



Incorporating Air Quality into Transportation Planning in China: Opportunities and Constraints

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Collaborators

- This presentation is part of a larger research effort that involves:
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Overview of Main Points

- Under the pressure of very rapid urban growth, China needs both to provide ***increased highway and transit infrastructure and services*** and to ***control transportation-related air pollution***.
- Environmental values, though being given much stronger emphasis, are poorly institutionalized ***analytically*** and ***bureaucratically*** in the planning process.

Overview of Main Points (2)

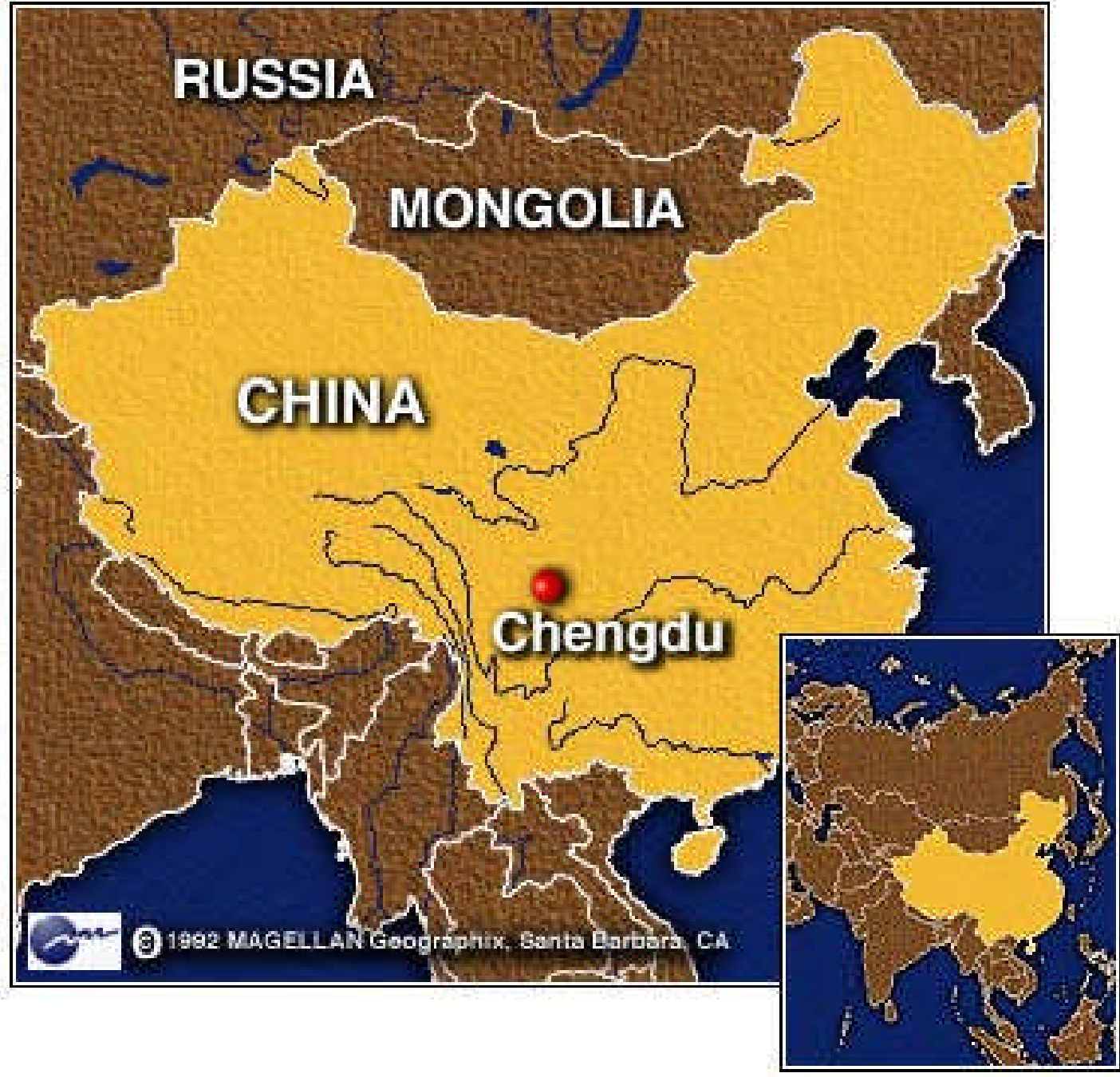
- The challenge for the future is to ***strengthen the connections*** between transportation planning and decision-making, on one hand, and policies for regulating transportation emissions, on the other.



