Public-Private Partnerships and Sydney Road Tunnels

- Cross City Tunnel (opened June 2005)
- Lane Cove Tunnel (opened March 2007)
Contract for the Cross City Tunnel

- In 2002, the NSW Government awarded Cross City Motorways the contract to build, own, and operate the Cross City Tunnel.
- Construction work for the cross city tunnel commenced in January 2003.
- The tunnel was originally scheduled to open in October 2005.
- The Tunnel opened in June 2005.
Cross City Tunnel Finances

- In December 2006, the Cross City Tunnel was declared insolvent with debts of over $500 million.
- On 20 June 2007, Leighton Contractors and investment bank ABN AMRO were chosen as preferred purchasers of the Cross City Tunnel Group for $700 million.
- It is privately owned and operated, but will revert to public ownership in 2030.
Cross City Tunnel Diagram

The ventilation tunnel will improve the management of air quality.
Analysis of Traffic Numbers
and Revenue

Cross City Tunnel 2005
Figure 1: Cross City Tunnel Traffic Demand Curve Model

Q = A/P^{0.265}, where A = 37,000
Figure 2: Improved Model of Demand for Cross City Tunnel

\[ Q = \frac{A}{(P + 0.5)^{0.32}}, \text{ where } A = 41,500 \]
Figure 3: Linear Model of Demand

Note that revenue is maximized at $6 per trip
Figure 4: Comparison of Demand Models

\[ Q = \frac{A}{(P + 0.5)^{0.32}}, \text{ where } A = 41,500 \]

\[ Q = -3P + 37 \]
Lane Cove Tunnel

- Start: June 2004
- Finish: June 2007
- Contract Type: Design and Construct
- Value: $1.16 billion, comprising
- Thiess: $582 million
- John Holland: $582 million
- (December 2006 estimates)
- Reverts to public ownership in 2040
Features of the Lane Cove Tunnel

- Twin 3.6km tunnel to link the M2 Motorway with the Gore Hill Freeway.
- Two lanes across the Lane Cove River
- Transit lanes on the Gore Hill Freeway
- New ramps at Falcon Street
- Cycleway from North Ryde to Naremburn (previous car lane along Epping Road)
Lane Cove Traffic and Revenue

- Original estimates: 90,000 - 110,000 cars/day

- Toll Free Period for Tunnel:
  - Tunnel: 75,000  Epping Road: 50,000

- With $2.55 toll for Tunnel
  - Tunnel: 50,000  Epping Road: 75,000
Morning Peak on Epping Road
Prior to Lane Cove Tunnel
Gore Hill Entrance to Lane Cove Tunnel
Pareto Optimum for a Multiple Objective Problem

- A Pareto Frontier is defined to be an optimum "trade-off curve" where:
  - No point is "better" than any other point on the line with respect to all objectives.
  - No improvements can be made in any objective without worsening another.
  - Each point on the Pareto Frontier is called a Pareto Optimum or solution.
Pareto Optimum Examples
Pareto Optimum and the Road Tunnels

The extent to which the tunnels were not a Pareto improvement is reflected in public dissatisfaction.
Evaluation of Cross City Tunnel

- Costs and Benefits:
  - Some real benefits for the limited volume of traffic using it.
  - Financial viability questionable.
  - Pareto Criterion: Fail
Evaluation of Lane Cove Tunnel

- **Costs and Benefits:**
  - Limited benefits for traffic using it.
  - Financially viable based on inconveniencing motorists.
  - Pareto Criterion: Fail
Public Private Partnerships in Urban Transport

- The Cross City and Lane Cove Tunnels provide good examples where public utility suffers for private benefit.
- More emphasis should be put on public transport rather than roads.