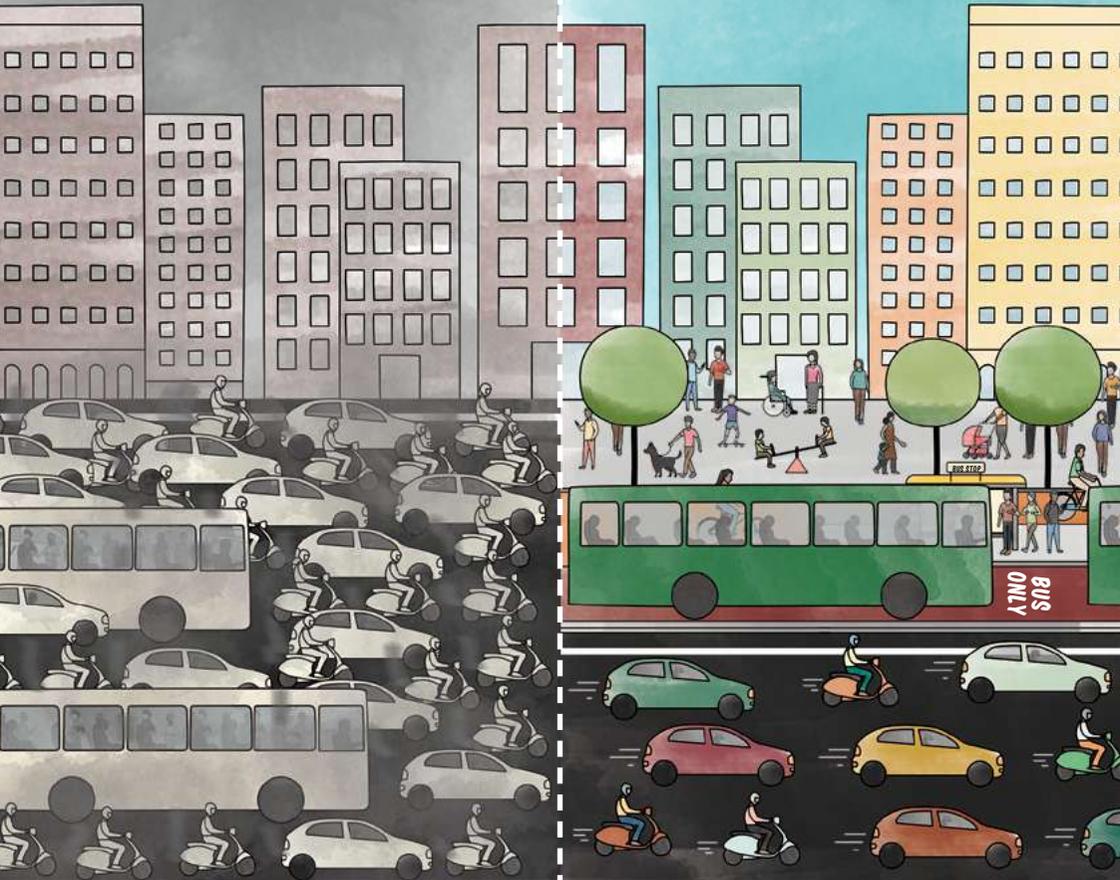




ITDP
India Programme

Congestion Pricing Basics

AN ILLUSTRATED GUIDE



Roads clogged with traffic, people always late.

No time for family. Frustrated, irate.
No footpaths, no trees. Walking, no mean feat.
Those who venture on cycles,
are threatened by motorists' heat,
Air choked with poison,
sick is our state.

Restless, we wonder, "Is this, forever, our fate?"

POLLUTION
LEVELS AT
AN ALL-TIME
HIGH!

SAH! I'LL
DIE SOON
FROM THESE
FUMES.

SORRY! WILL BE
LATE AGAIN TONIGHT.

I SHOULD
START LIVING
IN THE OFFICE!

I'M
EXHAUSTED.
CAN BARELY
STAY AWAKE AT
WORK.

I'M
SQUEEZED.
AND THESE
MOTORISTS
DEMAND
MORE!

I DREAMT OF
THIS FLYOVER.
NOW I DREAD
IT!

ONLY BIRDS FLY
OVER. MY LIFE IS
A CRAWL.

Can wider roads and more flyovers fix traffic congestion?

No, says data from cities across the world. More road space induces more people to drive. The situation improves briefly; then gets a lot worse.



Who causes congestion?

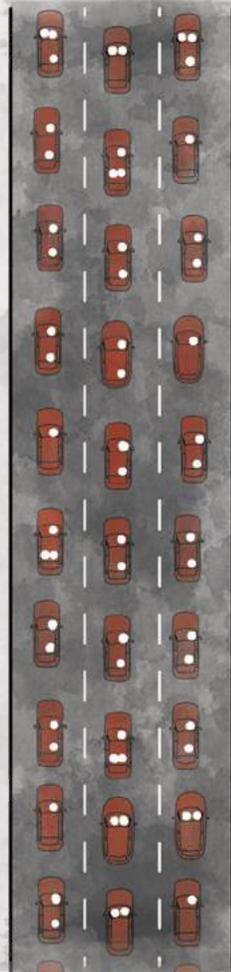
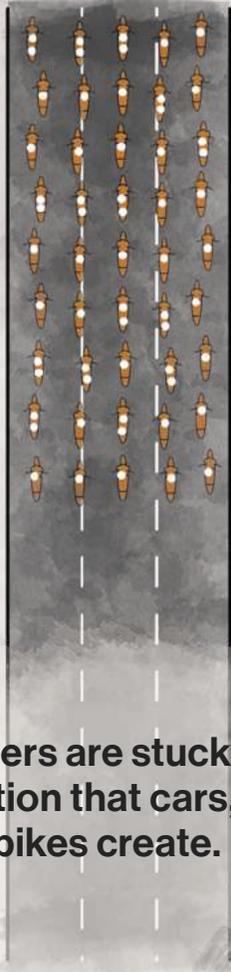
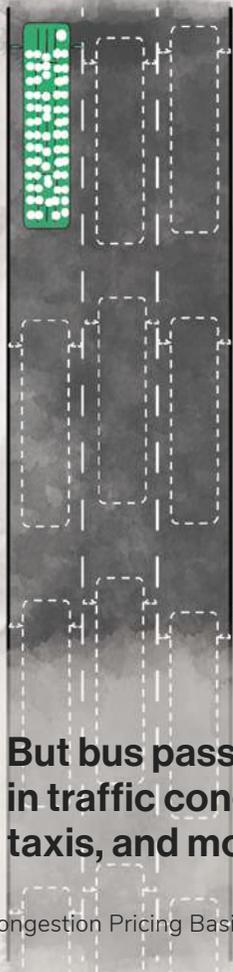
On an average, a car or a taxi user occupies nearly ten times the road space a bus commuter does. Motorbikes are only marginally better than cars. These personalised modes have an equally damaging effect on global climate and local air pollution.

