



# Monetizing the Health Impacts of Transportation Investments

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# Questions

- How is cost-effectiveness/cost-benefit analysis used in the health care field?
- How do economists monetize health costs and benefits?
- What are the implications for considering health benefits and costs in transportation planning?

# CEA and CBA

- Cost-effectiveness analysis (CEA)
  - Cost per life-year gained
  - Cost-per quality-adjusted life year (QALY) gained
- Cost-benefit analysis
  - Net monetary benefit
    - Net benefit (in \$s) minus net cost (in \$s)

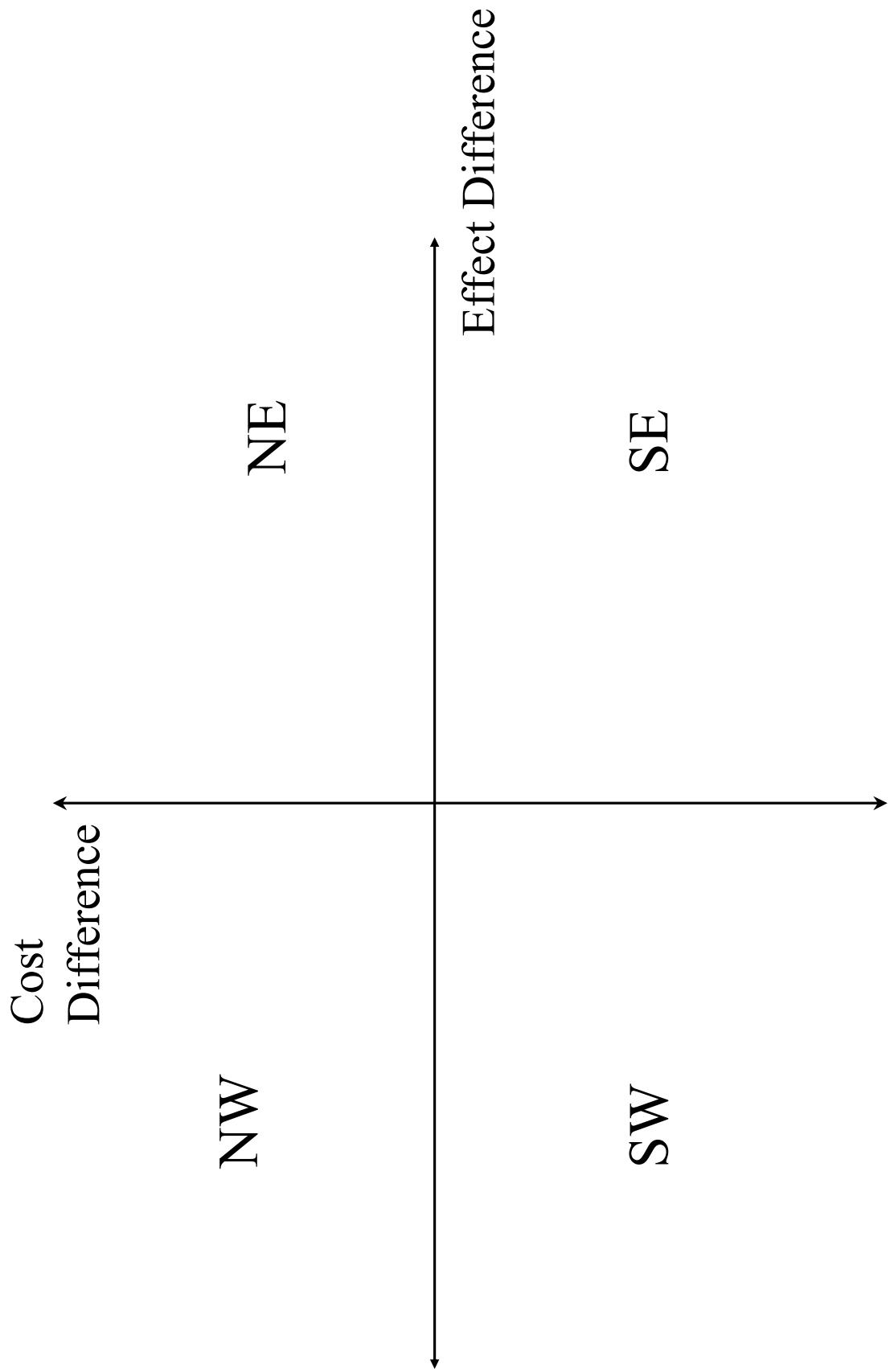
# Example CEA: riluzole for ALS

## Results

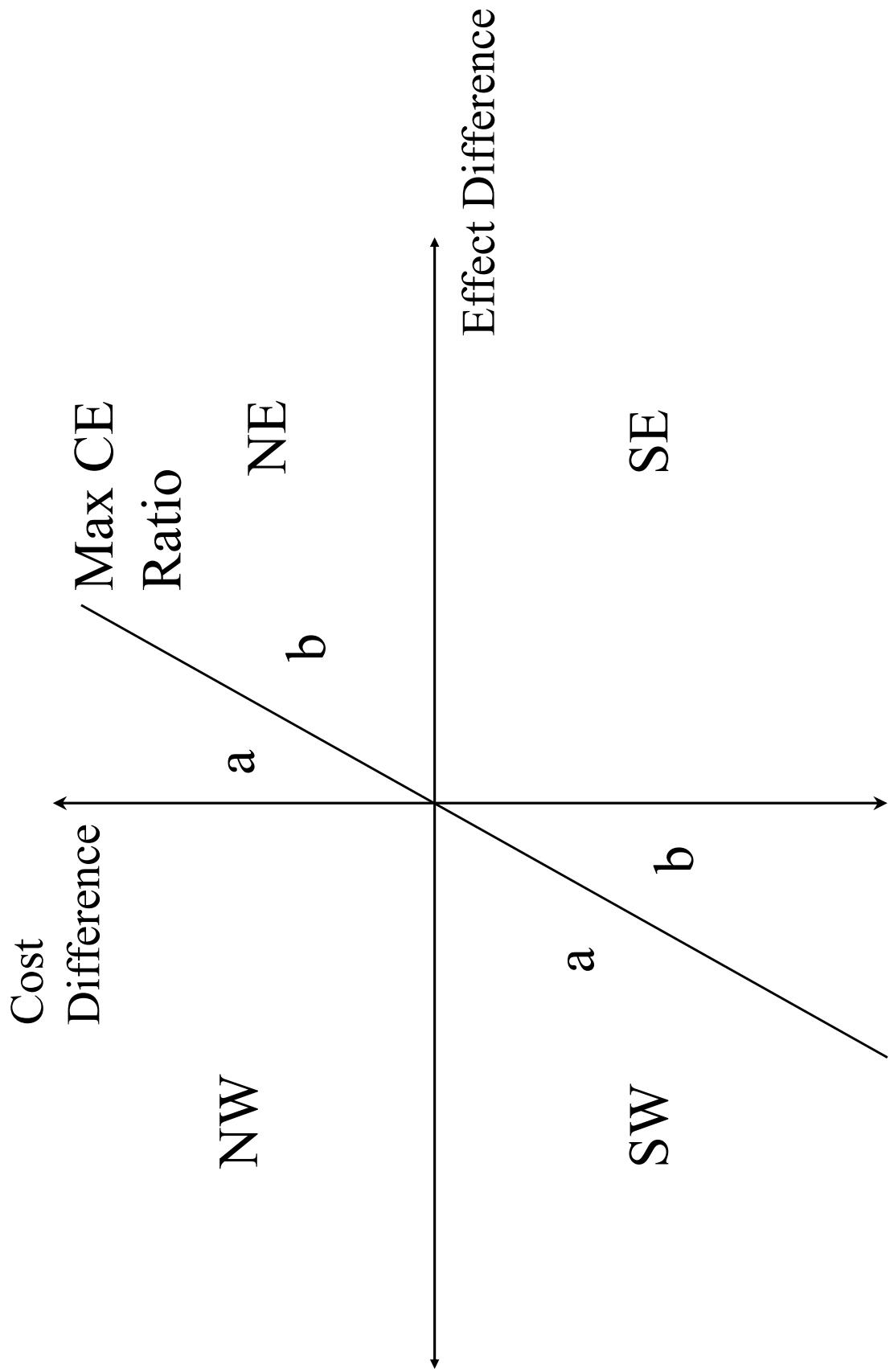
Lifetime cost of riluzole	£4,841
Life-years gained	0.13
QALYs gained	0.09
Increase in total costs	£5,200
ICER (cost per life-year)	£39,000
ICER (cost per quality-adjusted life-year)	£58,000