Example: **Chengdu**

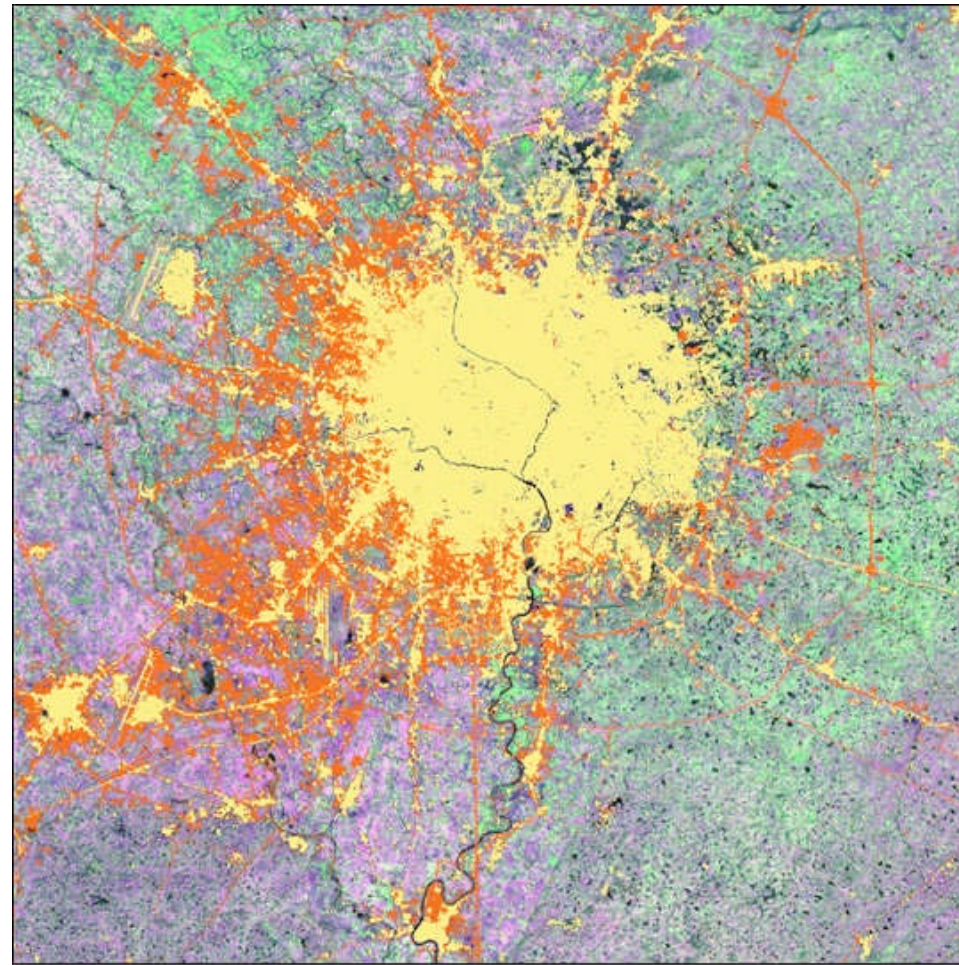
The city has been experiencing explosive urban growth over the past two decades – with substantial increases in travel and transportation-related air pollution.







