



Sustainable Transportation Principles and Practices

Presented at the University of Idaho

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Presentation Overview/Purpose

- Deepen our understanding of opportunities for sustainable practices in Transportation
- Provide a context for including sustainable practices/applications in the planning, design, construction and operations of transportation facilities



Presentation Focus

- The focus will be on transportation infrastructure not (necessarily) on transportation modes such as buses, bikes, etc.
 - Modes tend to represent “positions,” and, therefore, opportunities for disagreement.
 - We’ll focus on values-based themes related to principles and attributes which help lead to consensus and shared commitment



We'll Look at Sustainability at Three Levels

- Global
- Transportation Systems and Community Level
- Community/Neighborhood Level



Sustainable Development

Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.



Sustainable Transportation

The ability to meet the needs of current society to move freely, gain access, communicate, trade, and establish relationships without compromising the ability of future generations to meet their own needs.

Global Sustainability





The Natural Step (TNS) Conditions

TNS Condition 1: *Substances from the earth's crust must not systematically increase in the biosphere*

TNS Condition 2: *Substances produced by society (man-made materials) must not systematically increase in the biosphere*

TNS Condition 3: *The physical basis for the productivity and diversity of nature must not be systematically diminished.*

TNS Condition 4: *There must be a fair and equitable distribution of resources to meet human needs.*



Opportunities to Impact at the Local Level

- ***TNS 1 and 2:*** relatively indirect impacts related to use of non-renewable resources, such as, asphaltic compounds
- ***TNS 3:*** Impacts vary, local bio-diversity and habitat
- ***TNS 4:*** Direct impacts at the community level (within the community)



Opportunities to Impact at the Local Level

Although impacts may be indirect and limited, it's important to remember that all contributions matter.

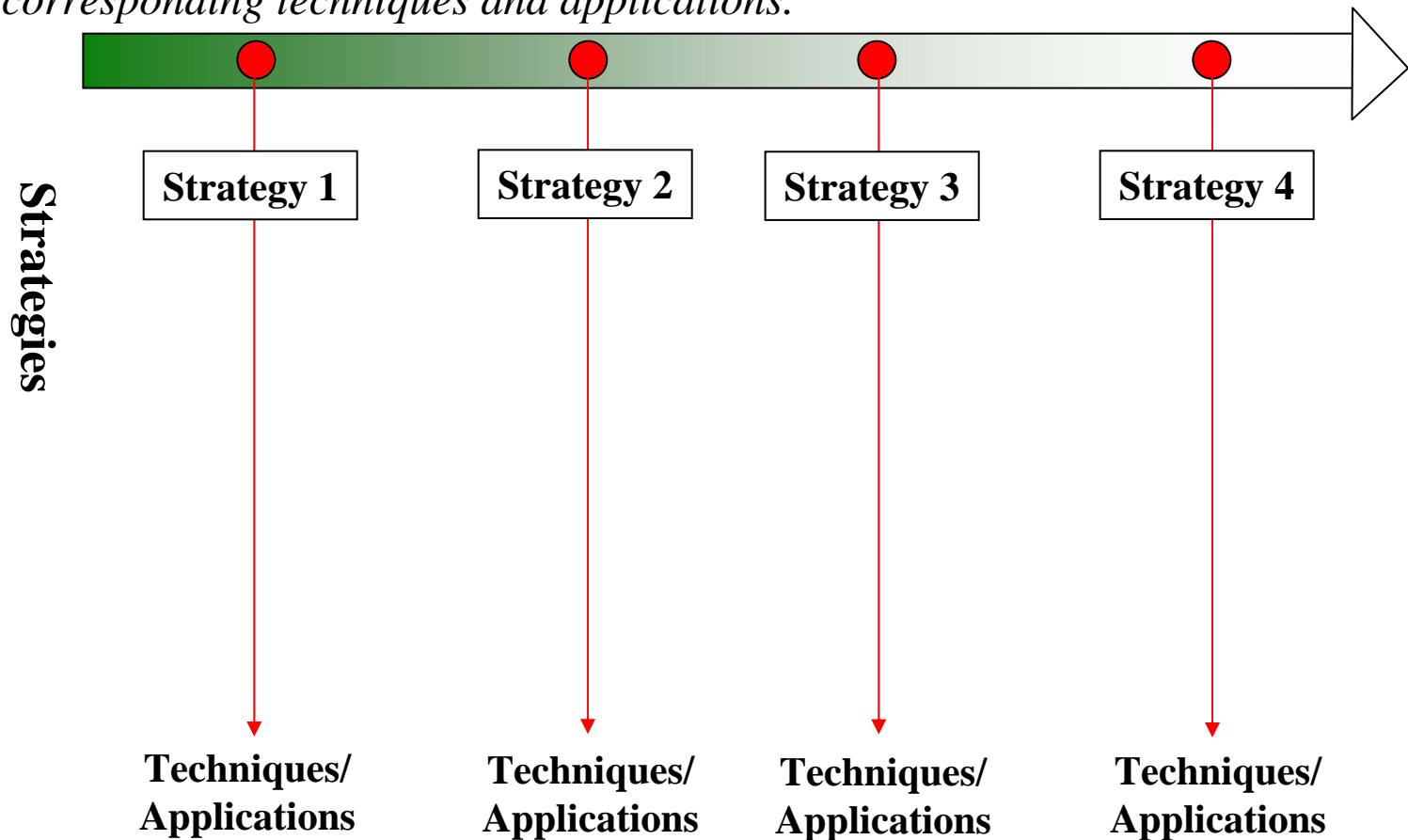
“No snowflake believes its responsible for the avalanche.”

Transportation Systems and Community Level



Approach for Evaluating Principles, Strategies, and Techniques/Applications:

For each principle, strategies are evaluated and implemented by first working from left to right. Each strategy is implemented vertically through corresponding techniques and applications.





