

Making Kathmandu Walk Again

: Planning and Designing for People Friendly Kathmandu

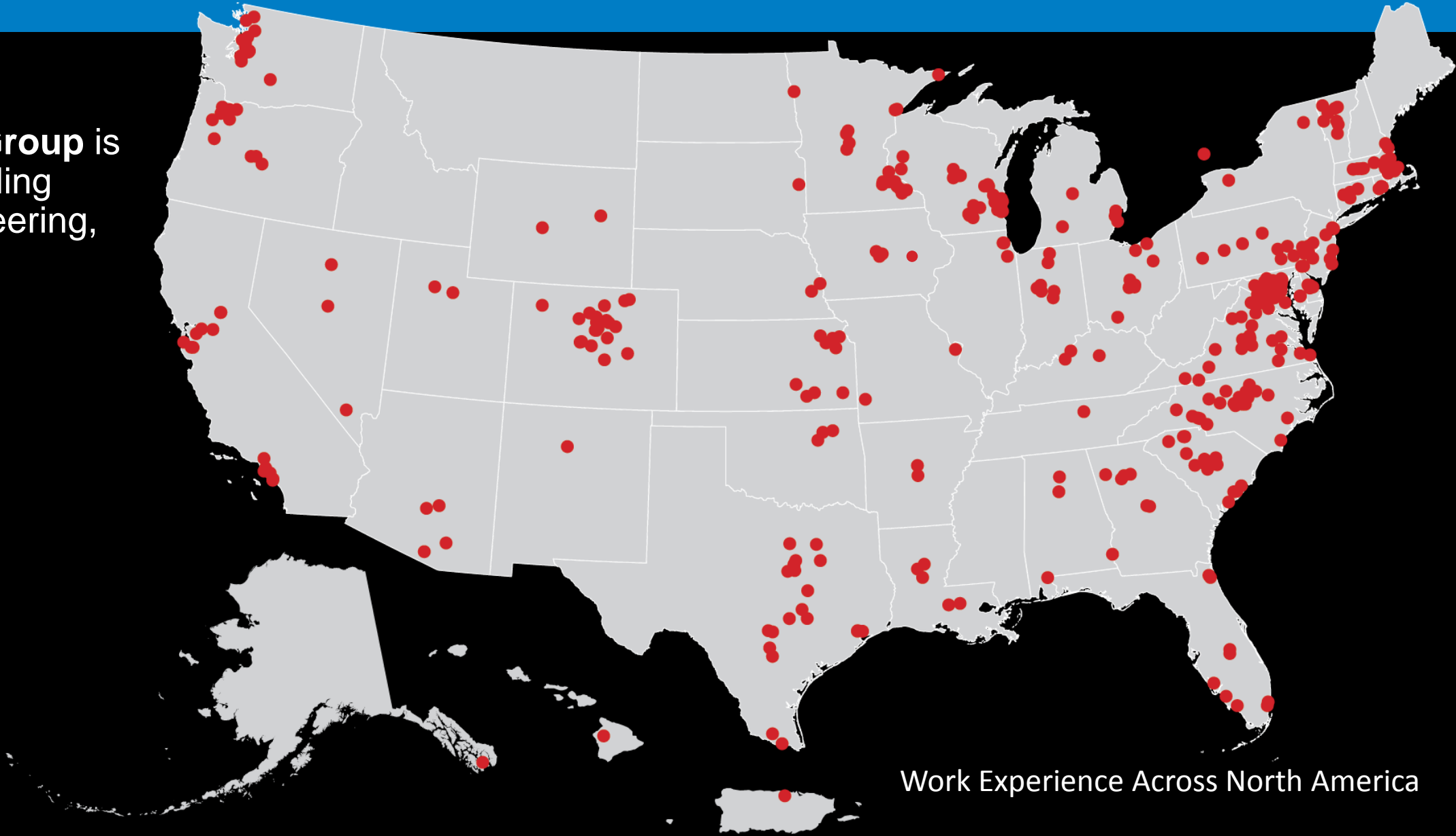
Sagar Onta, PE, PTOE
Denver Engineering Director
Toole Design Group

NEA Talk Program
Kathmandu, Nepal
August 2018

Toole Design Group



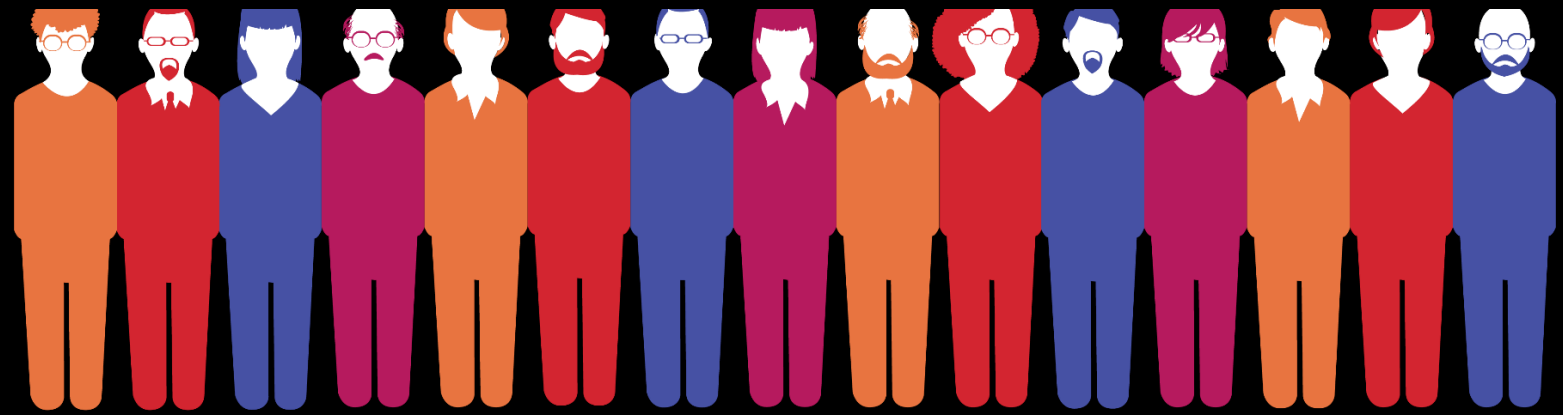
Toole Design Group is the nation's leading planning, engineering, and landscape architecture firm specializing in multimodal transportation.



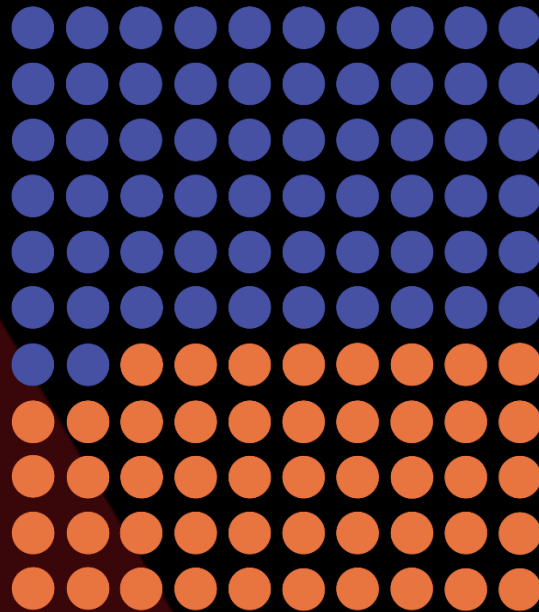
Work Experience Across North America

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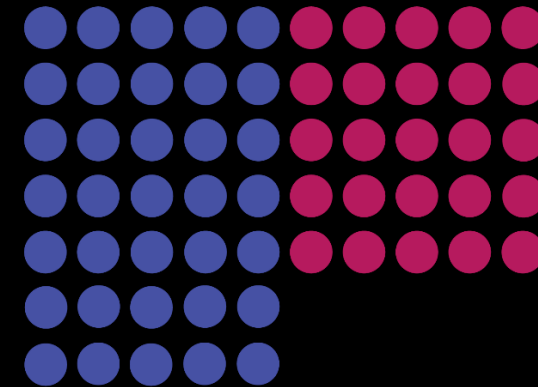
- WTS Colorado – 2017 Employer of the Year
 - Women-owned
 - Of the 10 primary offices, half are led by women



