Challenges – priorities for Mission Cities

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Mission Cities are now four years into their active engagement with the EU Mission for climate-neutral and smart cities. While much of the initial phase entailed engaging with the EU and specific elements (i.e. climate city contract development and resourcing through a series of funding offerings), Mission Cities have been and are shifting into full-scale implementation activities.

Given the explicit and intensive learning activities embedded in the Mission's process, both cities and NetZeroCities have been to identify key areas of focus for enabling implementation to progress as best as possible. We are bringing those into our collaboration with Mission Cities in the form of "challenge areas" with the aim of helping to bring clarity of focus and shape our Mission platform support offerings.

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1. Decarbonising European Port-City Ecosystems

Challenge Area

Helping cities move from managing ports as standalone infrastructure assets to integrating them as strategic platforms for climate neutrality, where clean energy, zero-emission logistics, industrial transformation, resilience, public value and economic competitiveness are planned and delivered together. Ports here refers to the broader port area and its connections to the city: the energy flows, freight corridors, industrial land, the points where port and city meet, and the governance structures that link port activity to urban life. The goal is not simply to green port operations in isolation, but to redesign the relationship between the port and the city so that the transition to climate neutrality is pursued as a shared ambition, with genuinely joined-up planning and a common stake in the outcome.

The problem [in short]

For many Mission Cities, the port is not a marginal emissions source. It is often the place where maritime transport, heavy freight, energy infrastructure, industrial production, fossil fuel logistics, land-use pressure and climate-risk exposure overlap. That makes ports a potential “elephant in the room”: if port-related emissions and infrastructure systems are not addressed, a city may make progress on buildings, public transport or local services while leaving one of its largest transition systems unresolved.

Why ports matter for urban transition

- Ports matter because they sit at the intersection of European trade, energy, industry and urban emissions.
- Ports sit at the core of Europe’s economy. European ports handle around 74% of the European Union’s external trade, around 3.4 billion tonnes of goods, and nearly 395 million passengers annually. They also support more than 423,000 direct jobs. (Mobility and Transport)
- Shipping is a material part of the climate problem. The Fourth International Maritime Organization Greenhouse Gas Study found that shipping’s share of global anthropogenic greenhouse-gas emissions increased from 2.76% in 2012 to 2.89% in 2018. (imo.org)
- Shipping emissions are still expected to grow without stronger intervention. The Fourth International Maritime Organization Greenhouse Gas Study reports that greenhouse-gas emissions from shipping rose from **977 million tonnes in 2012 to 1,076 million tonnes in 2018, and analysis of the study notes that emissions could increase significantly by 2050 under continued demand growth. (Maritime Cyprus)
- Transport remains one of Europe’s hardest sectors to decarbonise. The European Environment Agency reports that transport is responsible for about a quarter of European Union greenhouse-gas emissions and continues to create air pollution, noise and habitat impacts. (Europäische Umweltagentur)
- Ports concentrate multiple emissions systems at once. Decarbonising port areas can affect ship emissions at berth, port machinery, on-site power and heat, heavy road and rail freight, adjacent industrial processes, and the emerging infrastructure for hydrogen, e-fuels, carbon capture and offshore wind connections.
- Renewable shore power can remove a large share of at-berth carbon dioxide and local air-pollutant emissions for suitable vessel types, depending on the electricity mix, berth use, vessel compatibility and operating patterns.
- European Union policy is locking in expectations for rapid port decarbonisation. The Alternative Fuels Infrastructure Regulation requires shore-side electricity supply in key maritime ports by 2030, while FuelEU Maritime and the European Union Emissions Trading System extension to maritime transport are changing the regulatory and investment context for shipping and ports. (European Union)

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Taken together, if Europe does not decarbonise ports and port-industrial clusters, it cannot decarbonise trade, heavy logistics, maritime transport and major parts of industrial production at the speed required.

What is blocking progress

- Fragmented mandates: Municipalities, port authorities, national ministries, private terminal operators, utilities, industrial clusters and logistics actors each hold different pieces of the transition. No single actor has a full mandate to decarbonise the port-city system end-to-end.
- Weak port-city governance. Climate City Contracts, port masterplans, industrial strategies and infrastructure investment plans are often only partially aligned. Port-related emissions may sit partly outside municipal control, while cities still face the air-quality, land-use, traffic, resilience and political consequences.
- No shared understanding of the problem or commitment to act. Even where all actors recognise the need for decarbonisation, they may not agree on the scale of the problem, who should act first, who carries the cost, or how climate action should be balanced with competitiveness, security of supply, employment and growth.
- Infrastructure bottlenecks. Shore power, grid reinforcement, hydrogen and e-fuel bunkering, rail capacity, truck charging, energy storage and carbon dioxide infrastructure require major capital expenditure, long lead times and coordination with actors beyond the city.
- Project-by-project delivery. Shore power quays, electric yard equipment, green corridors, hydrogen pilots, industrial decarbonisation projects and waterfront resilience projects are often pursued as isolated measures rather than sequenced as a coherent transition portfolio.
- Unclear demand signal to markets. Terminal operators, shipowners, fuel suppliers, grid operators, logistics companies and investors see fragmented opportunities, not a clear multi-city demand signal for standardised and scalable solutions.
- Financing and risk allocation gaps. Business cases cut across ports, utilities, shipping lines, industrial actors, logistics operators, municipalities and national bodies. Cost-sharing, revenue models, public-value conditions, risk allocation and procurement routes are often not mature enough to move from aspiration towards delivery.
- Monitoring, reporting, verification and accountability gaps. Port-related emissions, air pollution, freight impacts, resilience risks and co-benefits are not consistently measured, reported or attributed between the city and the port. This weakens accountability and makes it harder to prove impact.
- Public value and social licence gaps. Communities often want cleaner air, less noise and better waterfront access, but may also be concerned about jobs, economic security, land-use conflicts and the port's competitiveness. Public opinion and community impact, therefore, need to be treated as part of the transition logic, not as a communications add-on.

