



Fact sheets

Urbanisation and human mobility

July 2020



Economy and jobs • Education • Health • Public transport • Waste management

Background

These fact sheets provide an overview of existing research and evidence on some key dimensions of sustainable urban development and human mobility. Each concludes with a series of case studies showcasing innovative examples of city-led policies and initiatives at the intersection of urbanisation and human mobility.

The fact sheets were prepared by ODI as background briefing materials for the first virtual city consultation of the ‘Growth and solidarity: reimagining human mobility in Africa and Europe’ initiative, supported by Open Society Foundations. Led by the Mayor of Freetown, Yvonne Aki-Sawyer, and the Mayor of Milan, Giuseppe Sala, the initiative will culminate in a Mayors’ Dialogue in early 2021. The Dialogue will be the first milestone in a city-led and action-orientated initiative to establish practical avenues for cooperation between African and European cities on human mobility for delivering inclusive and sustainable growth and inclusive societies.

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Economy and jobs



- As workers and consumers, **urban migrants contribute to local development** by growing workforces, paying taxes, and filling key labour shortages.
- Cities can support efforts aimed at **tapping into migrants' qualifications and skills**, as well as developing and expanding these efforts to match current and future labour needs.
- The **informal economy** employs a majority of migrants across cities in the world. While providing livelihoods to millions, this results in **foregone tax revenues** that could support cities' basic services.

As workers and consumers, urban migrants contribute more in taxes and social benefits than they receive from public assistance. Migrants in Organisation for Economic Co-operation and Development (OECD) countries are predominantly employed in manufacturing (53 million workers), wholesale/retail/repairs (50 million), and health/social work (28 million). In Africa, labour migration is predominantly lower-skilled and skewed towards the agriculture, fishing, mining, construction, hospitality, healthcare, and service sectors (ILO, 2020). Migrants help grow local workforces and labour market flexibility, and account for 70% of Europe's workforce growth between 2004 and 2014, and 15% of new entries into occupations in the healthcare and STEM fields (OECD, 2014). In London (UK), it is estimated that employment rate goes up by 0.35% for every 1% increase in the number of EU migrants (Fingleton et al., 2019).

Urban youth migration can be an opportunity to fill labour shortages as un/under-employment disproportionately affects migrant youth. In Morocco, rural–urban migration of youth has exacerbated urban youth unemployment rates to 40% (Schwenk, 2019). The potential socioeconomic benefits to be gained by building young peoples' training and employment profiles to match actual labour needs in other cities are further compounded by recent projections of demographic decline – and associated skill shortages and economic instability – across cities in Germany, Italy and Poland, for

example. Building skill profiles to fill labour gaps in major metropolitan regions presents a practical imperative as well as an opportunity for developing twin city linkages.

Cities, companies, and residents can benefit from welcoming visa regimes and open-minded, tolerant societies. Where urban migrants are empowered to integrate equitably, the benefits can spread to all. Some American metropolises observed that an increase in migrant diversity corresponded to an increase in wages (Kemeny and Cooke, 2018). In contrast, low wages and difficulty changing jobs experienced by foreign workers in Dubai has resulted in a cost born by employers equal to 7% of their total costs (Vazquez-Alvarez, 2010).

Where adequate job creation and job-matching infrastructures fail, migrants may fall into chronic unemployment and under-employment. This fuels the informal economy. The growth of informal economies across much of the world's cities underlines this challenge; in Lagos (Nigeria), a city built by urban migration, the informal sector is thought to employ 80% of residents and contribute \$125 billion to Nigeria's economy (Neuwirth, 2004). While the informal economy makes indirect contributions to the formal economy, capturing that untaxed turnover could translate into additional funding for basic services that would fuel urban economic growth while at the same time legitimating migrants' contributions to urban life.



Cities across the world are spearheading initiatives to empower newcomers and unlock job opportunities, to the benefit of all. See some examples on the following page.



