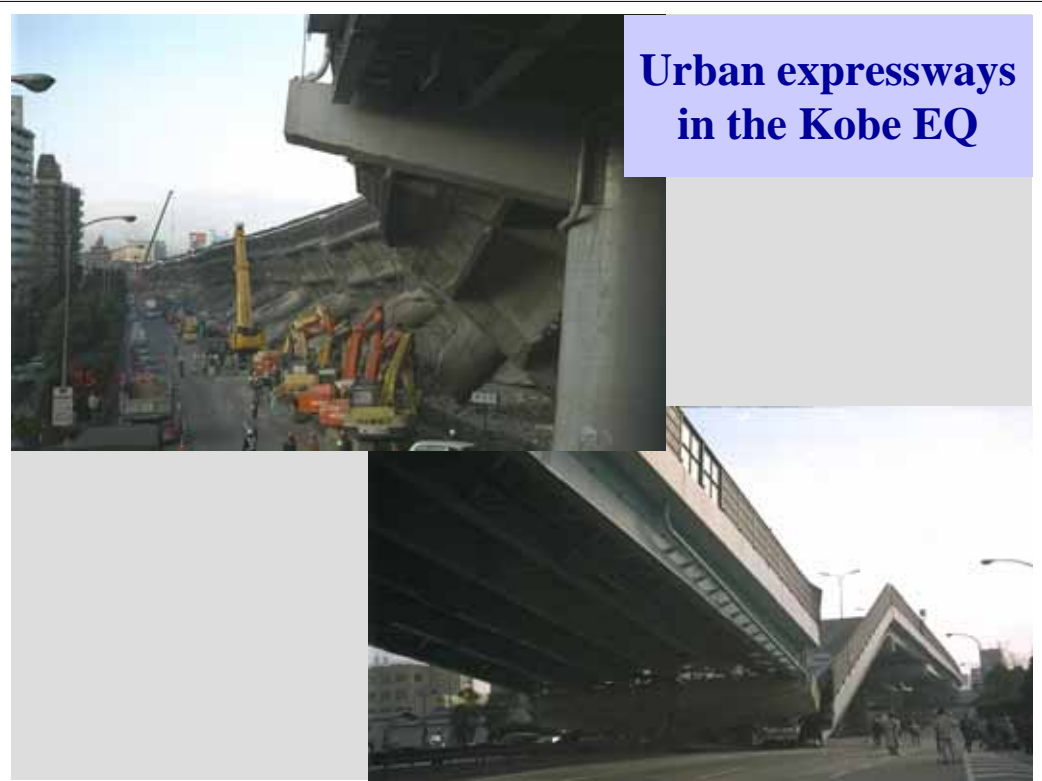
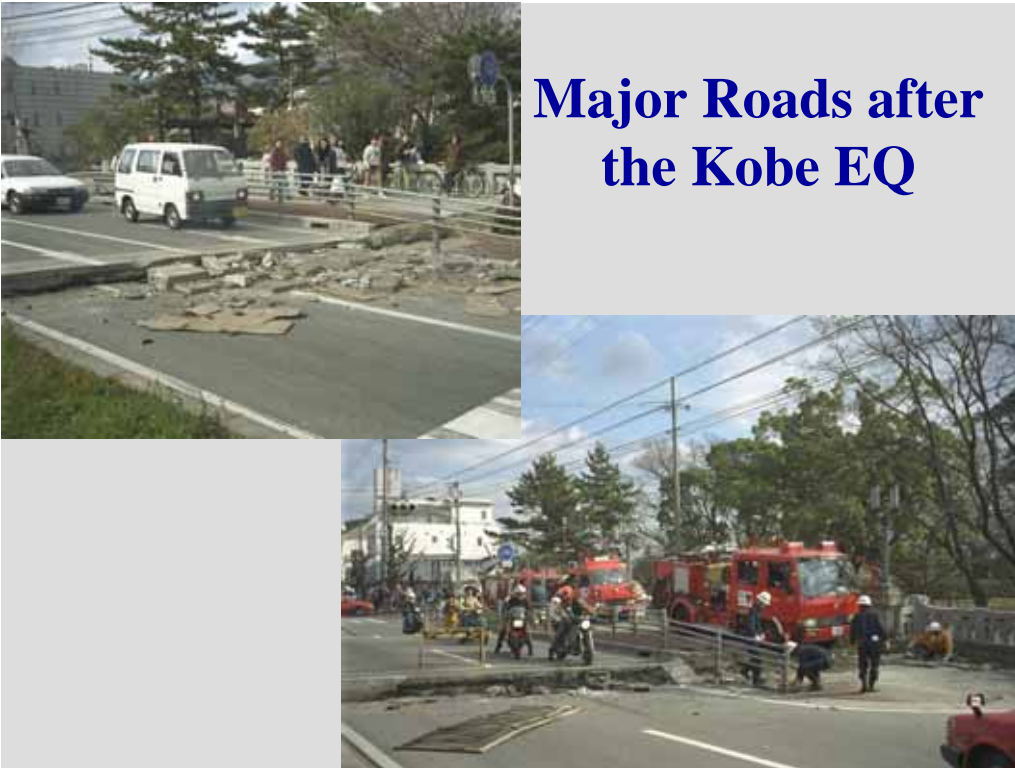