Sustainable Transportation

Principles



Sustainable Transportation

Guiding Principles

A:
**Address the
Mobility Need**

B:
**Be an Asset
to the Community**

C:
**Be Compatible with
the Natural and
Built Environment**



Address the Mobility Need

A



As evidenced by:

Mobility solutions that are:

- *safe and convenient for users,*
- *technically credible,*
- *financially feasible*



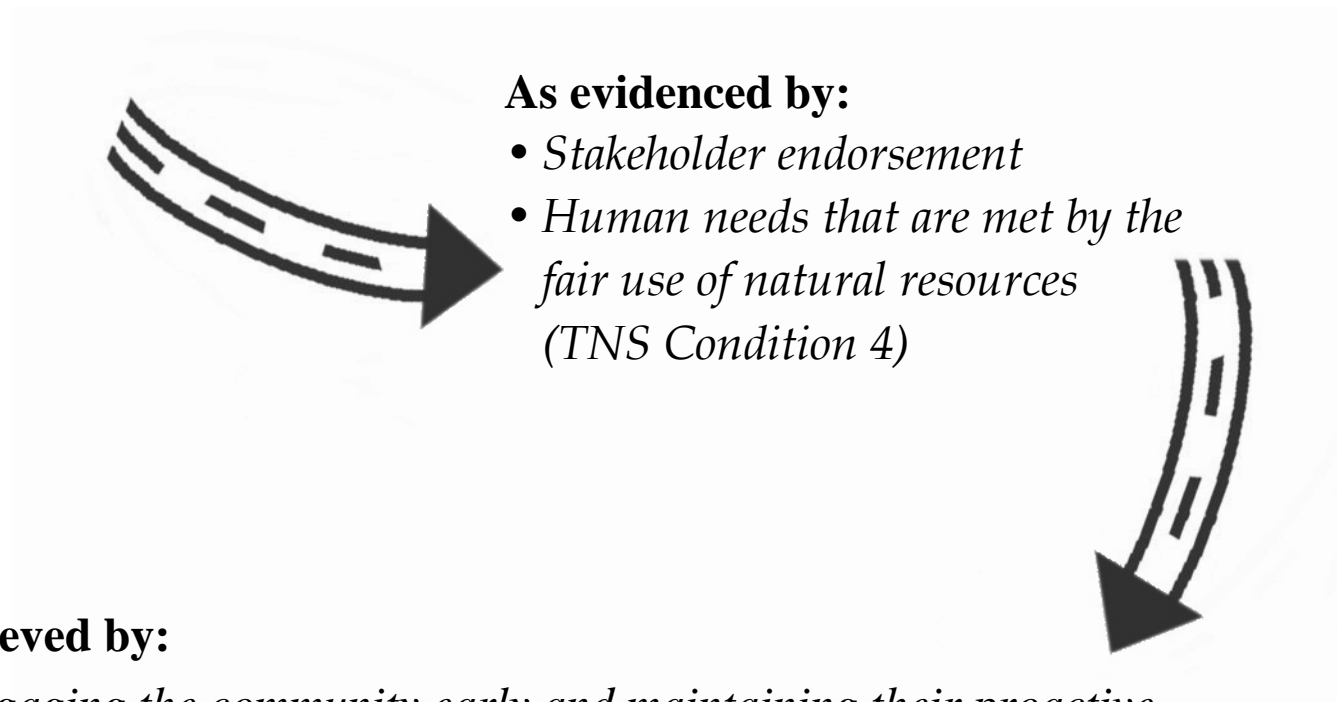
Achieved by:

- *Evaluating attributes to define and eliminate modal gaps that could limit modal use*
- *Practicing common sense and the flexible application of design standard*



Be an Asset to the Community

B



As evidenced by:

- *Stakeholder endorsement*
- *Human needs that are met by the fair use of natural resources (TNS Condition 4)*

Achieved by:

- *Engaging the community early and maintaining their proactive involvement throughout design, construction, and maintenance*
- *Including all stakeholders (even the “silent” ones)*
- *Evaluating sensitivity to social justice issues per TNS Condition 4*
- *Ensuring compatibility with the “community’s” social and livability values*

Be Compatible with the Natural and Built Environment

C

As evidenced by:

- *“Community” stakeholder endorsement*
- *Regulatory agency acceptance*

Achieved by:

- *Minimizing system/project intrusion in the existing environment*
- *Ensuring aesthetically appropriate features*
- *Minimizing the “taking” of other natural resources*