The Mentoring Partnership (Toronto, Canada)

Managed by the Toronto Region Immigrant Employment Council (TRIEC), The Mentoring Partnership works with community partners to match, coach, and place new migrants in Toronto with employers. Toronto is Canada's most migrant-dense city and contends with an immigrant unemployment rate (11%) almost double that of its native-born population (6%). Since 2004, the Partnership has paired more than 18,000 newcomers with mentors in their specific job field and boasts a 77% job placement rate for mentees within one year of programme completion. Within two years, an evaluation found that for every \$1 invested in the programme, the Partnership returns \$11 on average in benefits to society.



Mingo Migrant Enterprises (Vienna, Austria)

Developed by Vienna in 2008, Mingo Migrant Enterprises tackles migrant un/under-employment by mentoring migrant entrepreneurs who wish to set up a company or develop an existing one. Though Vienna maintains a low unemployment rate of 12% as of 2018, migrants are disproportionately affected, with 44% of foreign-educated migrants unemployed (OECD, 2018). Mingo targets Viennese entrepreneurs with a migrant background (estimated at 37% by the ILO) by offering financial coaching, intercultural business classes, networking events, and personal consultations in a wide number of languages, in addition to a special stream for migrant women entrepreneurs. The initiative exceeded its goal of supporting 300 entrepreneurs within the first three years of operation, with 800 mentored and a six-fold increase in submitted applications by 2011.



Delala (Addis Ababa, Ethiopia)

Though not yet operationalised, Delala hints at the innovative possibilities of city-level coordination in the face of urban un/under-employment and came third at the 2017 Geneva Challenge by the Geneva Graduate Institute. Delala is a kiosk-based, job-matching system that aims to solve Addis Ababa's 24% unemployment rate (Lercari et al., 2017). Driven partially by increased rural–urban migration among newly landless Ethiopian youth, unemployment in Addis Ababa is exacerbated by the spatial dislocation, high transportation costs, and lack of internet connectivity its job-seekers face. Due to these, a stunning 20% of the city's unemployment is estimated to be the result of unfulfilled job matches between employers and potential workers (ibid.). With these issues in mind, the team conceptualised the Delala kiosks to provide spatially decentralised, non-internet based, job-matching and employment information services to the youth and rural–urban migrants who live predominantly in Addis Ababa's outskirts.



ARRIVO BERLIN (Berlin, Germany)

Berlin has been one of the cities at the forefront of the European refugee 'crisis'. Today, its foreign-born population represents 18% of the city's 3.7 million inhabitants (WEF, 2017: 65). Unemployment among Berliner migrants is more than twice that of unemployed nationals; integrating asylum-seekers with uncertain application outcomes poses an even greater problem. To address this gap and the growing skilled labour shortage across Germany, ARRIVO BERLIN launched in 2014 with support from the Berlin Senate Department for Integration, Labour, and Social Affairs to: (1) provide local refugees and asylum-seekers with language training, vocational workshops, and specialised professional courses; (2) connect participants with companies looking for paid interns and/or apprentices; and (3) organise subsequent employment. Since its inception, ARRIVO has expanded to include 10 subdepartments that work across sectors with employers, government ministries and professional associations to ensure programme training and qualifications meet local hiring needs. Its Berlin-based network included more than 200 companies in 2018, with 450 individuals trained – despite a mere 60-person capacity (OECD, 2018: 66).

Education



- **Closing the educational gap** between urban migrants and their native counterparts holds long-term gains for all.
- **Reskilling** and **retraining** adult learners, as well as tapping into their **existing skills**, can help fill employment gaps.
- Creating **welcoming learning environments** requires tapping into and training teachers with migrant backgrounds.

Broadening educational opportunities to all migrants is central to achieving economic and social benefits for all city dwellers, but requires large upfront costs. To deliver on this, cities face the challenge of meeting increased demand for educational resources across all age groups. Factors contributing to the under-performance of migrants and their children include geographic, economic, cultural, and language barriers. Building schools in migrant-dense areas, increasing the number of classes, offering targeted curricula, and where necessary retraining teachers all require coordination that may or may not be feasible under specific city governance mandates and budgetary constraints. Aiming to offer education and skills development for all city residents is key to improving livelihoods and health outcomes, reducing gender inequality and enhancing political participation.