Imagine 60 people...

...in a single bus,

...or on motorbikes that require **5X MORE SPACE** than a bus,

...or in cars or taxis that require **10X MORE SPACE** than a bus!



But bus passengers are stuck in traffic congestion that cars, taxis, and motorbikes create.

What is its impact?

MARCH							APRIL						
S	M	T	W	T	F	S	S	N	T	W	T	F	S
							5	X	X	X	X	X	4
1	X	X	X	X	X	7	12	13	14	15	16	17	18
8	X	X	X	X	X	14	19	20	21	22	23	24	25
15	X	X	X	X	X	21	26	27	28	29	30		
22	X	X	X	X	X	28							
29	X	X	X										

MUM SAYS I CAN'T PLAY OUTSIDE BECAUSE IT'S TOO POLLUTED.

...YOU LOSE **30 WORKING DAYS.**
WORTH A MONTH AND HALF'S SALARY!

...YOU EMIT **AN ADDITIONAL HALF TONNE OF CO₂!**

IND - 678

...YOU WASTE **AN ADDITIONAL 230L OF FUEL!**
ENOUGH TO TRAVERSE THE LENGTH OF INDIA IN A CAR.

That is the annual impact of one car stuck in traffic congestion for an hour each day. Now, imagine the impact of a million cars—and millions of other vehicles—in a city.

What is the solution?

Roads in a city are a precious and limited resource. To maximise their utility, buses must get priority. But, without steps to discourage private motor vehicle use, demand for road space grows unabated.

Here are three ways to discourage private motor vehicle use and decongest roads.

Behavioural nudges

Encourage people—primarily through communication—to make better decisions without limiting their options. These are easy to implement but less effective than other approaches to reduce motor vehicle use.



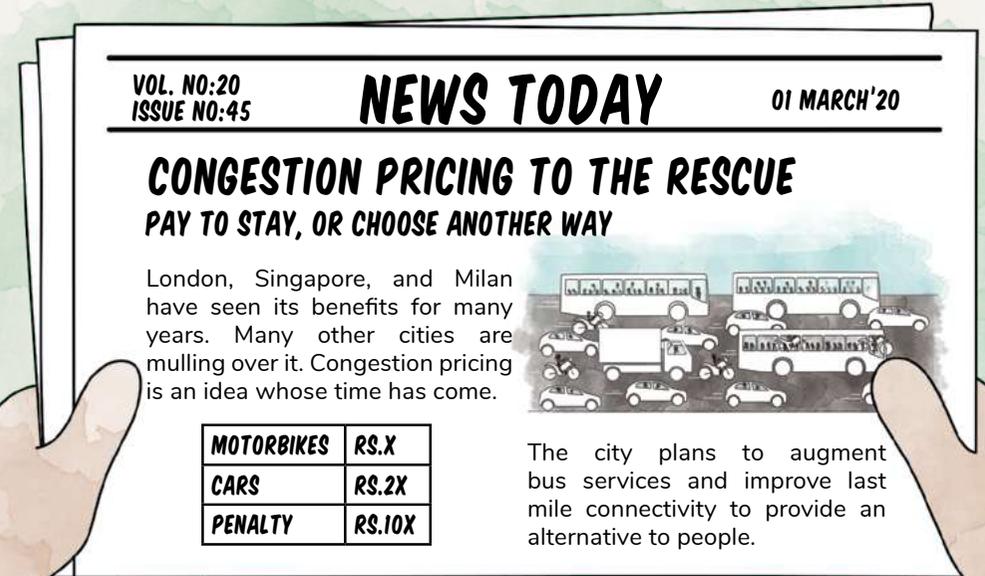
Access restrictions

Pedestrian promenades, transit malls, and no parking zones are forms of restrictions that discourage the use of motor vehicles. These are effective at a local level.



Monetary deterrents

When the demand for a limited resource exceeds its supply, its price goes up. This core economic principle is the foundation of measures like market-determined parking fee and congestion pricing. When implemented well, these are very effective in reducing motor vehicle use.



Congestion price is a fee to access congestion-prone roads. The fee deters some motor vehicles from using those roads. It is a direct and effective means to decongest roads in real-time.