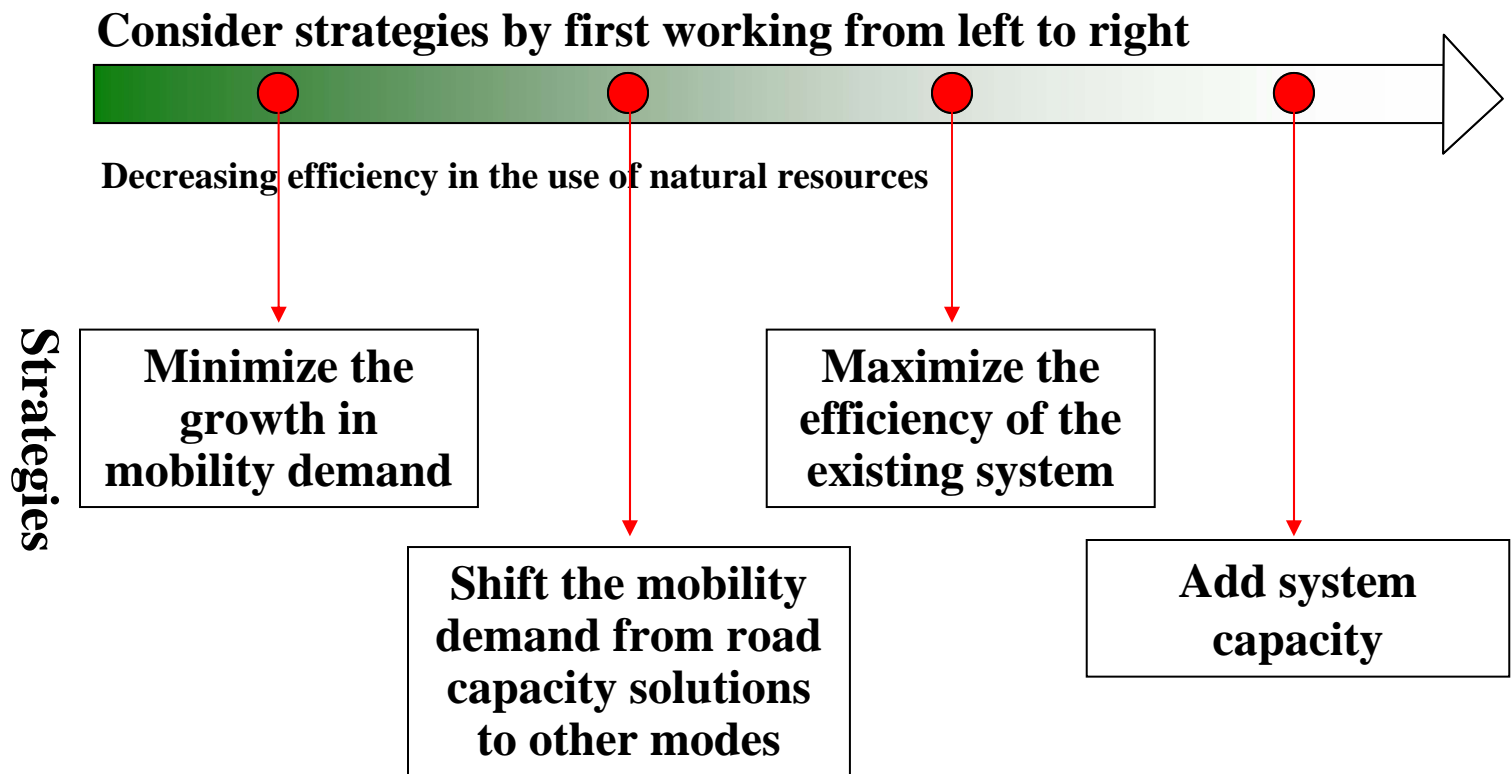


Sustainable Transportation

Strategies, Techniques, and Applications

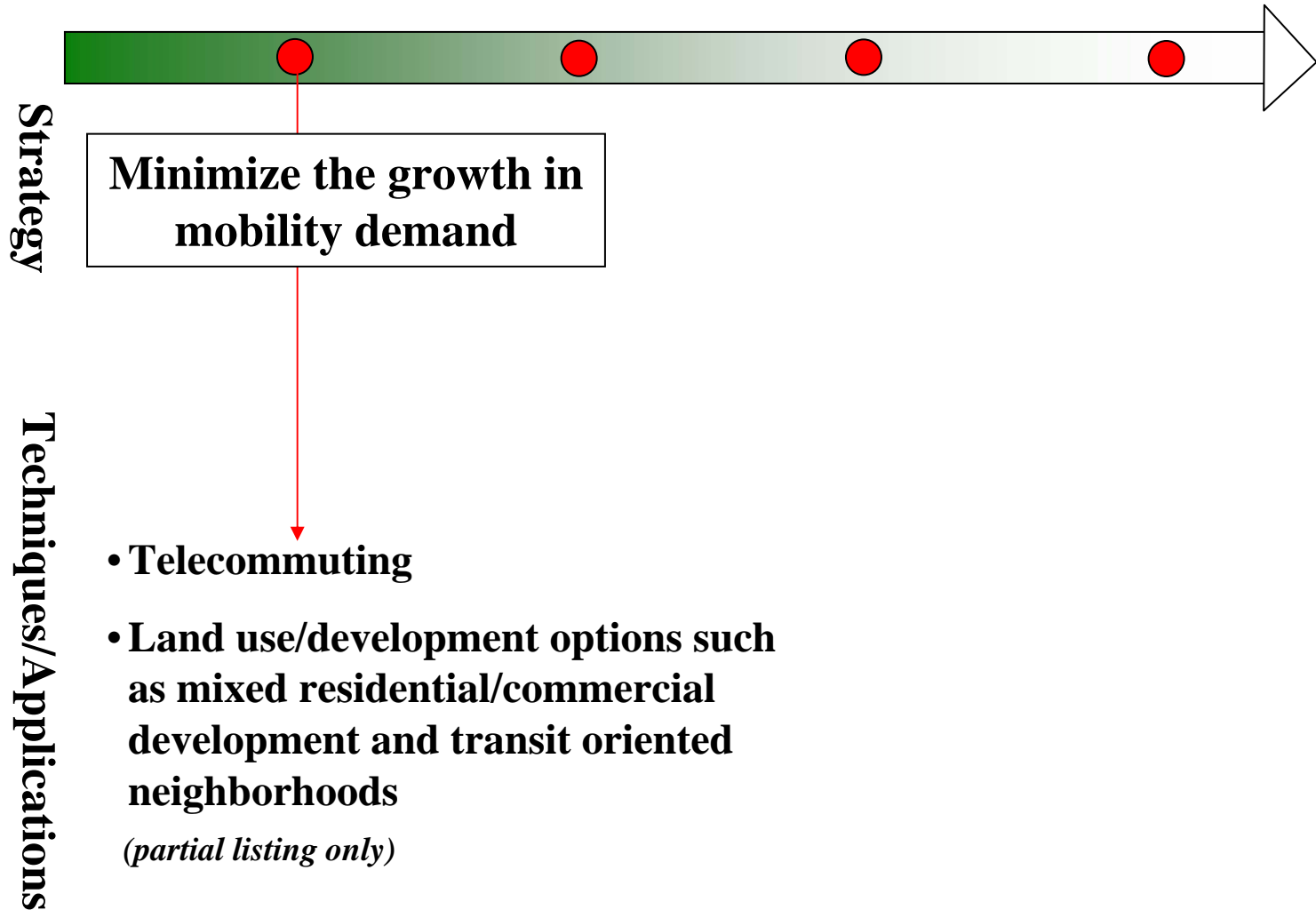


Principle A: Address the Mobility Need





Principle A: Address the Mobility Need





Principle A: Address the Mobility Need