Opening up access to life-long learning opportunities is a critical task for cities, as 88% of international migrants globally are adults over the age of 18 (UNICEF, 2018). Skill matching, language classes, educational equivalencies, and vocational training can all contribute to increased employability for adult migrants, simultaneously mitigating economic losses associated with urban labour shortages. This is the logic behind the regional ‘Pilot Project Addressing Labour Shortages Through Innovative Labour Migration Models’ between Flanders and Morocco, whereby information and communications technology (ICT) students in Morocco will receive special training and assistance securing jobs

nationally and in Flanders, which is currently experiencing an ICT worker shortage. Potential payoffs can be important: in the UK, it was modelled that a 10% increase in vocational training between 2015 and 2025 could result in a £163 billion increase in national GDP (City & Guilds Group, 2015).

“Aiming to offer education and skills development for all city residents is key to improving livelihoods and health outcomes, reducing gender inequality and enhancing political participation.”

Cities should strive to create welcoming and inclusive learning environments for all. For that to be the case, migrants’ perspectives need to be represented in schools, with the inclusion of teachers and trainers from migrant backgrounds. Some municipal programmes have leveraged migrants’ cultural insights to simultaneously increase education, employment, and integration outcomes. Every year, 15,000 Romani asylum-seekers are sent from the EU to Serbia (SIPRU, 2016). In Subotica (Serbia), members of the Roma community have worked with the city council to advocate for training and employment of Romani teachers in local schools; funding was also raised to transform abandoned buildings into cross-cultural educational facilities for Romani students. By 2006, 61% of primary school-age Romani children in Subotica were enrolled locally, compared to the average 40% across 15 Central and Eastern Europe countries that same year (OSI, 2006; ICC, 2011).



Empowering urban migrants to access education and skills development has significant economic and social benefits for all. On the following page are some city initiatives that are proving just that.



**Quality in
Multicultural
Schools (QUIMS)
(Zurich,
Switzerland)**

QUIMS was first piloted in a few high schools in 1996 before being incorporated into municipal legislation as a new framework for education in 2006. Zurich, one of Switzerland's most prosperous cities, became a prominent destination for higher-skilled Italian and German migrants at the time, with foreign-language children representing 21% of all students in the city in 2007. As a statutory support system for all local 'multicultural' schools, or those in which foreign-language students constitute 40% of total enrolment, QUIMS provides additional funds from the Education Directorate to promote educational success, language learning, and social integration for its students. By emphasising systemic inclusivity as a benefit to all children, and by engaging parents, teachers, and administrators at every stage, QUIMS manages to scale, sustain, and improve programme performance each year, with an 82% perceived success rate in 2018.



**Employment
Access
Programme
(EAP)
(Cape Town,
South Africa)**

Managed by the Scalabrini Centre of Cape Town, the EAP promotes socioeconomic integration for asylum-seekers, refugees, migrants, and dispossessed South Africans alike by enhancing access to local employment opportunities. Across South Africa, unemployment hit an 11-year high of 29% in 2019, due in large part to a growing nationwide skills mismatch, with a reported 54% of unemployed jobseekers possessing advanced qualifications but not in the skill sets desired by employers (City & Guilds Group, 2015; Toyana, 2019). Targeted interventions undertaken by the EAP to address these gaps include vocational skill and job readiness trainings; employer outreach and advocacy; a Help Desk for assistance with CVs and applications; a Job Placement Service that connects employers to unemployed migrants directly; and a Foreign Professionals Desk that assists migrants with a three-year degree or higher with educational equivalencies, professional development and employment. Of the 1,300 individuals who have used its Help Desk services, 24% have got a job and for individuals who attend skill trainings, the employment success rate is estimated at 49% (Scalabrini Centre of Cape Town, 2018).