Demand signal: why this matters across Mission Cities

Across Mission Cities, many coastal and riverine cities face similar versions of this challenge:

- Multiple City Climate Contracts identify ports, maritime logistics or port-industry clusters as major emitters and leverage points, including Amsterdam, Rotterdam, Limassol, Marseille and Oslo.
- Cities highlight similar intervention families: sustainable energy ports, shore power, green bunkering, zero-emission logistics, industrial clusters, waterfront resilience and coastal adaptation.
- Several cities face similar governance and infrastructure barriers**:** unclear port-city mandates, grid congestion, competition between port electrification and other urban electricity loads, fragmented industrial decision-making and complex lock-ins.

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- A coordinated challenge can help cities compare their port-city transition needs, aggregate demand for reusable solutions and develop stronger evidence for the European Union, national and private investment.

Impact & Learning Opportunities

Cities may learn how to:

- Move from isolated port decarbonisation projects to a joined-up port-city transition pathway that connects energy, freight, industry, resilience and public value.
- Build shared governance arrangements between municipalities, port authorities, utilities, logistics actors and industry, where responsibilities, costs and risks are clearer.
- Sequence and prioritise enabling infrastructure decisions (such as shore power, grid reinforcement, rail, bunkering and storage) as part of a coherent delivery portfolio rather than standalone investments.
- Develop stronger market signals and investment cases by aggregating demand and clarifying where scalable solutions are needed across cities and ports.

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2. Decarbonising Urban Logistics Systems

Challenge Area

Helping cities move from fragmented, diesel-based deliveries and service trips to zero-emission, well-managed urban logistics systems that support cleaner air, safer streets and reliable access to goods. Urban logistics here includes last-mile freight, service vans, construction logistics and other commercial trips that enter, circulate within or supply dense urban areas. The goal is not simply to replace vehicles with cleaner ones, but to redesign how goods and services move through dense urban areas so they are reliable, low-emission and well-managed.

The problem [in short]

Despite efforts to decarbonise urban logistics (via Climate City Contracts, mobility plans, low emission zones and pilot projects) progress is slowed because the system remains fragmented. Responsibilities, infrastructure, data, contracts and incentives are spread across many actors who operate independently, meaning solutions are not aligned, cannot scale, and fail to deliver system-wide change.

Why urban logistics matters for urban transition

- Urban logistics sits at the intersection of several transition systems:
    - Transport and mobility: Freight and service vehicles compete with public transport, cycling and walking for limited street space, contributing to congestion.
    - Air quality and public health: Vans and trucks are a major source of nitrogen oxides and particulate pollution in dense areas, with direct effects on respiratory and cardiovascular health.
    - Climate neutrality: Freight vehicles and service fleets form a material share of road-transport emissions; without tackling them, city-wide climate targets will be missed even if private cars and buses improve.
    - Local economies and services: Retail, hospitality, care services, construction and maintenance all depend on reliable logistics; poorly designed measures can trigger backlash from small businesses and workers.
    - Street space and liveability: Loading, unloading and curb use shape the quality of public space, walking and cycling safety and perceived fairness in how streets are allocated.
- This challenge is time-critical because:
    - Policy deadlines are approaching: many cities have committed to climate neutrality by 2030 and to introducing Low- or Zero-Emission Zones (LEZ/ZEZ) or Urban Vehicle Access Regulations (UVAR) within the next few years.
    - Investment windows for charging infrastructure, depots, consolidation hubs and street redesign are opening now, often linked to recovery, cohesion or national climate funds.
    - Lock-in risks are high: new logistics facilities, depots, road layouts and parking assets built without decarbonisation and consolidation in mind will lock cities into high-emission patterns for decades.
- Market change is already underway: e-commerce growth, instant delivery platforms, new operators and vehicle technologies are reshaping urban freight faster than public rules and data systems have adapted.
- Urban freight and service movements are a material part of city traffic demand, but robust EU-wide statistics remain weak. In one case study, freight vehicles represent around 10% of the vehicle fleet yet account for around 20% of peak-hour congestion, suggesting that logistics has a much larger

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impact on street capacity than fleet share alone would imply. [Eurostat City Statistics metadata; Madrid Digital-Twin UCC pilot / EIT Urban Mobility]

- Freight vans and trucks are a significant source of local air pollution in dense urban areas. Indicative ranges show that freight may account for around 20–30% of inner-city NOx emissions and 10–20% of $PM_{2.5}$, with higher shares in larger capitals and dense corridors. [Clean Cities Campaign (London); EU Urban Mobility Observatory]
- There is still an important evidence gap around the growth of urban van-kilometres across the EU. A consistent EU-27 time series for urban light-goods-vehicle activity is not readily available in published datasets, making this a live monitoring and measurement challenge for Mission Cities. [Eurostat metadata on road traffic and urban LGV categories]
- Combining zero-emission zones, consolidation hubs and zero-emission vehicle fleets could deliver substantial emissions reductions by 2030 (25–50% CO_2 reduction, 30–60% NOx reduction, and 15–35% $PM_{2.5}$ reduction, with higher reductions possible under full zero-emission-zone roll-out and high compliance). [Actu-Environnement synthesis of EC policy alignment scenarios (2023)]
- Freight-related air pollution creates a significant health burden. Transport-sector $PM_{2.5}$ is associated with around 10,300 premature deaths per year in the EU, while heavy-duty vehicles account for a large share of avoidable NOx-related deaths; where timely standards and fleet transition could materially reduce this burden. [EEA health-impact indicator (2025); ICCT Euro 7 health-benefit study (2023)]
- Freight activity also places heavy demands on curb space and road capacity, but better-managed logistics can reduce that burden. In one instance, freight vehicles have been associated with around 20% of peak congestion. Elsewhere, an urban consolidation centre pilot reportedly reduced freight trips by around 50% and congestion/emissions by up to 30%. [EIT Urban Mobility – Madrid UCC Digital Twin (2022)]
- The economic scale of urban last-mile logistics is already large enough that coordinated city action could send a meaningful market signal. There is an estimated European last-mile market of around €32 billion per year in 2023. Under favourable policy and charging conditions, coordinated procurement could potentially shift around half of that towards zero-emission services by 2030 under favourable policy and charging conditions. [Grand View Research (2024); ICCT HDV market tracker (2025); EAFO charging-infrastructure update (2025)]

