



Future of Transportation in Asia

Prof. Cheng-Min Feng

Department of Transportation and Logistics Management, National Chiao Tung University
 President of EASTS
 EASTS, Japan
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The Future Challenging Prospects

- ▶ **Resilient** Transportation
- ▶ **Instant** Transportation
- ▶ **Sharing** Transportation
- ▶ **Fast** Transportation
- ▶ **Affordable** Transportation
- ▶ **Seamless** Transportation

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Resilient Transportation: Risk Management

- ▶ **Haiti** earthquake (2010), Japan **Tohoku** earthquake, tsunami and **Fukushima** nuclear disaster (2011), **Thailand** flooding (2011), US **Sandy** hurricane (2012), China **Lushan** earthquake (2013), Philippines **Haiyan** typhoon (2013) all have resulted in many deaths and injuries



Haiti earthquake



tsunami and Fukushima nuclear disaster



Thailand flooding



China Lushan earthquake



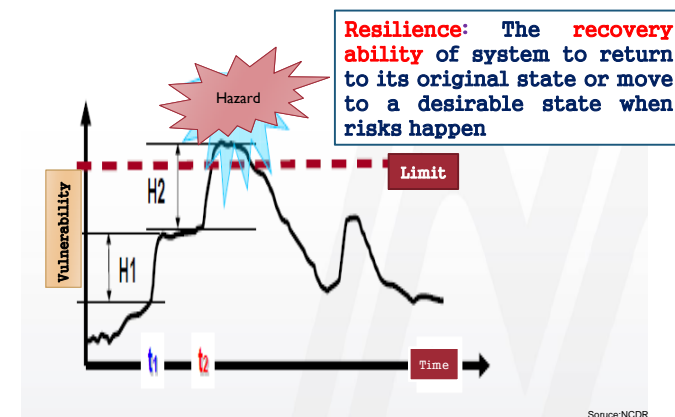
US Sandy hurricane



Philippines Haiyan typhoon

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Vulnerability and Resilience



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Climate Changes for Analysis