150+ EMPLOYEES **13 OFFICES**

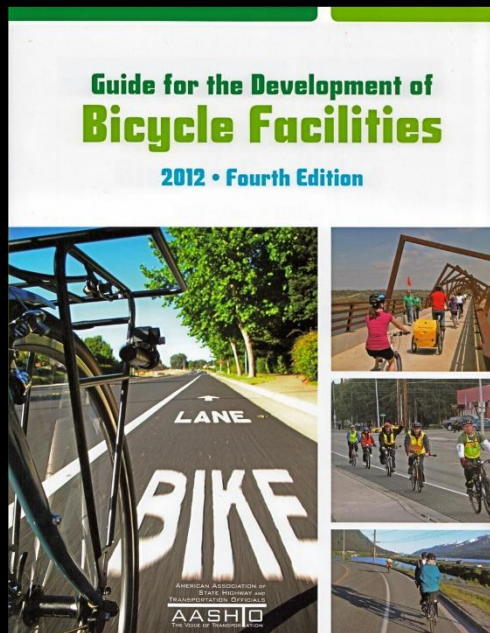


**EQUAL DESIGN
AND PLANNING**

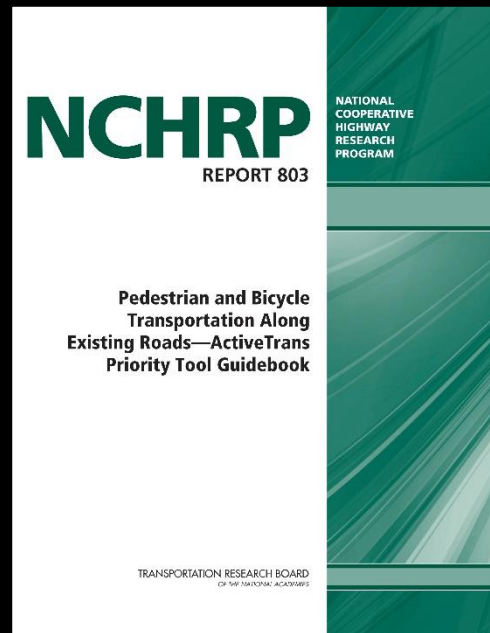


41%
WOMEN DESIGNERS

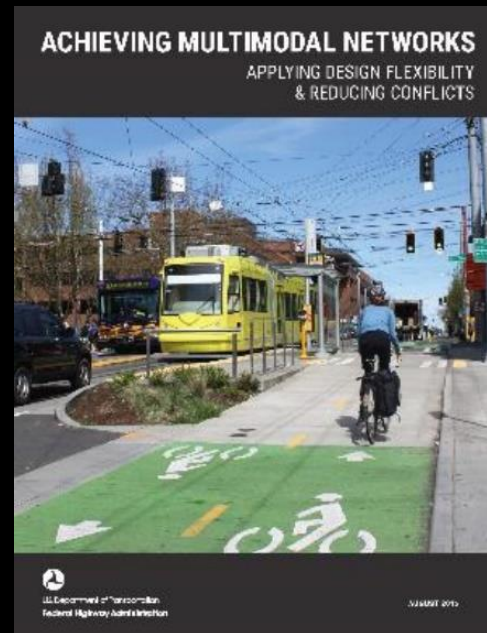
Our guidance work



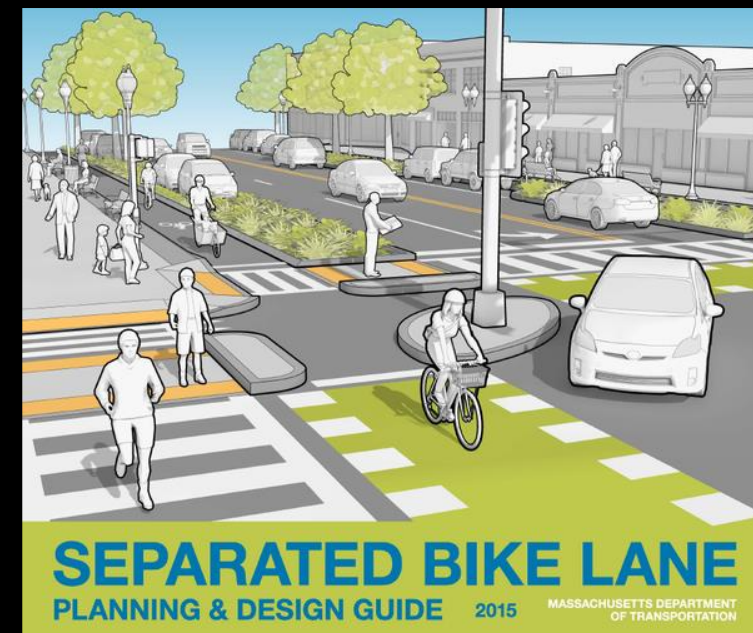
AASHTO *Guide for the Development of Bicycle Facilities*



NCHRP 803 *Pedestrian and Bicycle Transportation Along Existing Roads*



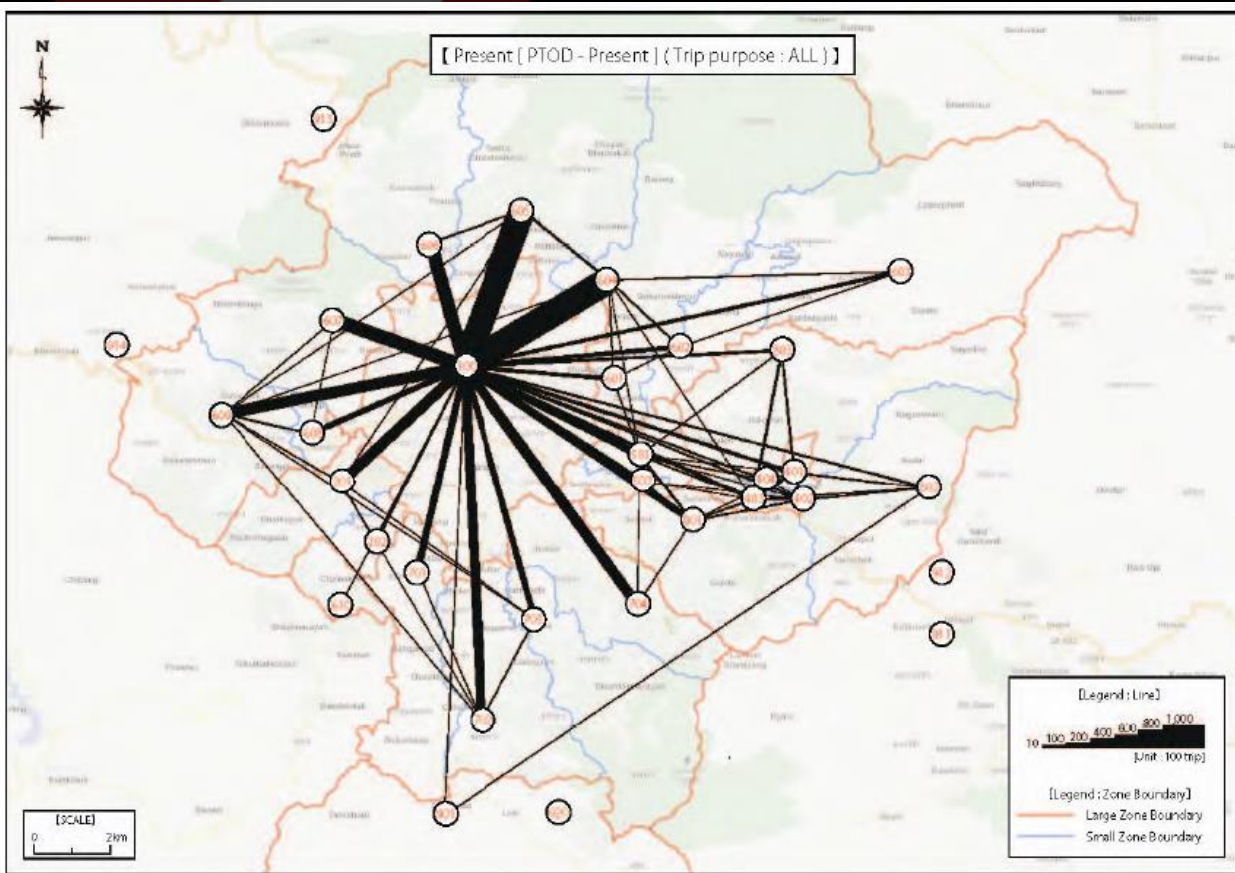
FHWA *Achieving Multimodal Networks: Applying Design Flexibility & Reducing Conflicts*



Massachusetts DOT *Separated Bike Lane Planning & Design Guide*

Transportation Planning Challenges

- Expensive to model travel demand for many cities
- TAZ do not match City's preferred zones
- Available model outputs may not include City's priority projects
- Emerging technologies are likely to dramatically transform travel behavior in the next 20-30 years – Difficult (if not impossible) to predict behavior



Source: JICA Survey Team

Figure 6.1.18 Person Trip Desire Line Map (All Purposes)

Changing the Paradigm

Old Method

Survey
Behavior



Travel Demand
Model



Forecast
Growth



Identify
Projects /
Policy /
Programs



New Method

Planning

Community
Vision



Identify
Projects /
Policies /
Programs



Check
viability



Conduct
detailed
analysis



Seek
Funding

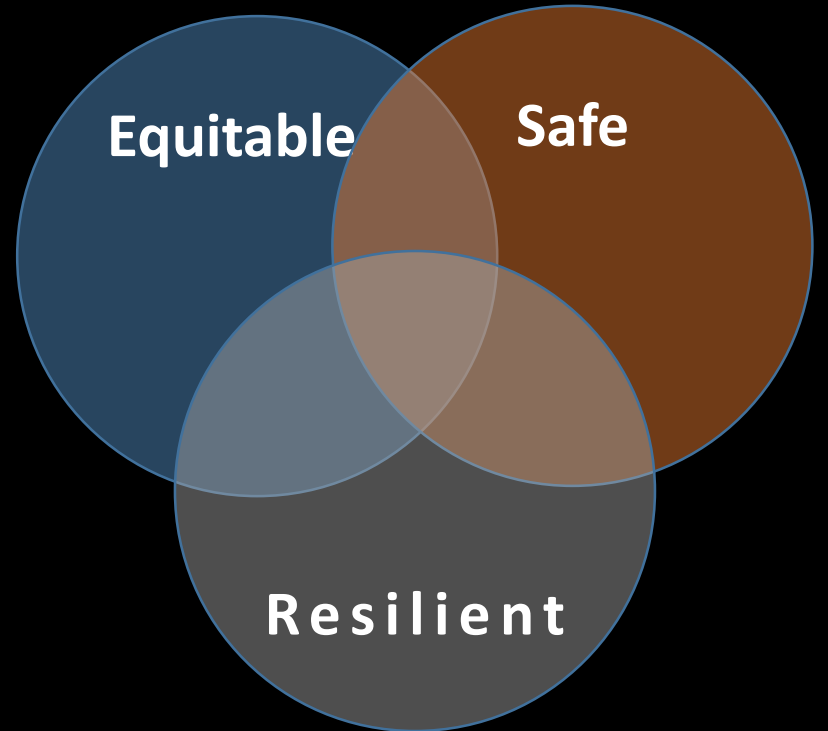




Back to the Basics

- Rely on core principles on how transportation can make communities
 - Economically vibrant
 - Entrepreneurial and innovative
 - Socially harmonious and safe

Transportation that is:





Highway vs Urban Street

- Basic engineering education and practice focuses on high-speed highways connecting cities for:
 - Support economic development
 - Reducing time/cost of transportation
- Same philosophy is used for Urban Streets inside cities which is **WRONG**
- Transportation within cities :
 - Is not a means to an end
 - Is big part of living in cities – livability
 - Should be stress-free and enjoyable



Paradigm Shift

- Do not build roads to meet future demand
- Plan and build cities/roads to reduce travel demand and change behavior
 - Do not expand area of cities i.e. no outer ringroad
 - Provide safe bicycle and pedestrian infrastructures
 - Go high, not wide
 - Do not widen existing streets for vehicular capacity, instead build new street connections to distribute traffic







With 2020 hindsight, you decide the truth:

Option A: *“The City’s lifeblood is the highway. The mobility it provides is vital for economic health and the convenience of the motoring public. If anything, the highway should be expanded to fight congestion. Removing it is simply anti-progress.”*

Option B: *“Walkability and access to the waterfront, parks, trails, and other places in the downtown is key to the economic and social health of the City. The highway has contributed to the woes of the City and needs to be replaced with something that contributes to an urban context.”*