What is blocking progress

Across cities, five to seven recurring delivery barriers appear:

- Fragmented mandates: Freight responsibilities are split across transport, economic development, planning, public works, police and sometimes port or regional authorities. No single owner is accountable for “urban logistics outcomes”.
- Project-by-project delivery instead of system design: Cities test individual micro-hubs, cargo-bike pilots, street redesigns or procurement clauses without a coherent logistics transition pathway or clear sequence of measures.
- Invisible flows and weak data governance: Detailed trip, stop and loading data exist in operator and platform systems, but cities lack data-sharing agreements, common schemas and dashboards to use this information for planning, UVAR design, enforcement and investment.
- Under-used consolidation infrastructure: Hubs are piloted where funding is available, not where long-term business cases are strongest. Zoning protection, volume guarantees and integrated contracts are often missing, leading to “ghost hubs” with low utilisation.
- Misaligned incentives for fleets and operators: SMEs and subcontractors face capital constraints, uncertain zone rules and tight margins. Public procurement for city services and state-owned companies sometimes fails to require zero-emission logistics or consolidated deliveries.

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- Weak integration with street space and UVAR design: Access rules, loading windows, parking and cycling infrastructure are often planned separately from freight needs, leading to conflicts at the curb and ad-hoc exemptions that undermine decarbonisation.
- Lack of replication logic: Many cities can point to promising pilots, but few have clear criteria for scaling, standard contract models, or replication packs that peers can adapt.

Demand signal: why this matters across Mission Cities

Analysis of Climate City Contracts and related plans shows that many Mission Cities describe very similar logistics challenges, even if they use different language:

- Commitments to zero-emission logistics zones, cargo-bike promotion, clean construction logistics and consolidation hubs recur across contracts.
- Cities repeatedly mention conflicts between freight and neighbourhood liveability, pressure on historic centres, and a lack of suitable space for hubs and micro-hubs.
- Several cities already run or plan urban consolidation pilots, but struggle to sustain volume, align business models or integrate them into zoning and access rules.

This is not a niche issue in a few capitals. It is a structural pattern across large, medium and smaller Mission Cities. Demand is emerging for similar families of solutions rather than identical projects:
The demand signal is not that every city wants the same hub or the same UVAR design. It is that multiple cities face structurally similar transition barriers and could benefit from:

- Comparable delivery models and value streams (who does what, in which sequence).
- Reusable resources and evidence (tender packs, SLAs, SOPs, data schemas, contract clauses).
- Zero-emission logistics zones and UVARs that explicitly cover freight and service vehicles, with clear phase-in paths.
- Networks of consolidation hubs and micro-hubs, often linked to rail, ports, major depots or large traffic generators.
- Cargo-bike and light-electric delivery ecosystems, integrated into cycling networks, public-space design and loading rules.
- Data-sharing platforms and logistics dashboards that support zoning, enforcement and optimisation.
- Standard contract models and procurement clauses for zero-emission deliveries and consolidated services.
- Clearer market signals for vehicles, charging, hubs, platforms and logistics services.

A coordinated challenge can turn this fragmented ambition into a credible, aggregated demand signal for zero-emission logistics solutions and supporting finance.

Impact & Learning Opportunities

What cities may learn:

- How to move from isolated logistics pilots to investable pipelines.
- How to align public, private and community actors around a shared logistics transition.
- How to turn plans and political commitments into delivery workflows and contracts.
- How to design ZEZ/UVAR and curb regimes that work for both climate and logistics.
- How to create credible demand signals for suppliers and financiers.
- How to replicate and tailor reusable resources from peers.

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3. Neighbourhood-Scale Heat & Cooling

Challenge Area

Helping Mission Cities design and implement neighbourhood-scale cooling strategies that protect residents from extreme heat, treating cooling as a collective urban service rather than a problem left to individual households to solve. Neighbourhood-scale cooling here refers to the combination of passive measures, shared infrastructure and demand management that can be planned and delivered at the district level, rather than leaving households to respond individually. The goal is not simply to keep residents cool, but to build the shared delivery models and governance structures that integrate cooling into Climate City Contracts and make it compatible with the city's climate-neutrality commitments.

The problem [in short]

Currently, cities cannot protect residents from rising extreme heat at the neighbourhood scale without triggering a surge in uncoordinated individual air conditioning that worsens urban heat islands, spikes electricity peaks and undermines climate-neutrality targets. Cooling is barely integrated into Climate City Contracts, and there is no shared delivery model for neighbourhood-scale cooling.

Why neighbourhood-scale heat and cooling matter for urban transition

- Urban heat is becoming one of the defining climate risks for European cities. Heatwaves in 2022 and 2023 caused tens of thousands of premature deaths across Europe, with the highest impacts in dense, low-income neighbourhoods and in building stocks designed to retain heat. At the same time, global evidence shows that mechanical cooling demand in cities can rise by over 40% between a 1.5°C and 3°C world, even before accounting for urban heat island (UHI) amplification.
- Several time windows are converging:
    - Heat trajectory: High-resolution projections (e.g. UrbClim®, NHESS 2024) show rising frequency, duration and intensity of urban heatwaves in almost all Mission Cities over the next 10–20 years.
    - AC adoption curve: European AC penetration is still comparatively low (~20% of households) but rising quickly. Decisions taken in the next 5–10 years will determine whether Europe follows the high-lock-in pathways already visible in parts of North America and Asia.
    - Infrastructure lock-in: Grid reinforcement, district heating upgrades, public-space redesign and building retrofits already planned under Climate City Contracts will either make coordinated cooling easier (or much harder), depending on choices now.
- Extreme heat is already a major urban health risk in Europe. Estimates of around 61,000 heat-related deaths in 2022, and around 47,000 in 2023, underline that urban heat is no longer a future risk but a present public-health challenge. [WHO / Lancet; regional health studies cited in the briefing]
- Rising urban temperatures can drive substantial increases in electricity peak demand. Each additional 1°C of urban temperature may increase city peak electricity load by roughly 0.45–4.6%, equivalent to around 22 watts per person or around 215 MW per degree for a medium-sized city, depending on local conditions. [Stanford / RFF synthesis; Salamanca et al.; other literature available]
- Uncoordinated air-conditioning uptake can create a self-reinforcing waste-heat feedback loop. Around 65% AC penetration, mean night-time urban temperatures may rise by roughly 0.5–1.5°C from AC waste heat alone, further increasing cooling demand. [Salamanca et al., JGR 2014; Osaka study (2019)]