- ☐ Temperature
- ☐ Precipitation
- ☐ Drought
- ☐ Cold/Frost
- ☐ Flooding



Flooding of Passaic River in Paterson NJ from Hurricane Irene

Source: Periman, NJTPA

Consequences of Climate Change



Increase in rutting



More "Blow ups" in concrete surfaces



Heat-expansion of prestressed concrete bridges

Heat waves and extreme precipitation



Inundation due to ill-dimensioned drainage systems



Inundation of tunnels



Storm-caused accidents

Source: FEHRL

Consequences of Climate Change



Erosion



Landslides



Source: FEHRL

Sea level rise



Droughts



NJ TRANSIT – Trenton Transit Center-Hurricane Irene

Source: NJ Transit, 2012

Consequences of Climate Change



Thailand Don-Mueang Airport



Source: www.thaipostbiz.com



Bangkok

Source: www.thaipostbiz.com

Bangkok Nightmare in 2011 | Flooding

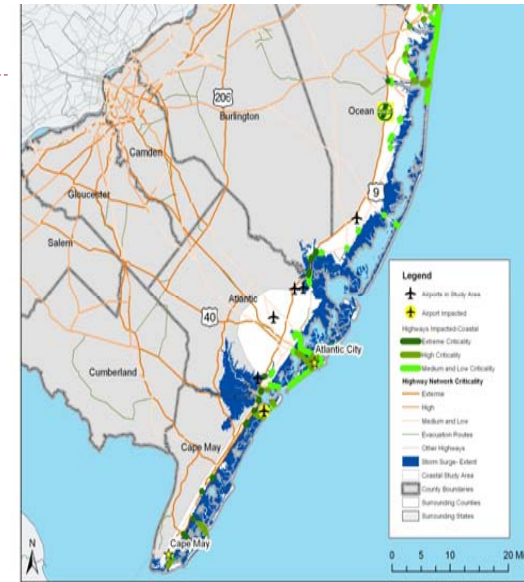
Consequences of Climate Change



Mexico Chihuahua International airport, 2013 July

www.environment.com

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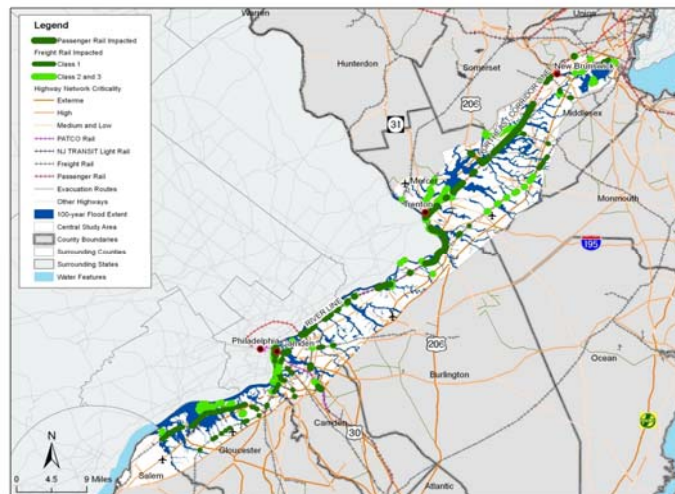


Source: Periman,NJTPA

Highways Potentially Vulnerable to Sea Level Rise & Storm Surge – medium GHG scenario for 2100

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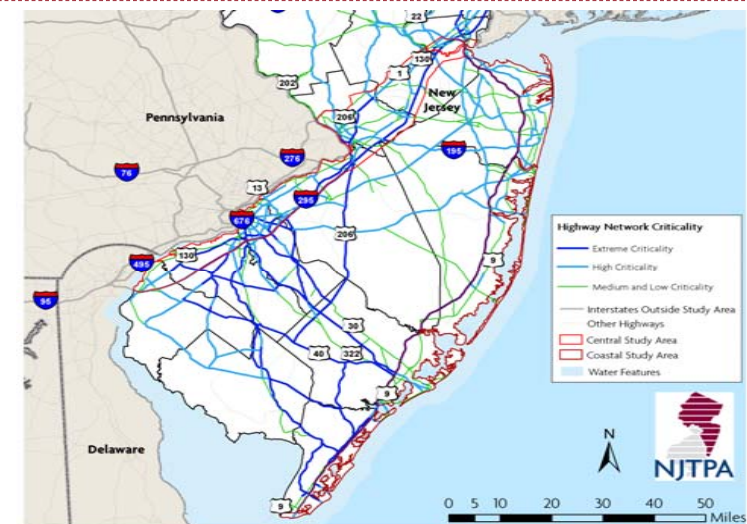
Rail Infrastructure Potentially Vulnerable to 1% Storm Event – Medium GHG scenario for 2100



Source: Periman,NJTPA

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Ranking Criticality for New Jersey's Infrastructure



Source: Periman,NJTPA

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Promote the Resiliency of our Cyber, Physical and Social Infrastructure



“Ensuring the **resilience** of our **critical infrastructure** is vital to homeland security...We will **invest** in our Nation’s most pressing short and long-term **infrastructure needs**, including modernizing our electrical grid; upgrading our **highway, rail, maritime, and aviation infrastructure**; enhancing security within our chemical and nuclear sectors; and safeguarding the **public transportation systems** that Americans use every day

White House [Homeland Security and Counterterrorism](#) issues page.

ERTRAC Roadmap: Climate Change Resilient Transport



Headline actions

- Assess climate change models
- Identify **vulnerabilities** on the key European **transport networks**
- Establish future service levels
- Identify **key high risk points** on the network
- Identify technology **‘best practices’** for climate change **adaption**
- Identify remaining technology gaps to be developed urgently

