Toll Lanes

SR 91 Express Toll Lanes

SR 91 Express Toll Lanes

Typical Afternoon Peak

Toll Collection System: overhead antennas and transponder



Windshield-mounted Transponder

Florida Motorway: EPass on the Left, Traditional Toll on the Right

Good Governance and PPP

- Several countries have found that PPP reduce variation orders, which may save public funds
- Payments based on results achieved tend to avoid some difficulties with the payment of inputs
- Increased user satisfaction
- Reduction of public sector workforce

Revenue and Financial Support to the Private Partner

- Direct revenues: Tolls or fees charged to the users
- Shadow tolls
- Availability fees
- Capital grants
- Minimum revenue guarantee
- Hybrid, i.e., some combination

Toolkit for PPP in Roads & Highways

- **Funded by the Public-Private Infrastructure Advisory Facility (PPIAF); implemented by the World Bank; published in June 2009**
- **Objective: To assist policy makers to implement procedures to promote private sector participation in the financing of roads**
- **Available on the WB website at:** ***http://go.worldbank.org/P2XMGNYLD0***

How can PPP projects attract private investors?

- Risks and profit must be competitive with other investment alternatives
- Some usual indicators: Project Financial Internal Rate of Return (FIRR), Return on Equity (ROE), Annual Debt Service Cover Ratio (ADSCR)
- The Toolkit **Financial Simulation Model** (an Excel file) is an excellent tool for scrutinizing PPP projects

Debt Service Cover Ratio (DSCR)

$$DSCR_n = \frac{(CAFDS)_n}{\sum_{i=1}^{3} (\text{Debt Service})\text{i, n}}$$

where
i = number of tranches, 1≤ i ≤3
n = current year
(Debt Service) i, n = (Principal) i, n + (Interest) i, n
CAFDS= Cash Available for Debt Service

How can the goals of a complex PPP project be achieved?

- Careful selection of the project
- Due consideration of economic, financial, social, and environment aspects
- Transparent, competitive selection of the concessionaire
- Realistic expectations, including deadlines
- A dedicated and well prepared team
- PPP agreement satisfactory to stakeholders, including a fair distribution of risks

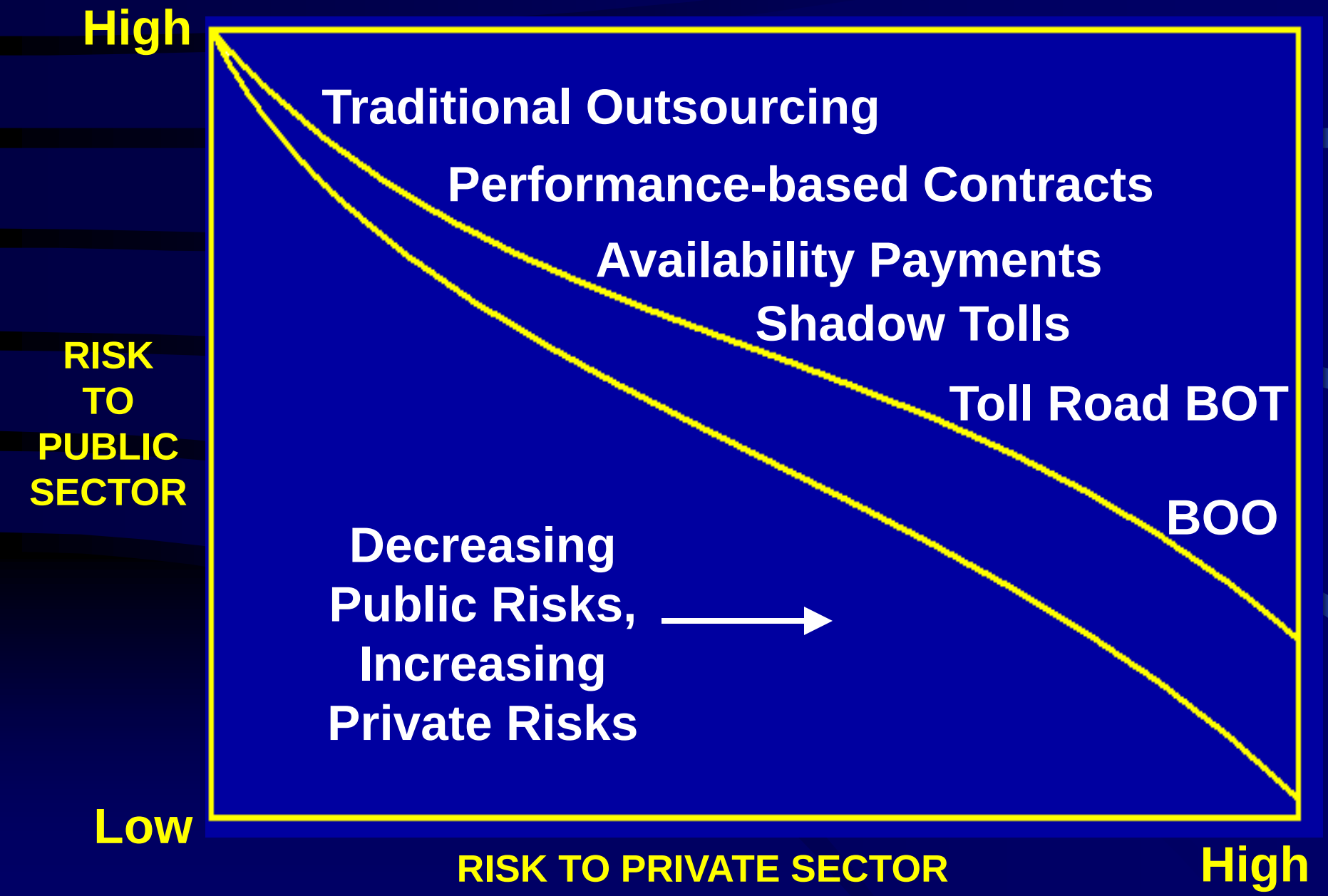
Distribution of risks between the public and private sectors