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- Cooling demand rises sharply under higher warming scenarios. Global urban cooling scenarios suggest that mechanical cooling demand in European cities may increase by around 44% between 1.5°C and 3°C warming, before accounting for additional urban heat island amplification. [WRI 2024]
- Shared or district cooling can outperform individual split-unit approaches where conditions are suitable. Compared with individual units, district/shared systems have indicative ranges of up to 40–50% higher energy efficiency and around 20–35% lower lifecycle costs, assuming good system design and appropriate heat sinks or storage. [ScienceDirect Topics; ARANER; IEA DHC materials]
- Most Climate City Contracts still do not include neighbourhood-scale heat or vulnerability maps, despite widespread data availability. This gap affects most CCCs even though external mapping resources exist for 80+ Mission Cities. [Urban heat mapping briefing analysis; comparison with Copernicus / EEA coverage]
- If each household responds alone, by installing split-system AC, cities risk a self-reinforcing feedback loop: more AC would result in more wasted heat, fueling higher outdoor temperatures and necessitating more AC. This is structurally incompatible with climate-neutrality pathways.
- Without a focused, delivery-oriented challenge, cities will continue to respond to heat with unstructured pilots and household-by-household decisions, rather than coherent neighbourhood strategies. Existing work is necessary but insufficient:
    - City-level climate plans commit to resilience and “thermal comfort” without specifying how cooling will be delivered at the neighbourhood scale.
    - European district cooling examples (Copenhagen, Helsinki, Stockholm, Amsterdam) are mostly commercial-district or flagship projects, not yet translated into retrofit models for mixed residential neighbourhoods.
    - Nature-based cooling pilots (green corridors, cool roofs, sponge-city projects) often lack integration with building retrofits, energy communities or district energy planning.
    - CCCs rarely treat uncoordinated AC uptake and the AC–heat feedback loop as explicit transition risks.

What is blocking progress

Across Mission Cities, recurring barriers for neighbourhood-scale heat and cooling include:

- Fragmented responsibility for cooling. Cooling cuts across departments: climate, health, buildings, energy, public space, social services, and utilities. No clear owner is accountable for neighbourhood-scale cooling outcomes.
- Missing heat and vulnerability baselines in CCCs. High-resolution UHI and vulnerability data exist (Copernicus, CLMS, GUHVI, local atlases) but are not integrated into CCC governance or investment logic.
- No shared delivery models for neighbourhood cooling. Cities lack standard value streams for: district / shared cooling, integrated passive + active measures, and governance-first community cooling approaches.
- AC lock-in is invisible in planning. The systemic risks of mass AC adoption (waste heat, peak demand, refrigerant leakage, affordability) are not treated as a core design constraint.
- Grid and district-energy constraints. Electricity and district heating networks are planned on long cycles; many cities have not yet defined how grids will accommodate coordinated cooling and demand response.
- Weak business models for shared cooling. Cost and revenue models for district or shared cooling in residential neighbourhoods are poorly developed, especially where heat pumps, thermal storage and nature-based solutions must be combined.

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- Equity and affordability concerns. Low-income households face the highest heat risk and the highest burden from high energy bills. Cities lack practical mechanisms (tariffs, community ownership, public-value criteria) to make coordinated cooling affordable and fair.
- Limited neighbourhood-scale data: Monitoring focuses on city-wide emissions and energy use, not on neighbourhood-level thermal comfort, peak-load impacts or cooling equity.

Demand signal: why this matters across Mission Cities

- The urban heat crisis is not limited to a handful of southern cities:
  - Copernicus and EEA data show elevated UHI intensity and heat risk in many Mission Cities, from Barcelona and Valencia to Vienna, Berlin and Amsterdam.
  - Several Mission Cities already operate or plan district heating networks and are exploring district cooling or integrated heating-cooling systems (e.g. Copenhagen, Helsinki, Stockholm, Amsterdam, Barcelona, Valencia, Milan/Padua).
  - CCCs frequently reference energy poverty, vulnerable residents and neighbourhood inequality, but rarely connect these explicitly to cooling and heat exposure.
- Across CCCs, four recurring gaps appear:
  - No neighbourhood-scale heat baseline. CCCs track emissions but not spatial heat and vulnerability maps, even where high-quality external data already exists.
  - No cooling demand and peak-load modelling. Very few CCCs analyse future electricity peaks or AC penetration trajectories under warming scenarios.
  - Cooling treated as an afterthought. District energy plans, building renovation programmes and energy communities focus on heating and electricity, with cooling added late or not at all.
  - Lack of replicable neighbourhood models. There is no documented, replicable playbook for retrofitting existing residential neighbourhoods with shared cooling or integrated passive + active solutions.
- This challenge targets those structural gaps and can aggregate demand for:
  - Common transition elements such as *unmanaged heat risk* (towards managed neighbourhood-scale cooling), *uncoordinated AC* (towards coordinated shared or high-efficiency cooling packages) and *no heat baseline* (towards using a neighbourhood heat and vulnerability atlas).
  - Standardised value streams for at least three intervention types (shared cooling, passive + active packages, governance-first community cooling), each with clear customers, owners, steps, KPIs and reusable resources and evidence.
  - Replicable neighbourhood blueprints that link heat mapping, building stock, energy systems and social vulnerability into prioritised, investment-ready projects.
  - Comparable baselines and indicators for neighbourhood coolth, peak-load impacts, equity and affordability.
- Suppliers (district cooling utilities, heat-pump and chiller providers, nature-based solution providers, energy management platforms) and financiers (municipal bond schemes, cooperative finance, EIB/EIB-like instruments) need:
  - Clear SKU-like delivery packages (e.g. “Type A: waterfront mixed-use district cooling retrofit”; “Type B: passive-plus package for 1,000 social housing flats”; “Type C: governance-first cooling programme for vulnerable neighbourhoods”).
  - Archetype-aware demand waves, indicating which types of cities (A/AB/BA/B/C) can credibly deliver which packages, at what tempo.

