SOUTH AFRICA ROAD FEDERATION

Non-Motorised Transport Practitioner's Course

12 NOVEMBER 2020

Session 8: Bike Share Systems & Community Cycling Programmes (Case Study)

SARF
founded in 1950

Session 10: Bike Share Systems and Community Cycling Programmes

Part 1: Planning a Bike Share System

Part 2: Designing Bike Stations

Part 3: Cycling Network Infrastructure

Part 4: Community Cycling Programmes

Bike Share systems

Resources:

- Bike share systems – a comprehensive approach

  (The Bikeshare Planning Guide, ITDP 2018 *Excerpts from the Planning Guide*)
- Presentation only covers the planning and physical aspects of bike share schemes
- Overview of all the other aspects involved in Bike Share systems, international best practice.

Number of Bike Share systems worldwide

Continent	Number of cities with Bike Share	
North America	Canada	7
	USA	58
South America	South America incl. Mexico	19
Asia		43
Australasia	Australia	10
	New Zealand	2
Africa		0?

https://en.wikipedia.org/wiki/List_of_bicycle-sharing_systems#Cyprus
Page updated 29 June 2018

The Bikeshare Planning Guide, ITDP 2018

1. INTRODUCTION

1.1 Understanding the Current Bikeshare Landscape

1.2. The Opportunity of Bikeshare

2. GETTING STARTED

2.1 Building Political Will

2.2 Equity and Accessibility

3. GOAL SETTING & INITIAL PLANNING

3.1 Identify Goals for Bikeshare

3.2 Examine Feasibility & Choose a System Type

3.3 Draft Financial Planning Estimates

4. SYSTEM PLANNING AND REGULATION

4.1 Planning Station-Based Systems

4.2 Planning & Regulating Dockless Systems

4.3 Cycling Infrastructure Network

4.4 Information Technology Systems and Payment Mechanisms

4.5 Bikes

The Bikeshare Planning Guide, ITDP 2018

5. ENCOURAGING RIDERSHIP THROUGH COMMUNITY ENGAGEMENT

5.1 Communications and Marketing

5.2 Community Outreach and Education

5.3 Ensuring Equity by Reducing Barriers to Entry

6. SYSTEM OPERATIONS

6.1 Organizational Structure

6.2 Asset Ownership

6.3 Contracting Structure

6.4 Enforcement

7. FINANCIAL MODEL

7.1 Capital Costs and Financing

7.2 Operating Costs

7.3 Revenue Streams

8. IMPLEMENTATION

8.1 Implementing a Privately-Operated System

8.2 Implementing a Public- or PPP-Operated System

9. PLANNING FOR AN UNKNOWN FUTURE

Part 1: Planning a Bike Share System

- Examine Feasibility & Choose a System Type
- Solicit Community Input and Ideas
- Determine Service Area
- Determine System Size
- Choose a Bike share System Type
- Choose a bike to best fit the environment, look

Planning a Bike Share System

Examine Feasibility & Choose a System Type

- A feasibility study will estimate basic system metrics, evaluate potential investment and revenue sources, and recommend (the agency or department conducting the feasibility study may not be the implementing agency) a contracting or permitting model and an organizational structure.
- Identifying local contextual elements and potential obstacles to implementation such as weather, topography, cycling infrastructure, culture, and political and legal realities, is critical as well.
- The goal of a feasibility study, though, is to inform planning decisions that will yield the most successful bikeshare system possible.

Planning a Bike Share System

Examine Feasibility & Choose a System Type

A successful bikeshare system should be:

- Safe, reliable, affordable and accessible to all potential users, consider elements like helmet laws
- Flexible and adaptable to changes in technology, trends, and operating models.
- Thoughtfully connected to public transit and other modes.
- Able to leverage and generate expanded investments and land use dedicated to cycling.
- A tool to help meet broader sustainability goals set by the city.
- Make use of attractively-styled, practical bikes

Compulsory Helmet Laws For Cyclists Are Rare Globally

Legal rules regarding helmet-use for cyclists worldwide in 2019*

* For example, in Canada helmets are mandatory in Newfoundland and Labrador. U.S. helmet laws vary by state with 21 having mandatory helmet laws for children.