- Varies with the form of public support
- For both actual tolls and shadow tolls, the private investors assume demand (traffic volume) risk, but this risk is smaller under shadow tolls because traffic volumes are not subject to the effect of toll rates ("elasticity")
- For availability payments, demand risks remain with the public sector, while the main risks assumed by the private partner are construction risk and those associated with road performance during implementation of the contract
- Minimum traffic or revenue guarantee helps to mitigate the demand risk

Road Concession Options and the Distribution of Risks

Option	Construction	Demand	Performance
- Traditional Outsourcing	Public	Public	Public
- PBC	Public	Public	Private
- Tolls	Private	Private	Private
- Shadow Tolls	Private	Private	Private
- Availability Fees	Private	Public	Private
- Hybrid	Private	Pri/Pub	Private

Allocation of Risks




I'm sure glad the hole isn't in our end...

Thank you!

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Cesar Queiroz, former World Bank Highways Adviser, is an international consultant on roads and transport infrastructure. His main expertise is in public-private partnerships, road management and development, performance-based contracts, port reform and rehabilitation, improving governance, quality assurance and evaluation, research, teaching and training. Between 1986 and 2006, he held several positions with the World Bank, including Lead Highway Engineer and Principal Highway Engineer. Prior to joining the World Bank, Cesar was the deputy director of the Brazilian Road Research Institute in Rio de Janeiro. He holds a Ph.D. in civil engineering from the University of Texas at Austin, a M.Sc. in production engineering from the Federal University of Rio de Janeiro, and a B.Sc. in civil engineering from the Federal University of Juiz de Fora, Brazil. Cesar has published two books and more than 130 papers and articles. His recent assignments include infrastructure advisory services to Russia, Brazil, Latvia, Lithuania, Poland, Ukraine, Philippines, Uganda, Sri Lanka, India, Egypt, Colombia, Saudi Arabia, Sweden and Norway. He is currently a visiting professor at the University of Belgrade, Serbia, and has lectured at George Washington University since 1996 on private participation in infrastructure.

GNI per capita, Atlas method (current US$)

GNI per capita is the gross national income, converted to U.S. dollars using the World Bank Atlas method, divided by the midyear population. GNI is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad

To smooth fluctuations in prices and exchange rates, a special Atlas method of conversion is used by the World Bank. This applies a conversion factor that averages the exchange rate for a given year and the two preceding years, adjusted for differences in rates of inflation between the country and a group of reference countries (the Euro area, Japan, the United Kingdom, and the United States)

Source: http://data.worldbank.org/indicator/NY.GNP.PCAP.CD