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Impact & Learning Opportunities

Cities may learn how to:

- Turn abstract “heat adaptation” commitments in CCCs into concrete neighbourhood cooling delivery pathways.
- Use existing European and local data to build a neighbourhood heat and vulnerability baseline that guides decisions.
- Choose between and combine cooling typologies (shared mechanical systems, passive & active integration, governance-first community cooling) based on local conditions.
- Design value streams and contracts that align cooling, energy, grid and public-space decisions.
- Structure community governance and ownership models that make cooling affordable and legitimate.
- Harness neighbourhood cooling data that supports both local learning and cross-city comparison.

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4. Nature-Based Solutions (NBS) at City Scale

Challenge area

Helping cities move from scattered greening projects to city-wide, investable nature-based infrastructure that cools neighbourhoods, manages water, restores biodiversity and improves liveability. Nature-based solutions here refers to green and blue systems, including trees, soils, wetlands, permeable surfaces and green roofs, planned and managed at city or district scale with defined service levels, maintenance responsibilities and investment plans. The goal is not simply to deliver more green projects, but to establish nature-based solutions as core urban utilities, sitting alongside energy, water and transport in the city's planning, finance and governance systems, so that cities can finally move from ambition to delivery at scale.

The problem [in short]

Cities struggle to deploy nature-based solutions at the scale and speed needed for climate neutrality and resilience because governance, finance and maintenance are fragmented, even though NBS already feature in most climate plans, pilots and Climate City Contracts.

Why nature-based solutions matter for urban transition

- Nature-based solutions can make a meaningful contribution to urban emissions reduction, especially when cooling, water and land-use effects are considered together. Across a review of 54 major EU cities, there is an average emissions-reduction potential of around 17.4% from prioritised NBS deployment. That said, extrapolation to all Mission Cities requires care and caution.
- NBS has even greater impact when combined with other transition measures. Systems-modelling suggests that combined packages of NBS with energy, mobility and building interventions could contribute to total emissions reductions of up to 57% by 2030 in selected EU city contexts.
- NBS is already mainstream in city climate planning, even if delivery at scale remains weak. More than 90% of reviewed local climate plans and Climate City Contracts include NBS or green-blue infrastructure in some form. [CCC and plan review]
- A smaller front-runner group of European cities already demonstrates more systemic NBS integration by embedding NBS into planning codes, stormwater tariffs, district-scale programmes or governance systems.
- The timing of infrastructure renewal makes this a lock-in issue as well as a climate opportunity. Streets and sewers commonly have lifespans of around 30–50 years, meaning that failing to integrate NBS into current renewal cycles can lock cities into higher-risk, more carbon-intensive grey infrastructure pathways for decades.
- Heat and flooding are accelerating: European cities are already experiencing more frequent heatwaves and extreme rainfall. Without rapid deployment of cooling and sponge-city measures, heat stress and flood damage will rise sharply over the next decade.
- Infrastructure and investment windows are closing: Streets, sewers and buildings refurbished today will be locked in for 30–50 years. Missing the opportunity to integrate NBS now means locking in higher costs and risks.
- Policy and funding windows are open now: EU Missions for Cities and Adaptation, cohesion funds, national climate programmes and the NetZeroCities Capital Hub all recognise NBS, but cities lack delivery-ready, programmatic proposals.
- Public expectations are shifting: Residents increasingly expect cooler, greener, healthier neighbourhoods – but trust erodes if visible projects do not scale or are poorly maintained.

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- Nature-based solutions (NBS) are not just “nice to have” parks or isolated green roofs. When planned as urban infrastructure systems, they:
    - Cool buildings and streets, cutting peak electricity demand and improving comfort during heatwaves.
    - Absorb and store water, reducing pluvial flooding and pressure on grey drainage.
    - Capture and store carbon in biomass and soils, while reducing embodied emissions when combined with bio-based materials.
    - Filter air, reduce noise and support mental and physical health, particularly in dense urban areas.
    - Restore biodiversity and ecosystem services, underpinning food systems, pollination and soil health.
- If considered as real ecosystem (with owners, service levels and investment plans) NBS can become “green utilities” that sit alongside energy, water and transport in the city’s core systems.

What is blocking progress

Cities and partners repeatedly highlight a similar set of barriers:

- NBS remains project-based, not programme-based: Cities run pilots and flagship projects, but lack city-wide programmes and pipelines that survive political cycles.
- Responsibilities are split and unclear: Parks, roads, water, housing, environment, utilities and communities each own a piece of the puzzle. No single owner feels responsible for the end-to-end NBS system in a neighbourhood or corridor.
- Planning codes and standards still default to grey: Even where NBS is encouraged, most street designs, building codes and drainage rules assume pipes, asphalt and concrete as default.
- Finance and maintenance are fragile: Grants may fund construction, but long-term maintenance and operations budgets are missing, unclear or vulnerable to cuts. This undermines performance and public trust.
- Private property is hard to mobilise: Roofs, façades, yards and company premises hold huge NBS potential, but engaging owners is administratively heavy, incentives are weak, and trusted delivery models are missing.
- Data and measurement mechanisms are not yet fit for purpose: Cities struggle to answer basic questions: *Where are our NBS assets? What performance do they deliver? How much do they contribute to climate neutrality and resilience?* Without standard data, it is hard to build strong investment cases.
- Radical nature infrastructure is not yet treated as a utility: Trees, pollinators, soils and wetlands are still seen as “amenities” instead of critical services for cooling, water management, air quality, food systems and biodiversity. There are no “tree utilities” or “bee utilities” with service mandates, MRV infrastructure and tariffs.