@StatistaCharts

Source: Stuff.co.nz

statista

Planning a Bike Share System

Solicit Community Input and Ideas

- City should educate the public on the basics and opportunities of bikeshare, and seek input from community organizations, cycling advocacy groups, and residents about their views on how bikeshare should work in their city.
- Public meetings to share information about the feasibility study process, & in-person and online forums to provide comments and insights will help to establish transparency and cultivate a sense of ownership of the project among residents. Should continue past the feasibility study stage, and into system planning and implementation.

Planning a Bike Share System

Determine Service Area

- When beginning to plan a system, identifying a service area (the physical area within which Service Area bikes can be rented and returned) and saturating it with the appropriate number of stations and bikes is critical to cultivating high ridership.
- The service area should be grounded in dense, mixed-use areas with high trip-generation capacity, serving as both the origin and destination points of many trips. These areas—generally city centres—are likely to see the most demand for bikeshare. Should also extend to lower-density areas where connectivity to the transportation system may be lacking.
- For station-based systems, the service area must be large enough to contain a significant set of users' origin and destination points
- For dockless and hybrid systems, the service area is typically the jurisdictional boundary of the city, and has less of an impact on overall system usability than is the case for station based systems.

Planning a Bike Share System

Determine System Size

- The size of a bikeshare system is determined by the number of bikes (and number of stations).
- From a user perspective, density of stations and availability of docks (for station based systems), and availability of bikes (for all system types) will be the main considerations.
- For station-based systems, appropriate station density within the service area ensures that no matter where a user is, there will be a station within a convenient walking distance of both the origin and destination of their trip.
- A large area of dense stations creates a network that users can learn to count on for all their trips in the city.

Planning a Bike Share System

Choose a Bike share System Type

1. Station-based

- Systems that require bikes to be picked up from and returned to designated docking points or smart docks.

2. Dockless / geo-fencing

- Systems that do not require any standard docking points and do not have physical stations or hubs in which bikes must be locked. Users typically locate and unlock a bike via a web or mobile application and complete trips by closing the bike's on board lock.