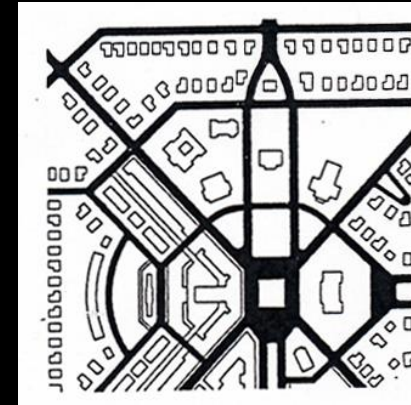
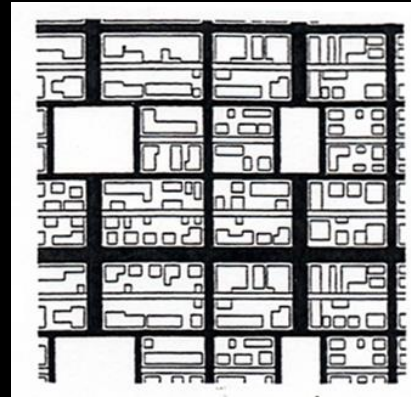
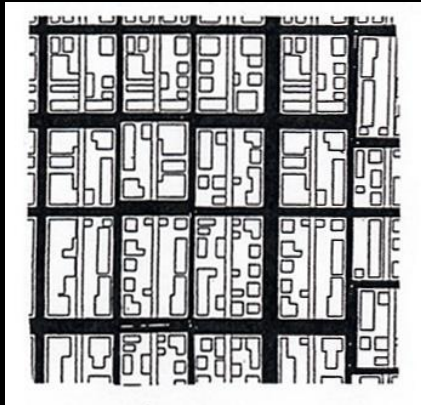


RIVERBEND '08

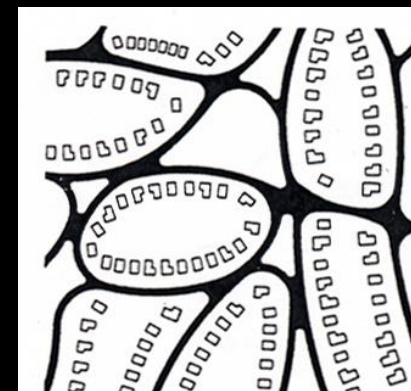
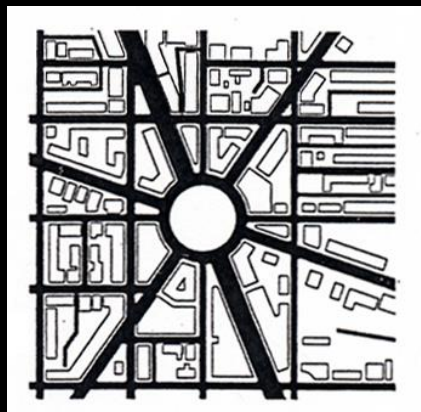
CHATTANOOGA, TENNESSEE - JUNE 8 - 14, 2008



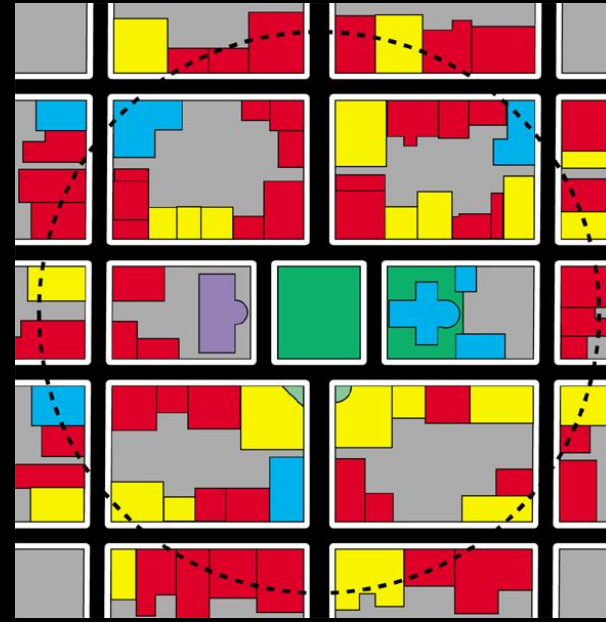
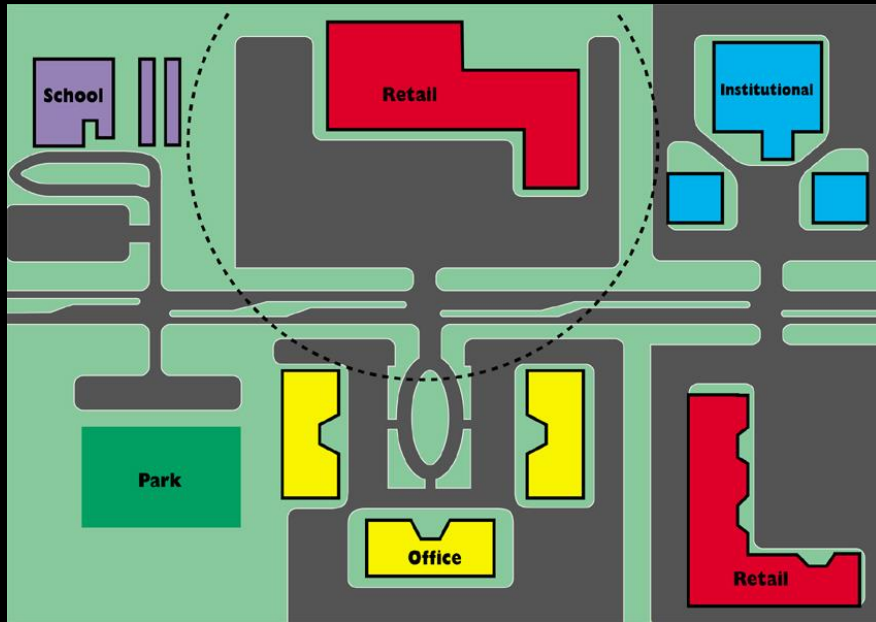
Connected Street Networks

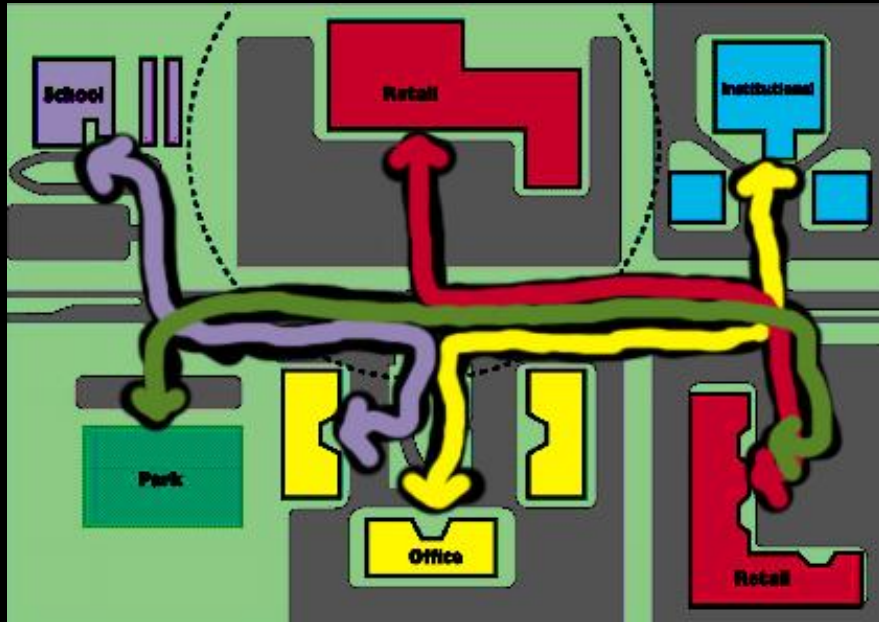


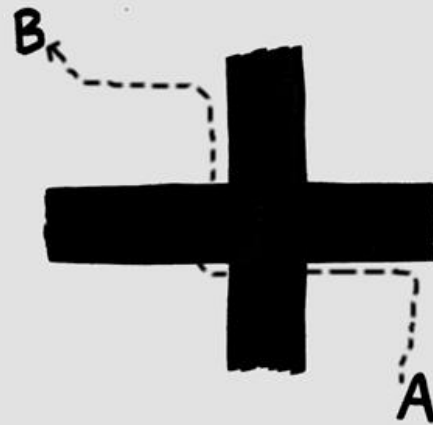
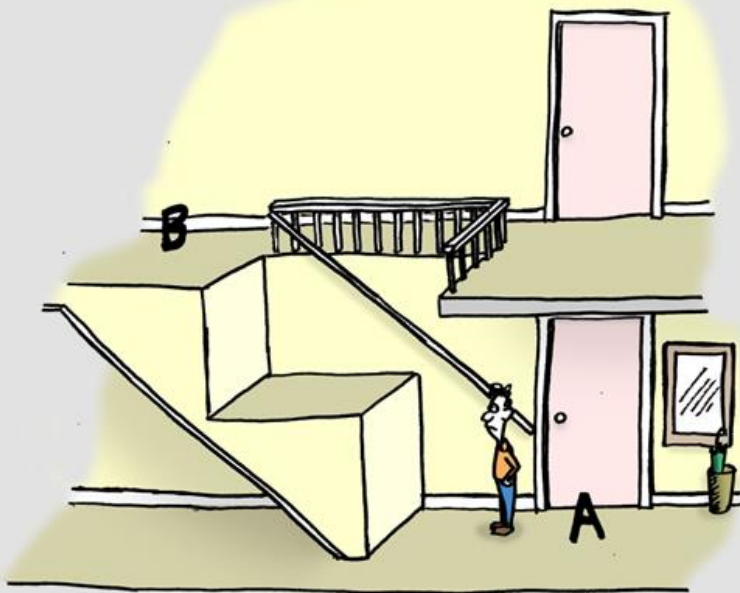
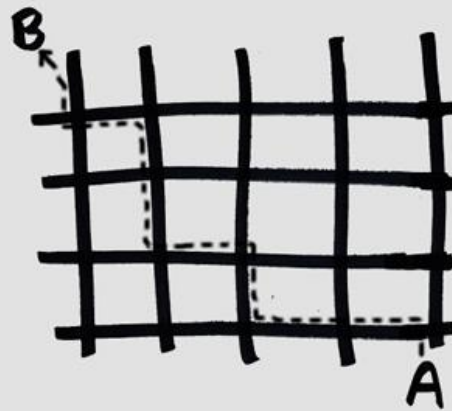
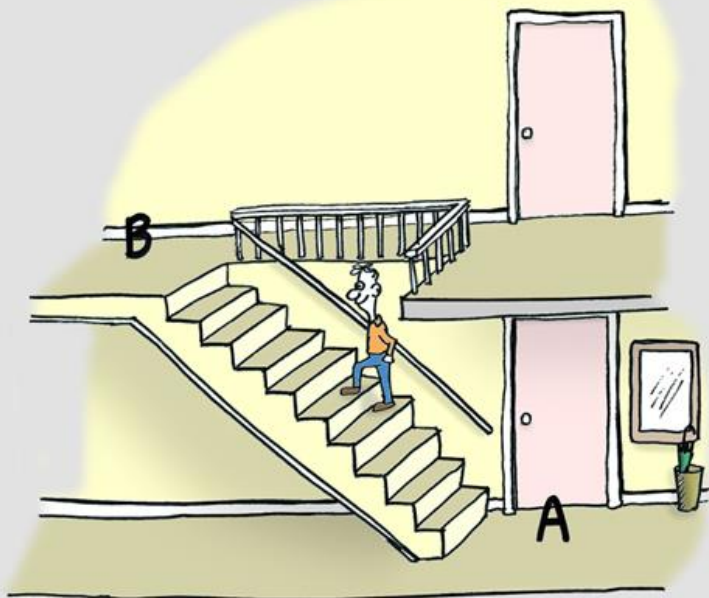
Streets are backbone of a City