Radial Growth of Urban Chengdu 1990-2000



Urban Areas in 1990 Growth from 1990-2000

Source: NASA Earth Observatory

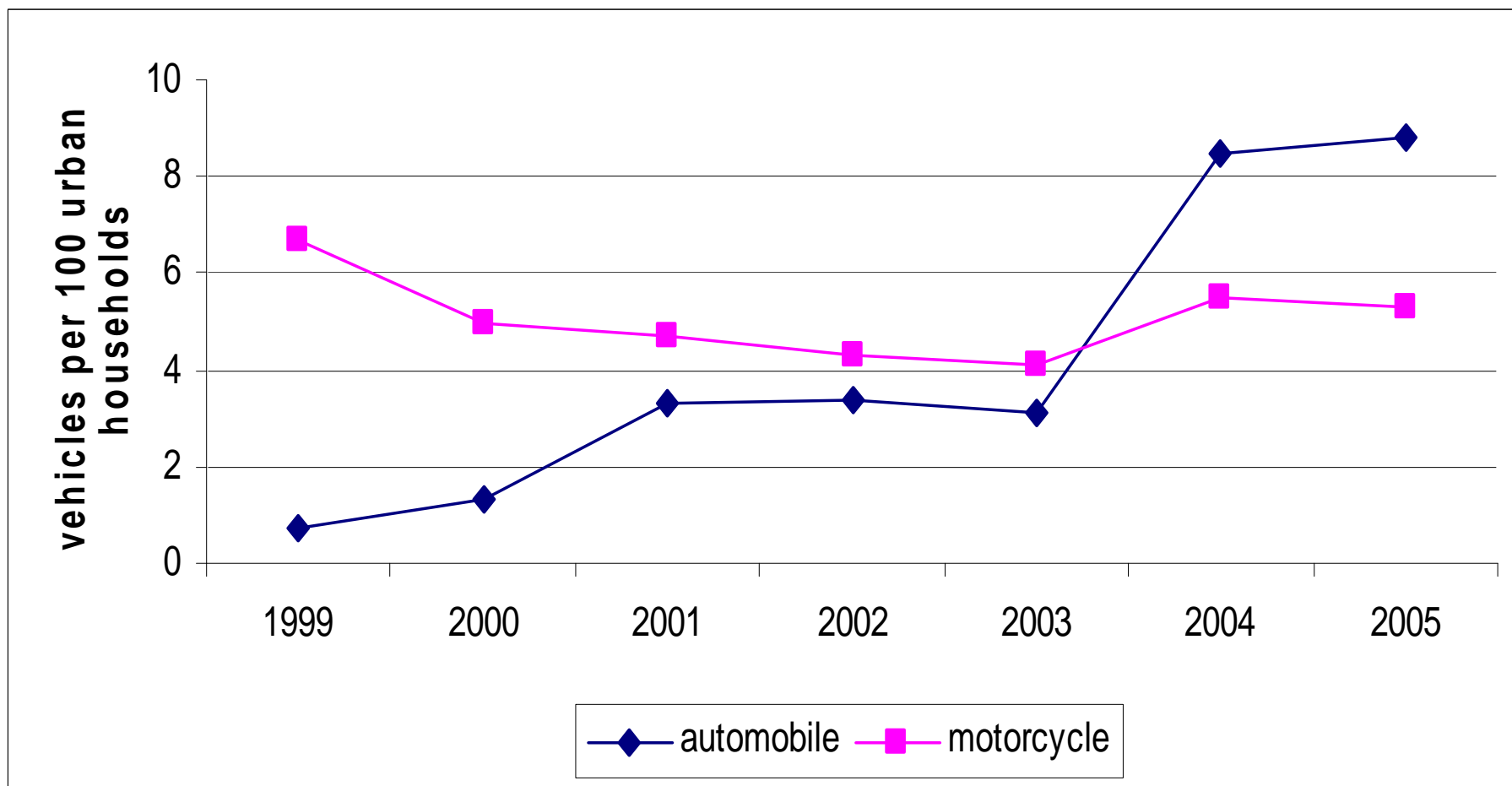
Change in Chengdu 2000-2005

Area of prefecture	~0%
Area of city	54%
Population (prefecture)	6.8%
Population (city)	43%
Average wage	92%
Residential real estate investment	493%
Built-up area	90%
Public expenditure on transit	165%
Public expenditure on environmental sanitation	55%
Public subsidy for environmental protection	-28%