Planning a Bike Share System

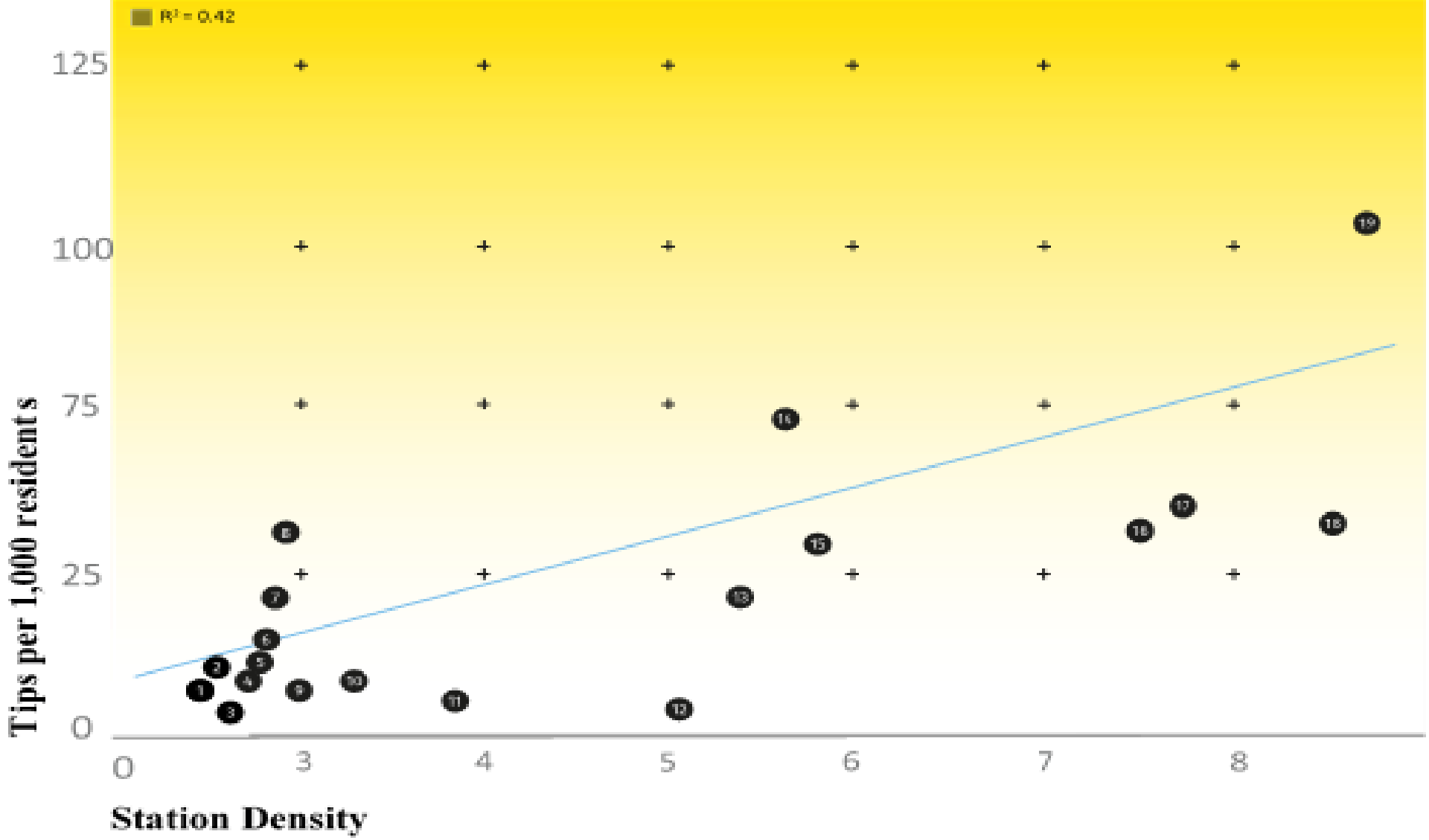
Choose a Bike share System Type

3. Hybrid

- Systems that include docking points at both physical stations and geo-fenced hubs.
- Users are given the choice to:
  - Pick up and return a bike to a station.
  - Pick up a bike from a station and lock it up anywhere within the designated hub.
  - Pick up a bike from within a hub and return it to a station, or
  - Pick up and lock a bike anywhere within the hub.

Part 2: Designing Bike share Stations

- Station Location
- Station Sizing
- Station Type & Design



1 Madison
2 Boston
3 Atlanta
4 Boulder
5 Minneaopolis
6 Chicago
7 Washington, DC
8 Montreal
9 Rio de Janeiro
10 Portland
11 Buenos Aires
12 Milan
13 Vancouver
14 Dublin
15 New York City
16 London
17 Paris
18 Barcelona
19 Mexico City

Bike share station location

On street

- Close to intersections
- Close to public transit stations
- High visibility and street lighting
- Low volume of cars, low speed limits
- Adjacent to bicycle infrastructure
- Not blocking manhole cover, storm drain, etc.

On sidewalk

- Sunny, minimal tree cover
- At least 2 meters of clear walking space
- Close to intersections
- Close to public transit stations
- High-visibility area and street lighting
- Easy access for users, as well as maintenance and rebalancing vehicles
- Close to bicycle infrastructure