Strategy

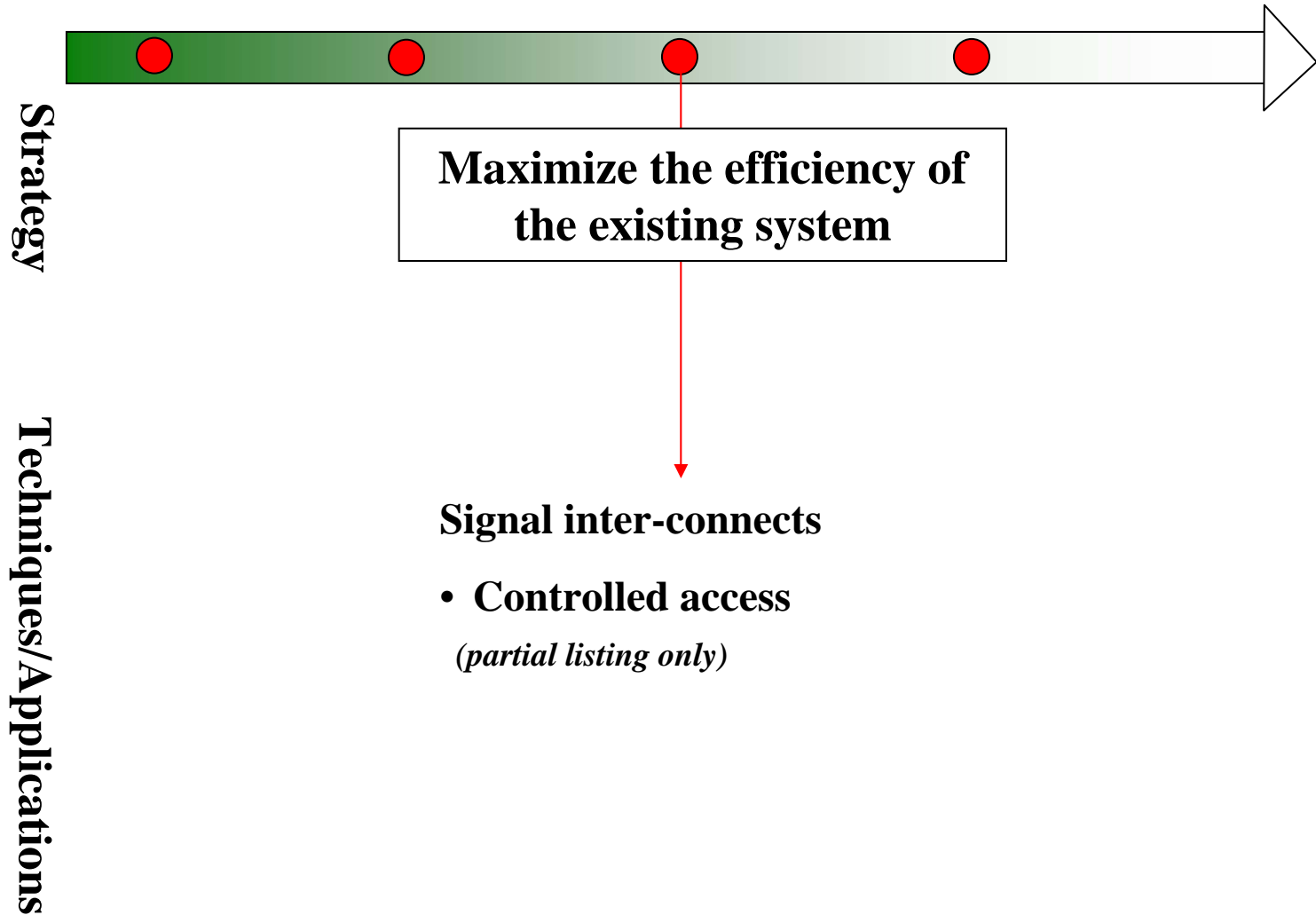
Shift the mobility demand from road capacity solutions to other modes

Techniques/Applications

- Shift SOV to carpooling
 - Provide other commute options such as bus transit
- (partial listing only)*