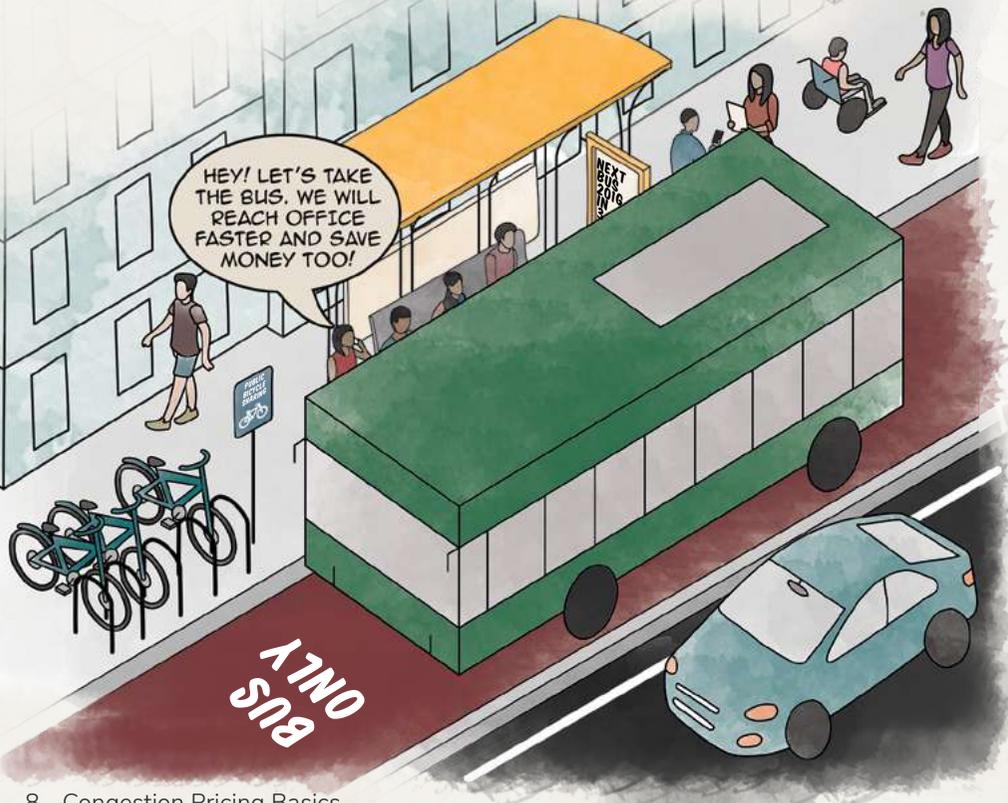
But is that enough?

Motorists may resist any curbs on their use of vehicles especially in the absence of desirable alternatives like high-quality public transport and safe facilities for walking and cycling.

Congestion pricing can not only decongest roads but also provide revenue to invest in green and efficient transport that everyone can access—a win-win solution.

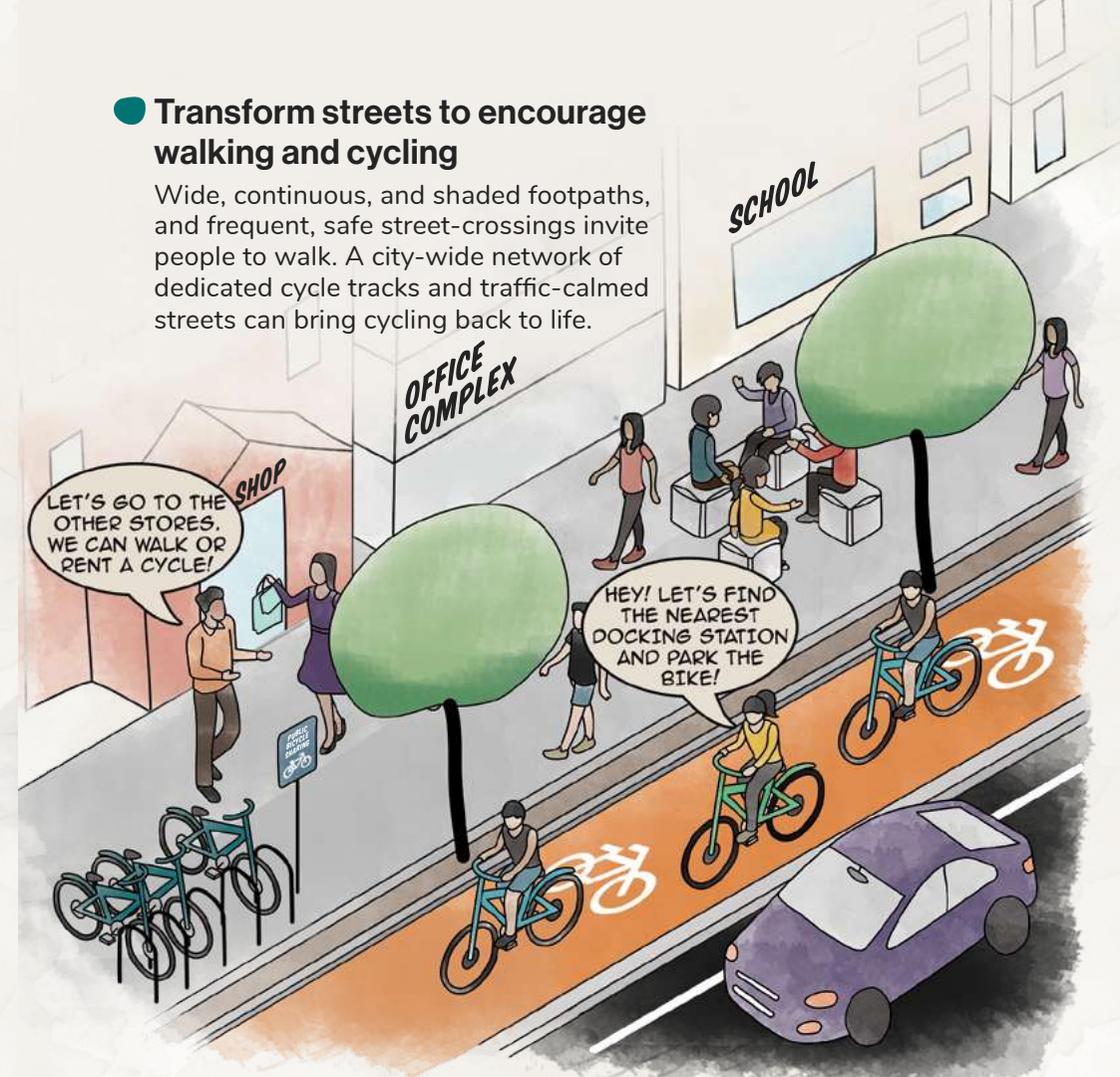
● Create high-quality public transportation

Public transport must be a viable and desirable option to encourage a shift from personal motor vehicles. It must be easily accessible, serve the routes that people need, be of a quality that people are willing to shift to, and have enough capacity to absorb the additional demand.