Ideal Station Location Characteristics

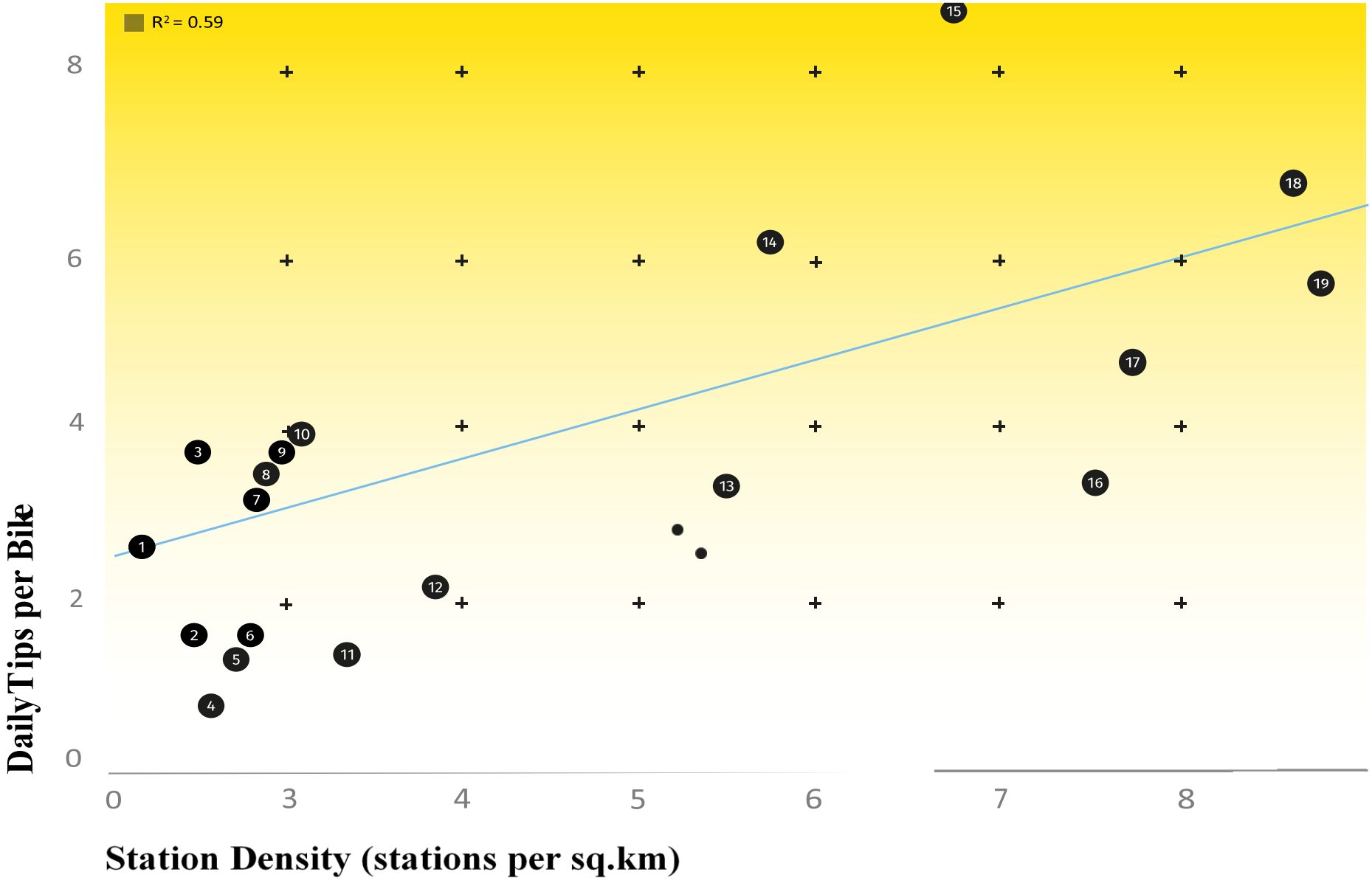
In general, bike share stations should:

- Achieve target station density
- Connect to public transport
- Support bike infrastructure
- Serve mixed-use areas
- Avoid physical barriers
- Offer multiple access points
- Provide access to the electrical grid (e-bike charging only)

Designing Bike share Stations

Station Sizing

- The next decision is about how big those stations should be, the number of bikes and the number of docking stations.
- This will depend on the demand of the area, which can be estimated using several different methods:
  - **Identify demand drivers**. Understand the variation in population, employment, and building density throughout the service area; high density often indicates high demand. Outlying or edge stations are more difficult to service and may be larger in size to avoid leaving a rider with no alternatives if the station is full or empty.
  - **Conduct surveys**. Interview transit riders and/or pedestrians to better understand where people are going and if they would consider using a bike for all or part of their trip if the option were available.
  - **Hold community workshops**. Consult the public to understand area demand and discuss what size stations fit best in what locations.


