

Tolling Technology

Randy Iwasaki

Chief Deputy Director

California Department of Transportation



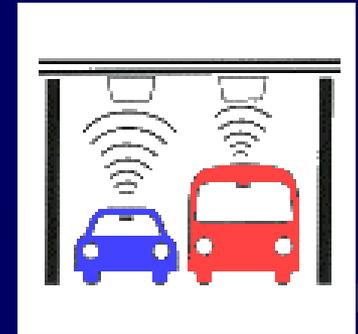
Toll Collection Plaza - Now



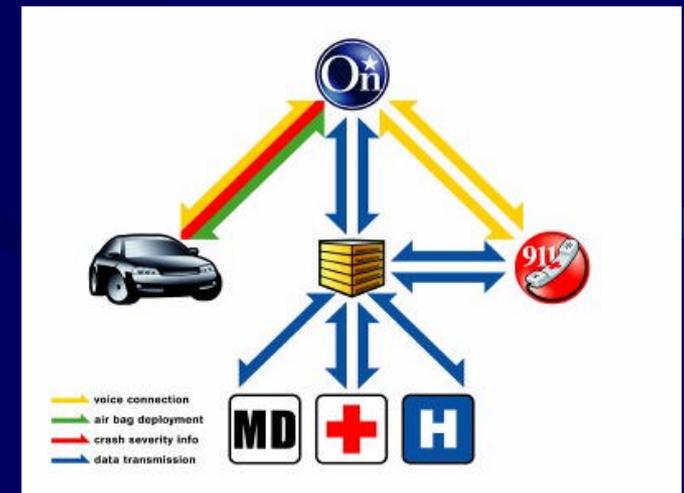
Caltrans Improves Mobility Across
California

Electronic Toll Collection (ETC)

- One-way Communication
 - Passive Transponder with Toll Plaza
 - Open-Road Tolling

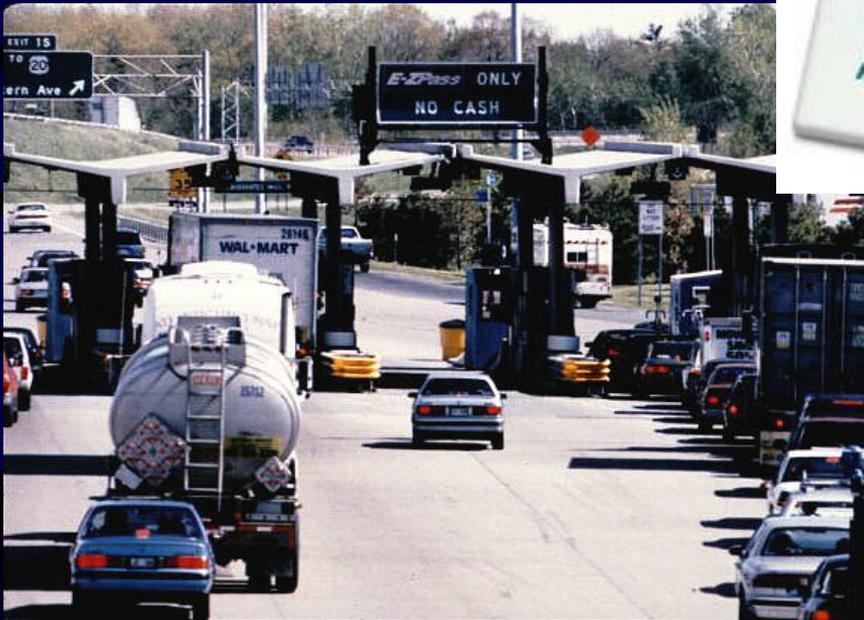


- Two-way Communication
 - Vehicle and Infrastructure
 - Vehicle and Control Center (On-Star)