ERTRAC: European Road Transport Research Advisory Council

ERTRAC Roadmap: Climate Change Resilient Transport

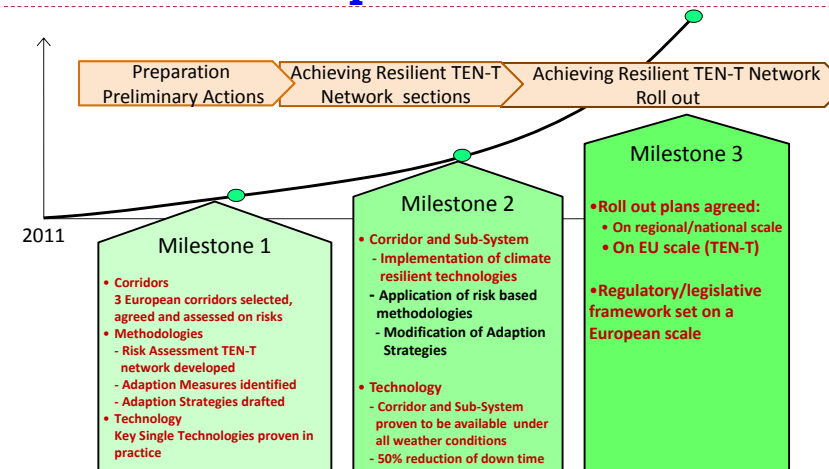
Tasks

- Selection of 3 Trans-European corridors
- Identification and modelling of climate change effects
- Risk based vulnerability assessment for TEN-T* Network
- **Adaptation technology** identification, proving, integration and roll out
- Development of **adaptation strategies** and their implementation for existing infrastructure

Source:FEHRL

- *TEN-T: Trans-European Transport Network

ERTRAC Roadmap: Climate Change Resilient Transport



Source:FEHRL

Risk Management

External Risks

- ▶ Terrorism
- ▶ Natural disaster (flood, earthquake, tsunamis, typhoon)
- ▶ Government regulation and illegal activity (bribery, fraud)
- ▶ Demand of market

Internal Risks

- ▶ Operations risk (information, skilled labor)
- ▶ Strategic risk

Are you ready for Risk Management?

Risk Identification
Risk Measurement
Risk Evaluation
Risk Control

Resilient Strategy

- ▶ Reserve Capacity (**Redundancy**)
- ▶ Alternative Route (**Flexibility**)
- ▶ Rent Modes from Partner (**Collaboration**)

A transportation sector needs **resilience strategies** in a highly vulnerable environment

Resilient Transportation: Risk Management

- ▶ Some mobility management ideas to increase transportation resilience
 1. **Transit transportation systems** especially those in high density cities, should be addressed to understand **where mass mobility from disaster areas is needed**
 2. **The timely traffic and public transportation information** is critical for individuals to **make choices** between public and private transportation
 3. **The needs of vulnerable and disabled people** should be considered in times of disasters

Instant Transportation: Advanced Traveler Information Services (1/2)

- ◆ To make instant mobility happen needs
 - Complete information of **location and destination** information of **each traveler**
 - Location information and status information of each possible **transportation mode**
 - A **device** to collect, publish and use this information based on **customers' needs**

An application example of a recently popular "big data" concept

Instant Transportation: Advanced Traveler Information Services (2/2)

- ◆ An Example of Instant Transportation
 - “Fun Travel in Taipei” (FTiT)



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Sharing Transportation: Bike Sharing System

- Fast or **Slow Down** (Conflict/ Complementary)
- Own or **Share** a Bike
- Public Bike Sharing: **First and Last Mile Solution**



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Public Bike Sharing – Purposes

- Provide the **last mile service** for the trip
- Increase the **bike use**
- Decrease the use of **motorized modes**
- Reduce **pollution and energy**



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Public Bike Sharing in Taipei

- ▶ **Special Design** of Bike and Bike Station
- ▶ **Location** of Bike Station: Park, MRT Station, School, Open Space
- ▶ Users Rent Bike at Station A and Return at Station B
- ▶ **Automatic Fee Collection** through Cash, Membership Card, Smart Card and Credit Card
- ▶ **Rent Fee** is Determined by Gov.
 1. Expand **Service Area** to **163** Stations and **5350** Bikes
 2. More Convenient Use through **Smart Card and Smart Phone**
 3. Cheaper **Rent Fee** (Free in **30** Minutes)



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Public Bike Sharing– Bike Station



Gov. building

MRT station

Taipei city gov.

MRT station



School

Plaza (Taipei101)

World trade center

Citizen plaza

Sharing Transportation: Issues of Bike Sharing System

1. **key Improvement Factors in Taipei YouBike**
 - Expansion of **service coverage**
 - **Easy registration**
 - **Fare adjustment**
 - **Safe riding environment**
2. **Challenging issues**
 - How much percentage of users **shifted from the transit passengers?** If it is a big share, the development of public transit will be hurt.
 - Is there a **good bike accident countermeasure** to deal with issues of bike speed, bike license, bike accident insurance, and bike safety regulation?
 - How to **optimize the relocation of public bikes** so that there will not have the problem of bicycle shortage in one station and full in another station.
 - What is the **better business model** to be **financially sustainable** without government subsidy?