**BRIDGE
(Rotterdam,
Netherlands)**

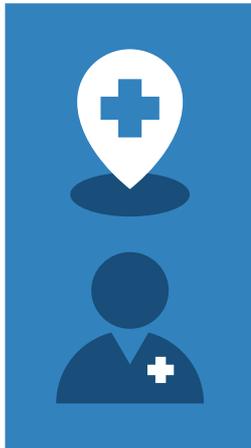
Building the Right Investments for Delivering a Growing Economy (BRIDGE) launched in 2017 and is managed by the Town Hall with financial support from the EU. It aims to better align students' educational choices with future labour market needs in South Rotterdam. In South Rotterdam first and second-generation migrants constitute 74% of the local population, and unemployment stands at 21% (UIA, n.d.). BRIDGE engages parents, students, teachers, and employers alike. The scheme starts in primary school, before leading towards a 'Career Start Guarantee'. Here 700 local employers in major growth industries have committed, in advance, to offering jobs to students in the scheme upon satisfactory completion of training.



**Portas Abertas:
Português
para Imigrantes
(São Paulo, Brazil)**

Portas Abertas launched in 2017 as a joint initiative between São Paulo's Municipal Secretaries of Human Rights and Citizenship and of Education, to offer free Portuguese classes to all migrants, regardless of immigration status. Migrants account for nearly 20% of São Paulo's population, with nearly 10,000 foreign-born students (Juzwiak, 2014). Portas Abertas provides language training that covers employment and legal issues, in order to facilitate migrants' entrance into the formal labour market, while also promoting an agenda of inclusion, human rights, and equal access (Governo do Estado de São Paulo, 2018). The initiative is aligned with municipal policies of enrolling school-age migrant children regardless of immigration status. Portas Abertas has now been expanded to 15 schools (Cidade de São Paulo, 2017; Special Secretariat for Communication, 2019).

Health



- Increased migration to cities results in greater **demand on healthcare** systems. Without access to health services, the risk of disease transmission in high-density areas is exacerbated.
- **Mobile clinics, training migrant workers** and improved **monitoring** are all tools that cities have deployed to step up to the challenge.
- Healthcare workers move to and between cities for better prospects and to fill **labour shortages**. This may result in a 'brain drain' for some cities, but a gain for others. This requires tailored interventions to ensure 'win-win' approaches for cities.

Cities face practical and political challenges relating to the provision of healthcare for migrants. Increased need and demand for medical services may lead to shortages of personnel, pharmaceuticals, vaccines and facilities (Tulloch et al., 2016; Chiarenza et al., 2019). In places, cost-prohibitive or lack of access to healthcare regimes also risks straining emergency room services and exacerbating migrants' already-low physical and mental health outcomes compared to native-born populations (Crede et al., 2018). Although some migrant health issues may be the result of a difficult and stressful migration journey, others are linked to socioeconomic conditions like improper sanitation, overcrowding, and proximity to polluting infrastructures such as processing plants, and highways and landfills (Tulloch et al., 2019; WHO, 2020).

“Where equitable health coverage and sufficient resources exist, cities should ensure migrants can access those services.”

Where equitable health coverage and sufficient resources exist, cities should ensure migrants can access those services. Linguistic and cultural barriers, a fear of authority and deportation (if undocumented), and general lack of awareness can hinder migrants' access to healthcare. Cities can address these issues by bringing services to migrants-in-need directly, as has been done in Berlin

with the Med-Points system, and in Flanders with mobile vaccination clinics; or by instituting cross-sector community training programmes. The World Health Organization (WHO) estimates that schemes employing migrants to increase outreach to migrant populations could see a 10-to-1 return on investment in sub-Saharan African cities, as a result of increased general productivity (Dahn et al., 2015).

“Trained doctors, nurses and care workers move to cities offering better prospects, with better wages and improved working conditions.”