Demand signal: why this matters across Mission Cities

- The repeated pattern across Mission Cities is clear:
    - Nature-based solutions already appear across the vast majority of Climate City Contracts and wider city climate plans, often linked to cooling, flood management, biodiversity, public space and liveability.
    - A smaller group of frontrunner cities has begun to integrate NBS more systematically into planning codes, stormwater management, district programmes and cross-departmental governance, but many other cities remain stuck between strong ambition and scattered delivery.

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- NBS is widely recognised as important, yet governance, finance, maintenance, standards and monitoring are still too fragmented for city-scale delivery.

- This creates demand not for one standard park or green roof, but for shared delivery models and reusable tools. Across Mission Cities, there is shared demand for:
  - Common delivery models: e.g. how to run a sponge-city corridor programme, a roof-greening scheme for housing associations, or a neighbourhood pollinator network.
  - Reusable resources: design pattern-books, standard contracts, grant templates, data schemas, MRV dashboards and maintenance playbooks.
  - Clearer market signals: aggregated demand for services such as green infrastructure planning, NBS construction, ecological maintenance, pollinator habitat design, or soil restoration.
  - New "green utilities": operating models for trees, pollinators, shade, soils and wetlands as managed systems with service obligations – not scattered responsibilities.

Impact & Learning Opportunities

In the longer term, addressing the challenge cities could:

- Reduce emissions and cooling energy demand.
- Lower heat and flood risks, particularly in vulnerable districts.
- Restore biodiversity and ecosystem services in urban environments.
- Establish nature-based infrastructure as core, investable urban utilities.
- Improve climate-resilient spaces for all communities, particularly those most vulnerable to climate impacts.

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5. Urban Energy Systems

Challenge Area

Helping cities move from fragmented energy transition projects to coordinated urban energy systems that can support electrification, clean heat and flexibility at scale, without overloading networks or leaving vulnerable residents behind. Urban energy systems here refer to the interconnected infrastructure and delivery pathways for electricity, heat, storage, flexibility and demand management across buildings, mobility and district energy, rather than isolated pilots or technology projects. The goal is not simply to add more clean energy assets, but to build the shared workflows, reusable tools and aligned mandates across cities, utilities, housing providers and funders that allow cities to finally deliver on the ambition set out in Climate City Contracts.

The problem [in short]

The urban energy system is still organised through fragmented infrastructure planning, split delivery responsibilities and weak coordination between cities, utilities, network operators and building owners. As a result, projects that make sense individually do not yet add up to a grid-ready, affordable and investable pathway to climate neutrality. Many cities face the same structural challenge: they do not share the same energy system, but they do share the problem of weak coordination between infrastructure planning, utilities, finance and delivery.

Why urban energy systems matter for urban transition

- Electrification is accelerating, and without coordinated grid and heat-system delivery, cities risk lock-in through suboptimal assets, delays through connection queues, and equity backlash through affordability impacts.
- Across Mission Cities, electrification ambitions are rising, but the delivery engine (e.g. utilities, procurement, investment, and customer offer) is not yet standardised or scalable.
- Urban electrification increases pressure on electricity networks and makes grid flexibility more important. City climate contracts increasingly recognise that expanding EVs, heat pumps and electric loads requires both grid reinforcement and flexible demand-side management.
- Low-temperature district heating is emerging as a strategic systems lever rather than a single infrastructure project. This approach can integrate decentralised heat sources more effectively, but only if cities also address building-side adaptation, storage and flexibility.
- Cities are already experimenting with local flexibility solutions, but many remain at demonstrator stage.
- Energy communities are being used not only as participation models but also as practical tools for congestion relief and local energy access. Some cities are framing energy communities in this broader systems role, though their viability depends heavily on local legal and market conditions.
- Energy management systems and grid upgrades are increasingly treated as core enablers of heat-system transformation. In some cities, monitoring, control and network upgrades are positioned as essential to district-heating change rather than peripheral technical add-ons.

What is blocking progress

- Grid readiness is unclear: upgrades and flexibility pathways are not agreed with DSOs/TSOs.
- Heat transition is not bundled: many studies and pilots, few pipeline-ready investment cases.
- Procurement is not outcome-aligned: tenders reward inputs, not performance and delivery speed.
- Data exists but is not decision-grade: no minimum dataset or shared dashboard for prioritisation.

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- Responsibilities are split: city, utility, housing providers, regulators and market actors lack a shared mandate.
- Social acceptability is fragile: energy poverty and local impacts (noise, siting, neighbourhood conflict) are not systematically managed.
- Pilots don't scale: cities lack "scale gates" that convert pilots into programmes and contracts.

Demand signal: why this matters across Mission Cities

- This challenge is relevant not because every city has the same energy system, but because many face the same delivery problem:
    - climate-neutral urban energy systems require coordination across institutions, infrastructure and finance that is still underdeveloped.
    - Across Mission Cities, ambitions to electrify transport, scale heat pumps, expand district energy, use flexibility and improve affordability are rising faster than the urban energy systems needed to deliver them. Climate City Contracts repeatedly point to similar structural tensions: unclear grid readiness, fragmented ownership between cities, utilities and network operators, weak integration between heat planning and electricity planning, and limited routes from pilots to investable delivery pipelines.
- Demand is therefore for shared delivery models rather than one common technical solution:
    - Across Mission Cities, cities could benefit from common workflows to align city planning, utilities, procurement and finance; reusable resources and evidence such as tender packs, contract clauses, investment-case templates and minimum datasets; and stronger shared approaches to monitoring and measuring, flexibility procurement, heat-network transition and customer-facing delivery models.
    - The demand signal is strongest where cities need clearer routes from project ideas and demonstrators to grid-ready, socially just and investable urban energy pipelines.