ETC

Passive Transponders with Toll Plaza



EZ-Pass in New York



Fastrak in Bay Area



Caltrans Improves Mobility Across California

ETC

Open Road Tolling - without Toll Plaza



I-15 HOT Lanes



91 Express Lanes

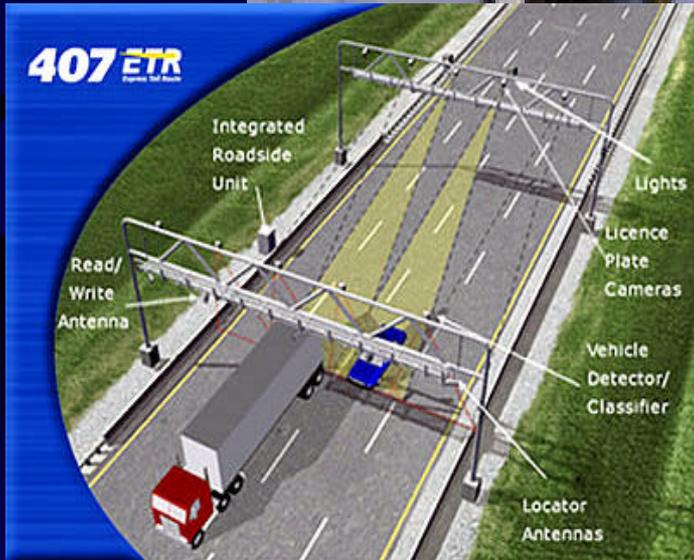


Using Transponders to help calculate Travel Time



ETC

Open Road Tolling - without Toll Plaza