R² = 0.59
Daily Tips per Bike
Station Density (stations per sq.km)
0
2
4
6
8
0
3
4
5
6
7
8
1 Cologne
2 Madison
3 Boston
4
5 Boulder
6 Minneaopolis
7 Chicago
8
9 Montreal
10 Rio de Janeiro
11 Portland
12
13 Vancouver
14 New York City
15 Dublin
16
17 Paris
18 Barcelona
19 Mexico City

Designing Bike share Stations

Station Type & Design

- Station design is a function of the level of demand, the amount of space available, cityscape, and the desired visual impact on the urban environment. The choice of station type will need to take into account the IT requirements for each option.
- Stations are composed of bicycles, docking spaces, and terminals, also known as kiosks. Docking spaces are where the bikes are parked and locked when not in use. In some systems, users can check out bikes at the docking space. Docking spaces represent the single largest capital cost in many systems, but a greater number of docking spaces helps cut operating costs by reducing the need for rebalancing of the bikes.

Designing Bike share Stations

Station Type & Design

There are two main types of stations – Modular and Permanent:

1. Modular

- Modular stations are easily moved, usually constructed on a base that is then bolted into the concrete or asphalt. In some cases, these stations are powered by solar power because they do not connect directly to the city's electrical grid.
- If a station location is found to be inadequate after it is built, modular stations can be fairly easily relocated to a place with better demand.
- Stations like this are also more easily scaled up or down, adding or removing docking spaces or racks as real usage is determined after opening.

Designing Bike share Stations
Bike Share Systems Planning

Station Type & Design

2. Permanent

- These stations require excavation and trenching to reach the power source. Requires a longer time frame to implement and may entail a more onerous approval process.
- Permanent stations may be preferred for systems with pedal assist e-bikes, so that bikes can be charged while they are checked into a station.

Designing Bike share Stations

Station Type & Design

2. Permanent (continued)

- In automated stations, there are two basic types of station design that accommodate check-in and check-out: *docking spaces and cycle parking areas*.
- A system may incorporate both station types depending on demand levels, desired street views, and availability of space at a particular station.
- Whether a system uses docks or parking areas, stations should always have more docking positions or storage space than bikes to accommodate peak demand.

Part 3: Cycling Infrastructure Network

Provide cycling infrastructure

- Commitments to improve infrastructure and street efficiency benefit users of bikeshare and cyclists more generally, as well as pedestrians.
- A bikeshare system could be viewed, by some, as increasing competition for public space on the sidewalk, green space, and parking space.
- Cities can kerb these sentiments by developing streetscapes that maximize space and usability for sustainable modes—complete streets—and using bikeshare as a catalyst to improve accessibility.

Cycling Infrastructure Network

- While bikeshare can be implemented even if there is little existing cycling infrastructure, pairing the construction of new bike lanes with the opening of a bikeshare system can add to public acceptance and improve safety for users of the new system, as well as personal bike riders.
- Building bike lanes has been shown to increase bike ridership, and when integrated with bikeshare, can make a compelling case for additional infrastructure investments that will continue to increase the number of bikes on the road.
- Conversely, a large uptick in the number of cyclists on the road because of bikeshare can be a visible reminder of the need for safe, separated bike lanes. Data generated from bikeshare trips can provide evidence of the impact of bicycle network improvements. This evidence showing that bike infrastructure is being used could even help make the case for more investment in bike infrastructure.

