

## Appendix

### 1. Pseudocode for social media collection

The social media data collection involved two rounds. The first round involved establishing customised search queries based on the programme's keywords and searching for relevant original tweets, and the second round involved searching for direct replies by official accounts in the relevant posts identified in the first round.

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From accounts >
  request all original tweets that include programme keywords between
  2020-03-11 ~ 2023-03-11 >
  in returned tweets >
  request all tweets replied to by official accounts
From first-round data >
  identify conversation threads >
  search all replies by the official accounts
  
```

### 2. Queries for collection

Table A1. Typical queries used to search results

City/Region, Country	Search query: username, not a retweet, (keywords)
Victoria State, Australia	'from:vicgovdtp -is:retweet -is:reply ("pop-up bike lanes" OR #popup OR #popupbikelane OR #pop-up OR #pop-up-bikelane OR "bike lane" OR "cycle lane")'
Vienna, Austria	'from:stadt_wien -is:retweet -is:reply ("temporäres Radnetz" OR Pop-Up-Fahrradspur OR Begegnungszonen OR #popup OR #popupradweg OR "pop-up radwege")'
Milan, Italy	'from:comunemi -is:retweet -is:reply ("strade aperte" OR "open streets" OR "open square" OR "Piazze Aperte" OR "piste ciclabili")'
Barcelona, Spain	'(from:bcn_ajuntament OR from:barcelona_cat OR from:BCN_Mobilitat) -is:retweet -is:reply ("Una nova mobilitat sostenible en un nou espai public" OR tactica OR bicicletes)'
Chicago, United States	'from:chicagodot -is:retweet -is:reply ("shared street" OR "shared streets" OR "outdoor patios" OR "outdoor dining")'
Los Angeles, United States	'from:ladotoofficial -is:retweet -is:reply ("slow street" OR "slow streets")'
New York City, United States	'from:nyc_dot -is:retweet -is:reply ("open street" OR "open streets" OR "open restaurants" OR "open restaurant" OR "outdoor dining" OR "outdoor dinings")'
Mexico City, Mexico	'from:lasemovi -is:retweet -is:reply ("Ciclovías Emergentes" OR #popupbikelane OR "Espacios peatonales emergentes" OR "conversion de espacios" OR "urbanismo tactico" OR #tacticalurbanism)'
Vancouver, Canada	'from:cityofvancouver -is:retweet -is:reply ("slow streets" OR "pop-up plazas" OR "temporary road closures" OR "reallocate" OR "temporary patios" OR "temporary plazas")'

### 3. Programme details and interview data collection

Table A2 elaborates programme information. The main operating agency refers to the government actors that manage the programme. The programme name refers to the names used during the pandemic, which differentiates from their post-pandemic programme names. Programme type includes the three most prominent street experiment types – outdoor patios, shared streets, and bike accommodations (Gregg et al., 2022), which is a term more generally referring to bike related additions but means exclusively temporary cycle lanes in this study. Status refers to the programme development as of 1 Jan 2023, when the developments stabilised. ‘Ongoing’ refers to temporary programmes, and ‘permanent’ refers to those converted to permanent structures. Other background information includes agency levels, case locations, informant number, informant role, and interview time. Typical roles included transport planners, city executive officers, transport deputy directors, deputy chief architects, city councillors, community relationship managers, and project managers. Interviews were conducted through Zoom unless specified in the table.