Gaps in the healthcare systems of ageing, wealthier cities leads many skilled migrants to move to fill labour shortages, particularly women (O'Neil et al., 2016). Trained doctors, nurses and care workers move to cities offering better prospects, with better wages and improved working conditions. For example, in 2012, 22% of nurses and 35% of medical practitioners in the UK were foreign-born (Jayaweera, 2015). The emigration of skilled workers risks weakening the healthcare system of some cities, while benefiting others. To mitigate 'brain drains', bilateral skills partnerships can be drawn up. Under such partnerships, skill creation and skill mobility are traded; with funds for training provided to cities of origin and those trained given the option of living and working for a reasonable period of time in a 'brain gain' city (McKee and Talbot, 2016).



Cities are undertaking targeted, cross-cutting initiatives to improve health outcomes for migrants. See some examples on the following page.



Mohalla Clinics (Delhi, India)

Mohalla (*community*, in Hindi) Clinics first opened in 2015 in Delhi to deliver universal healthcare by offering free primary care services to chronically underserved populations. In Delhi, where 450 Mohalla Clinics have already been opened, low-income, rural–urban Indian migrants constitute about 33% of the urban population (Times of India, 2018). City officials aim to open 1,000 clinics Delhi-wide, to bring free healthcare services within a 1km radius of every resident’s home, with a large number opening in lower-/middle-class neighbourhoods and informal settlements (Times of India, 2020). The programme is funded through the state budget and has achieved significant success, serving two million residents by 2017 and inspiring plans to scale the programme across several other Indian states (Fernandes, 2017). The availability of Mohalla Clinics has increased the number of doctor’s visits annually to 5.6 visits per year (compared with the national average of one per year) by breaking down geographic and cultural barriers to healthcare among Delhi’s underserved urban poor (Agrawal et al., 2020).



Warwick Junction (Durban, South Africa)

Located on the outskirts of Durban, Warwick Junction is South Africa’s largest transportation and trading hub, through which 460,000 people pass daily, and to which 8,000 informal traders – many of whom are unemployed rural–urban migrants – come to sell their wares (PPS, 2015). To address unsanitary and unsafe market conditions due to heavy foot traffic, vehicle pollution, overcrowding of vendors, and food handling, the municipal health department launched a series of health training and certification programmes for traders in 1996. Four years later, the city inaugurated an Informal Economic Policy (IEP) that not only made Durban the only South African locality to include the informal economy in its policy but has also helped legitimate informal traders’ contributions to urban life. The IEP was closely followed by a collaborative, area-based intervention to improve services and facilities in Warwick Junction by introducing toilets, trash bins, and water fountains. In more recent years, the local NGO-based ‘Phephanathi Platform’ has collaborated with city officials to conduct hazard-mapping walkabouts of the market, provide occupational health and safety trainings to traders, distribute first aid kits, and offer medical assessments across the market. Given the difficulty migrant traders experience in accessing healthcare in Durban, these interventions are essential.



Health in Sweden (all cities, Sweden)

Health in Sweden represented a collaborative effort between Swedish municipalities to better address refugee health needs and to improve the number of medical examinations provided to newcomers. Amidst an increase in refugee populations since 2013, the Swedish Health Ministry provided funding in 2015 to the Swedish Association of Local Authorities and Regions (SALAR) to conceptualise and implement a cultural sensitivity training programme that could be independently scaled across every Swedish municipality. The training sensitised healthcare professionals to the specific needs of refugees (including migration-related stressors) and consisted of everything from basic interventions to diagnostic and treatment interventions for mental illness; best practice and knowledge-sharing tools were also implemented. Between 2016 and 2017, 20,000 medical professionals were trained across all Swedish municipalities, resulting in a 29% increase in the number of medical examinations provided in 2016 alone (SKL, 2018). The initiative also launched the Asylum Healthcare Platform – a compilation of national and local data related to migration and refugee health, developed with the goal of improving system management and monitoring across the entire country.