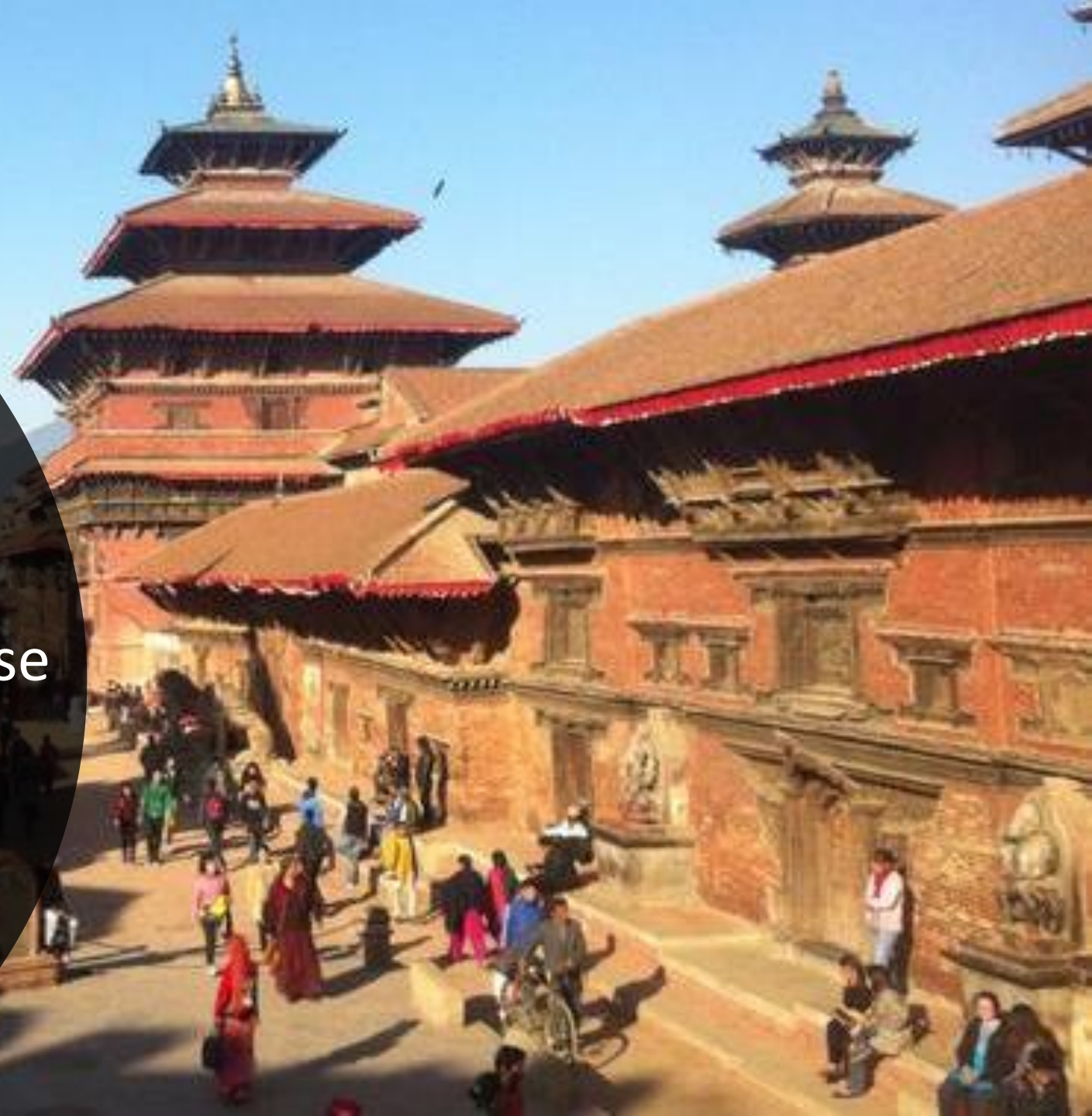




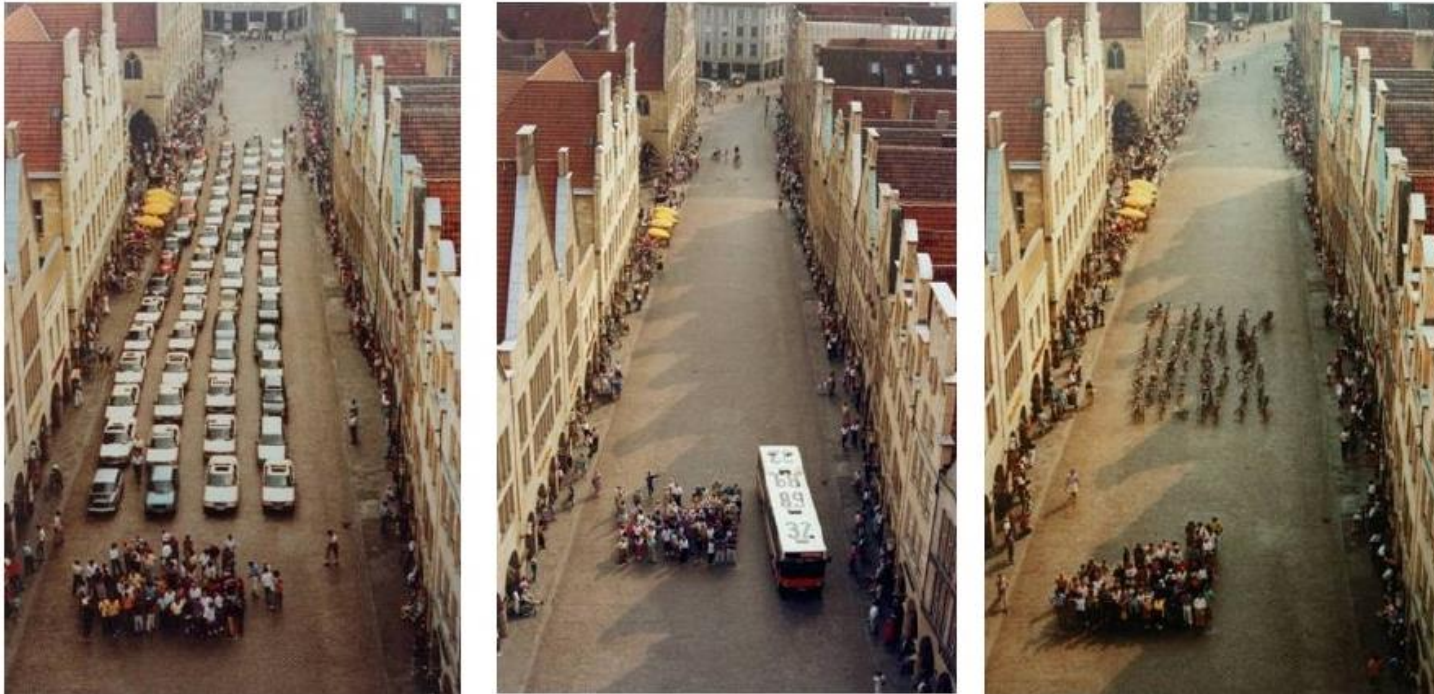
Lockwood

What is a City?

- **Land/River** – make the best use
- **People** – make them safe
- **Economy** – make it vibrant
- **Heritage** – preserve it