Table A2. Case information

Case ID	Main operating agency	Agency level and case location	Programme name	Programme type	Status (as of 1 January 2023)	Informant number and role
AS01	Active Transport Program Management Office, Department of Transportation (DOTr)	National level, Mandaue City, Philippines	Bayanihan II Bike Lane Networks	Bike accommodation	Semi-permanent	1. Programme lead 2. Architect 3. Engineer
EU01	Department of Traffic Organization and Technical Traffic Matters, City of Vienna	Municipal level, Vienna, Austria	Pop-up Radwege	Bike accommodation	Permanent	1. Programme lead
EU02	Mobility, Public Works and Road Safety, Government of the Brussels-Capital Region	Regional level, Brussels, Belgium	nouvelles pistes cyclables (new bike paths)	Bike accommodation	Permanent	1. Programme lead 2. Planner
EU03	Transportation Section, Dublin City Council	Municipal level, Dublin, Ireland	Protected cycle lanes	Bike accommodation	Ongoing	1. Programme lead 2. Programme lead
EU04	Municipality of Milan; Agency Mobility Environment and Territory (AMAT)	Municipal level, Milan, Italy	piste ciclabili (bike lanes) of Strade Aperte (Open streets)	Bike accommodation	Ongoing	1. Architect
EU05	AMAT	Municipal level, Milan, Italy	Piazza Aperte (open squares) of Strade Aperte (Open streets)	Shared street	Ongoing	1. Architect

<b>EU06</b>	Department of Roads and Travel, Paris City Hall; Collectif Velo Ile de France	Municipal level, Paris, France	Coronapistes (Pop-up bike lanes)	Bike accommodation	Permanent	1. Planner 2. Planner
<b>EU07</b>	Senate Department for District Office Friedrichshain-Kreuzberg; Mobility, traffic, climate protection and the environment, City of Berlin	District level, Berlin, Germany	Pop-up Radwege, Temporäre Radfahrstreifen	Bike accommodation	Ongoing	1. Programme lead
<b>EU08</b>	Office Area of Urban Ecology, Barcelona City Council	Municipal level, Barcelona, Spain	Una nova mobilitat sostenible en un nou espai públic (A new sustainable mobility in a new public space)	Bike accommodation; Shared street	Permanent	1. Architect
<b>LA01</b>	Bicycle and Pedestrian Affairs, District Mobility Secretariat, City of Bogota	Municipal level, Bogota, Colombia	Ciclovías Temporales	Bike accommodation	Permanent	1. Programme lead 2. Programme lead
<b>LA02</b>	Ministry of Mobility (SEMOVI), Government of Mexico City	Municipal level, Mexico City, Mexico	Ciclovías Emergentes Covid-19	Bike accommodation	Permanent	1. Programme lead
<b>NA01</b>	Transportation Planning, City of Vancouver	Municipal level, Vancouver, Canada	Slow Streets	Shared street	Ongoing	1. Engineer 2. Engineer
<b>NA02</b>	Transportation Planning, City of Vancouver	Municipal level, Vancouver, Canada	Pop-up Plazas	Shared streets	Ongoing	1. Programme lead
<b>NA03</b>	Chicago Department of Transportation (CDOT)	Municipal level, Chicago, USA	Shared streets	Shared street	Ended	1. Programme lead
<b>NA04</b>	CDOT	Municipal level, Chicago, USA	Expanded Outdoor Dining Permits	Outdoor dining	Permanent	1. Programme lead
<b>NA05</b>	Denver Department of Transportation & Infrastructure (DOTI)	Municipal level, Denver, USA	Shared streets	Shared street	Permanent	1. Programme lead
<b>NA06</b>	DOTI	Municipal level, Denver, USA	Temporary Outdoor Dining Program	Outdoor dining	Permanent	1. Programme lead
<b>NA07</b>	Los Angeles Department of Transportation (LADOT)	Municipal level, Los Angeles, USA	Slow streets	Shared street	Ongoing-evolved	1. Planner
<b>NA08</b>	New York City Department of Transportation (NYCDOT)	Municipal level, New York, USA	Open streets	Shared street	Ongoing	1. Programme lead
<b>NA09</b>	NYCDOT	Municipal level, New York, USA	Open restaurants	Outdoor dining	Ongoing	1. Programme lead
<b>NA10</b>	City of Oakland Department of Transportation (OakDOT)	Municipal level, Oakland, USA	Slow streets	Shared street	Permanent	1. Planner

<b>OC01</b>	Active Transport, Department of Transport and Planning, Victoria State Government	State level, Melbourne, Australia	Pop-up bike lanes	Bike accommodation	Ongoing-partially removed	1. Programme lead 2. Programme lead
<b>OC02</b>	Strategy, Planning and Climate Change, Melbourne City Council	Municipal level, Melbourne, Australia	Pop-up bike lanes	Bike accommodation	Ongoing-partially paused	1. Planner