Public transport



- **Access to public transport** is key to the inclusion of urban migrants who, like other city dwellers, need public transportation to go to work, attend school, socialise, and shop.
- Lower-income migrants tend to settle in cities' peripheries, where access to transport networks can be more constrained and costly. This may lead to **increased demand** on cities, transportation systems.
- Cities can ensure migrant inclusion while also delivering on their **low-carbon** transport development goals.

Urban transport solutions for migrants can be integrated into municipal clean energy projects at no cost. Cities with 100-bus fleets could save \$25 million in fuel costs by switching from diesel to natural gas buses (Clean Energy Fuels 2018) – savings that could be used to enhance transport access into peri-urban areas, or to fund other local economic development projects reaching low income migrants. Where up-front funding is scarce, cities can also offer low-cost, clean-energy options at the individual level. In the UK, London-based ‘The Bike Project,’ for example, refurbishes second-hand bikes and hands them out to local refugees for free; so far, 6,000 refugees have received bikes through the programme. In Paris (France), Solidarité Transport discount offers up to 75% off normal Paris Métro fares for socioeconomically disadvantaged and unemployed persons.

Enhancing transport access has important implications for migrants’ and cities’ social inclusion, health, and economic productivity. Public transportation connects otherwise spatially dislocated migrants with the city centres where formal economic activities, social services, food banks, health clinics, and legal services are located. In Portland, Atlanta, and Houston (USA) access to public transport disproportionately determines rates of urban labour participation among cities’ most dispossessed residents (Sanchez, 1999; Yi, 2006). Across Africa, urban sprawl combined with low income levels account for the fact that

walking and cycling – often across long distances and along roads with no sidewalks – account for 70% of all trips in Dakar, and 40% of trips in Nairobi, Addis Ababa, and Lagos (Starkey and Hine, 2014: 30).

Enhanced transportation access to low-income and informal settlements would bring more migrants into formal employment sectors and make commutes safer.

“Enhancing transport access has important implications for migrants’ and cities’ social inclusion, health, and economic productivity.”

Cities with a high rate of immigration will face new as well as changing demand for public transport. Enhancing access to migrants may necessitate both larger fleets to accommodate increased passenger loads and enlarged transport networks, to reach and integrate the peri-urban and suburban areas where many migrants settle. The large up-front costs of restructuring multi-modal transport networks and the potentially conflicting governance mandates between local and national administrations may hinder cities from investing in public transport solutions, but cities will also face high migrant unemployment and reduced inclusion outcomes where geographic, financial, and cultural barriers combine to prevent adequate public transport access.



Cities across the world are working to broaden access to transport to help facilitate migrant inclusion. See some examples on the following page.



Bus Rapid Transit (BRT) Pilot Project (Dakar, Senegal)

Launched in 2017 with financial support from the World Bank, Dakar's BRT pilot aims to enhance urban mobility between the city centre and Guédiawaye, its smallest but most populous district. Guédiawaye is characterised by informal settlements that house a large percentage of the city's urban poor and rural–urban migrants. Traffic congestion in the city has long been considered an obstacle to growth; in 1998, an estimated \$18 million (2% of Greater Dakar's GDP) were lost due to negative externalities and insufficiencies associated with Dakar's urban transport system (World Bank, 2017: 10). With unemployment at 17% and its population expected to double by 2030, Dakar is rapidly scaling its municipal transportation system (WEF, 2017: 111; Riveras, 2018). The BRT, by restructuring the city's public transport network and constructing a BRT line with three major terminals, 20 additional stations, a new bus fleet, and discounted fares, aims to enhance integration and shared prosperity across the Greater Dakar area (World Bank, 2020). By 2023, it is projected to cut commute times from 95 minutes to 45 minutes, service 37,000 km each day, save 14,000 tonnes of CO₂ eq. emission per year and bring 69% of the area's residents (against 57% currently) within a 60-minute commute of the city centre where economic opportunities are concentrated (World Bank, 2020).