● Transform streets to encourage walking and cycling

Wide, continuous, and shaded footpaths, and frequent, safe street-crossings invite people to walk. A city-wide network of dedicated cycle tracks and traffic-calmed streets can bring cycling back to life.



● Strengthen last mile connectivity with micro-mobility

Public cycle sharing and other micro-mobility modes are good alternatives to personal motor vehicles for local trips. Integrate them with public transport to provide seamless travel across the city.

● Create Inclusive Compact Cities

A fine grid of people-friendly streets, vibrant public spaces, and inclusive mixed-use development that strikes the right balance between density and liveability are the means to create cities less dependent on private automobility.

SMART STEPS TO DO CONGESTION PRICING RIGHT!



1 CHOOSE THE RIGHT PLACE AND TIME

When and where should congestion pricing be implemented?
Which forms of congestion pricing can a city choose from?

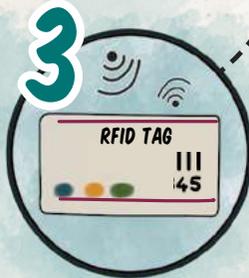


2 SET THE RIGHT PRICE

What is the process to determine the initial user fee structure?
What factors inform user fee?
When and how should the fee be revised?

3 CHOOSE THE RIGHT INTERFACE

How are vehicles charged a fee?
How are violations detected?
What technology is required to ensure seamless operations?

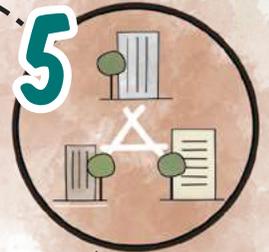


4 BUILD THE RIGHT SUPPORT

Whose support is required?
What are the means to garner support?
What should the message be?
How can legal hurdles be overcome?

5 ENGAGE THE RIGHT INSTITUTIONS

Who will implement congestion pricing and how?
Which public institutions must be engaged?
Does the private sector have a role?
What should the terms be?



6 COMPLEMENT WITH THE RIGHT MEASURES

What other measures are required to reduce and streamline traffic?

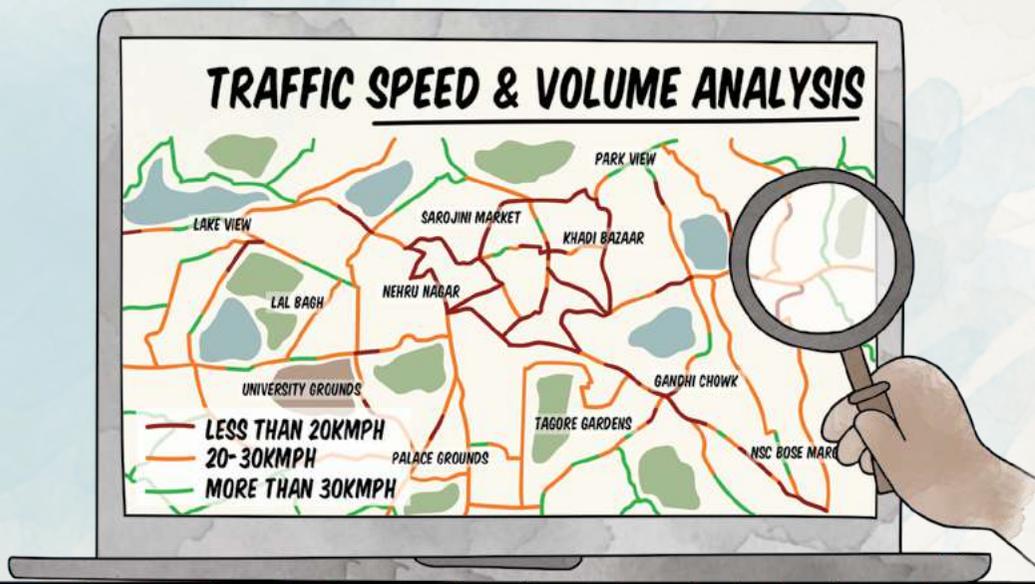
7 MEASURE THE RIGHT INDICATORS

Which indicators show if the initiative has had the intended impact or needs corrections?



1 Choose the right place and time

Rarely is traffic congestion equally spread across the city or equally severe at all times of a day. Find out where and when traffic congestion exists, and its intensity. Congestion pricing may be deployed when travel speeds drop below 20 kmph on arterial roads, and below 40 kmph on expressways.



● Map and analyse traffic speeds and volumes

At all hours of a day in a typical week of the year, map traffic speeds on the entire primary road network of the city. Identify congested locations as well as the hours of congestion. At each of the congested locations, count and analyse traffic volumes and occupancy of each vehicle type at each hour of the day. Determine the extent by which traffic must be reduced to achieve the desired speed.

● Identify an appropriate type of congestion pricing

Based on the congestion pattern in the city, deploy one or more of these three pricing types — **Area**, **Corridor**, **Network** — can be deployed.

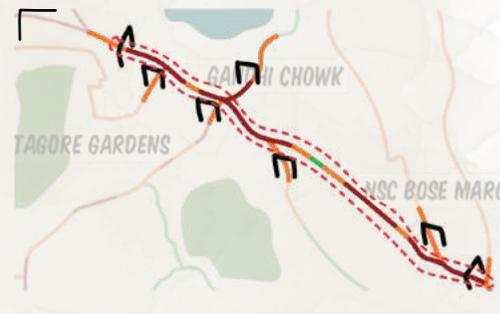
● Area pricing

Vehicles pay to enter a congestion-prone area. Trips entirely within or only outside this area remain undeterred.



● Corridor pricing

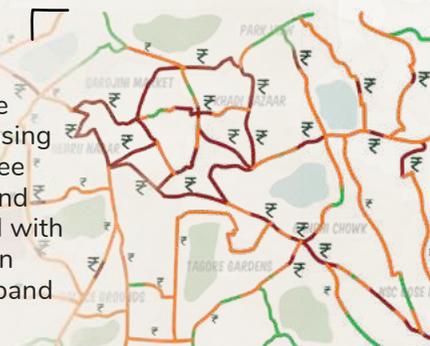
Vehicles pay to use congestion-prone stretches of important arteries or expressways. On a long corridor, they may be charged multiple times.