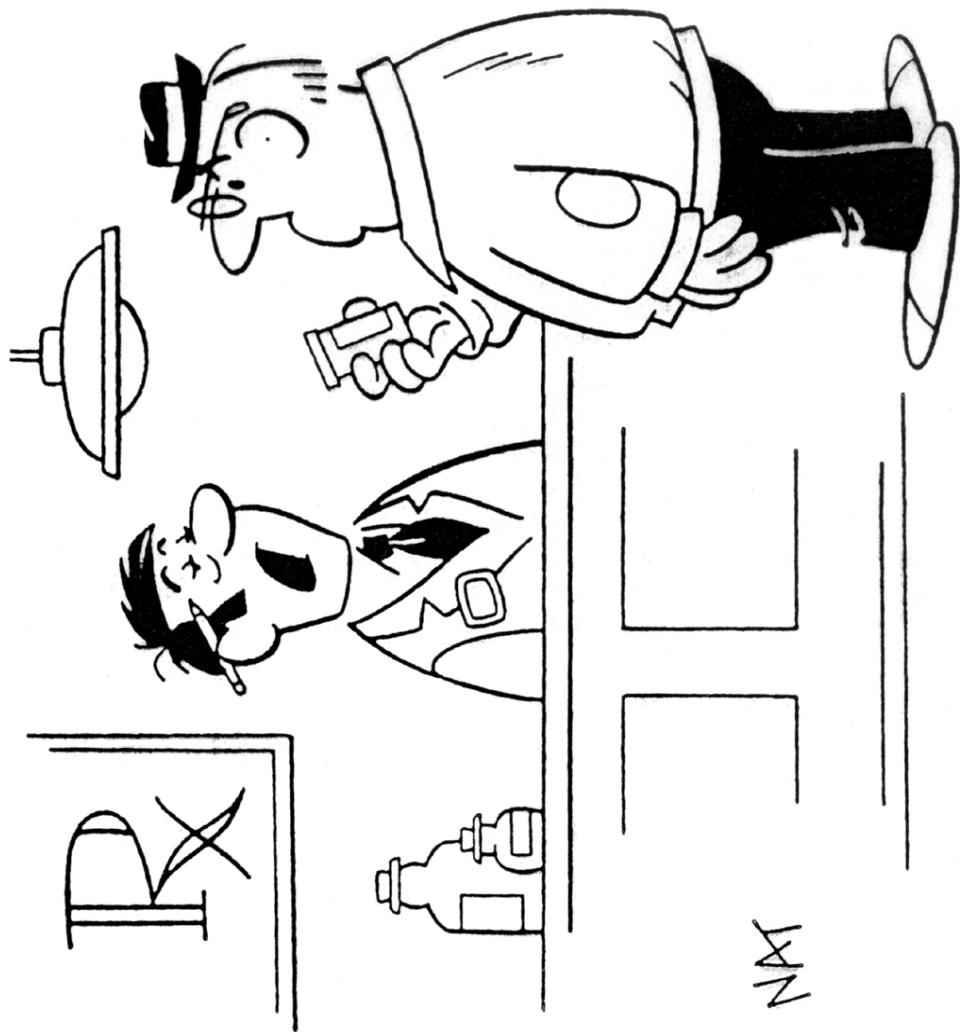
*Guidance:* “Riluzole is recommended for the treatment of individuals with amyotrophic lateral sclerosis (ALS) form of Motor Neurone Disease (MND).”

