

# Environmental Sustainable Transport (EST) in Nakhon Ratchasima City Thailand

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## Profile of Nakhon Ratchasima

- Nakhon Ratchasima province is located on Korat plateau that is the lower part of Northeastern plateau of Thailand.
- General area is mainly within the high level plain, average range is elevations of 130-300 meters.
- Nakhon Ratchasima city is the capital of the Nakhon Ratchasima Province.



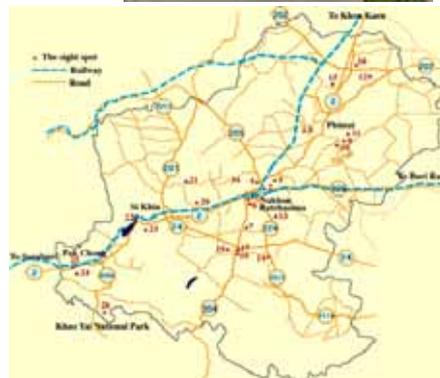
## Nakhon Ratchasima City & Province Population(2005)

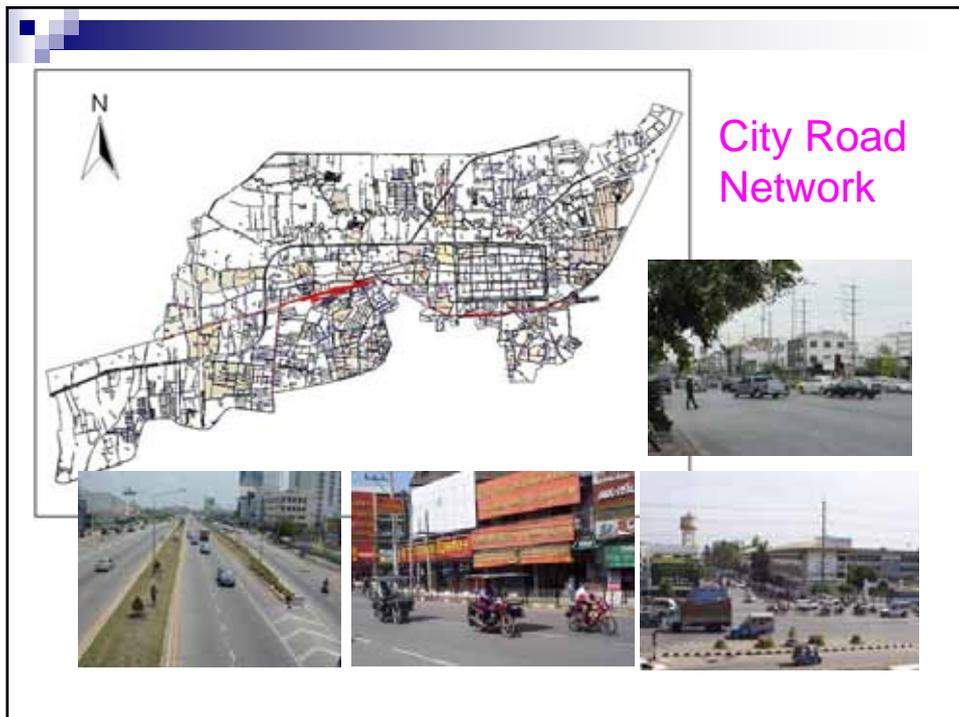
	City	Province
Area(km <sup>2</sup> )	37.5	20,584.16
Population	173,117	2,565,685
Population density	4,616	124.6
GDP/capita US\$(2002)	-	1,030



## Transportation

- Nakhon Ratchasima is connected with the northeastern railway line, connecting Bangkok with Nong Khai and Ubon Ratchathani to Lao PDR.
- [Thai highway no.2 \(Friendship highway\)](#) 256 km. from BKK.
- Domestic airport 30 km from city center, no flight services.





## Problem Situation

- Increase of transportation demand in province (new register vehicle 46,824 /year(2002).
- Inadequate Infrastructure supply :- road , traffic sign, parking lot.
- Traffic congestion with high risk traffic accidents
- Traffic noise and air pollution (PM10) exceed ambient standard.