Gantries are needed for automated detection of vehicles where they enter or exit a congestion-priced area or corridor. The number of points of entry or exit should be limited to reduce the cost of implementation and operation, and to plug leakages.

● Network pricing

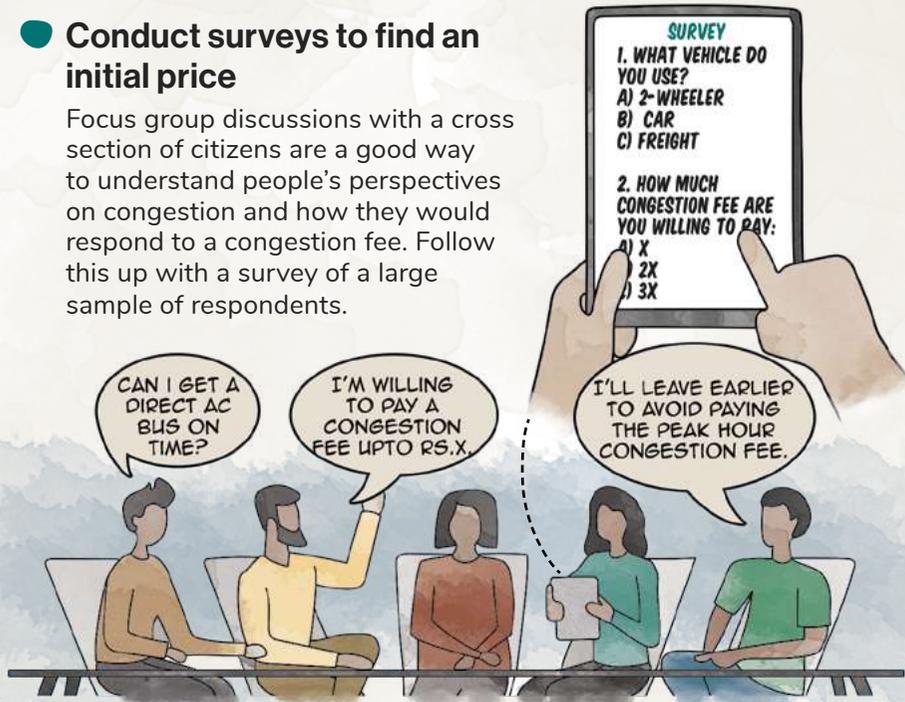
In this new and emerging type, the entire trip of a vehicle is tracked, using GPS or similar technology, and a fee is levied depending on the route and distance of travel. It can be piloted with the taxis that are already tracked in many cities. Its application can expand as the technology matures.



2 Set the right price

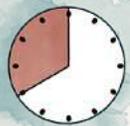
● Conduct surveys to find an initial price

Focus group discussions with a cross section of citizens are a good way to understand people's perspectives on congestion and how they would respond to a congestion fee. Follow this up with a survey of a large sample of respondents.



Survey questionnaire can be shared upon request

● Decide price based on



Time of the day

When demand is high, charge more. When demand is low, charge less (or nothing).



Size of vehicle

What vehicle is it? Big ones pay more. Small ones pay less.