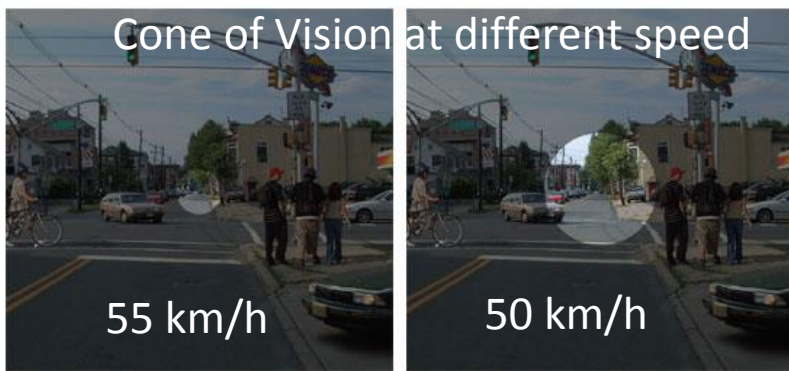
Efficient use of urban space



The amount of space required to transport the 60 persons by different modes

Best use of our very expensive Land

Cone of Vision at different speed



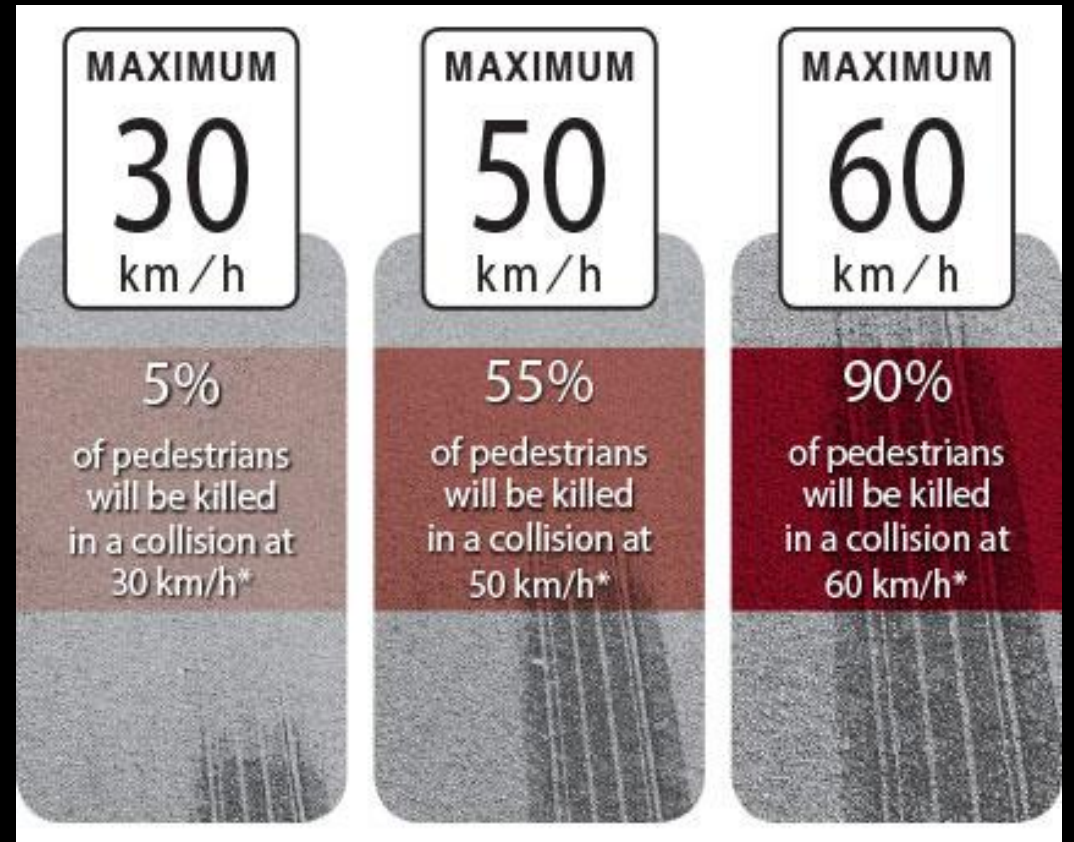
55 km/h

50 km/h




40 km/h

30 km/h

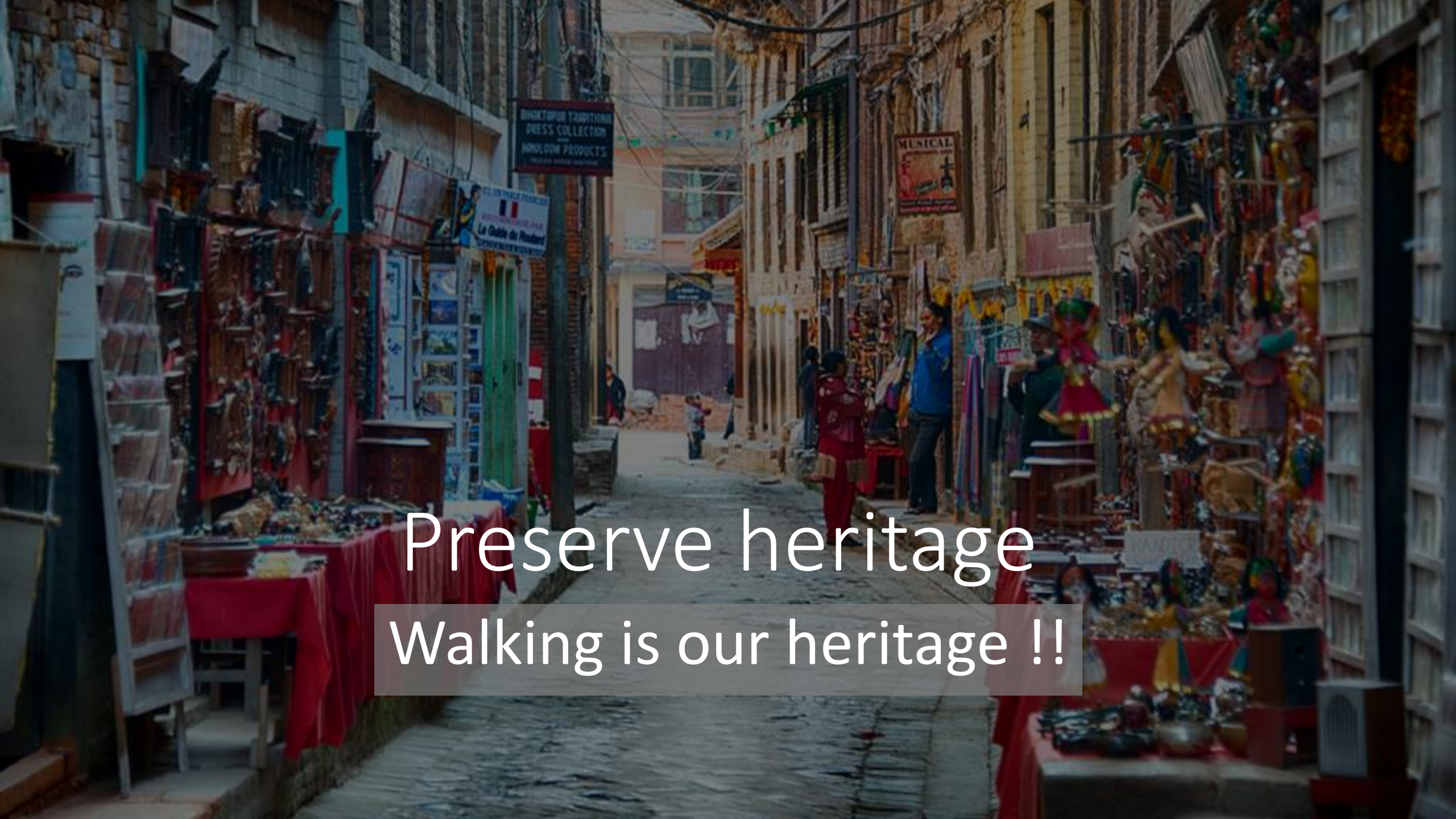


Make people safe



Economy that is vibrant

- Less government red-tape
- More people walking = high no of interactions = share ideas = innovation and entrepreneurial
- We are social animals



Preserve heritage
Walking is our heritage !!

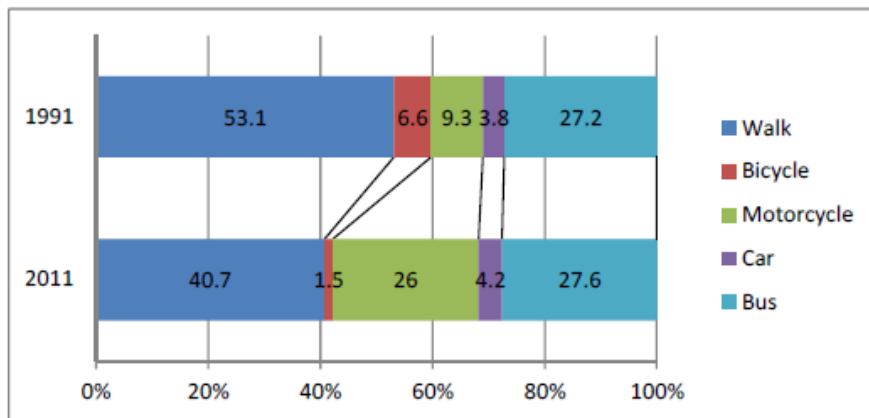
Travel Preference in KTM

Table 6.1.8 Trip Composition by Mode

| Travel Mode | Number of Trips | Percentage |
|-------------|-----------------|------------|
| Walk | 1,398,378 | 40.7 |
| Bicycle | 52,445 | 1.5 |
| Motorcycle | 893,126 | 26.0 |
| Car | 145,980 | 4.2 |
| Bus | 948,464 | 27.6 |
| Total | 3,438,393 | 100.0 |

Source: JICA Survey Team

- Walking is still the king
- Walking should be promoted :
 - For health
 - For social harmony
 - For innovative interactions

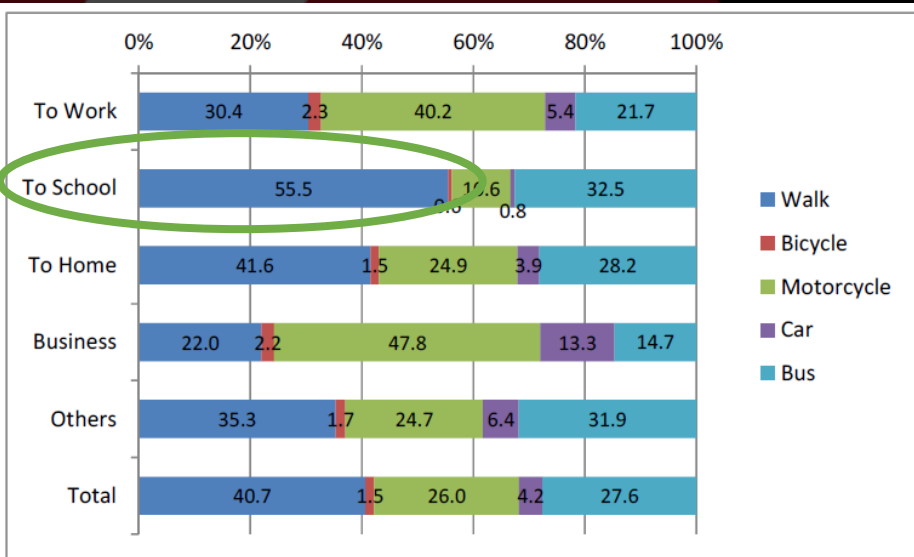


Source: JICA Survey Team

Figure 6.1.24 Comparison of Travel Modes between 1991 and 2011

How to Make KTM Walk Again

- Design streets that are safe and inviting
- City defines project
- Donor/city selects consultant/facilitator based on experience working with community, not how many big projects they have completed
- Urban Designer to lead projects, supported by engineers