# Traffic Systems

Urban expressways  
in the Kobe EQ



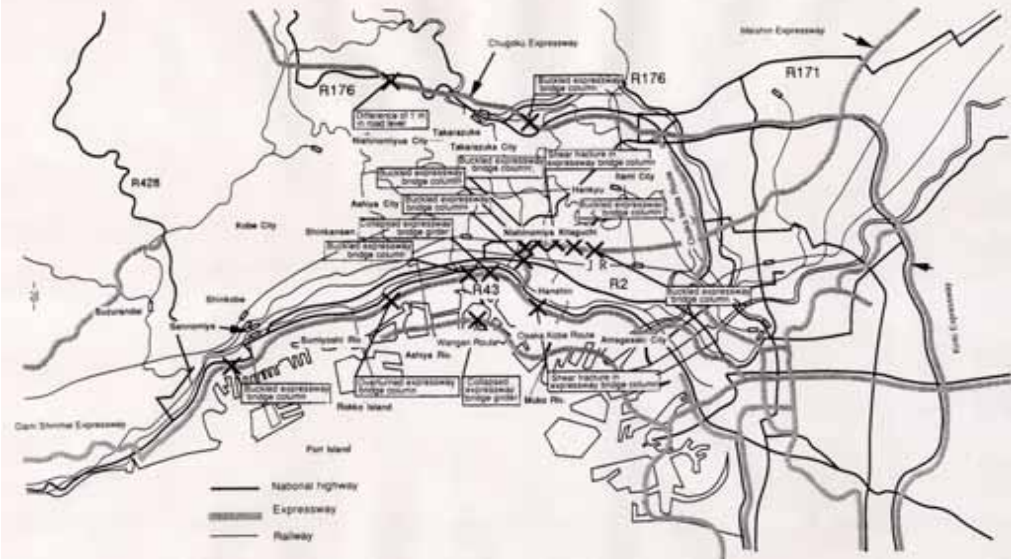
Major Roads after  
the Kobe EQ



Railways after  
the Kobe EQ



# Major damage distribution of expressway structures in the Kobe EQ



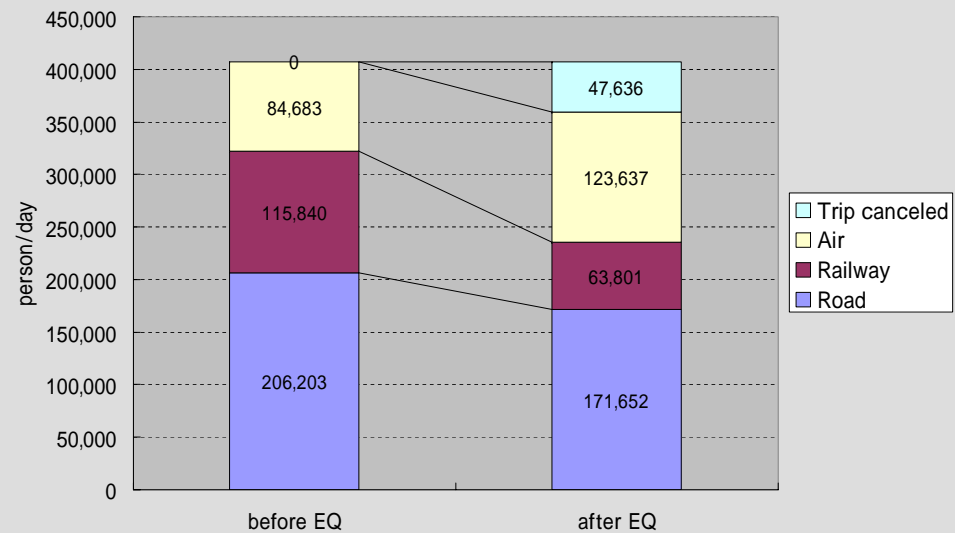
**Alternate Route for Railways**



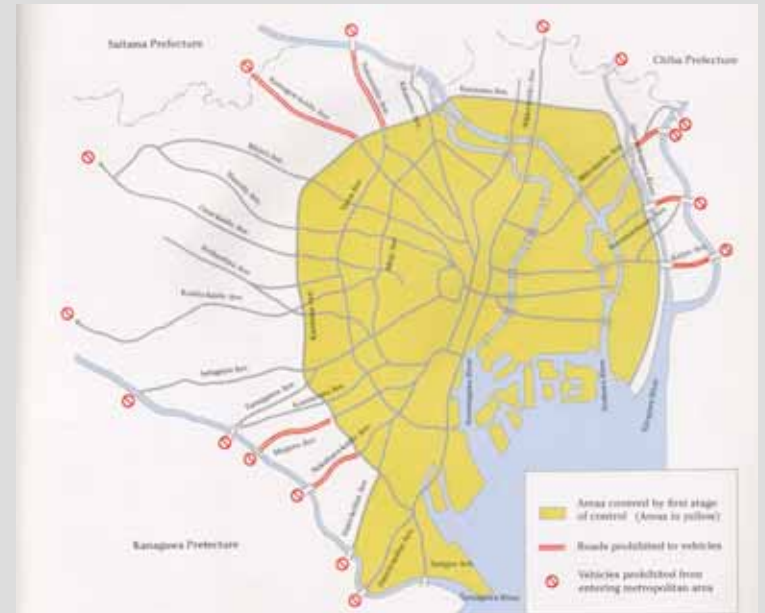
**Alternate Route for Highways**

## Effects of the Kobe EQ to Trips

Number of person trips from/to and passing Kobe City



## Traffic Control of Tokyo Metropolis in Major Earthquakes

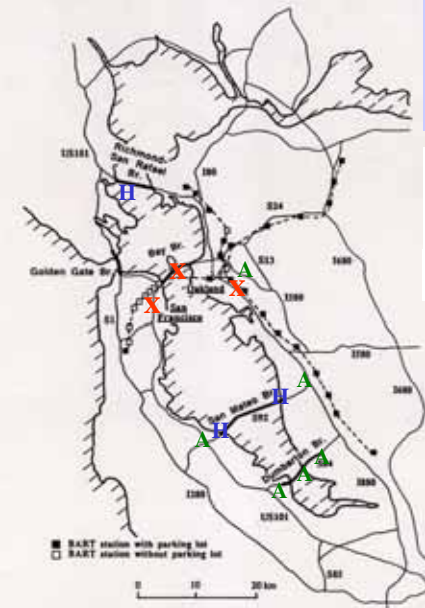




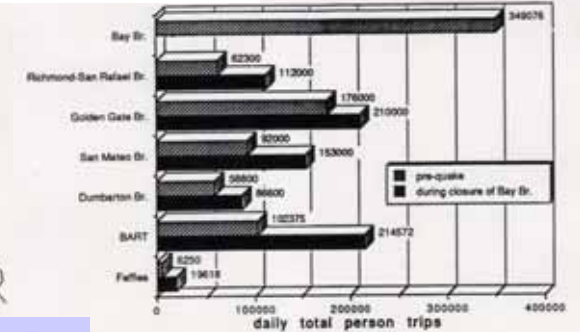
# Emergency Transport Route Network of Tokyo Metropolis in Major Earthquakes



# Traffic in the Bay area after the Loma Prieta EQ



X: closed  
