Transforming Transportation

How tolling strategies and technology are helping governments deliver transportation outcomes

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About Transurban

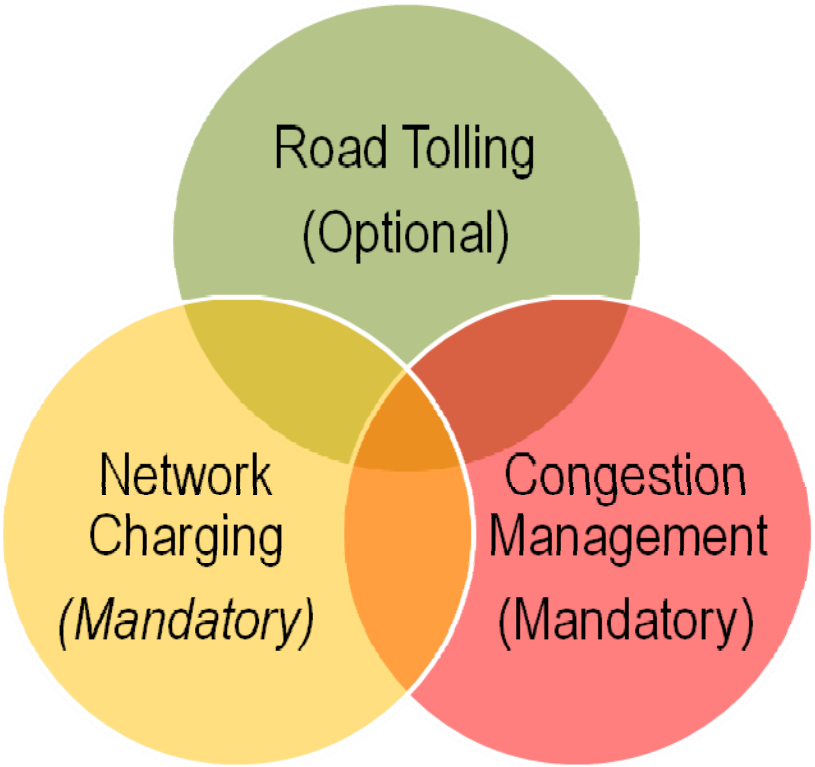
- Values-based, value-driven toll road owner-operator with assets and projects in North America and Australia
- More than 5.1 million customers worldwide and 600 staff in offices in North America and Australia
- Constructing HOT lanes on I-495 Capital Beltway
- Developing HOT lanes project I-95/395
- Long term concession to manage and maintain Pocahontas Parkway in Richmond, Virginia
- Interests in 5 Australian toll roads including some of the world's most advanced and successful toll roads
- Capabilities include innovative transport , road performance and safety, concession management, project development, asset enhancement, tolling and customer service, sustainability, road safety and performance, financial management

Tolling Technology

Tolling is a form of 'road user' charging designed to deliver transportation outcomes:

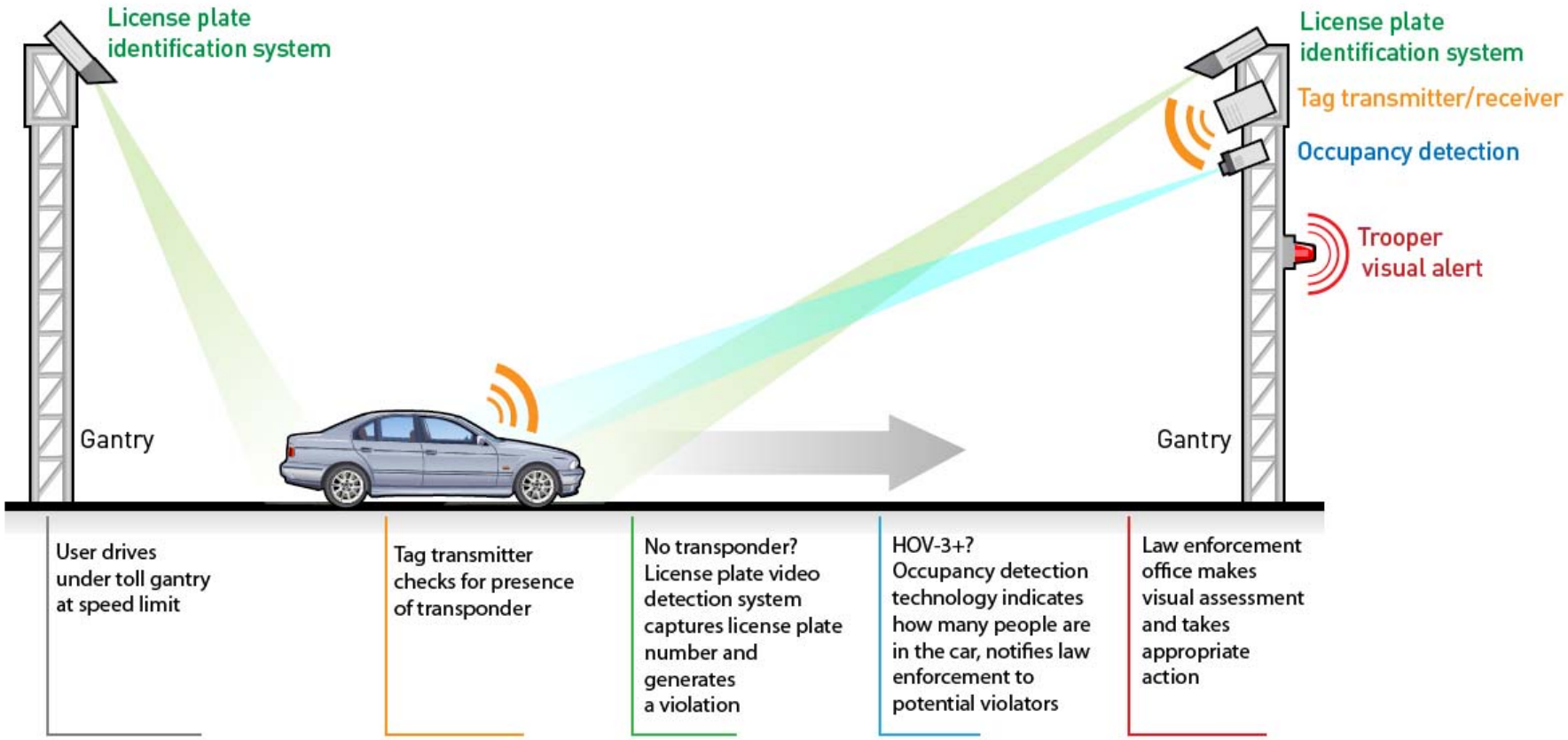
- Revenue generation
- Cost recovery
- Congestion management