407 Express Toll Route
In Toronto, Canada

The Illinois Tollway

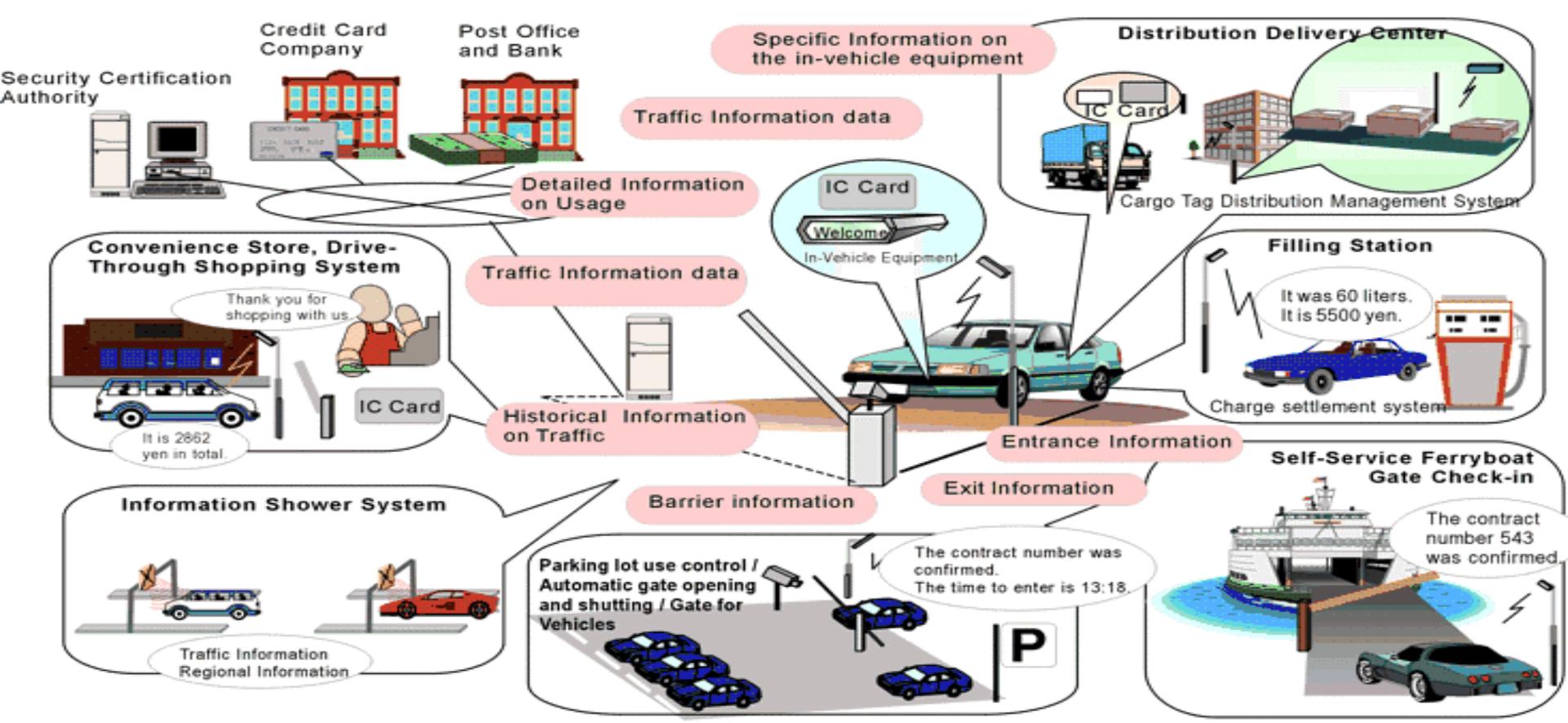


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ETC – Where We Want to Be

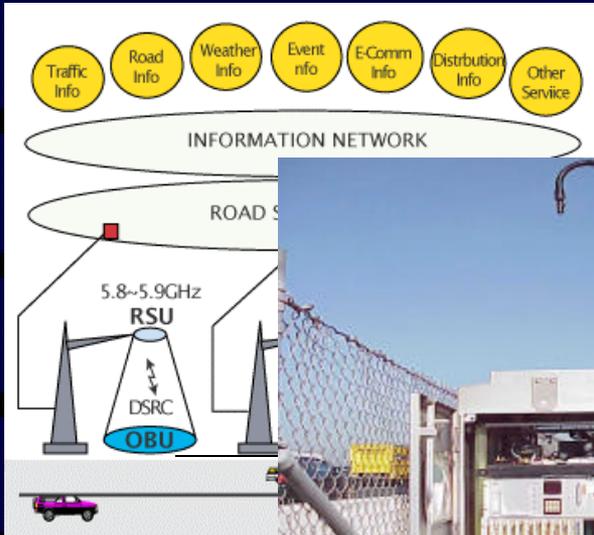
Two-way Communication Transponders

Beyond Toll Collection – Use Case Scenario



ETC

Active Transponder



(DSRC)



