



Sustainable Transportation

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1900's, Century of the Automobile



- Autos have greatly contributed to society
 - Expanded personal mobility
 - Raised standard of living
 - Become an essential element of life



Impact of Automobiles



- Prosperity & reliance has come at a price
 - Traffic congestion
 - Air pollution
 - Global warming



Toyota Leadership Commitment



“Toyota and the other automakers will not survive the 21st Century unless we pull together now and find ways to limit the car’s impact on our earth.”



Fujio Cho

President

Toyota Motor Corporation

We Must All Address Sustainability

Environmental protection & economic growth are not mutually exclusive

- Economic growth which ignores environmental consequences is reckless
- Resolving environmental issues without addressing need for economic impact is unrealistic

This century must be the era of environmental partnership

Vehicles That Benefit Society



- No “silver bullet” technology exists . . . yet
- Toyota is exploring every avenue
 - Improved conventional vehicles
 - Improved fuel economy
 - Further reductions in criteria pollutants
 - Alternative power sources
 - Electric vehicles (EV)
 - Hybrid vehicles (HV)
 - Fuel cell hybrid vehicles (FCHV)

Vehicles That Benefit Society



Electric vehicle : *RAV4-EV*

- Range: 125 miles (Comb. test)
- Top speed: 78 mph
- Nickel-metal hydride batteries
- Recharge time: 6 -1/2 hrs
- Looks & drives like a “regular” car
- ✓ Considered “Lexus of EVs”
- ✓ Key component of Toyota’s ZEV strategy



Vehicles That Benefit Society



Hybrid Vehicle : Prius

- Toyota hybrid system (THS)
- Mileage: 52(city) / 45(hwy)
- SULEV emissions
- Top speed: 100 mph
- Battery pack: nickel-metal hydride
- 5-passenger automatic sedan
- A “real” car
- No new infrastructure



Hybrid Technology for the Real World



Vehicles That Benefit Society



Concept EV : e-com

- Range: 50 miles (UDDS)
- Maximum speed: 60 mph
- Not intended for freeways
- Targeted for short range travel
 - Business parks
 - College campuses
 - Destination resorts
 - Station car depots