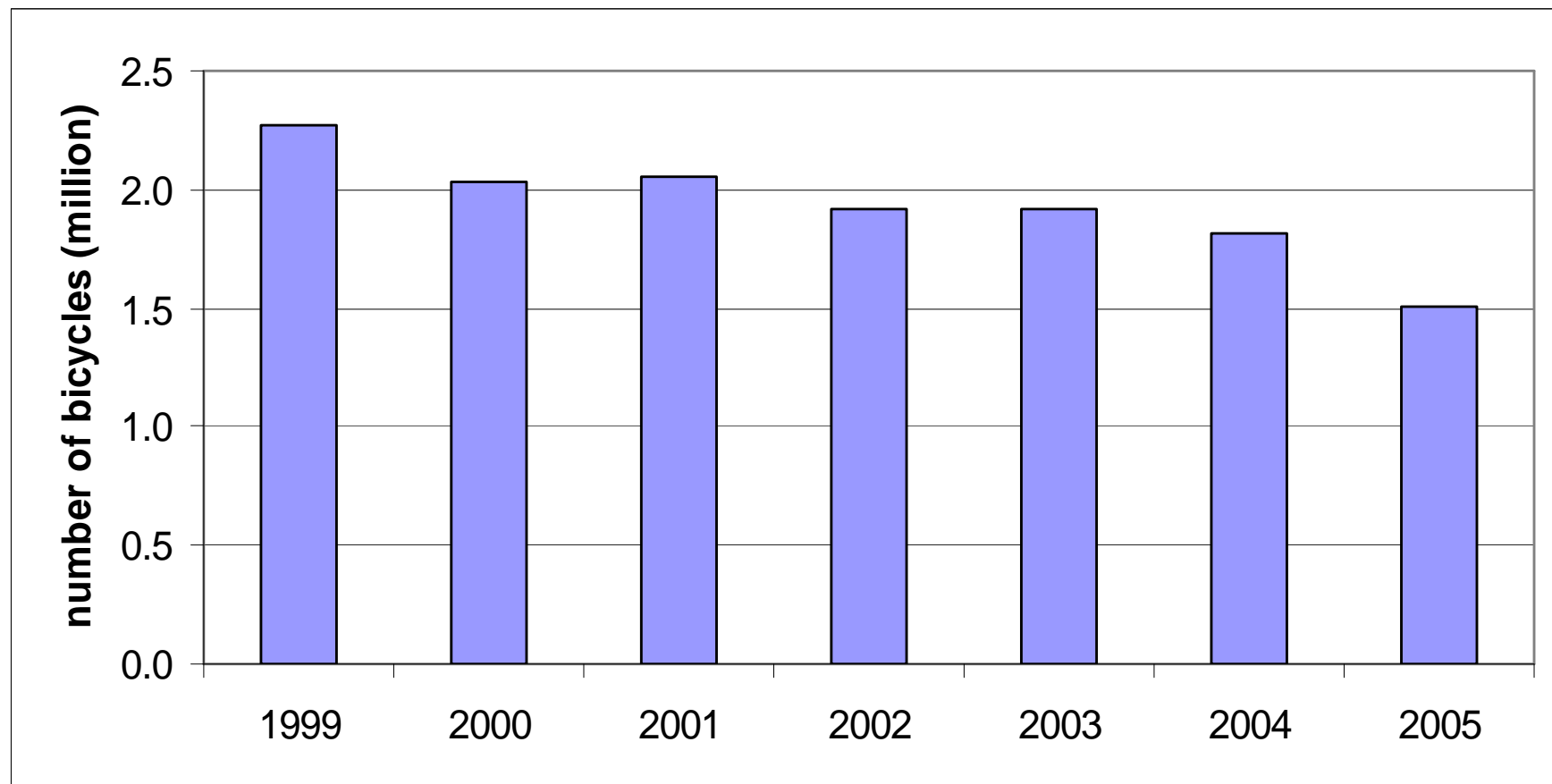
Transportation Change 2000-2005

Bicycles	-30%
Automobiles	577%
Motorcycles	6%
Buses	105%
Taxis	8%
Bus route length	49%
Paved road length	121%
Traffic accident deaths	49%

Private Motor Vehicle Ownership Rate in Chengdu



Declining Bicycle Population in Chengdu



**A new but still tentative
approach to transportation
planning is being developed
in Chengdu...**

**alongside a traditional, top-
down system of urban
planning led from the state
level.**

Rethinking Transportation Planning and Policy

- Chengdu is actively rethinking how it does transportation planning and what its policies should be.
- The city is also considering institutional changes in the transportation planning process, which will give more prominence to environmental considerations.

Rethinking Transportation Planning and Policy (2)

- A white paper issued about two years ago contemplates new policies:
 - Controls on auto usage (but not on ownership)
 - Doubling transit mode share to 30% in the central area by constructing a major rail system and providing bus rapid transit or priority lanes.
 - Disincentives for driving, through differential pricing of parking in different areas.