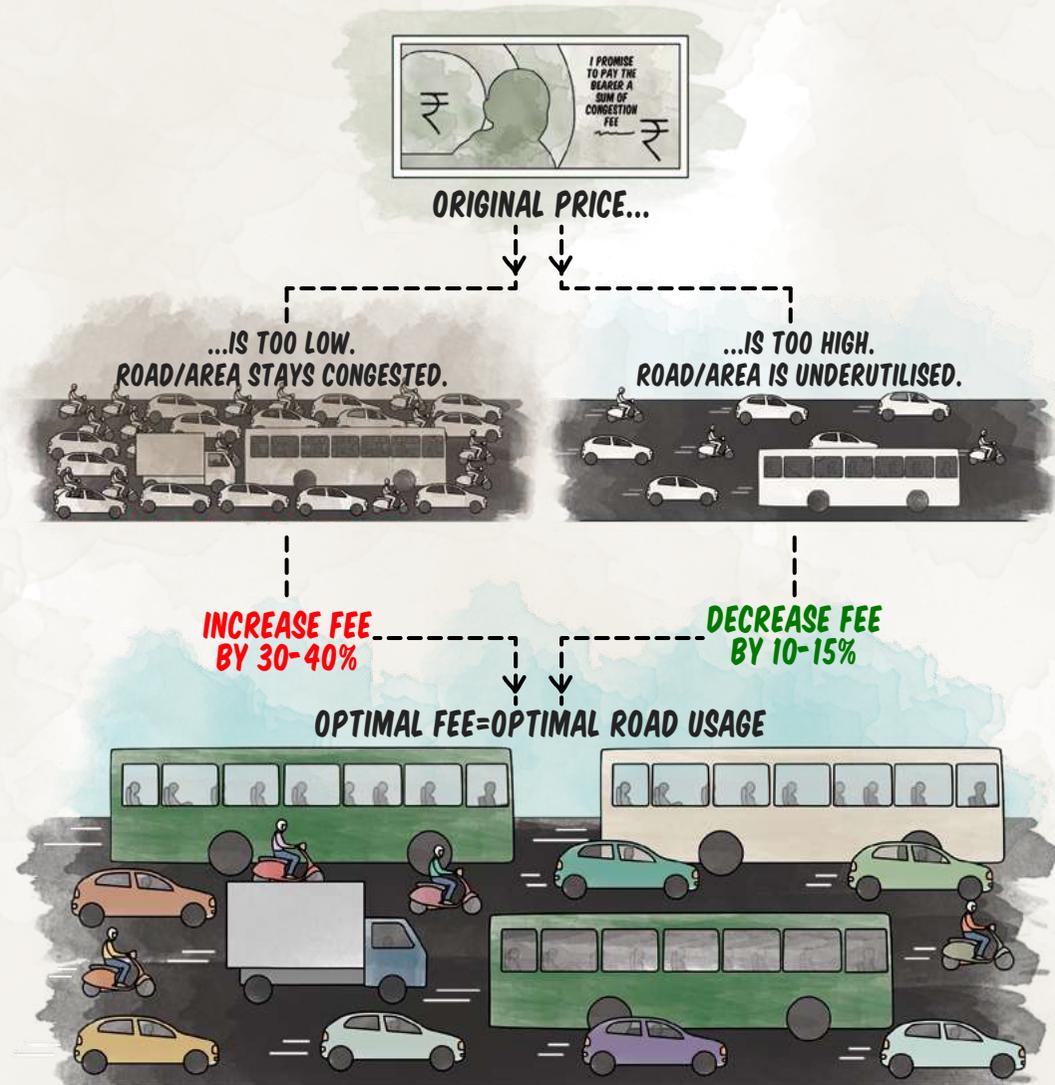


Location

Where demand is high, charge more. Where demand is less, charge less (or nothing).

● Revise price regularly using congestion data

The fee charged may deter too many or too few from using their personal motor vehicles or taxis. The fee at each location and for different vehicle types should be revised regularly — typically, once in a quarter — based on congestion data collected. The revision should not require political or administrative approval. A predefined formula should do the job.



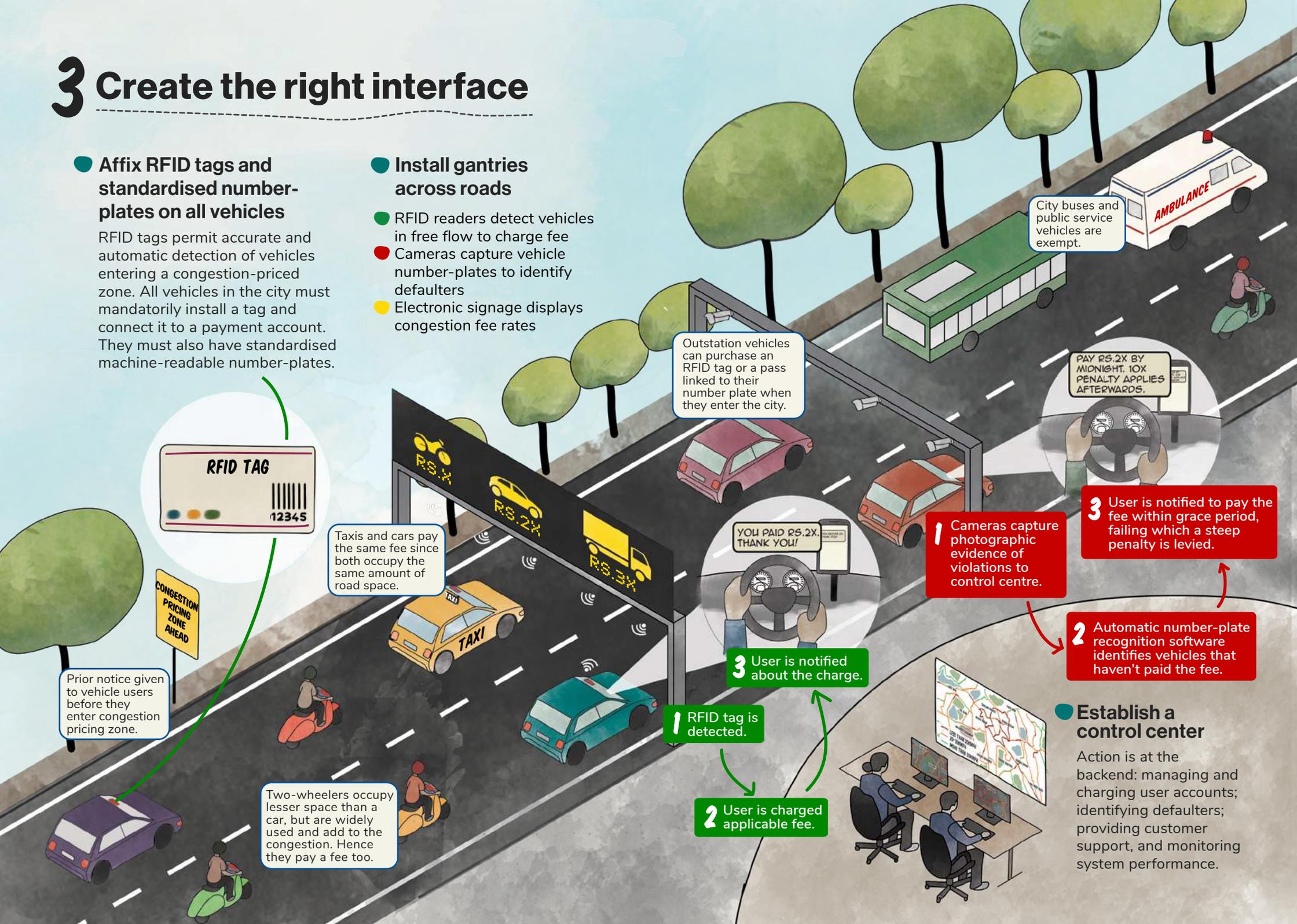
3 Create the right interface

Affix RFID tags and standardised number-plates on all vehicles

RFID tags permit accurate and automatic detection of vehicles entering a congestion-priced zone. All vehicles in the city must mandatorily install a tag and connect it to a payment account. They must also have standardised machine-readable number-plates.

Install gantries across roads

- RFID readers detect vehicles in free flow to charge fee
- Cameras capture vehicle number-plates to identify defaulters
- Electronic signage displays congestion fee rates



Taxis and cars pay the same fee since both occupy the same amount of road space.

Prior notice given to vehicle users before they enter congestion pricing zone.

Two-wheelers occupy lesser space than a car, but are widely used and add to the congestion. Hence they pay a fee too.