# Cost-effectiveness plane

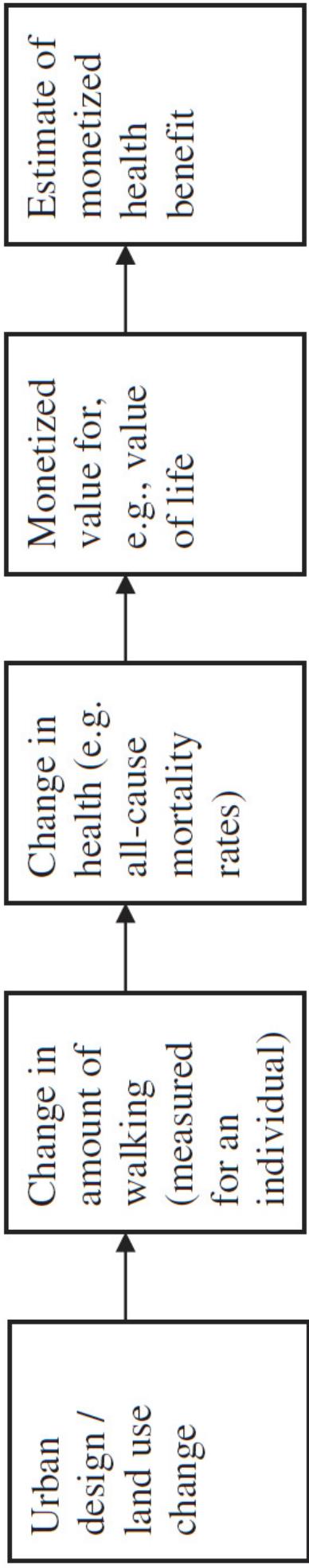


# Cost-effectiveness plane





*The drug itself has no side effects ...  
but the number of health economists needed to prove its value  
may cause dizziness and nausea*



**Figure 1.** *Chain of Reasoning Required to Link Urban Design to Monetized Health Benefits.*

Boarnet et al (2008)

# How do economists monetize health costs and benefits?

- In CEA, implicitly
- In CBA, explicitly
  - Methods:
    - Willingness to pay
    - Human capital
    - Statistical value of life

Table 5.  
Health benefit calculations.

Land Use/Urban Design Change	Change in Amount of Walking (in Miles, Two-day Period)	Number of Persons Who Will Move from First to Second Tertile of Physical Activity	Present Discounted Value of Life (in Dollars)			Present Discounted Value (in Dollars)		
			Low	High	Project, Number of Persons Affected	Low	High	
<i>Hypothetical Project,</i>								
No. intersections within 1/2 mile of TAZ	0.3816	1,1844	5,000	22.79	78.59	0.0456	0.1572	2,473,620
Retail employment density, TAZ (jobs/square mile)	0.0652 <sup>a</sup>	0.9734	5,000	4.72	62.09	0.0094	0.1242	2,473,620
Total employment density, TAZ (jobs/square mile)	0.0019 <sup>b</sup>	1.0648	5,000	1.57	66.02	0.0031	0.1320	2,473,620
Population density, block group (persons/square mile)	0.2581 <sup>a</sup>	0.549 <sup>a</sup>	5,000	15.72	28.29	0.0314	0.0566	2,473,620
Distance, home to city hall (central business district), miles	-0.8108	-2.5054	5,000	45.58	209.05	0.0912	0.4181	2,473,620
<i>High (U.S. Law (Mrozek and Taylor 2002) Agency 2000) Low High</i>								
						7,381,513	2,255,107	23,205,007

Note: TAZ = transportation analysis zone.

# Implications of considering health benefits and costs

- Health costs
  - Relatively straightforward to value
  - Challenge to attribute change in health care costs to change in transportation
- Health benefits
  - Challenge to value
  - Challenge of attribution (again)
- But just because its difficult doesn't mean its not important