But the Traditional Urban Planning System Remains Important

- Chengdu planning as part of an integrated national system.
- Every five years Chengdu is responsible for producing a *comprehensive* urban plan and derivative *functional* plans – e.g., for transportation, economic development, land use, environmental protection, and culture.
- These plans are developed from a prior state-level plan and a subsequent Sichuan provincial plan.

But the Traditional Urban Planning System Remains Important (2)

- The city-level Chengdu plan, in turn, becomes the basis for more detailed plans for the city's 20 districts, cities, and counties.
- This nested system of plans is supposed to be tightly integrated functionally and geographically.

Planning at the City Level

- Policy for urban planning in Chengdu is set by the Urban Planning Commission, a body presided over by the Mayor and which includes the Deputy Mayor, Vice Mayor for Urban Development, several department heads, and a key official from the Sichuan province government.
- The Planning Administrative Bureau provides operational capacity for this body – and does much of the technical work for the plan.

Expertise and Functional Planning

- As the comprehensive plan is developed, other city agencies are asked for data, forecasts, or other inputs, but only at the discretion of and as directed by the Planning Administrative Bureau.
- Individual departments are later expected to develop *functional* plans that accept the parameters and goals of the comprehensive plan.
- Overall, the expertise applied to planning has been increasing. Better data and forecasts, more analysis.

National Mandates ...

- In developing its plan, Chengdu has to satisfy explicit national requirements for content and promise to meet standards or targets for projected outcomes/results – for example:
 - Protection of construction land and other land use requirements
 - Road quality
 - Transit capacity
 - Environmental quality
- A national standard is responsible for the goal of a 30% transit mode split – doubling the current level.

National Mandates ...(2)

- Provincial and city plans are reviewed and must be approved by the next higher level of government.
- Chengdu reports its plan through the provincial ministry of construction and, ultimately, to the State Council in Beijing.
- The review generally focuses on nationally defined strategic issues and those for which standards have been set.

...and Some Flexibility

- Over time the system is becoming less hierarchical and more interactive.
- When the fast pace of development changes conditions, the city plan can be revised more frequently than every five years (it will be three times in 10 years in Chengdu when current round is over) – and adopt different planning assumptions than those in the higher level plan.
- Overall trends of decentralization in Chinese government have reduced the amount of higher level oversight.

Environmental values are getting more attention in transportation planning than previously, but capacity and bureaucratic influence are low.

Environmental Issues

- The impetus for greater attention in planning to environmental concerns, including air pollution, seems to come primarily from the national goal of a “harmonious society.”
- But the level of knowledge about environmental issues seems low, data is poor or non-existent, and the Environmental Protection Bureau has limited analytic capability and influence in the bureaucratic process. It appears to be left out of at least some significant consultations.

Enhancing Environmental Analysis in Transportation Planning

- In Chengdu and other Chinese cities, the increased visibility of and political attention to environmental problems creates opportunities to increase the weight given to air quality and other environmental concerns in transportation planning.

But significant analytic and institutional changes would be required to accomplish this.

Conceptualizing the Transportation-Air Quality Linkage

- Assessing the transportation system in relation to the air shed.
- Comprehensive assessment: system-wide impacts rather than project by project analysis.
- Improved data collection, system modeling, and travel and air quality forecasts.

Improved Tools for Analysis

- **Data:** Need for improved measurement and/or estimates of transportation-related pollution, type by type.
- **Modeling:** Cities need the capacity to forecast the air quality impacts of changes in:
 - highway and transit infrastructure and related transportation demand.
 - Travel behavior – including policy incentives and disincentives for vehicle use.
 - Fleet composition – taking account of size and changing vehicle and fuel technologies.

Institutional Capacity of Environmental Agencies

- While *transportation* agencies need enhanced ability to analyze environmental issues, environmental values are not likely to get sufficient weight unless *environmental* agencies significantly increase their own size and capacity for analysis and are permitted greater and earlier participation in the transportation planning process.

Political Values and the Decision Process

- Expanding the role of environmental agencies in transportation planning will involve a clash of societal interests:
 - those that accord primary priority to immediate development,
 - those that are concerned with the sustainability of development.
- The changes sketched here thus have important political implications, as well as technical ones.



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