Principle A: Address the Mobility Need

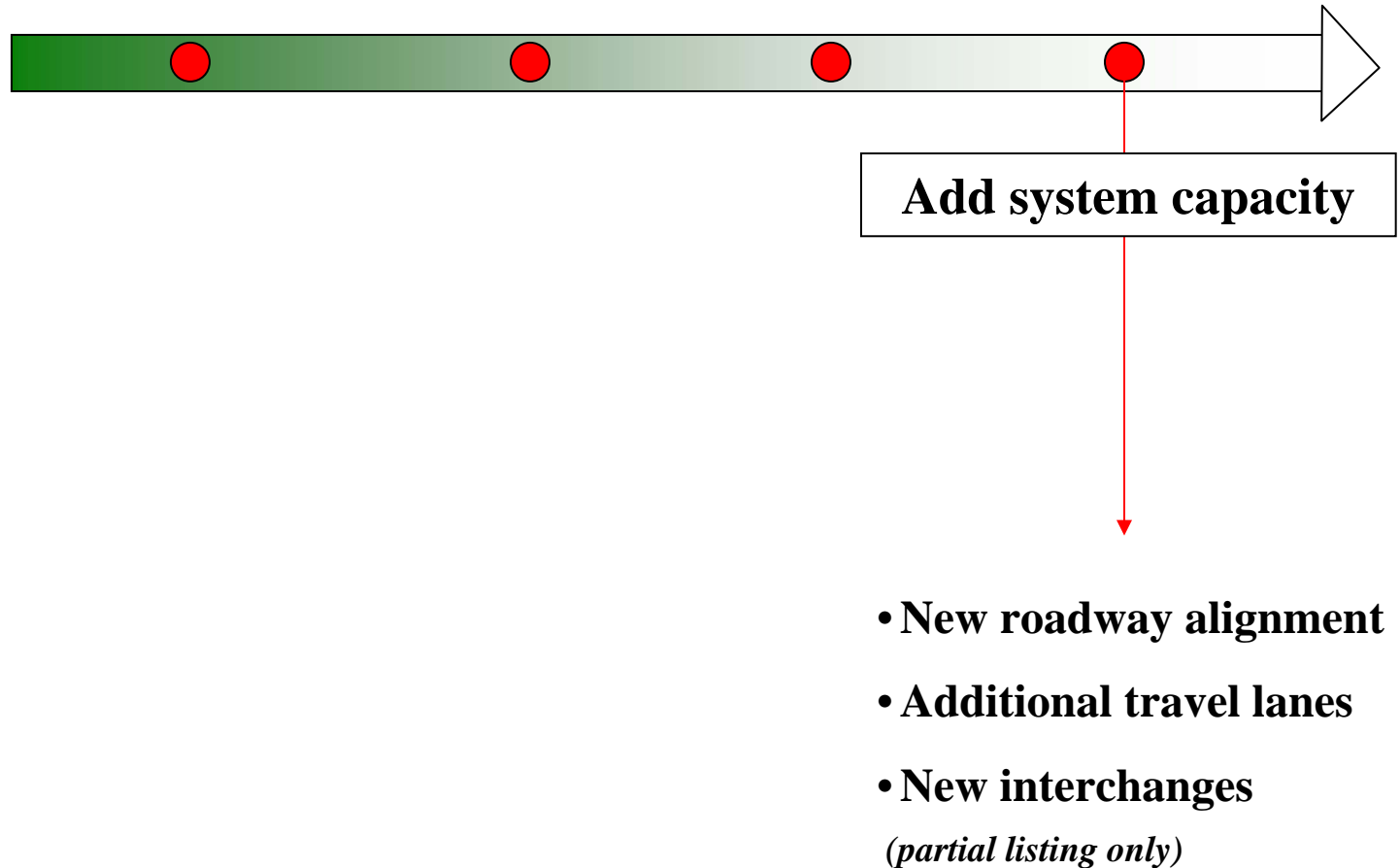




Principle A: Address the Mobility Need

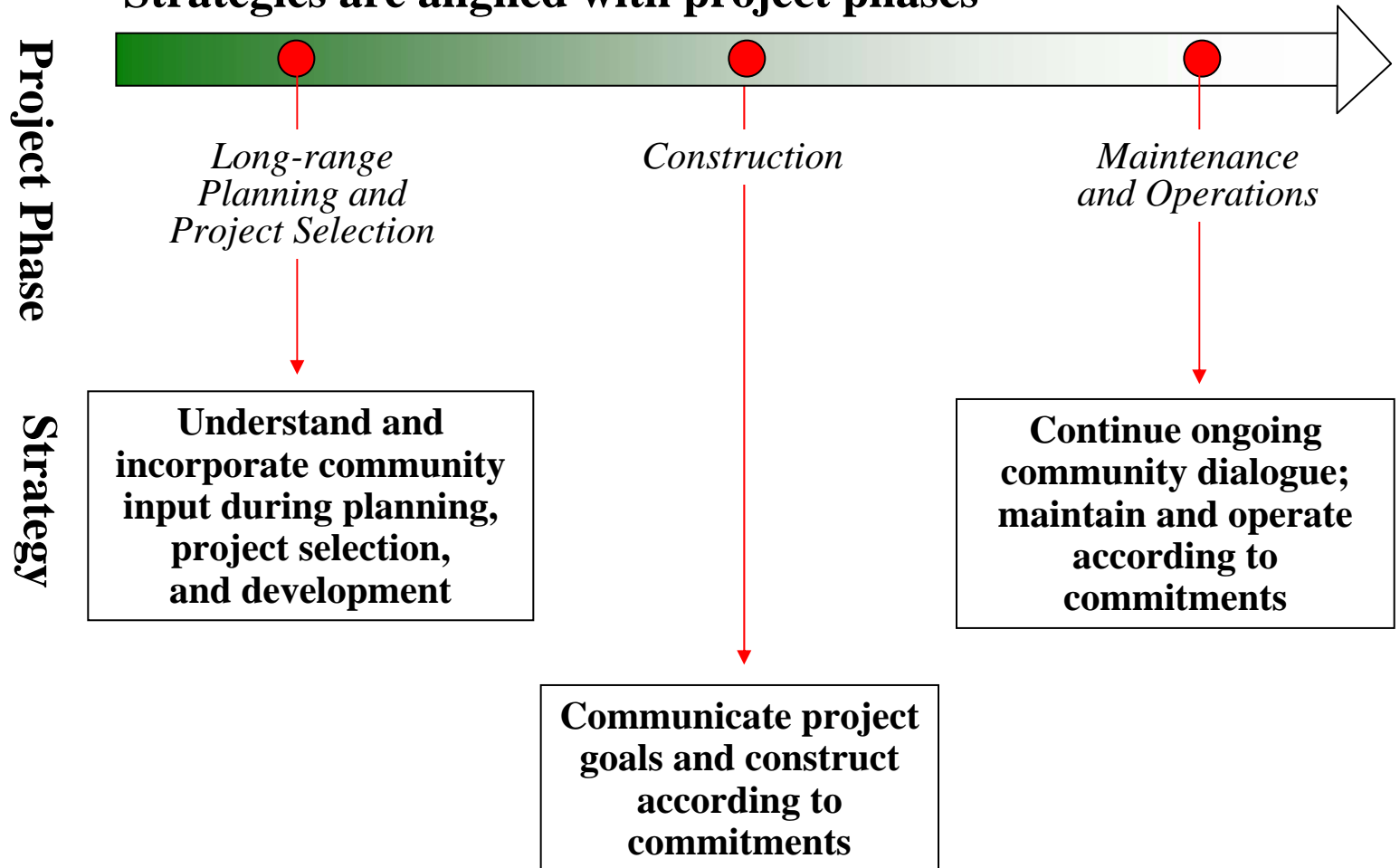
Strategy

Techniques/Applications



Principle B: Be an Asset to the Community

Strategies are aligned with project phases





Principle B: Be an Asset to the Community

Long-range Planning and Project Selection

Strategy

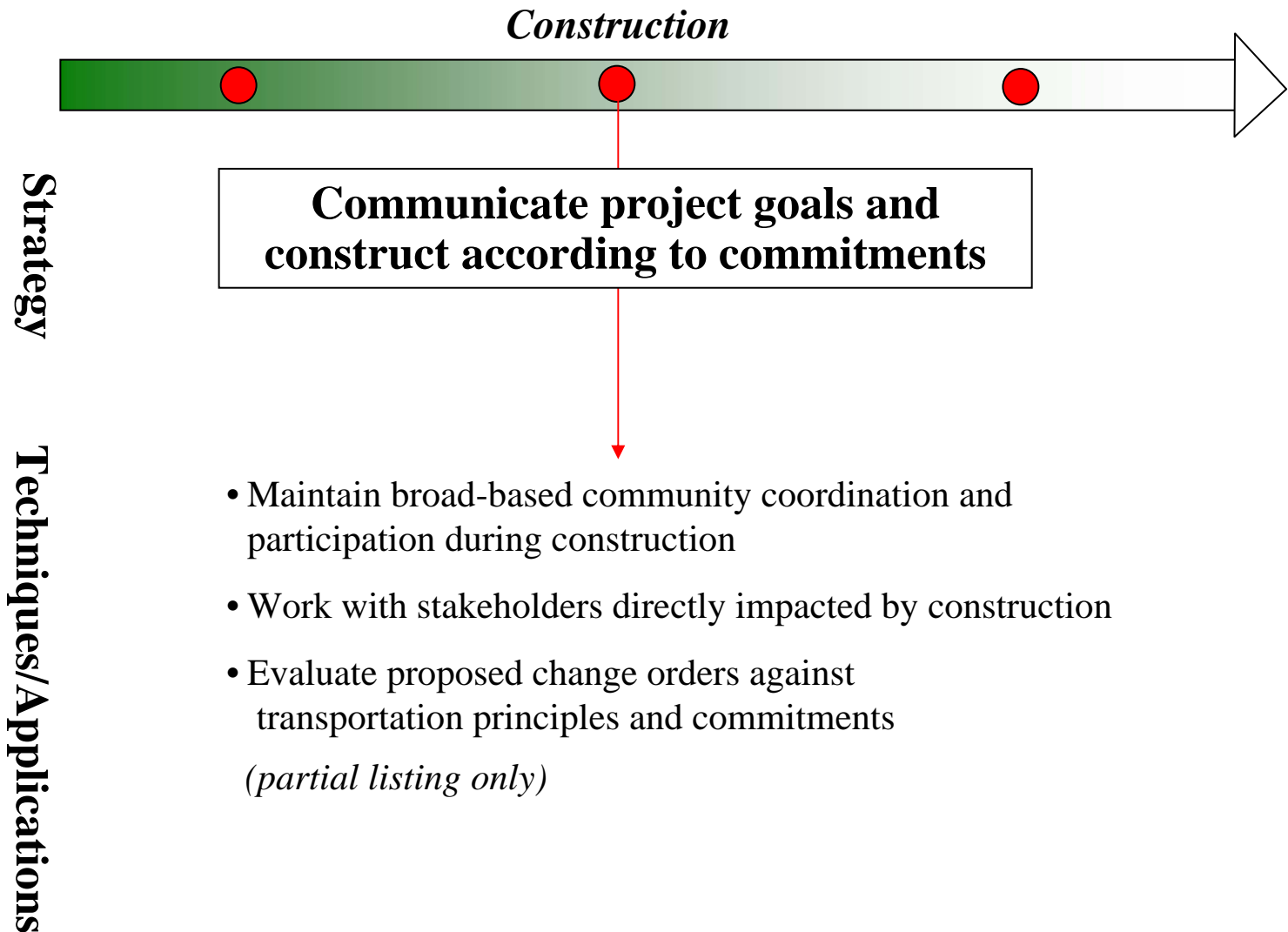
**Understand and incorporate
community input during planning,
project selection, and development**

Techniques/Applications

- Balance advocacy of own interests/position with inquiry about the community's interests/position
- Seek to align community values with sustainable transportation policy and solutions
- Gain endorsement/commitments for proposed solution and design according to commitments
(*partial listing only*)