Year	Injured	Dead
2000	46,904	737
2001	49,846	800
2002	50,198	716

Cases of injured and dead from traffic accident during year 2000-2002 , Nakhon Ratchasima Province

## Problem Identification

- Traffic disorder and weak law enforcement.
- Unsafe situation both drivers and pedestrians.
- Inadequate traffic light control system and maintenance.
- Imbalance on public transportation service (demand and supply)
- Inadequate information on traffic accident and injured report.



## Problem Analysis : Weakness

- Limited of land acquisition and land use planning.
- Supply of transportation facilities:- road (quality and maintenance) , Inadequate parking lot, traffic light control system.
- Conventional Urban Planning (predict and provide)
- Inadequate of cooperation between Regional and Local government.
- Low public participation during early planning stage.



## Problem Analysis :Threat

- Energy crisis and increase demand of petroleum consumption .
- Uncontrolled urbanization , scatter settlement.
- Low cooperation among local government and regional government.
- Social value and modernization.



## Environmental problem related to transport sector.

- Urban environmental degradation was considered as threats to health and livelihood.
- Solid waste , wastewater and air pollution are considered as the main environmental problem in the city.
- Air and noise pollution cause by urban transportation activities and affected to people health status and living environment.
- Increasing number of traffic congestion and accident are realized as upcoming problem.



## Urban Transport & Development Policy

- Environmentally Sustainable Transportation are considered as the challenges for regional and urban development.
- Transportation Demand Management (TDM) include land use and urban planning have potential to prevent serious transport problem.



## Demand side

- **Transport Demand management**
  - Travel reduction by telecommunication.
  - Peak spreading reduction in rush hours.
  - Modal shift – reduction of car and truck use.
- **Land use and urban planning**
  - Growth management.
  - Compact city and linkage between city.
  - Transit- oriented development
- **Regional and National Development Policy** :- Secondary Cities Policy distribution development
- **Industrial and Labor Policy** :- work , business style , production and distribution process.



## Supply side

- Traffic Management
- Improvement of alternative modes
- Integrated multimode transport system : - public transportation , Non Motorize movement , bicycle and walking.
- Transportation infrastructure development
  - *Functional road ,ring road and by pass.*
  - *Public transportation network with high quality capacity system*



## Road side air quality and traffic noise monitoring

- Established 4 roadside air quality and 5 traffic noise monitoring station.
- During dry season (December-March) PM10 exceed air ambient standard 120 microgram/m<sup>3</sup> in some station(130 microgram/m<sup>3</sup>)
- In some area traffic noise exceed standard 70 dB A ( $L_{eq,24} = 72,75$  dB A)



## Vehicle emission control

- Reduction in emission from in use vehicles:- city truck maintenance and retro fitting program , discard 15 yrs olds truck ,
- Annual vehicles inspection and retro fitting for motorcycle, car, truck by certify private station.
- Introduced alternative fuels :- CNG, LPG, gasohol, biodiesel.
- 2 gas station and 20 gasoline stations with alternative fuels.



## Challenges in Implementation

Expected Output	How to know?	Negative impact?	Mitigation
1. Long term sustainable transportation planning integrate with land use planning along public participation& partnership	Reporting and reviews planning document	Different demand and benefits	Negotiation and cooperation
2. Improvement of alternative non-motorize transportation.	Surveys	Oppose from lost benefits	Public concern and enforcement
3. Balancing transportation demand and supply.	Review and research	Resistance of change	Alternative Technology Modal shift
4. Increasing of public participation	Recording & Questionnaire	Inactive participatory	Motivation

## Benefits and Difficulties

- Change in social value and modernization induced people use motorized than non-motorized transportation.
- Limited transport infrastructure while transport demand increased quickly.
- Mass transportation are considered but high cost investment and unacceptable.
- Decentralized policy still on slowly process and conflict.



## Nakhon Ratchasima : Environmental Sustainable Transport City



- Balance transport demand and supply based on the accepted institutional framework of society.