Roadside Unit on hwy



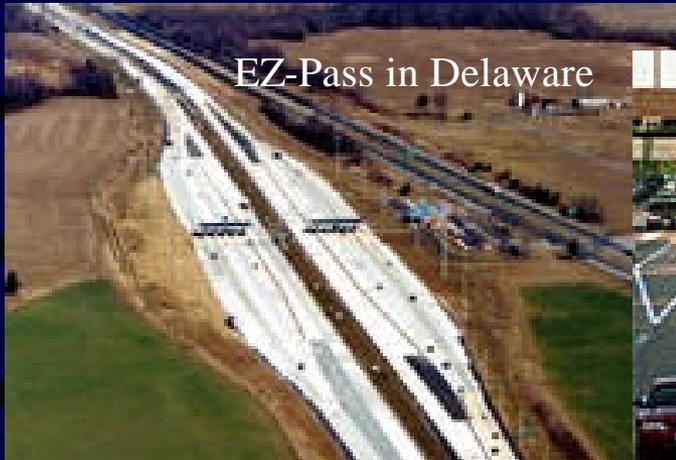
On Board Unit in vehicle



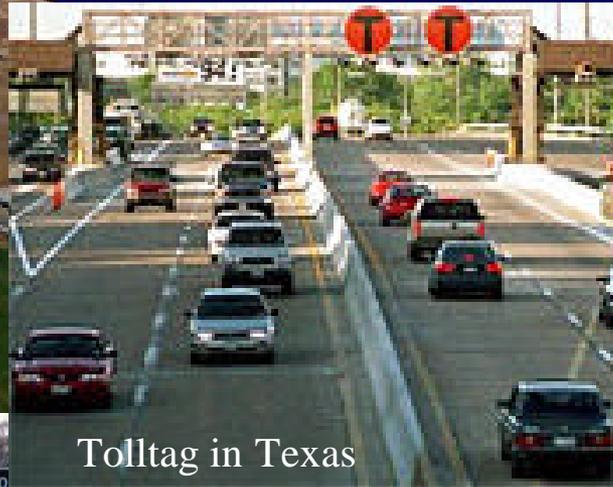
VII Test bed on I-80

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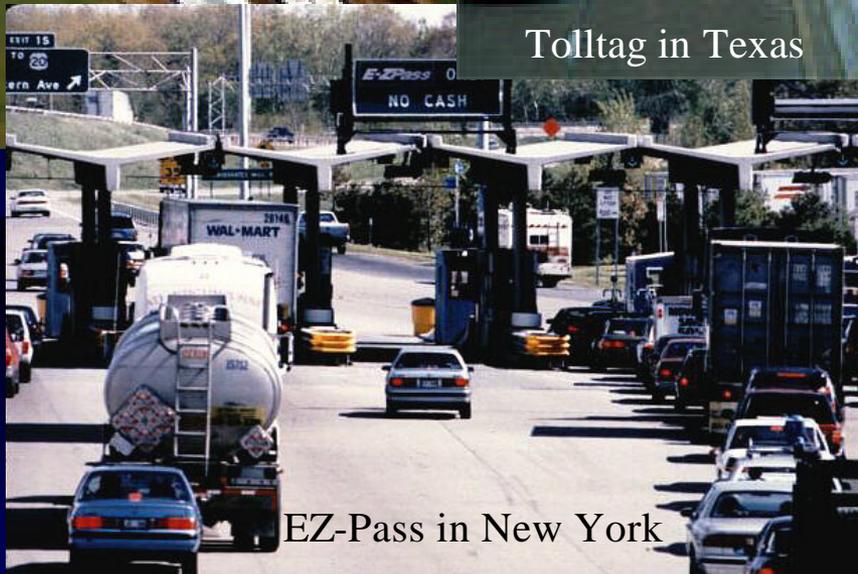
ETC – United States



EZ-Pass in Delaware



Tolltag in Texas



EZ-Pass in New York



SunPass in Florida

Florida's Turnpike Enterprise



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ETC - Asia



Autotoll in Hong Kong



ETC Demonstration using DSRC in China



Electronic Road Pricing in Singapore

電子收費系統

- 全線收費機關
- 下地置等服務
- 提供電子車牌之使用
- 消費環保

電子收費

跨世紀之交通創舉
高速公路電子收費系統

- 減少空氣污染
- 避免能源浪費
- 對應收費站車道
- 節省用路人時間

中華電信

ETC in Taiwan



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ETC - Europe



ETC System in UK
Tamar Bridge and Torpoint Ferry



Autopass project,
NORWAY

16 different projects around in the mid/south part of Norway and still increasing.

Q-Free has today delivered to the total AutoPASS project approximately 1.000.000 MD5885 Q-Free OBU's, and has equipped more than 300 lanes with Q-Free equipment.