Fast Transportation: High Speed Rail

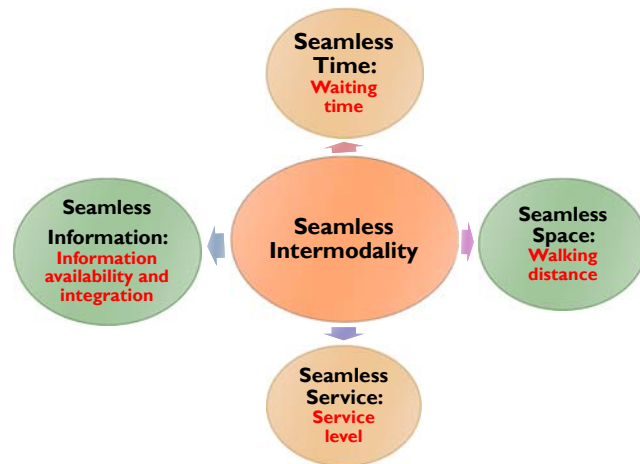
- ▶ **Issues of the high speed rail(HSR)**
 1. What is the **objective** of the HSR, and how should **cost and benefits** be determined?
 2. How should HSR **routes and stations** be selected?
 3. Who are the **investors and builders**: the public sector, private sector, or a public-private partnership?
 4. What are the **effects** of HSR on the shares of **intercity passenger ridership**, including air transportation, conventional rail, and intercity bus?
 5. What are the **operational and financial performance levels?**
 6. Will HSR cause **straw effects** on regional development?

Affordable Transportation: Innovative Transportation financing

1. **Value Capture Scheme**: capture back the **windfall gain** that enjoyed by few land owners but created by the public infrastructure
2. **Tax Increment Financing (TIF)**: designate the tax increment **districts**, specify the tax payment period, and identify the tax items such as the **land tax and property tax**
3. **Transit Oriented Development (TOD)**: is **mixed-use** of development typically focused within a 500 meter radius of a **transit station**

Value Capture Scheme + TIF + TOD

Seamless Transportation: Intermodality of Public Transportation



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Summary

Transportation infrastructure and service in tomorrow is unlikely to be the same as it is at present. **Many changes** have occurred on the needs of travelers and operators, the policy directions in government regulators and the development in technology, we need to **change our thinking and actions** in future transportation.



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Activities of Easts



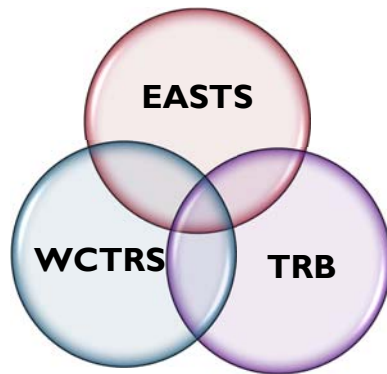
What is EASTS?

EASTS= Eastern Asia Society of Transportation Studies



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Three Major Transportation Conferences



Purpose of the EASTS

1. To **share the experiences** in Eastern Asia
2. To provide the incentives for **young experts**
3. To **enhance cooperation** between different disciplines; academicians and practitioners



Current 18 Domestic Societies of EASTS

AUSTRALIA National Committee on Transport Engineering	MONGOLIA Mongolian Transport Research Society
CAMBODIA Cambodia Society for Transportation Studies	MYANMAR Committee on Myanmar Transportation Studies
CHINA Society for Transportation and Logistics Studies, CCTA	NEPAL Society of Transport Engineers, Nepal
HONG KONG Hong Kong Society for Transportation Studies	NEW ZEALAND EASTS New Zealand
INDONESIA Indonesia Transportation Society	PHILIPPINES Transportation Science Society of the Philippines
JAPAN EASTS-Japan	SINGAPORE Centre for Transportation Research/ Institute of Engineers Singapore
KOREA Korean Society of Transportation	TAIWAN Chinese Institute of Transportation
LAO PDR Lao-EASTS	THAILAND Thai Society for Transportation and Traffic Studies
MALAYSIA Transportation Science Society of Malaysia	VIETNAM Transportation Studies Society of Vietnam