Impact & Learning Opportunities

Cities may learn how to:

- Move from isolated projects to investable pipelines.
- align city and utility planning.
- procure flexibility and heat decarbonisation as services.

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6. City Finance Innovations for Climate Neutrality

Challenge Area

Cities have climate plans. The challenge is turning them into funded delivery.
Helping cities move from fragmented funding bids and stand-alone projects to investable climate-neutrality pipelines that can attract and align public, private and community capital. City finance innovation here refers to the models, instruments and governance arrangements to fund climate priorities, risk-sharing, delivery partners and verification, rather than treating finance as a separate activity at the end of project design. The goal is not simply to raise more money, but to enable cities to build repeatable, socially just investment pathways that turn climate plans into delivery at scale.

The problem [in short]

Strong plans and promising projects often exist, but the mechanisms to fund and scale them do not. Cities cannot turn climate ambitions into delivery at the required scale if the finance system around climate action remains fragmented: projects are not packaged into investable pipelines, responsibilities for structuring and de-risking investment are split, and many cities lack the instruments or capacity to connect public, private, philanthropic and community capital.

Why finance innovation matters for urban transition

- Municipal governments typically control only a minority share of territorial emissions directly (indicative ranges put this at around 10-30%). Most emissions reductions depend on influencing non-municipal investment decisions and therefore on finance models that can mobilise wider actors. This makes the city's role as orchestrator and enabler, rather than sole funder, essential.
- Legal limits on municipal debt are a real constraint for many cities, especially in smaller or more capacity-constrained contexts. Debt rules can materially restrict capital expenditure even where climate investment needs are clear.
- Energy poverty shapes what kinds of finance models are politically and socially feasible. As a proxy, some estimates show that 15% or more of households are unable to keep their home adequately warm, this signals how affordability constraints can limit uptake of low-carbon options unless finance design includes targeted support. [Eurostat indicator used as proxy]
- Analysis of the CCC IP estimates that €307bn in incremental expenditure will be needed for all 100 EU-located Mission Cities to meet their climate neutrality 2030 target, and that 80% of this capital will have to come from private sources. Municipal budgets alone cannot close this gap. Grants can play a role in de-risking early-stage projects but the scale of investment required means cities must increasingly design projects that can attract repayable finance (loans, equity, green bonds, Energy Service Companies - ESCOs and blended instruments) not grants alone.
- The investment window is compressed: 2030 commitments force decisions in the next 3–5 years that will lock in emissions trajectories for decades. Many cities face hard financial constraints and have limited experience with green instruments, slowing action even where needs and plans are clear. Equity pressure is high: energy poverty and affordability constraints require targeted finance design, otherwise the transition cannot scale politically or socially. Across Climate City Contracts, project ideas often exist, but they are not bundled into investable pipelines, and cities remain dependent on EU or national funds with complex eligibility and timing. Some cities are already building finance innovations, including green bond portfolios, ESCOs and dedicated funds, but resources and learnings are not yet reusable across the cohort.

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What is blocking progress

- Responsibilities and budgets are split across departments, utilities, private actors and agencies, so no one can orchestrate end-to-end investment pipelines at scale.
- Projects exist, but they are not packaged into financeable programmes with standard documentation, risk allocation and replication rules.
- Bankability gaps: cities report limited capacity to structure bankable climate-smart projects, even when funding sources exist
- Instrument gaps: limited experience with green bonds, ESCOs, Public-Private Partnerships - PPPs and blended finance creates risk aversion and slows deployment.
- Grant dependency: where project design is built around grant eligibility rather than investment logic, projects struggle to attract repayable finance or to scale beyond the grant cycle.
- Policy inconsistency and perverse incentives (tax, tariffs, regulation) can undermine electrification and retrofit economics.
- Energy poverty and affordability constraints limit uptake of low-carbon options without targeted support (and can increase inequality).
- Weak data reduce investor confidence and make outcome-based contracts harder.

Demand signal: why this matters across Mission Cities

- Finance innovation is relevant across Mission Cities not as a specialist sub-topic, but as a recurring condition for whether climate action can move from strategy to implementation. The demand is not for one uniform finance instrument, but for shared methods and reusable tools that help cities build financeable climate portfolios.
- Across Climate City Contracts, the same finance pattern recurs: cities have project ideas, climate commitments and partial funding sources, but struggle to package these into investable pipelines with clear governance, bankability and delivery logic.
- Capacity to structure projects, use innovative instruments and connect public, private and community capital varies significantly across the cohort, while debt constraints, policy inconsistency and affordability pressures further limit delivery.
- The strongest common demand lies in pipeline-governance methods, standardised investment-case templates, Monitoring, Reporting and Verification - MRV packages, green bond frameworks, ESCO and Energy Performance Contract - EPC models, PPP structures, subsidy and blending approaches, and practical tools for linking climate priorities to de-risked capital flows.
- There is also a clear demand for support in transitioning from grant-dependent project cultures to programmes designed from the outset to attract repayable and private finance and for city teams to develop the internal capacity to act as credible orchestrators of multi-actor investment.
- The collective opportunity is to make finance more legible and repeatable across different city archetypes, so that promising projects can be bundled, verified and funded at greater scale.

Impact and Learning Opportunities

Cities may learn how to:

- Move from funding bids to investable climate pipelines: packaging project ideas into pipeline with clearer governance, sequencing and delivery logic.
- Act as orchestrators of climate investment: aligning public, private, philanthropic and community capital around shared priorities, rather than acting as sole funders.

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- Choose and adapt fit-for-purpose financing instruments, such as green bonds, ESCO/EPC models, blended finance or guarantees, based on local delivery conditions and institutional capacity.
- Design projects that can attract repayable finance: reducing dependence on grants and building programmes that can scale and sustain beyond individual funding cycles.
- Protect the most vulnerable: integrating affordability, energy poverty and social fairness into finance design from the outset, so investment pathways are politically and socially viable, not just bankable.
- Build the evidence base investors need: strengthening data and MRV infrastructure to improve investor confidence, support outcome-based finance and make climate investment more replicable.