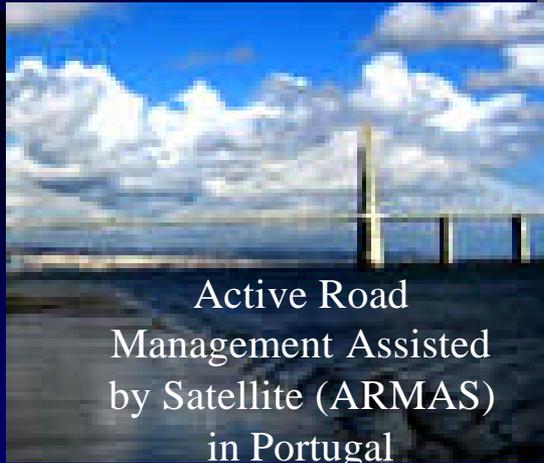
Autopass in Norway



TelePass in Italy



Satellite Truck toll system in Germany –
LKW-MAUT



Active Road
Management Assisted
by Satellite (ARMAS)
in Portugal

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Electronic Toll Collection On the Horizon

Assembly Bill 2032

HOT (High-Occupancy Toll) Lanes demonstration projects **Included in the bill about HOT Lanes:**

- San Diego County
- Alameda County
- Santa Clara County

- Proven successful
- Provide additional choice
- Mechanism for transportation financing
- Equitable means of assessing fee
- Increase efficiency of transportation system
- Should be entirely by electronic means

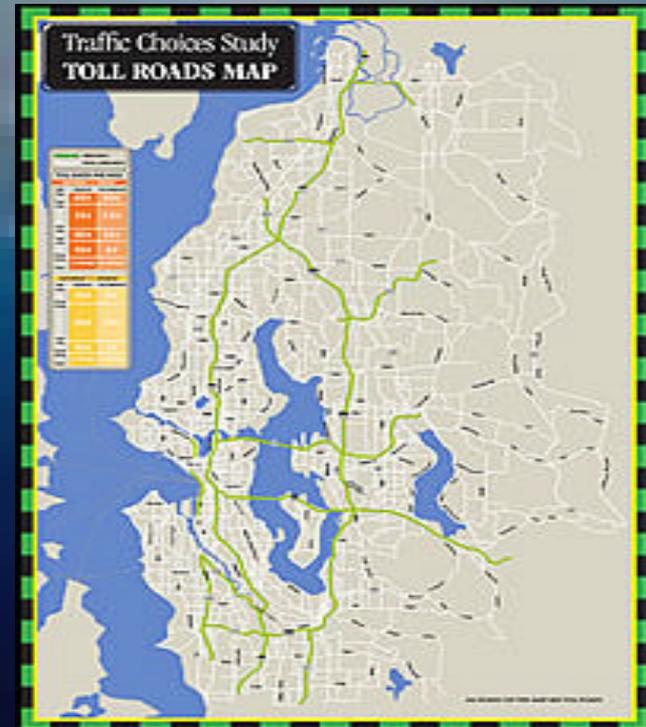


Electronic Toll Collection On the Horizon

Traffic Choices Study Washington State

MONDAY — FRIDAY			SATURDAY & SUNDAY		
TIME	FFRWAYS	NON-FFRWAYS	TIME	FFRWAYS	NON-FFRWAYS
6 AM ↓ 9 AM	40¢	20¢	6 AM ↓ 10 AM	10¢	5¢
9 AM ↓ 12 PM	15¢	7.5¢	10 AM ↓ 2 PM	20¢	10¢
12 PM ↓ 3 PM	50¢	25¢	2 PM ↓ 5 PM	10¢	5¢
3 PM ↓ 6 PM	10¢	5¢	5 PM ↓ 9 PM	no charge	no charge
6 PM ↓ 9 PM	no charge	no charge	9 PM ↓ 6 AM	no charge	no charge

Toll Rate



Traffic Choices Study
in Washington State



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Electronic Toll Collection (ETC)

- Reduce congestion
- Increase highway capacity
- Decrease air pollution
- Reduce costs – both toll operation and construction of toll infrastructures
- Enhances congestion pricing implementation



Electronic Toll Collection (ETC)

Questions?