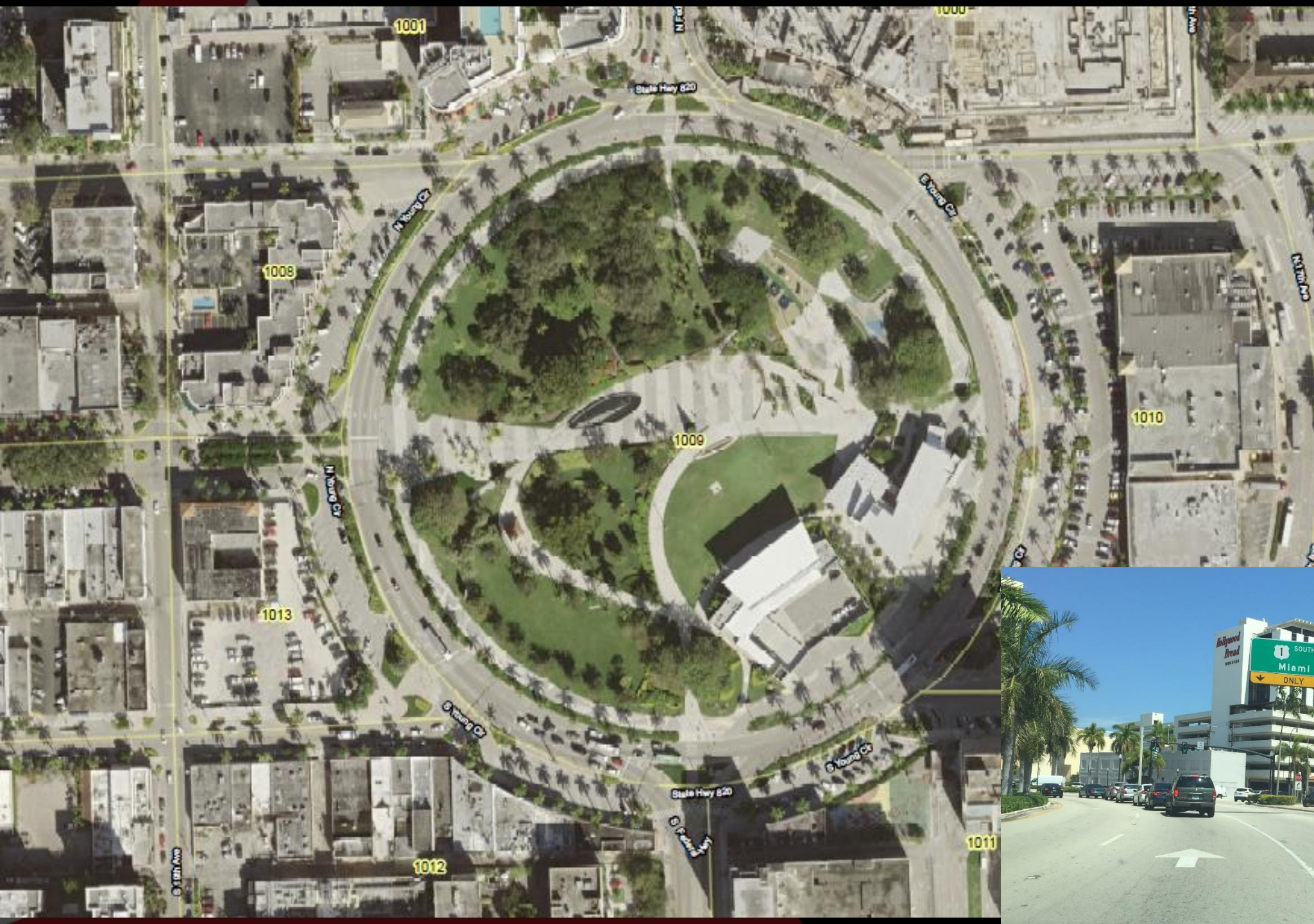
Source: JICA Survey Team

Figure 6.1.25 Travel Mode by Trip Purpose

Community Led Infrastructure Development

- **Day 1:** Site visit, public meeting to hear from community what they like, dislike and core values
- **Day 2-3:** Work from city offices, open to public, meeting with stakeholders, mayors, department heads
- **Day 4:** Draw conceptual designs based on public input, public meeting to present to all





Example:
CLID

The
Problem



One of the biggest circles

The Process



1,000 ft.



750 ft.



480 ft.



220 ft.

Big circles manage traffic by making it smaller or no traffic



545 ft.
1,100 ft.



430 ft.
1,200 ft.



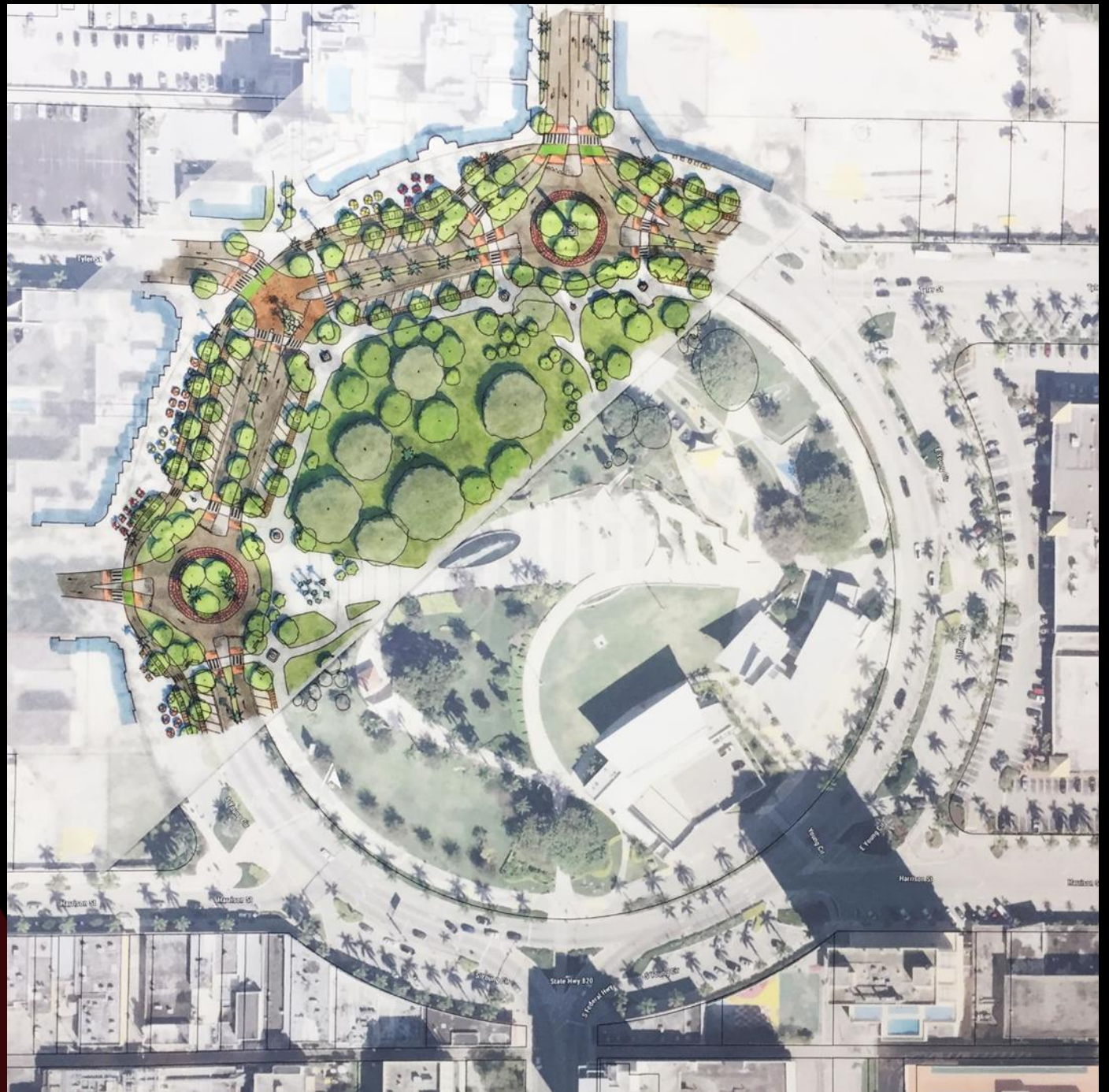
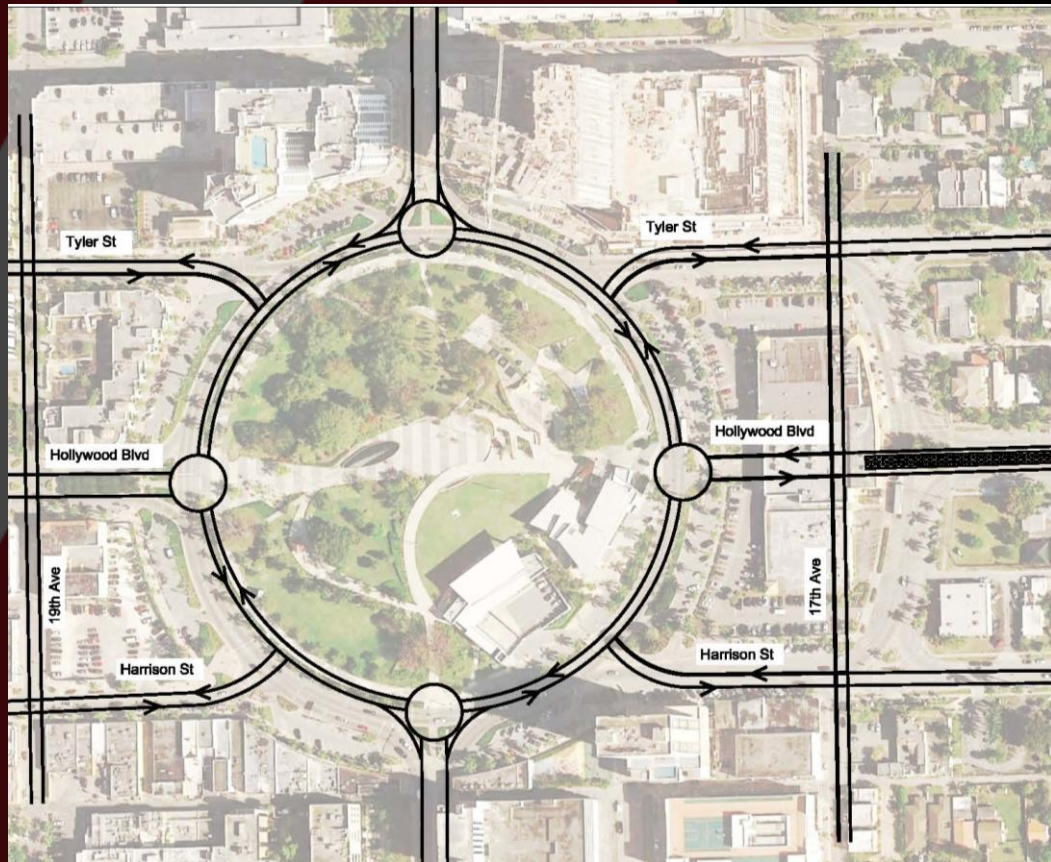
1,140 ft.

| Options | Description |
|---------|--------------------|
| 1 | Remove Signals |
| 2 | 1 + Ped Bridge |
| 3 | 1 + Underpass |
| 4 | Tweaks & Slow |
| 5 | By-Pass |
| 6 | Calm Flow |
| 7 | Stop n Go |
| 8 | Network Options |
| 9 | US 1 Tunnel |
| 10 | Central Roundabout |
| 11 | Flow Meter |

Options Comparison

| | Walk-ability | Pedestrian Safety | Historic Compatibility | Access to Park | Bike friendly | Direct ness | Event Closures | Traffic Flow | Total |
|----|--------------|-------------------|------------------------|----------------|---------------|-------------|----------------|--------------|-------|
| 1 | | | | | | | | ★ | 1 |
| 2 | | ★ | | | | | | ★ | 2 |
| 3 | ★ | ★ | | ★ | | | | ★ | 4 |
| 4 | ★ | ★ | | ★ | ★ | | | ★ | 5 |
| 5 | | | | ★ | | ★ | ★ | ★ | 4 |
| 6 | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | 8 |
| 7 | ★ | ★ | ★ | ★ | ★ | ★ | ★ | | 7 |
| 8 | ★ | ★ | | ★ | ★ | ★ | ★ | ★ | 7 |
| 9 | ★ | ★ | ★ | ★ | ★ | | ★ | ★ | 7 |
| 10 | ★ | ★ | | ★ | ★ | ★ | | ★ | 6 |
| 11 | ★ | ★ | ★ | ★ | | | | ★ | 5 |

The Product



Community Guided Infrastructure Development

- All projects must be guided by the community
- Design may be conducted in consultant offices but it must very guided / checked / verified by the community
- Need the process to be transparent
 - Public meetings on government plans
 - Public meetings to review design concepts
 - Public accountability/inspection during construction



Fort Collins stakeholders attend an open house about the Bicycle Master Plan.