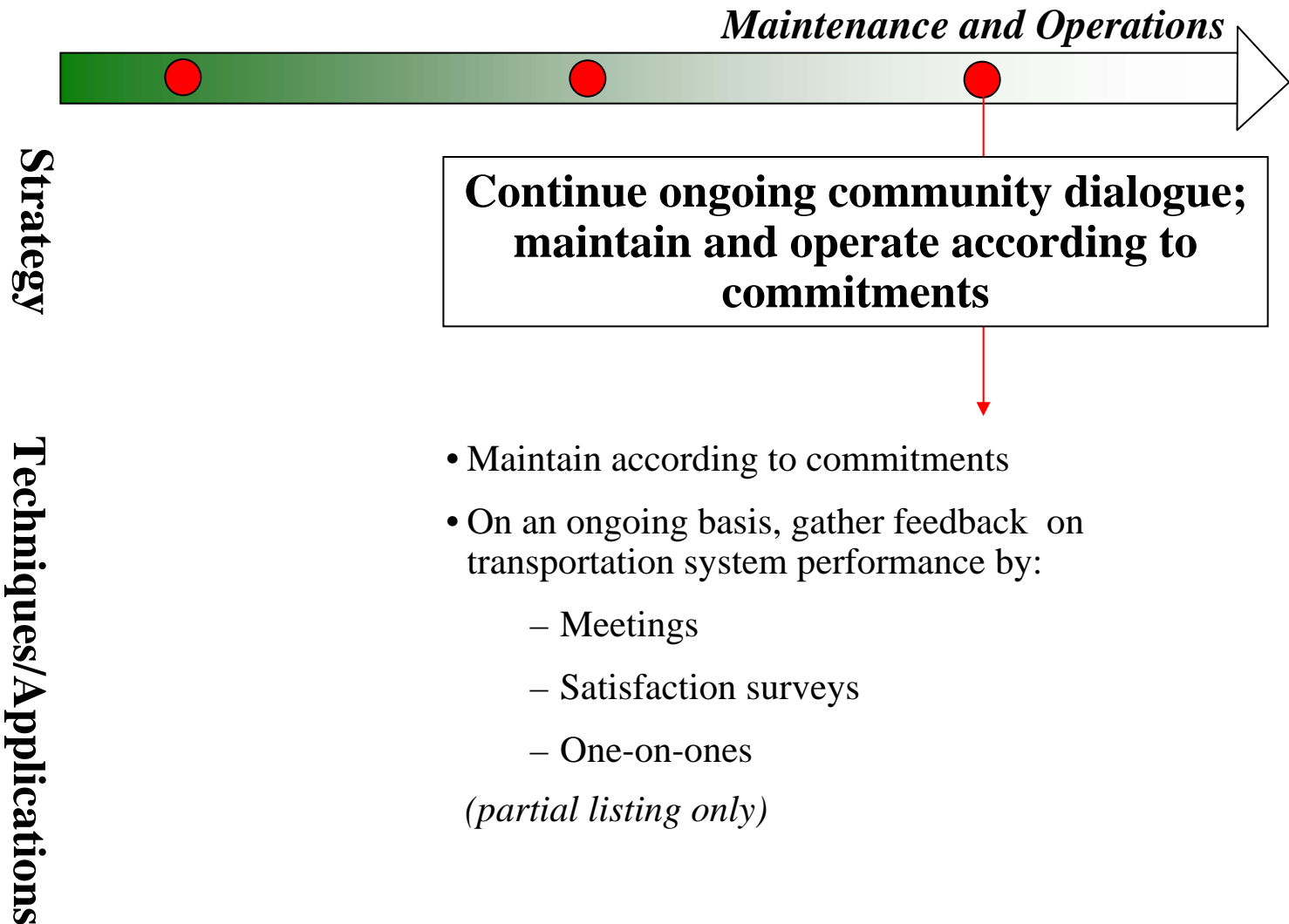


Principle B: Be an Asset to the Community





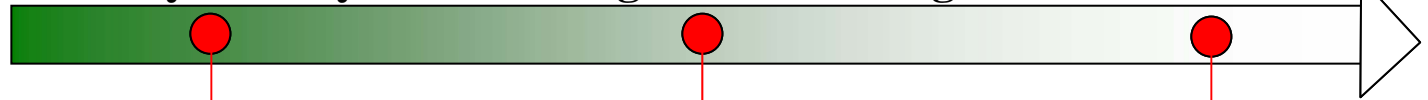
Principle B: Be an Asset to the Community





Principle C: Be Compatible with the Natural and Built Environment

Employ the least intrusive strategy that addresses the mobility need by first working from left to right



Increasing adverse impact on existing environment

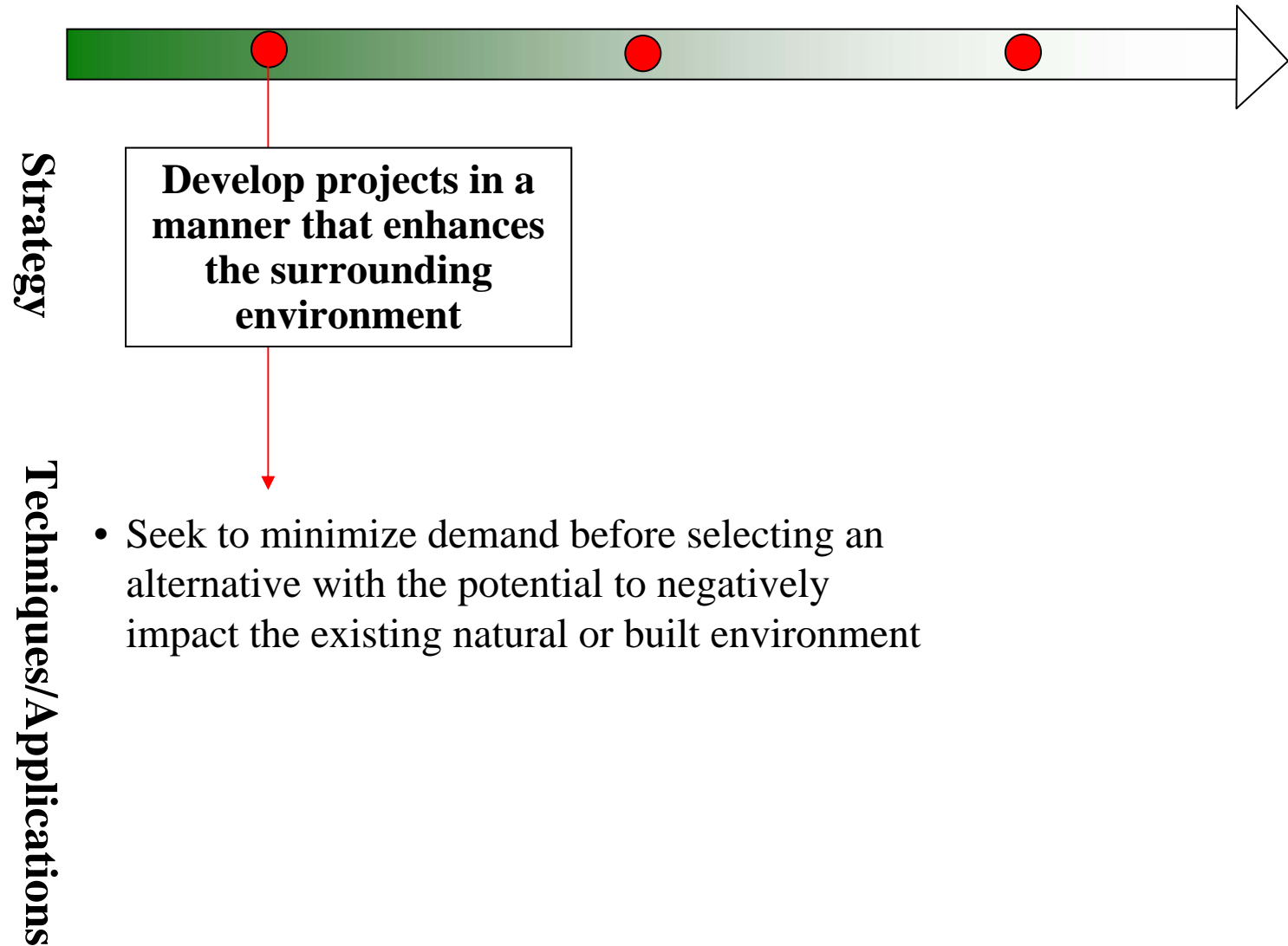
Strategies

Develop projects in a manner that enhances the surrounding environment

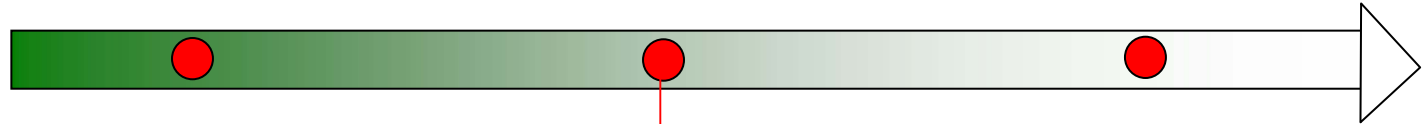
Develop projects in a manner that minimizes or avoids impacts to the environment

Develop projects in a manner that mitigates impacts to the surrounding environment