<b>OC03</b>	City Sustainability and Strategy, Yarra City Council	Municipal level, Yarra City, Australia (in Melbourne area)	Pop-up bike lanes	Bike accommodation	Ongoing	1. Councillor 2. Programme lead

#### 4. Public engagement tactics

Table A3. Public engagement tactics analysis

Cases	Public engagement tactics			Structure type	Feedback to Outcome
	Push	Pull	Network		
----- Type: Outdoor dining -----					
NA04	o Webpage (Y)	o Virtual community meeting (Y) o Email (Y) o Social media (N)	o Business owner partnership (Y)	Lean Push-Pull-Network	o Feedback: anecdotally support to programme (no formal study) o Outcome: Extended Outdoor Dining (EOD) Permit is made permanent
NA06	o Webpage (Y)	o Online commenting platform (Y) o online survey (Y) o Virtual community meetings (Y) o Email (Y) o Phone (N) o Social media (N)	o Business owner partnerships (Y)	Rich Push-Pull-Network	o Feedback: 85% responded more likely to visit Denver streets when there was a street patio o Programme extended o Programme formalised through zoning change
NA09	o Webpage (Y)	o Online survey (Y) o Email (N) o Phone (N) o Social media (N)	o Community meetings (Y) o Business owner partnerships (Y)	Rich Push-Pull-Network	o Programme kept ongoing; format stayed the same: application-inspection-run
----- Type: Shared streets -----					
EU05	o Webpage (N)	o Social media (N)	o Community partnership (Y)	Lean Push-Pull-Network	o Continuing to operate
NA01	o Webpage (Y) o Flyer and signages (Y)	o Social media (N) o Mobile Phone App (N) o Email (Y) o Phone (N) o Online commenting platform (N) o Online surveys (Y)	o Stakeholder and advisory group support (Y)	Rich Push-Pull-Network	o Design minor changes, adjustments, and removal (occasional) o Phased developments
NA02	o Webpage (Y) o Flyers and signages (Y)	o Online surveys (Y) o Mobile Phone App (N) o Email (Y) o Phone (N) o Social media (N)	o Business associations and partners (Y) o Community collaboration (Y) o In-person community engagement (Y)	Rich Push-Pull-Network	o Programme extended and rebranded to fit in non-pandemic public space development agenda
NA03	o Webpage (Y) o Flyer and signages (Y)	o Online survey (Y) o Email (Y) o Social media (N)	o Local elected officials (N)	Lean Push-Pull-Network	o The shared street died out due to lack of demand. The extended

					outdoor dining has become permanent and formalised. ○ The shared street effort has grown into several other initiatives, like the open boulevard (interview), strategic plan, the CMC.
<b>NA05</b>	○ Webpage (N) ○ Flyers and signages (Y)	○ Online commenting platform (Y) ○ online survey (Y) ○ Virtual community meetings (Y) ○ Email (N) ○ Phone (N) ○ Social media (N)	○ City councillors (N)	Rich Push-Pull-Network	○ programme extension ○ programme formalisation through zoning change
<b>NA07</b>	○ Flyers and signages (Y)	○ Webpage (Y) ○ Online survey (Y) ○ Email (Y) ○ Local councils (N) ○ Social media (N)	○ Community partnership (Y)	Rich Push-Pull-Network	○ Maintaining existing projects ○ Programme re-branding - Now moved on to permanent programmes like Open Street, Livable Street.
<b>NA08</b>	○ Webpage (Y) ○ Flyers and signages (Y)	○ Email (N) ○ Local elected officials (N) ○ Phone (N) ○ Online survey (Y) ○ Online feedback collection portal (Y) ○ Mail (N) ○ Fax (N) ○ Social media (N)	○ Community partnership (Y)	Rich Push-Pull-Network	○ Programme is ongoing; format stayed the same: application > partnership ○ Now need three supporting letters from local stakeholders ○ Radicalness: 100 miles of open street, big scale compared to other cities'
<b>NA09</b>	○ Webpage (Y)	○ Online survey (Y) ○ Email (N) ○ Phone (N) ○ Social media (N)	○ Community meetings (Y) ○ Business owner partnership (Y)	Rich Push-Pull-Network	○ Streets with outdoor dining observed 19% average sales increase compared to their pre-pandemic baseline ○ Programme turned permanent ○ Formalised programme by updating regulations
<b>NA10</b>	○ Webpage (Y) ○ Flyers and signages (Y)	○ Online commenting platform (Y) ○ Online survey (Y) ○ Mobile phone app (N) ○ Email (Y) ○ Phone (N) ○ Social media (N)	○ Virtual community meeting (Y) ○ Council meetings (N) ○ Community collaboration (Y)	Rich Push-Pull-Network	○ Programme formalisation – converted from temporary programme to long-term programme and with fundings ○ Programme rebranding: slow streets – essential places and serving bike network.