Part 4: Community Cycling Programmes

South Africa: distribution of and access to bicycles

- Problem: mobility of children
  - Population: 57.725m (12/2018)
  - GINI: 63.0 (high inequality)
  - 40% of income spent on travel
  - 16m school learners
  - 12m walk to school
  - >3m + walk > 1 hour per day to school: absenteeism, fatigue

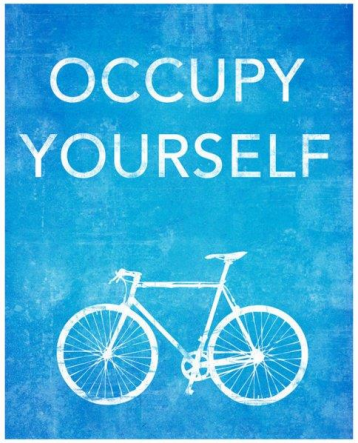
transport
Department:
Transport
REPUBLIC OF SOUTH AFRICA

- NDoT Shova Kalula
  - 2001-2018: over 95,000 bicycles across the 9 provinces

SA commercial imports +/- 500,000 new road, mountain and recreational bicycles p.a through the traditional wholesalers and retail outlets

Bicycle Distribution Case Study

BICYCLES CONTRIBUTE IN 3 WAYS to our (global) economy through mobility:



Economic poverty alleviation

- **lower cost of mobility for education, work, pleasure, and jobs are created in the bicycle and mobility industry**

Environmental and health/poverty alleviation

- **cleaner air, access to water, fewer oil wars**
- **For each kilometre travelled by bike instead of car, the amount of CO2 emitted reduces by 90%**
- **More than 60% of people in developing countries live more than 8km from a healthcare facility**

Societal poverty alleviation

- **we move together and will thus get to know each other far better as fellow citizens**

Bicycle mobility for all

- Vehicles for human transport that have two wheels and require balancing by the rider date back to the early 19th century - the archetype of the bicycle, was the German *draisine* dating back to 1817.
- The term *bicycle* was coined in France in the 1860s.
- Bicycles were shown to extend the range of people by a factor of 3

Philosophically speaking…

‘Cycling’ in actual fact encompasses an extremely large number of ways of life and forms of being… suggesting that *if cycling is any one thing, it is perhaps first and foremost a set of questions that asks us to reflect on identity* and the commitments we make in life."

Clive Cazeaux, Professor of Aesthetics at Cardiff School of Art and Design

The bicycle and women's liberation

The bicycle gave women the ***freedom to travel outside the home*** of their own power. Bicycle riding also necessitated ***more practical clothing for women*** and led to significant changes to female attire in society.

Susan B. Anthony stated in 1896: *"Let me tell you what I think of bicycling. I think it has done more to emancipate women than anything else in the world. I stand and rejoice every time I see a woman ride by on a wheel."*

bicycle cities

An entrepreneurial world in 21st Century

There is much evidence to suggest we are now moving to a new phase where work will comprise livelihoods rather than jobs, when people will work for themselves; bicycle transport fits perfectly into this paradigm, and by its very nature is profoundly democratic

(Economist Margaret Legum, Velo Mondial Cape Town 2006)

The motor car's contribution to our world

- Since the first documented fatality from a car crash in London on 17 August 1896 the motor vehicle in its various forms has been responsible for 110m+ deaths and one billion injuries globally – not counting the deaths attributed to CO2 emissions
- This is close to <u>all the deaths in all the wars</u> of the 20th century – estimated to be 160-200 million
- 1 billion cars on the planet (but fortunately balanced by the 1 billion+ bicycles)

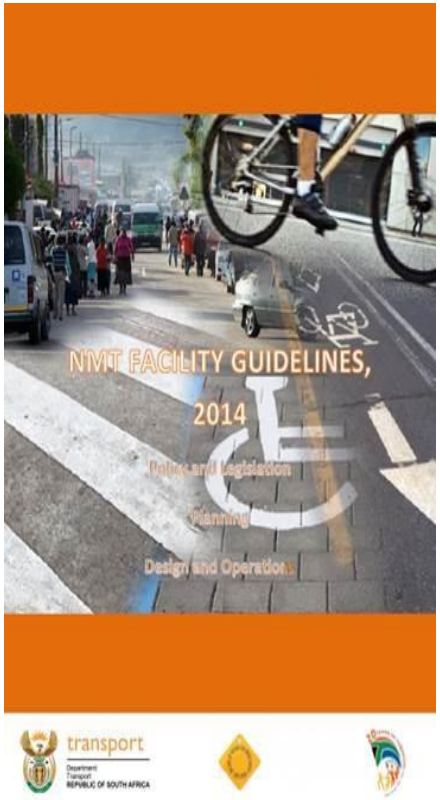
Creating safe cities for cycling?