Pedestrianize core cities

- Work with businesses and residents
- Thamel to Basantapur
 - May be provide electric scooters for mobility
 - Assign shop in each block to manage scooter
- All historic areas of Patan, Bhaktapur, Thimi, Kritipur





Engineers – be accountable

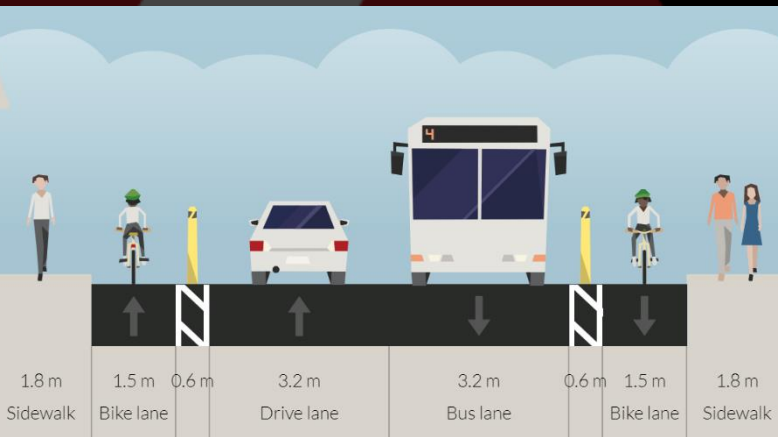
- Implement adopted policy and standards
- Use sound engineering judgement
 - KTM roads are NOT engineered
 - Roadway alignment are not made for safe travel
 - Don't use current alignment to widen roads
- Change alignment to make it safe
 - Able to see around corners (intersection sight distance)
- Will require additional property takes
 - Include in cost of project
- Don't allow vehicles in construction zones !!



People friendly streets

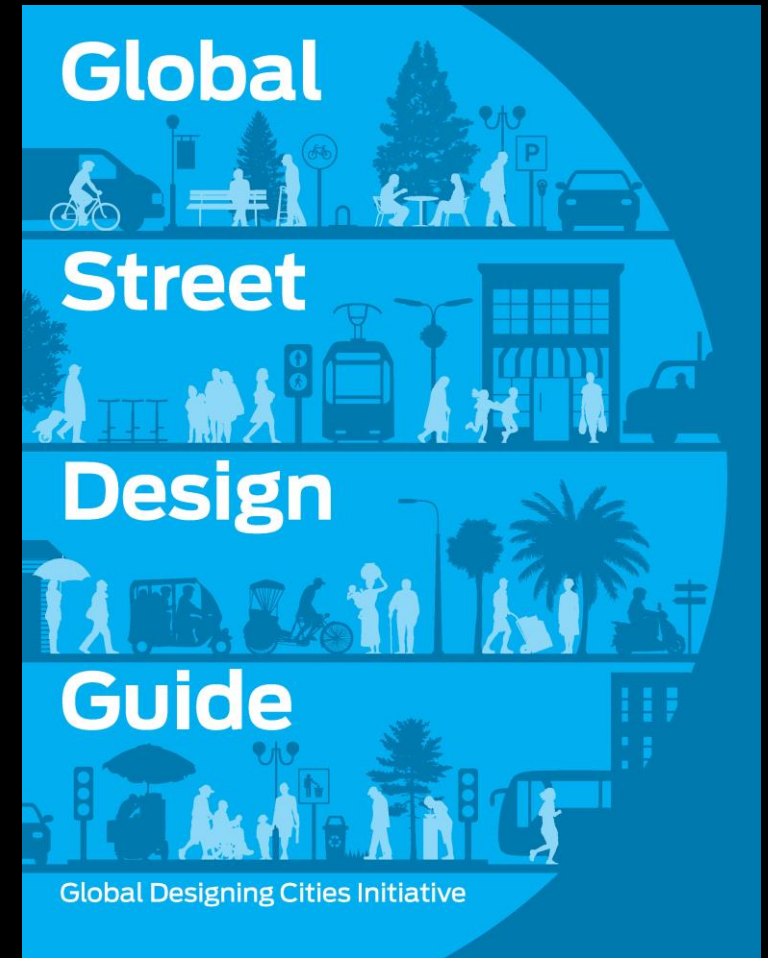
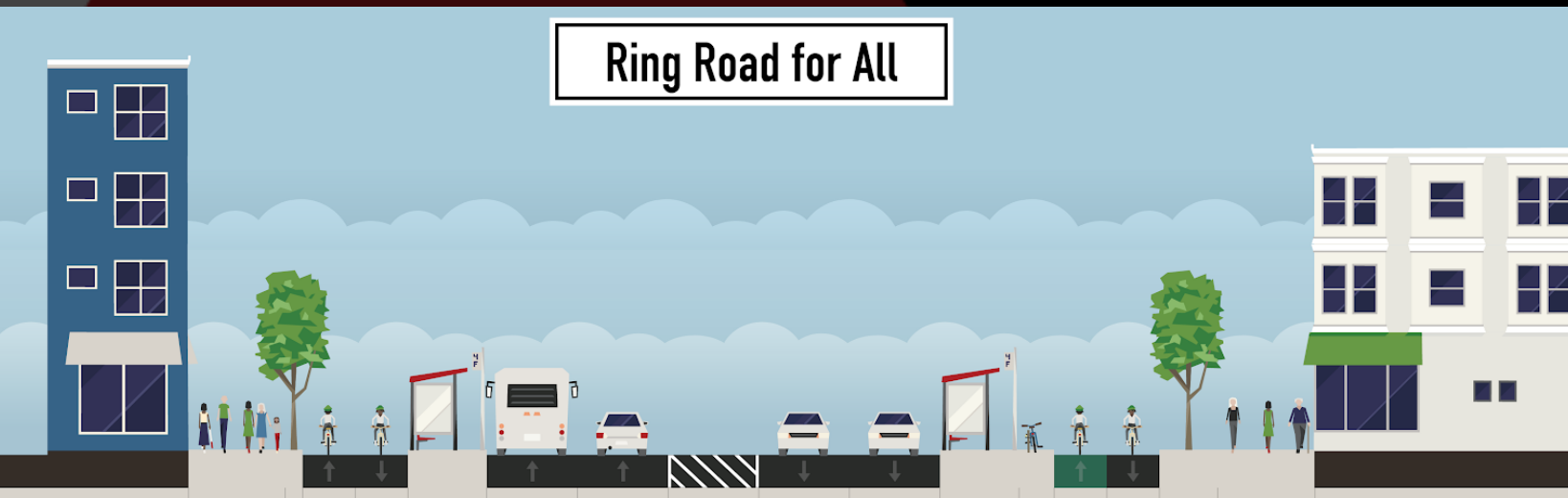
- Adopt and follow **Global Street Design Guide**
- Published by NACTO, National Association of City Transportation Officials

URBAN STREET
14.2 m ROW minimum



<https://nacto.org/global-street-design-guide-gsdg/>

Ring Road for All



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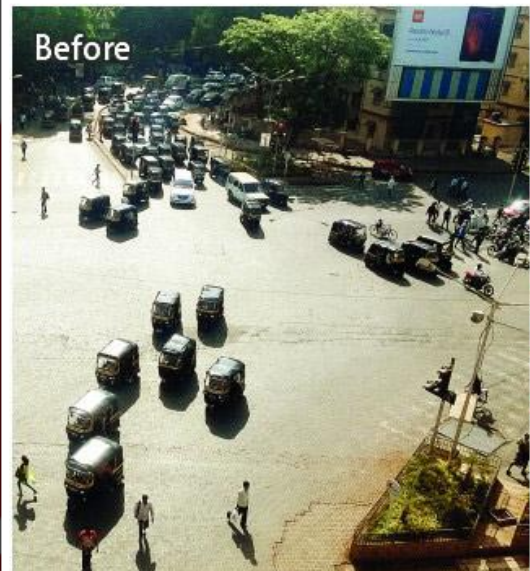
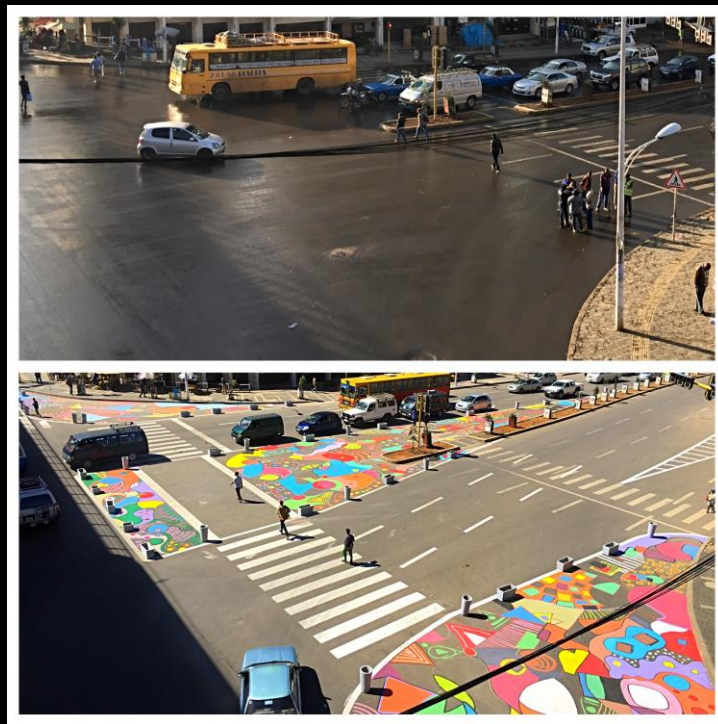
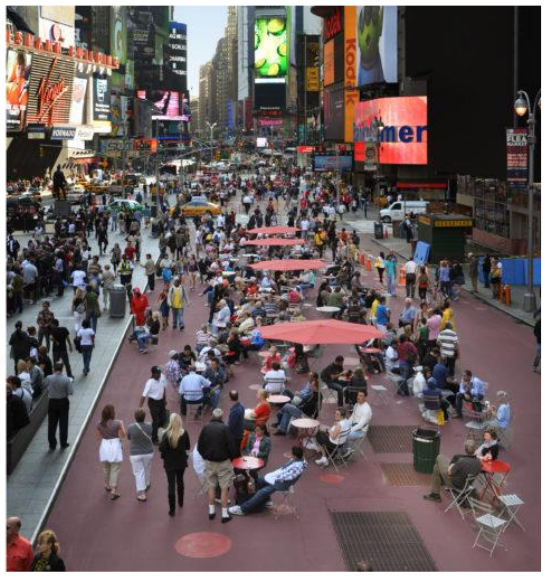
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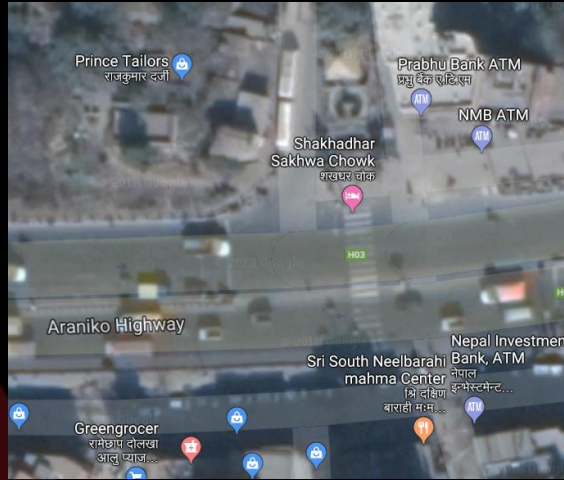
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Tactical Urbanism