<b>----- Type: Bike accommodation -----</b>					
<b>AS01</b>	○ Flyers (Y)	○ Social media (N) ○ Online survey (Y) ○ Civil society groups (N)	○ Community consultation (Y)	Lean Push-Pull-Network	○ Installed with semi-permanent materials, now trying with material upgrades at testing areas
<b>EU01</b>	○ Webpage (Y) ○ Social media (N)	○ Local elected officials (N)		Push-Pull	○ Emergency response, removed upon alleviated covid situation
<b>EU02</b>	○ Social media (N) ○ Webpage (N)	○ Online survey (Y)		Push-Pull	○ Design standard improvements
<b>EU03</b>	○ Webpage (Y)	○ Online survey (Y) ○ Email (Y) ○ Social media (N)	○ Webpage (Y) ○ Local elected officials (N)	Lean Push-Pull-Network	○ Design changes ○ continuation of trial periods ○ permanent implementation ○ regulatory change to allow future pilots to instigate without public consultation
<b>EU04</b>	○ Webpage (N)	○ Social media (N) ○ Phone interviews (Y)		Push-Pull	○ Permanent

	○ In-person interviews (Y)				
<b>EU06</b>	○ Webpage (N)	○ Social media (N)	○ Civil society groups (N) ○ Community meetings (Y)	Lean Push-Pull-Network	○ Continuing to operate ○ Transitioning to permanent structures
<b>EU07</b>	○ Webpage (N)	○ Social media (N) ○ Email (N) ○ Phone (N)		Push-Pull	○ Bike lanes were once deemed unlawful, but eventually gained support and turned permanent
<b>EU08</b>	○ Webpage (N) ○ Flyers (N)	Social media (N)		Push-Pull	○ Merged into greater policy agenda and perpetuated
<b>LA01</b>	○ Webpage (N)	○ Social media (N) ○ Survey (Y)		Push-Pull	○ Around one third converted to permanent bike lanes
<b>LA02</b>	○ Webpage (N)	○ Social media (N) ○ Business owners' engagement (Y)	○ Civil society groups (N)	Lean Push-Pull-Network	○ Two avenues were made permanent: Ave. Insurgentes is an iconic road that could not have been able to have a bike lane, had there not been Covid disruption.
<b>OC01</b>	○ Webpage (Y) ○ Flyers, signages (Y)	○ Online commenting platform (Y) ○ Online survey (Y) ○ Email (Y)	○ Council meetings (N) ○ Individual neighbour engagement (Y) ○ Community events (Y)	Rich Push-Pull-Network	○ Minor design changes continuation of pilot projects ○ Bike lane removal in Port Phillip due to public backlash
<b>OC02</b>	○ Webpage (Y)	○ Online commenting platform (Y) ○ Online survey (Y) ○ Social media (N)	○ Local elected officials (N) ○ Community meetings (Y)	Rich Push-Pull-Network	○ Deferral of upcoming fast-track plans in CBD for 12 months
<b>OC03</b>	○ Webpage (N)	○ Online commenting platform (Y) ○ Email (N) ○ Phone (N) ○ In-person surveys (Y) Social media (N)	○ Council meetings (N) ○ Pop-up community events (Y) ○ Correspondence to council (N)	Rich Push-Pull-Network	○ Minor design changes (based on community feedback and subsequent officer suggestions) ○ Extension of piloting periods (due to COVID-19 disruption) ○ Converting temporary to permanent installations