Outstation vehicles can purchase an RFID tag or a pass linked to their number plate when they enter the city.

City buses and public service vehicles are exempt.

PAY RS. 2X BY MIDNIGHT. 10X PENALTY APPLIES AFTERWARDS.

YOU PAID RS. 2X. THANK YOU!

1 Camera captures photographic evidence of violations to control centre.

3 User is notified to pay the fee within grace period, failing which a steep penalty is levied.

2 Automatic number-plate recognition software identifies vehicles that haven't paid the fee.

1 RFID tag is detected.

2 User is charged applicable fee.

3 User is notified about the charge.

Establish a control center

Action is at the backend: managing and charging user accounts; identifying defaulters; providing customer support, and monitoring system performance.

4 Build the right support

Without proactive and effective communication at all stages — from inception to implementation, and well into operations — the initiative can fail. Garner the support of all key stakeholders — political, media, businesses, and motor vehicle users — for the success of this initiative.

CONGESTION PRICING IS	
✗	✓
NOT A FINE ON VEHICLES	A FEE FOR FASTER COMMUTES AND CLEANER AIR
NOT A TOLL TO CREATE NEW INFRASTRUCTURE	A WAY TO OPTIMISE EXISTING INFRASTRUCTURE

● Get the message right



● Obtain legislative backing

Statutory backing ensures the legality of congestion pricing. Amend or create acts and policies to enable the implementation of congestion pricing.



● Bring aboard key influencers

Hold consultations with important stakeholders who have the ability to influence public opinion. Understand their perspectives to finesse the message.

● Find political champions

Congestion pricing is not easy to implement without a strong political champion backing the idea.



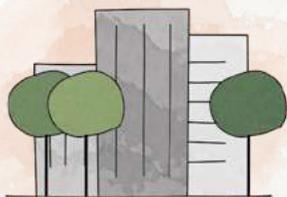
● Spread the word widely

Inform people about how congestion pricing will work and how they will benefit.



5 Engage the right institutions

● Identify key public agencies



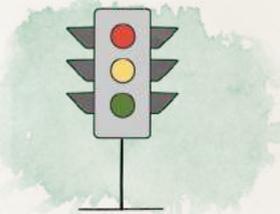
Development / Planning agencies

Regional / City development authority, Urban local body



Road owning agencies

Urban local body, Highway authorities, Public works department



Traffic management agencies

Traffic police, City-owned traffic management



Vehicle registration agencies

For up-to-date vehicle database



Electronic payment and settlement agencies



Public transport agencies

Bus, Rail and Metro

● Ensure inter-agency coordination



Form a multi-agency working group of all relevant public agencies. Identify roles and responsibilities of each agency. Create a dedicated Congestion Pricing Unit — with necessary statutory authority and a team of competent professionals — to implement congestion pricing and subsequently oversee its day-to-day operation.

● Hire a competent operator

Installing infrastructure and managing day-to-day operation is best done by a competent private sector agency hired through a competitive bid under a Build-Operate-Transfer model.



Its remit includes:

- Installing hardware: gantries, RFID readers, cameras, signages, etc.
- Developing software for system operations and reporting
- Operating a control centre to monitor the system in realtime
- Developing and managing web and mobile apps for system information, user accounts, and payment
- Maintaining the system



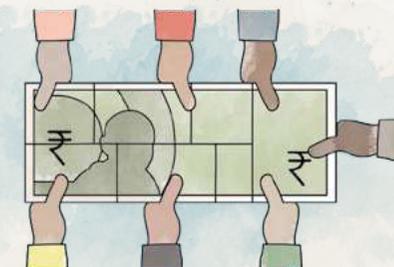
● Keep track of performance

Organize quarterly meetings with all public agencies and the operator to monitor system performance and take corrective measures.



● Share revenues

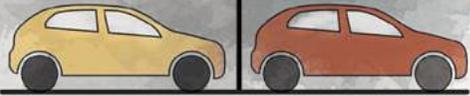
System revenue should be deposited in an escrow account and distributed amongst the agencies as defined by inter-agency agreements and service contracts.



6 Complement with right measures



PARKING IS A COMMODITY, NOT A RIGHT



For more info on parking, refer to "Parking Basics" by ITDP India

● Manage parking

More parking—especially when it is free — invites more personal motor vehicle ownership and use. Charge for it accordingly, whether on street or off-street; higher the demand, higher the price. Do not bundle parking with residential or commercial real estate. Restrict the amount of parking within buildings and at an area-level, and request proof of parking before vehicle registration.

● Manage freight movement

Local distribution hubs, unloading at off-peak hours, and the use of non-motorised and electric-assist vehicles for deliveries are some of the ways in which freight can be optimised.

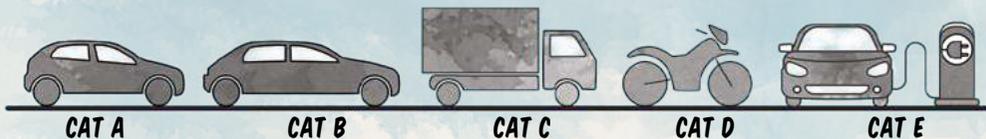


COE Open bidding - Mar 2020

CAT A	RS.15X	▲
CAT B	RS.18X	▼
CAT C	RS.18X	▲
CAT D	RS.X	▼
CAT E	RS.21X	▼

● Control vehicle ownership

This is the ultimate measure of curbing motor vehicle use. Those wishing to own one have to bid for and purchase one of a limited number of certificates of entitlements that the city releases at regular intervals. These certificates often cost much more than the price of a vehicle, thereby acting as a deterrent to ownership.

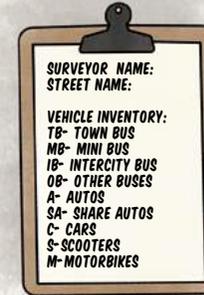


7 Measure the right indicators

Assess the impact of congestion pricing to take corrective steps as traffic and travel dynamics change in the city. The data is also useful to communicate results to various stakeholders to retain their support.