Bicycle Cities Vision

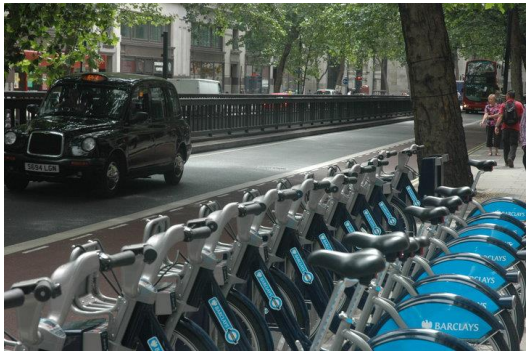
To create a city where ALL can connect safely and conveniently by bicycle. Cycling talks to addressing the needs of those most at risk - and adding inclusion and dignity to a city

<u>Steps to enhance urban cycling</u>

1. **Access to bicycle supply in all areas**
2. **Safe and enabling cycling environments**
3. **Manageable origin-destination distances/routes**
4. **Stylish and culturally desired routes, activities**
5. **Educational and promotional campaigns**



How do we access the city safely by bicycle?



- in numbers, with more bicycles being available to more people, more often, from more diverse backgrounds; and at the right cost
- with more education for cyclists and motorists alike on traffic safety, road laws, and above all, respect for one another
- with significantly increased bicycle lanes, with links to public transport hubs, parking and facilities, that have been well thought out and planned together with cyclists
- with more bicycle events that promote and popularise this wonderful invention

Qhubeka

BICYCLES CHANGE LIVES

NPC No. 2005/012333/08 / NPO no. 125-528 / PBO No. 930/048/293

bicycling · empowerment · network

ben South Africa

90,000 bicycles 2005-2018
8,500 bicycles in 2017

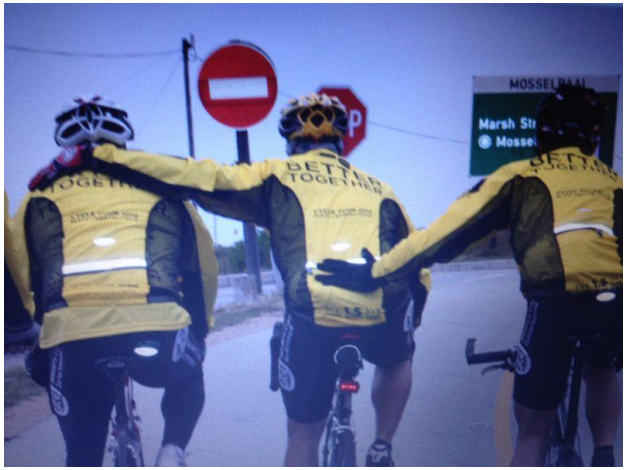
BEN 2002-2018
26,500 used bicycles;
16 BEC's;
55 trained Mechanics

Bicycle Centre's

- Neighbourhood/community bike projects every 5km radius
- Unemployed, semi-skilled project managers trained and set up with business
- Stock of bicycles + tools for the 'container' workshops
- Create a bike neighbourhood in your community, linked to transport hubs

Bicycle distribution

Wholesale/imports
Commercial retail
Government
NGO/civil society
Informal bike projects
Sports/recreation programs



- Considerations:
  - Type of bikes
  - Area of distribution
  - Age group(s)
  - Link with PT
  - Costing
  - Affordability
  - Public rental bikes
  - Subsidy schemes
  - Encouragement programs
  - Safety measures
  - Lifestyle change
  - SA health: obesity, etc.