Transit-Oriented Development Strategic Framework (TODSF) (Cape Town, South Africa)

As South Africa's second most populous city and its legislative capital, Cape Town has attracted migrants since the end of Apartheid. Between 2001 and 2011, it drew 335,000 migrants both internal and international; between 2011 and 2016, the city grew again by 265,000, 25% of which was due to migration (WEF, 2017: 107). In the face of such population growth, Cape Town has adopted a Transit-Oriented Development Strategic Framework (TODSF) for improved transport network design and outcome. The goal is to improve mobility for all residents; spatially transform and re-densify the city; mitigate the effects of an affordable housing shortage that has forced many low-income migrants and residents to settle in Cape Town's peripheries; and alleviate costs for the low-/medium-income residents who account for 95% of the city's public transport use but spend roughly 43% of their income on transport (UITP, 2017; City of Cape Town, 2016: 8). To this end, TODSF planners expanded the plan to include job-generating land uses and social facilities near high-density, low-income settlements. The implementation of these objectives is predicted to facilitate a simultaneous 20% increase in shared transport usage and 23% reduction in passenger travel distance (UITP, 2017).



Integrated Mass Transit System (IMTS) (Surat, India)

Surat, India's eighth largest city, is home to nearly six million people, of which an estimated 65% are rural–urban migrants (Times of India, 2019). Prior to 2014, the city had a mostly road-based transit system, consisting of city bus services, a six-route BRT service, private vehicles, and informal auto-rickshaws. Amidst increasing traffic congestion, the city of Surat developed the IMTS to expand the city's existing BRT system to a 156-vehicle fleet covering 102 km and expanding access by 23% (Thennarasan, 2018). Inaugurated in 2014, the IMTS has since enjoyed great success, due in large part to its integration of a circular 'high mobility corridor' route around the city centre where economic activities are concentrated, and to which all BRT lines lead; and a 690-stop 'City Bus' service connecting BRT passengers with the residential areas, informal settlements, and slums that house 94% of Surat's municipal population, including many of its low-income urban migrants (SMC, 2016). The entirety of the IMTS has, to date, expanded city bus operations to cover 376 km across 35 routes that transport an average one million people every day (SMC, 2016). The city is currently assessing options for a 73 km metro rail service and further expansion into neighbouring suburban areas.

Waste management



- Developing new and upgrading old **waste management infrastructures** is costly but necessary to deliver environmental health and urban sustainability for all – including for urban migrants.
- For cities, accessing **finance** for delivering long-term, resilient and **low-carbon** waste management infrastructures is crucial given the scale of the investment required.
- Urban migrants living in **informal settlements**, not connected to the waste management system, are exposed to negative health outcomes.

Increasing pressures on waste management infrastructures presents one of the greatest environmental and public health challenges facing local authorities. Many cities struggle to treat the total volume of human waste and solid waste generated by their residents. In 2016, the world's cities generated more than two billion tons of solid waste, a figure that is expected to rise to 3.4 billion tons by 2050 (World Bank, 2019). Where infrastructure for human waste management is in place, there remains substantial risk of water contamination in cities at risk of extreme climate events (WEF, 2017). Mismanaged solid and human waste can lead to soil pollution, proliferation of pests, and infectious disease spread, resulting in significant social and economic losses for all.

Better waste management is critical, particularly for urban migrants living in informal settlements. Poor waste management infrastructures can exacerbate already-low health outcomes for migrants living in informal settlements. More than 50% of city residents in the developing world experience illnesses related to water contamination due to lack of adequate human waste management infrastructures. This situation is particularly prevalent in informal settlements; with infants, young children, pregnant women, and the elderly especially vulnerable (WHO, 2020). So, too, does a lack of infrastructure for solid waste management undermine public health; many informal settlements' dwellers dump or burn

their refuse due to a lack of adequate disposal infrastructure. Municipal solutions to solid waste management must consider the informal economy that tends to develop around up-cycling, recycling, and re-selling unmanaged waste, as informal waste-picking provides a livelihood across cities in developing countries. Waste pickers in Durban (South Africa) report that this activity provides 60% of their household income, while in Nakuru (Kenya) waste pickers rely on this informal activity for 80% of their income (Dias and Samson, 2016).