H: HOV lane  
A: Auxiliary lane



Freeways and bridges around the San Francisco Bay

One day traffic volume before and after EQ

# Functional interaction of lifelines in the Kobe EQ

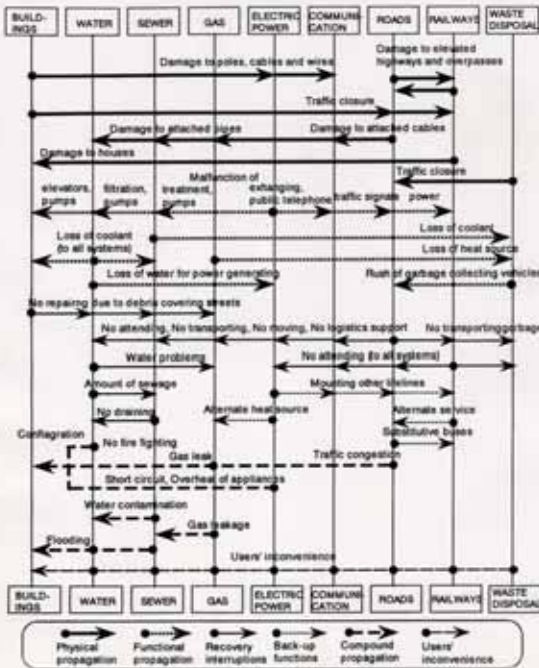


Fig. 1 Structure of lifeline interactions in the Hanshin-Awaji earthquake disaster

After Nojima (1996)

# Earthquake Countermeasures of Lifeline Systems

## Risk Management

1. Strengthening of facilities
2. Damage assessment and evaluation of functional losses for scenario earthquakes
3. Redundancy and backup systems

## Crisis Management

1. Seismic monitoring and early damage assessment
2. Information gathering/release and communication
3. Restoration planning considering priority and functional interaction of lifelines