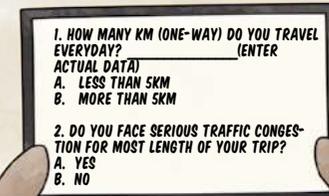
● Average speed to measure impact on traffic flow



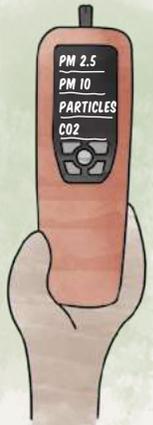
● Traffic volume counts to measure reduction levels



● Congestion on other routes to measure shift in travel routes



● Regular user interviews to get perception and feedback



● Air pollution at street level to measure impact on environment

● Ridership of public transport to measure switch to alternate modes



A better city, A better life!

Faster travel speeds,
more public transport users,
better air quality, with time
and money saved!

THE SKY IS
SO CLEAR!

BREATHE THE
GOODNESS
AROUND YOU!

OUR BUS IS
ARRIVING NOW!
SEE YOU
SOON.

I'M SAVING
SO MUCH
ON FUEL.

I'M NO MORE
CHOKED
WITH SMOKE.

I'M SO GLAD WE
DON'T HAVE
ENDLESS JAMS
ANymore!

ONE MORE
PLATE PANI
PURI, SIR?

CAN YOU BELIEVE
THIS WAS A
FLYOVER CHOKED
WITH TRAFFIC?

DUDE, LET'S
RENT A CYCLE
TO GET BACK.

If streets were rid of traffic, what could you create?

Walking gets the top spot.

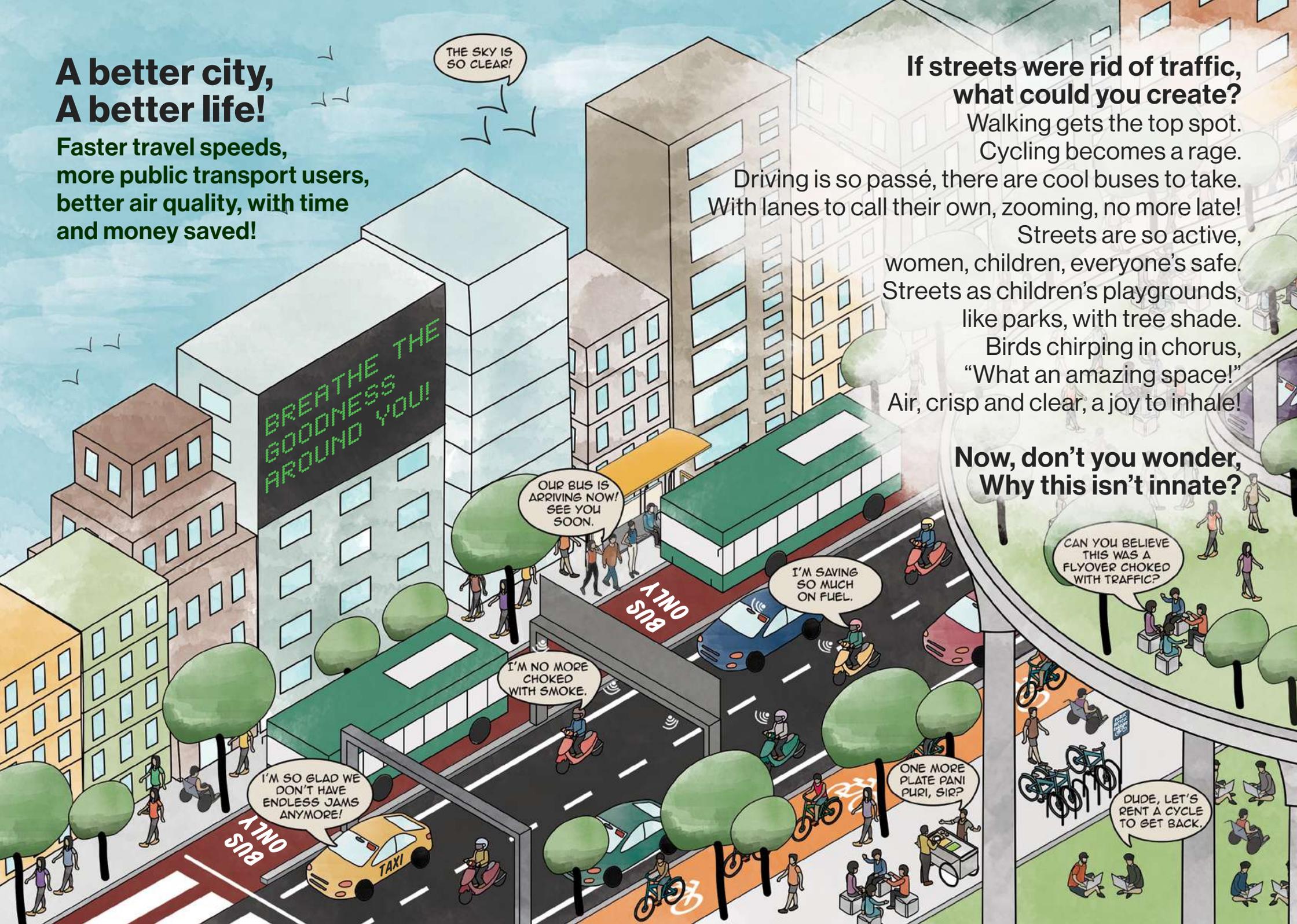
Cycling becomes a rage.

Driving is so passé, there are cool buses to take.
With lanes to call their own, zooming, no more late!

Streets are so active,
women, children, everyone's safe.
Streets as children's playgrounds,
like parks, with tree shade.

Birds chirping in chorus,
"What an amazing space!"
Air, crisp and clear, a joy to inhale!

Now, don't you wonder, Why this isn't innate?



Acknowledgements

A very special thanks to Shakti Sustainable Energy Foundation without whose support, this guide on congestion pricing would not have been possible.

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