Given the pressure on waste management services, creating and upgrading infrastructure is critical, but also offers an opportunity for low-carbon development and improved health outcomes. Transitioning to clean energy systems can help offset costs. For example, converting solid waste to energy not only offers an alternative to fossil fuel for energy production but also decreases the total volume of solid waste by 90%, alleviating pressure on costly and potentially polluting waste storage and disposal (Waste Management, n.d.). In Europe, waste-to-energy plants supplied 18 million people with low carbon electricity and 15 million with heat in 2015 alone (CEWEP, 2015). Climate finance can unlock funding which remains a significant barrier to expanding and upgrading urban waste management systems with solid waste management already accounting for an average 20–50% of municipal budgets in low-income countries (World Bank, 2019).



Despite widespread challenges, many global cities are doubling down on efforts to improve their human and solid waste management infrastructures. See some examples on the following page.



Ablution containers (Durban, South Africa)

Durban is one of South Africa's largest cities, a result of rural–urban migration, with a third of its residents thought to reside in its nearly 500 informal settlements (Schneider, 2016). Struggling to ensure inclusive access to human waste management and treatment systems for their low-income residents, municipal officials turned to the idea of installing low-cost 'ablution containers' across the settlements. Under the initiative and using international funding, hundreds of shipping containers were retrofitted with gender-separate toilets, showers, urinals, and laundry facilities, and connected to the municipal sewage system; lights were installed to ensure safe access for women and children at night. By 2015, 2,500 ablution containers had been supplied, improving access for more than 500,000 community members (Container World, 2015; Schneider, 2016). Containers were estimated to cost \$65,000 each and designed to create jobs for residents who could be involved in removing blockages and performing low-tech maintenance (Schneider, 2016; Mannak, 2017). The City of Durban was recognised internationally for its efforts, winning the 2014 Stockholm Industry Water Award and the 2015 African Municipality of the Year Award.



Landfill Gas Recovery (LFG) system (Amman, Jordan)

Since the outbreak of the Syrian Civil War in 2011, Amman's solid waste generation has increased by almost half as a result of the large refugee population. To address the growing waste issue, the Greater Amman Municipality (GAM) has secured more than \$1.1 billion in grants and loans since 2016 from the European Bank for Reconstruction and Development to build waste management and processing infrastructures. The ongoing LFG project will see generators installed in Al Ghabawi, the city's main landfill. The LFG system will help decrease environmental contamination risks associated with buried waste while at the same time generating clean electricity for national distribution via the power grid and reduce CO₂ emissions by more than 2.6 million tonnes (Zgheib, 2018). Additional funding has also been allocated for GAM to purchase new waste collection vehicles in order to replace older fleets and alleviate harsh working conditions for GAM drivers.



Amager Bakke (Copenhagen, Denmark)

An estimated 20% of Copenhagen's population is a migrant or from a migrant background (Denmark Ministry of Immigration and Integration, 2018). Following a rise in refugee populations since 2015, the city of Denmark opened a state-of-the-art, solid waste-to-energy plant in 2017 to cope with increased demand on its waste management infrastructure while also complying with its net zero climate targets. Known as Amager Bakke, the plant has a significant up-front cost – estimated at \$670 million, paid in full by the municipal government (Rathi, 2019). Amager Bakke has the capacity to treat 400,000 tons of waste produced by 500,000–700,000 city residents and 46,000 local companies. It supplies clean electricity to 62,500 local households and gas heating for 160,000 (B&W Vølund, n.d.). The plant site itself doubles as a public space with hiking trails, ski slopes, and the world's tallest artificial climbing wall (Crook, 2019).

Sources

Economy and jobs

Overview

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