US 'tolling' to date has focused on improving community accessibility and mobility



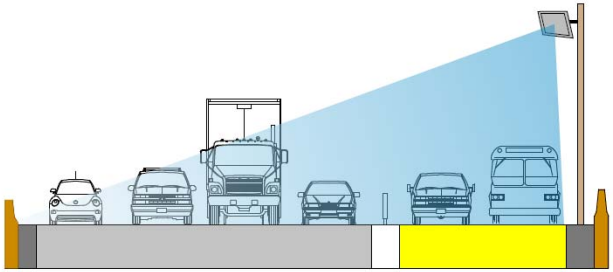
Various 'tolling' technologies deliver different outcomes.

All-Electronic Tolling: How it Works

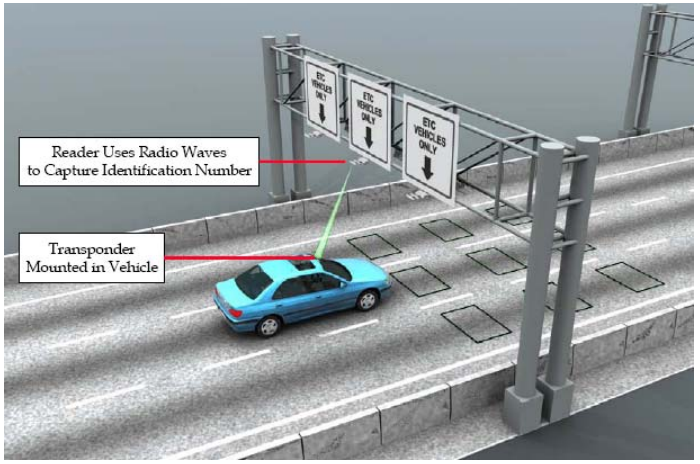


Current Tolling Technology

- Full electronic tolling, cameras, sensor systems, video vehicle identification, radio frequency/transponders