Vehicles That Benefit Society



Concept FCHV : FCHV-4

- ✓ Potential to be the ultimate solution

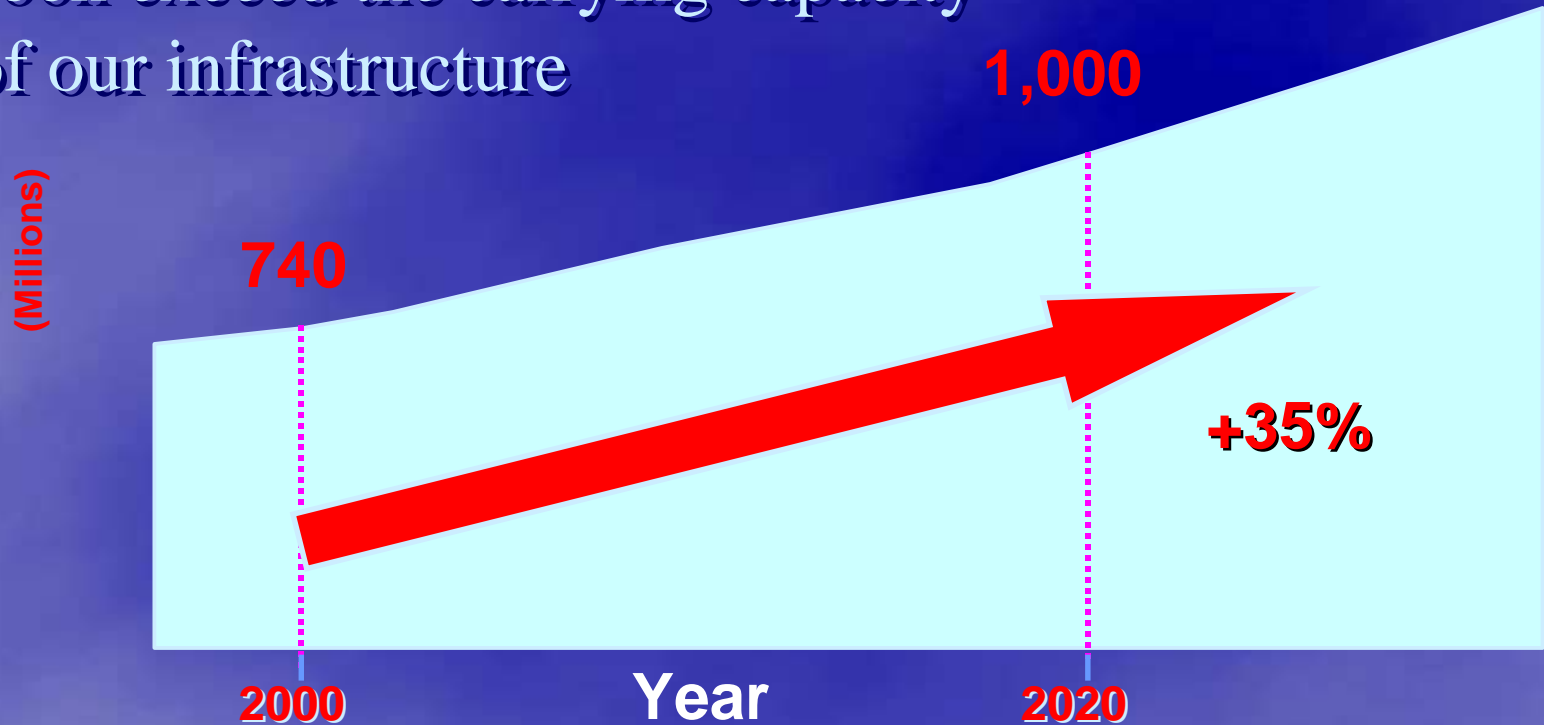
- Hydrogen fueled
- Many challenges remain
- Fueling infrastructure is a major challenge
- Public awareness issues must be overcome



Automobiles in Global Use



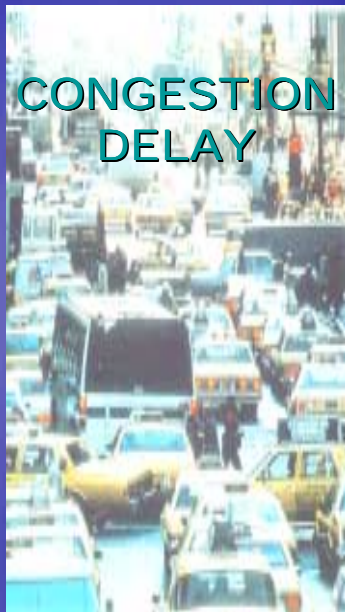
Growth of automobiles in use may soon exceed the carrying capacity of our infrastructure



Congestion is Strangling Cities



Urban congestion increased 1.8x ('82 to '97)



METRO AREAS - USA

Consequences of Congestion



- Congestion costs America over \$72 billion per year in lost productivity
- Congestion wastes 1.6 billion gallons of fuel per year
- Highway congestion threatens regional economic viability and productivity

We Need New Paradigms



Toyota's SC / SU Experience



- Crayon (Shared Use)
- Tama New Town (Shared Use)
- Kyoto Public Car (SC / SU)
- UCI (Shared Use)

SC / SU Systems: Enabling Technologies



Reservation Management System

Reservations from
home and office PCs

Card System

Membership card for
vehicle use

Depot Management System

Constant status
checks on each
vehicle's battery
charge

Location Management System

Managing location
information on
vehicle in use

Real-time Information System

Use of traffic
information services

Charge Billing System

Member billing

Station Car Flexibility Addresses Transit Rider Concerns



- **User Advantages**
 - Flexibility
 - Real alternative
 - “Free time”
 - No extra car
- **Community Advantages**
 - Air Pollution
 - Traffic Congestion