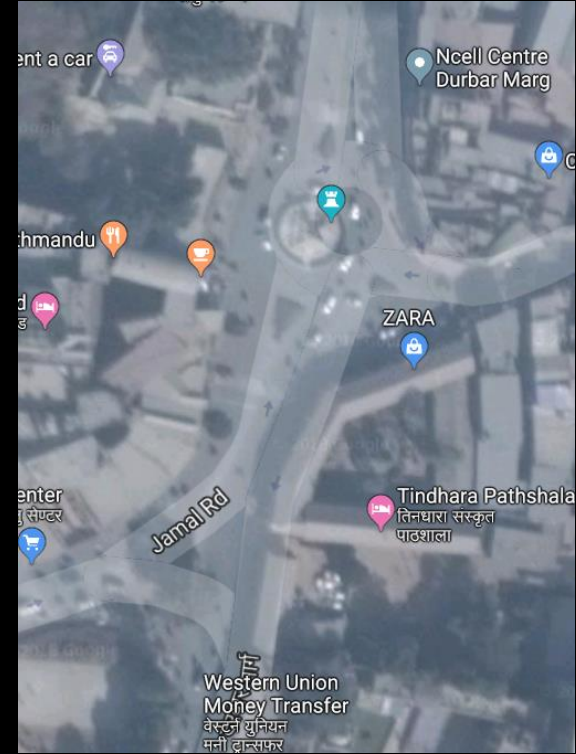




Must address DRAINAGE



Arniko Highway intersections



Durbar Marg

Curb Extensions

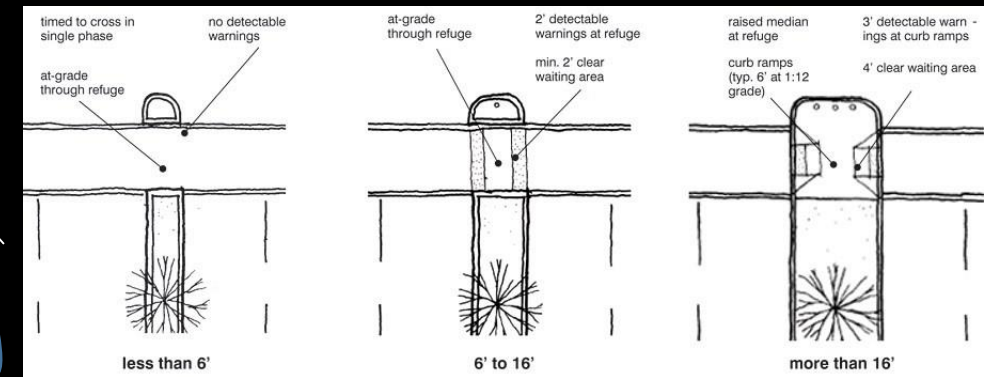


Arniko Highway Intersections

Must provide adequate space for people to stand, esp. those with disability



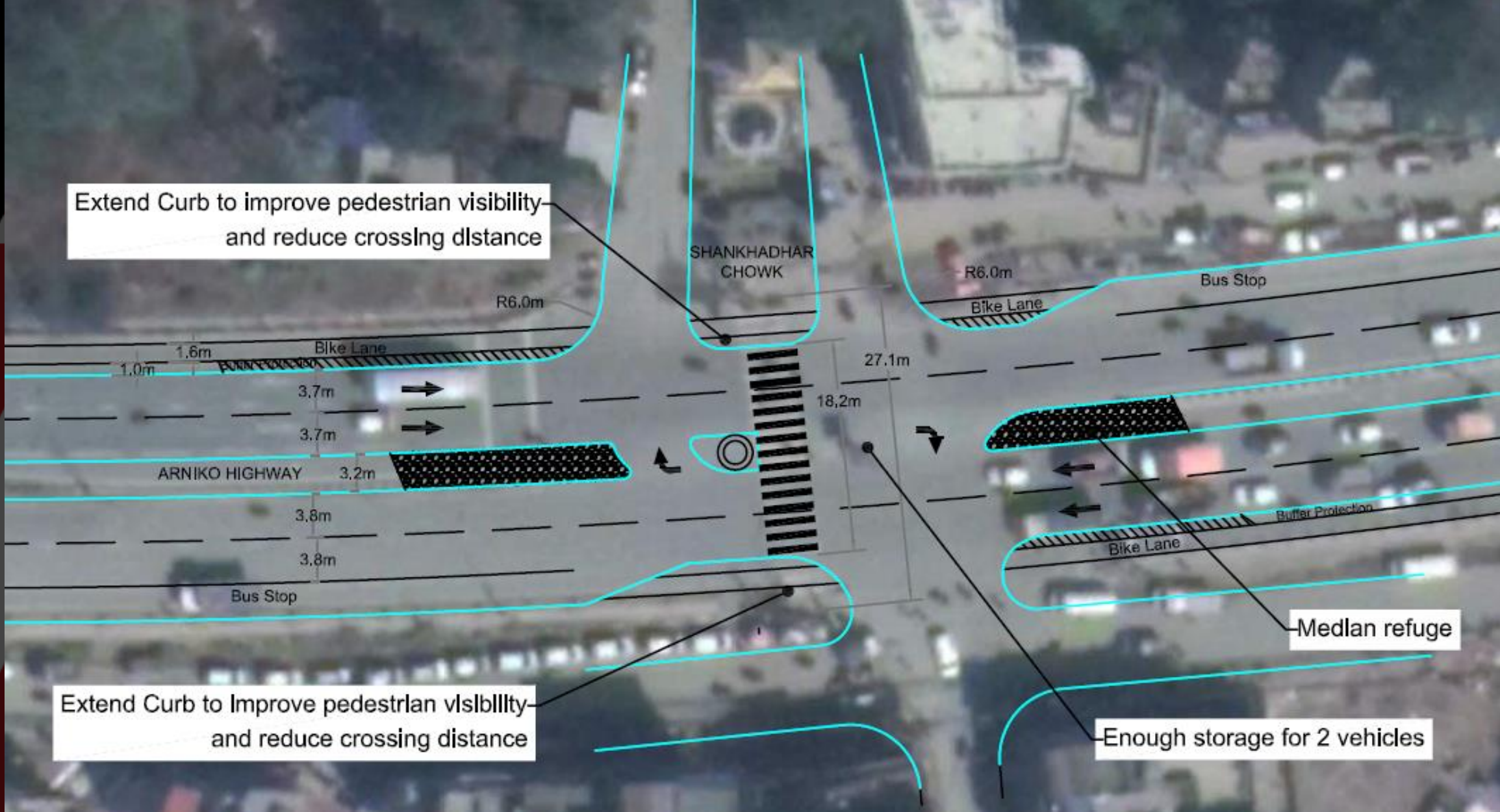
Durbar Marg !!!???



Median Refuge

Example: Shankhadhar Chowk, Thimi





Prepared By: Sagar Onta, PE
 Toole Design Group

Date: August 16, 2108

**ARNIKO HIGHWAY AND SHANKHADHAR CHOWK
 PEDESTRIAN SAFETY IMPROVEMENT OPTION**

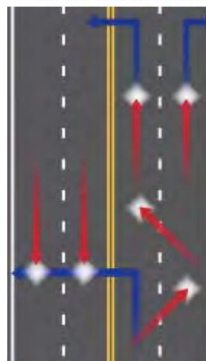
**Madhyapur Thimi Municipality
 Office of Mayor**

**FIGURE
 1**

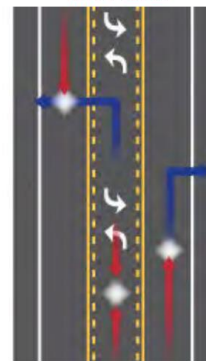
Road Diets

- Improve safety
- 2-lane + 1 center-turn lane capacity is 20,000 ADT
- 4-lane + 1 center-turn lane capacity is 52,000 ADT
- Ringroad 2012 ADT ranges from 18,000 – 50,000 ADT

Four-Lane Undivided



Three-Lane



Ring Road for All

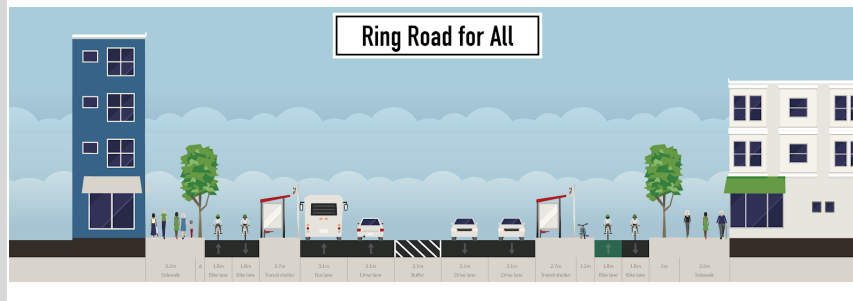
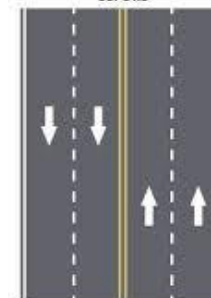


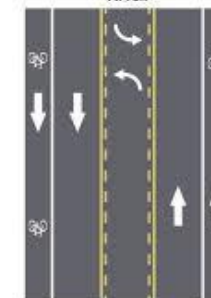
Table 6.2.8 Road Capacity

| | Urban (Inside the Ring Road) | Rural (Outside the Ring Road) |
|---------------|------------------------------|-------------------------------|
| Narrow 2-lane | 6,000 | 7,000 |
| 2-lane | 17,000 | 20,000 |
| 4-lane | 52,000 | 57,000 |
| 6-lane | 75,000 | 83,000 |

BEFORE



AFTER



Conclusion

- Kathmandu is a very walkable and bikeable metro
- Stop widening roads to accommodate more cars – induced traffic
- Distribute vehicular traffic by opening critical road connections
- Modify alignments to improve safety
- Invest big in transit and BRT for mass transportation
- **Re-design streets (long-term) to made it safe for pedestrians**
- **Use tactical urbanism (short-term) to make streets safe**
- Implement **Community Led Infrastructure Development**



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Questions and Discussion