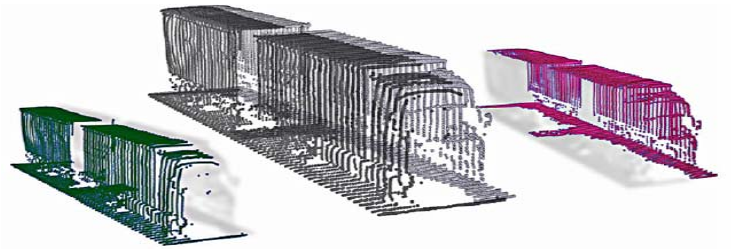


Video vehicle identification



Radio frequency/Transponders

Overhead cameras



Light curtain laser profilers used in Germany

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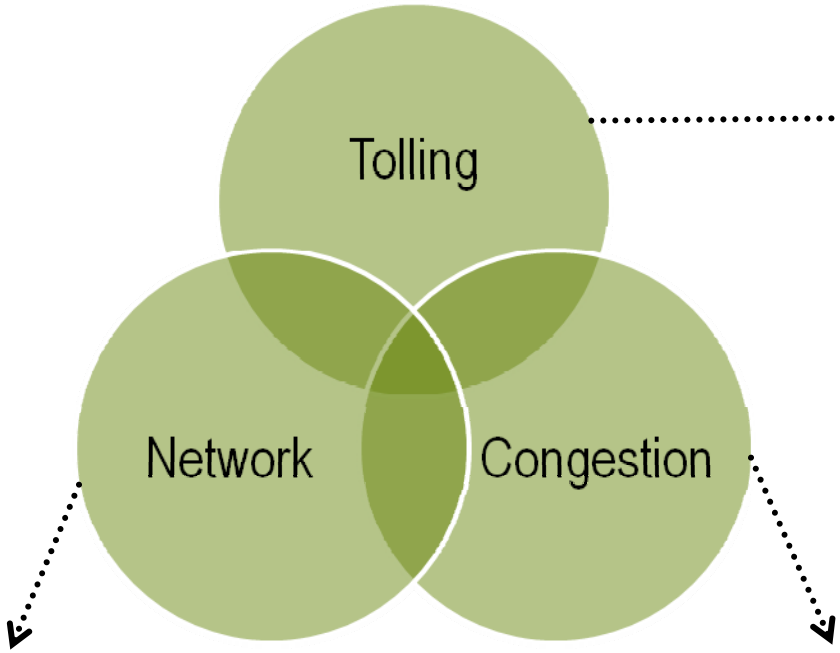
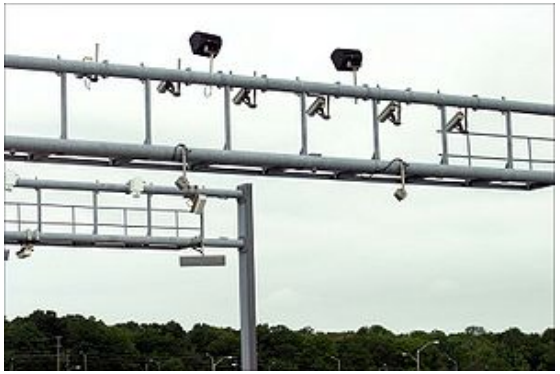
Current Technology Driven by Outcome Needed



Transponder/Tag or cash

Portland, OR – GPS

London - Video



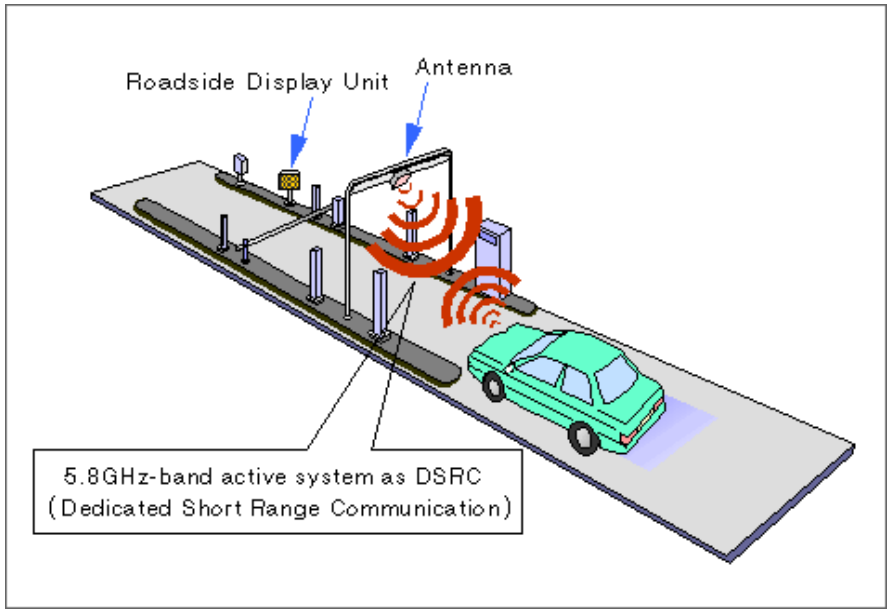
Technology matches ‘Business Need’

Technology	Application	Comments
Radio Frequency Identification (RFID) also known as Dedicated Short Range Communication (DSRC)	Road Tolling (Global)	Pros: Proven technology with high accuracy Low transponder costs (<$20) Widely used – 16 million E-Zpass customers Cons: Requires roadside gantries
GPS	Large National Network Charging (Germany, Slovenia)	Pros: Proven technology with high accuracy in most circumstances Cons: High transponder costs (>$500) Requires dedicated enforcement resources
Video	Congestion Charging (London)	Pros: Cheap as no ‘on board’ units required Cons: Proven technology but accuracy is limited by car tag ‘readability’

This list is not a complete analysis of technology characteristics and is meant only to provide examples.

Tolling Technology on the Horizon

- 5.9 GHz, on-board units, accident avoidance, satellite/GPS, cell



- Technology follows the need. Refine business requirements based on what the technology needs to accomplish.

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Your Constituents, Our Customers

- Business needs are defined by....
  - Convenience for customers
  - Demonstrated value for money
  - Visitors, members of the military
  - Customer service
  - Protecting customer privacy
- Locality-specific challenges can be overcome
  - Infrequent users
  - Taxis
  - Commercial vehicles

Conclusion: Implementation Considerations

- Tolling Technology is available to support most operational environments
- The key to successful application is the comprehensive development of the customer service and business strategies
- The major variable is cost – implementation and operation to achieve the ‘business’ outcome
- Legislation to support enforcement – keen focus on customer service
- Self- sustaining business model
- Customer service scalability and efficiency