Activities of EASTS

- ▶ EASTS is an international cooperative society for researchers and practitioners of over **18 countries and regions**.
- ▶ Utilizing “**human network**” in transportation field, EASTS is promoting various activities such as:
 - **International Conferences**
 - **International Research Group(IRG)**
 - **International Cooperative Research Activity (ICRA):research grant**



International Conference

The primary activity of the Society is to organize a conference on transportation studies, **once in every two years.**

	Venue	Date	Conference Theme
11 th	Cebu, Philippines	11-14 Sep., 2015	Resilient and Inclusive Transportation Systems through Smarter Mobility
10 th	Taipei, Taiwan	9-12 Sep., 2013	Towards a Harmonized Transportation Society
9 th	Jeju, Korea	20-23 Jun., 2011	Green Growth and Transport
8 th	Surabaya, Indonesia	16-19 Nov., 2009	Enhancing Transportation Infrastructure and Services in Rapid Regional Growth
7 th	Dalian, China	24-27 Sep., 2007	Towards Integrated Transportation for Rising Asia
6 th	Bangkok, Thailand	21-24, Sep., 2005	Gearing Up for Sustainable Transportation in Eastern Asia
5 th	Fukuoka, Japan	29 Oct - 1 Nov., 2003	Connecting Eastern Asia through Better Transportation
4 th	Hanoi, Vietnam	24-27, Oct., 2001	Transport for Equity, Economy, Mobility, and Sustainability
3 rd	Taipei, Taiwan	15-17, Sep., 1999	Sustainable Transport for the 21st Century
2 nd	Seoul, Korea	29-31, Oct., 1997	-
1 st	Manila, Philippines	28-30, Sep., 1995	-

Journal Publication (EASTS Journal/ATS)

Selected reviewed papers are published in the Journals

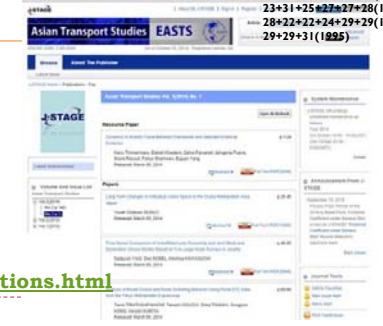
- **Asian Transport Studies (ATS): Total 84 Papers**
Vol.1 (2010-11), Vol.2(2012-13), Vol.3(2014-15)
- **Journal of EASTS :Total 1843 Papers**
Vol.1 (1995) - Vol.10 (2013)
- **Proceedings of EASTS: Total 2256 Papers**
Vol.1 (1997) ~ Vol.9 (2013)

Journal	Count
153(2013)	153
154(2011)	154
174(2009)	174
232(2007)	232
313(2005)	313
246(2003)	246
165(2001)	165
161(1999)	161
154(1997)	154
89(1995)	89
Without invited paper	39+26+23+29+28+20(2001)
	23+31+25+27+27+28(1999)
	28+22+22+24+29+29(1997)
	29+29+31(1995)



ONLINE JOURNAL:
The ATS, journal and proceedings can be freely accessed on the website

<http://www.easts.info/publications/publications.html>



Paper Award

- **Excellent Paper Award**
Yasoshima Prize: 1 paper, Best Paper Award: 8 papers
- **Best Paper Awards for**
 - Enlightening Asia-specific topics
 - Discovering interesting facts
 - Technological innovation
 - Institutional innovation
 - Theoretical development
 - Methodological development
 - Best application in practices
 - Difficult research accumulations

**Yasoshi
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PRIZE**



➤ **Outstanding Presentation Award for Young Researchers**

Other Awardings

- **Outstanding Presentation Award**
- **Best Domestic Society Award**
- **Outstanding Transportation Project Award**



Future Prospects of EASTS

- ▶ More **societies**
- ▶ More younger **researchers**
- ▶ More **enterprises**
- ▶ More cooperative **activities**
- ▶ More presentation **papers**
- ▶ More recognition of Easts **journals**

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Thank You Very Much!