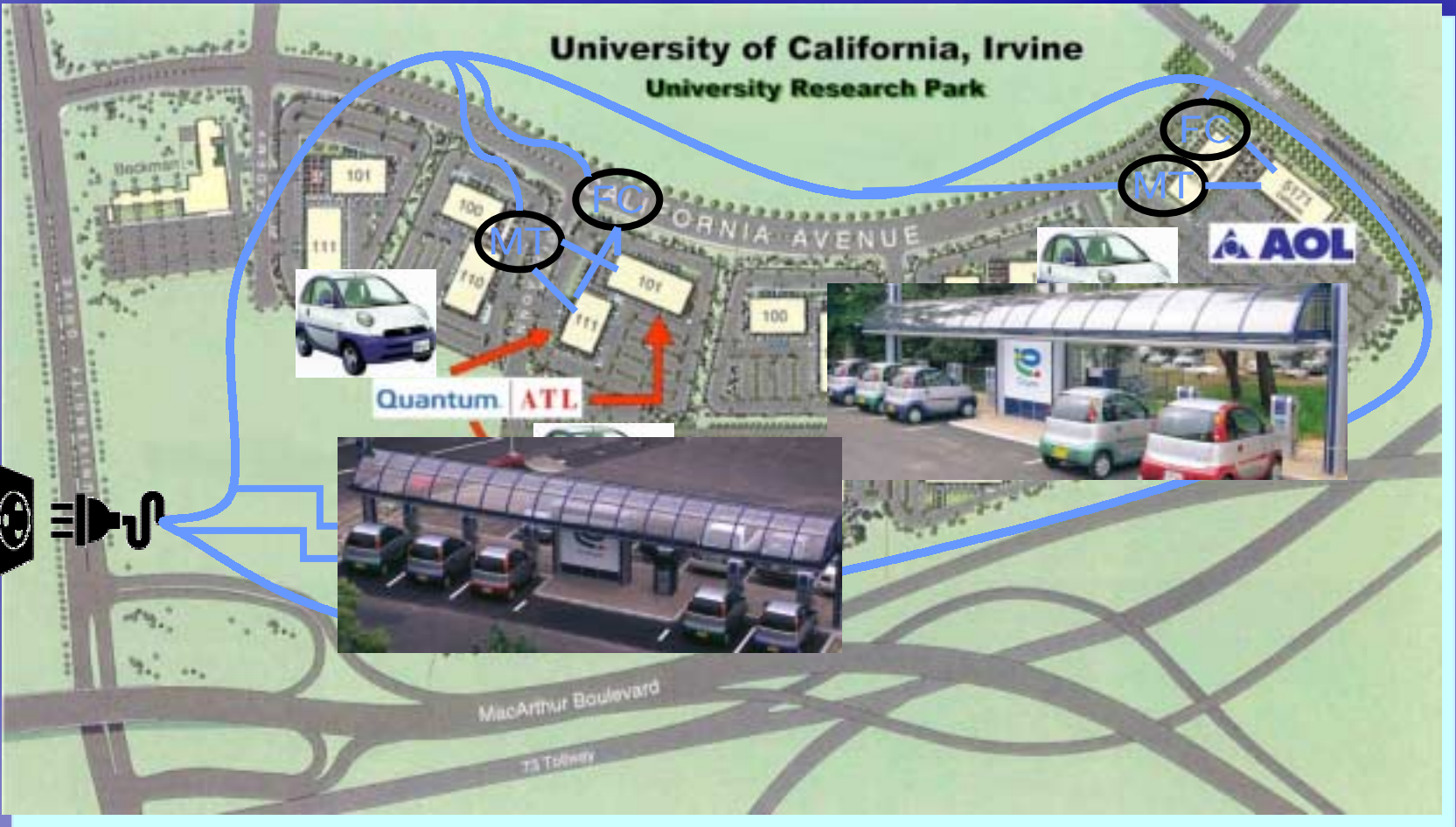
e-com Demo Program: Shared-Use



- Toyota loans partner companies e-com vehicles
- Employees use during the day for business use
- Employees check out for personal use in evening



Demo Program



Toyota's Commitment to ZEV-net



- Manpower for planning process
- Initial vehicles for Irvine station
 - 10 e-com
 - 30 RAV4-EV
 - 10 Prius
- Possible ITS elements
- Consideration for expansion