Principle C: Be Compatible with the Natural and Built Environment



Principle C: Be Compatible with the Natural and Built Environment



Strategy

**Develop projects in
a manner that
minimizes or avoids
impacts to the
environment**

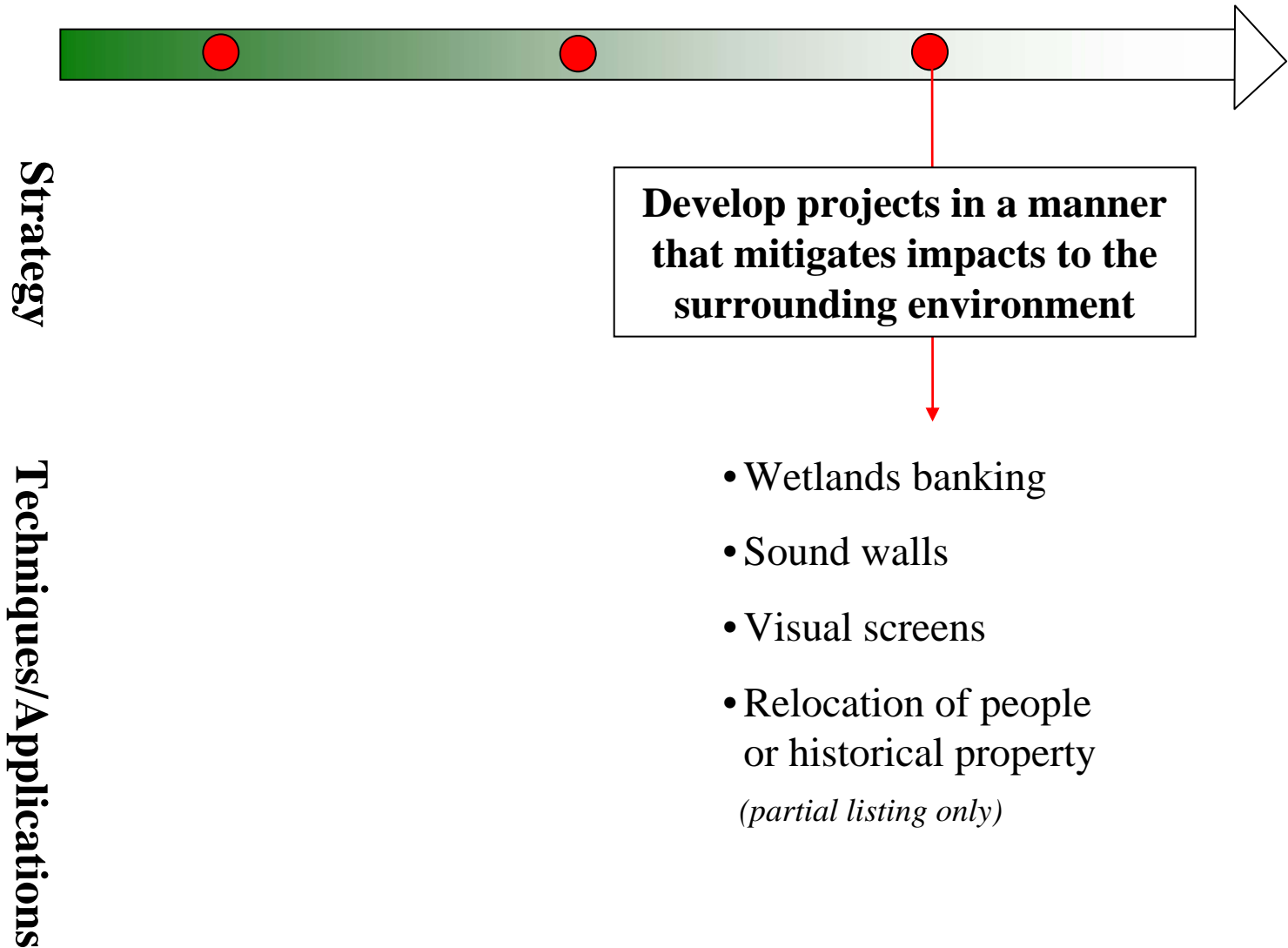
Techniques/Applications

Add features to the projects such as:

- Traffic calming devices
 - Landscaping/visual screens
- (partial listing only)*



Principle C: Be Compatible with the Natural and Built Environment





Community/Neighborhood Level



Guidelines for Maximizing Transportation Investments

- ***Encourage the creation of “centers”-*** opportunities to live, shop, and work in or near “town centers” dramatically reduces infrastructure costs
- ***Connect the flows-*** drainage/watersheds, greenways, streets (limit cul-de-sacs)
- ***Layer the systems-*** for example, co-locate greenways, streams, pedestrian and bike paths
- ***Maintain an economy of effort-*** employing the three guidelines above recognizes that resources are limited and must be conserved.



Issues Regarding Land Use and Transportation

- Land use and transportation are integrally tied.
- The only question is whether transportation wants to be involved during the planning phase to help create a cost- effective infrastructure or whether transportation is willing to accept the consequences and play catch up.



Issues Regarding Land Use and Transportation

- For example, zoning and development patterns can dramatically affect the cost of building and maintain streets/roads
 - Atlanta: deficient land use policy during high growth have led to sprawl, lack of centers, and no pedestrian planning. AND expensive/extensive road system with limited ties to transit
 - Chicago: villages every 1-3 miles with opportunities for local shopping and restaurants. Variety of mobility options
- The number of access breaks (road/driveway permits) can dramatically reduce the carrying capacity (through put) of a street.



Questions?



Sustainable Transportation

Evaluation Methods



Evaluation Methods

The sum of the convenience attributes below determines the relative “willingness” of users to travel by a given mode. This matrix can be used to identify “gaps” for a given mode that can lead to projects that will close the gap and make the mode competitive.

Transportation/Modal Option to Meet Mobility Needs

Convenience Attributes	Modal Option 1	Modal Option 2	Modal Option...
<i>Connectivity</i> <i>Accessibility</i> <i>Frequency of Service</i> <i>Total Travel Time</i> <i>Affordability</i> <i>Reliability</i> <i>Comfort</i> <i>Security</i> <i>Safety</i>	<i>These attributes are evaluated qualitatively across options to determine the relative viability of each option.</i>		
Total Score			