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7. City Commercial Centre Reconceptualisation (CCCR)

Challenge area

Helping cities move from fragmented city-centre regeneration initiatives to coherent transition programmes that reshape commercial centres as liveable, low-carbon, climate-resilient and mixed-use urban ecosystems. City commercial centre re-conceptualisation here refers to the combined redesign of buildings, mobility, logistics, public realm and local economic activity in central urban areas, rather than treating vacancy, tourism, access, affordability and heat stress as separate issues. The goal is not simply to revitalise city centres, but to build delivery pipelines that improve liveability, inclusion and long-term resilience for everyone who uses them while contributing to climate neutrality.

The problem [in short]

The reconfiguration of commercial centres is spread across too many disconnected systems (buildings, mobility, logistics, public realm, tourism, land use and local economic development) each with different owners, incentives and decision-making structures. The result is that city-centre change is often pursued through partial regeneration measures rather than as a coherent transition pathway for one of the city's most visible and contested urban systems.

Why city-centre re-conceptualisation matters for urban transition

- Across Mission Cities, city centres are emerging as places where multiple transition pressures converge at once: changing work and commercial patterns, tourism pressure, inclusion and affordability tensions, and the need for climate-resilient public realm. [City Centre Climate Neutrality overview synthesis]
- Across the 112 Climate City Contracts, city centres repeatedly appear as places where cities seek to reduce congestion and emissions via low-traffic or low-emission approaches while also dealing with heritage and older-building constraints.
- Heat and extreme weather increase the need for cooling, shade, drainage and climate-adaptive public realm, especially in dense inner-city fabrics.
- Affordability and inclusion are now make-or-break constraints: if city-centre transition pathways worsen cost burdens or displace vulnerable groups, the transition can stall politically and socially.
- Older and heritage building stock makes city-centre decarbonisation harder and more expensive. This is arguably a recurring structural barrier, especially where protected or pre-regulation buildings dominate the central urban fabric.
- Some cities are already attaching material emissions expectations to city-centre measures such as low-emission or low-traffic approaches.
- "15-minute city" or district-centre logics are increasingly being used to reduce car dependence by concentrating services and strengthening urban centres beyond purely retail functions.
- Tourism stress and competing uses of public space are intensifying trade-offs between liveability, economic vitality and local legitimacy.

What is blocking progress

- Fragmented ownership and decision rights: many critical assets are privately owned, with owners sometimes distant, speculative, or disengaged; cities cannot rely on "appeals and dialogue alone" to shift use, quality and investment.

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- Competing uses and political trade-offs: resident liveability, tourism flows, retail vitality, and freight access collide in the same streets and squares, slowing decisions and creating backlash risk.
- Vacancy, inflexible commercial space, car-dominated streets and disengaged or remote private owners form a recurring barrier cluster in city-centre transition, blocking meaningful re-conceptualisation and delivery.
- Mobility and logistics lock-ins: car traffic, parking economy, and last-mile delivery patterns consume space and create emissions, yet responsibilities and levers are split across multiple actors (city, operators, businesses).
- Heritage/old building constraints (and cost): older or protected buildings are harder and more expensive to retrofit, and cities struggle to align incentives, standards and permitting with climate targets.
- Affordability pressure and uneven benefits: without explicit targeting, the transition can raise rents, push out essential services, or increase energy and mobility costs for vulnerable groups, undermining legitimacy.
- Projects don't become pipelines: cities often have initiatives, but not a bundled, investable set of delivery products (standard lots, repeatable contracts, clear operators, and an investable story across multiple sites).
- Data: data exists, but it is not standardised into a minimum dataset that supports prioritisation, procurement choices and proof of progress at city-centre scale.

Demand signal: why this matters across Mission Cities

- Demand is not for one standard city-centre model, but for comparable transition products that integrate buildings, mobility, logistics, public realm, climate resilience and inclusion.
- Across the Mission, cities could benefit from reusable lot structures, contract models, operating rules, governance charters, decision-rights maps, minimum datasets, indicator dictionaries and replication packs for city-centre interventions.
- Many cities already have regeneration initiatives, low-traffic or low-emission ambitions, and plans for mixed-use revitalisation, but these are often pursued as separate strands rather than as a coherent transition pathway for the commercial centre. The collective demand signal is strongest where cities need to turn fragmented regeneration ideas into bankable, procurement-ready and adaptable city-centre delivery pipelines.

Impact & Learning Opportunities

What cities may learn:

- How to move from "nice centre concepts" to bankable, procurement-ready pipelines.
- How to align public, private and community actors around a shared transition outcome.

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8. Large-scale Building Retrofits & Renovations

Challenge area

Helping cities move from one-off retrofit projects and fragmented renovation schemes to repeatable, large-scale renovation programmes that can upgrade whole districts and portfolios. Large-scale building retrofits and renovations here refers to the coordinated delivery of technical upgrades, finance, procurement, quality assurance, commissioning and monitoring across many buildings and ownership types, rather than treating each asset as a separate project. The goal is not simply to improve individual buildings, but to build the industrial, financial and institutional delivery models that can decarbonise the building stock at the speed and scale climate neutrality requires.

The problem [in short]

Retrofit delivery is fragmented across institutions, finance, procurement, technical standards, contractors and monitoring systems. On top of this, the building stock itself requires different approaches depending on type and ownership. If mechanisms for aggregating these diverse portfolios into repeatable programmes are not developed and deployed, retrofit will remain too slow, costly and difficult to scale at the pace climate neutrality requires.

Why large-scale retrofit matter for urban transition

- Retrofit ambition is widespread across Mission Cities, but delivery reality differs strongly by governance type (public-led, market-led or capacity-constrained) meaning that without a shared delivery structure, learning does not transfer easily.
- Practically all the building assets that will be in use in 2040–2050 are already built, so every year of delay compounds lock-in and cost.
- Policy and funding windows increasingly demand verifiable delivery and pipelines rather than aspirational roadmaps.
- The pace at which retrofit can scale differs sharply by governance and delivery capabilities.
- Readiness strongly affects whether demand can actually materialise.
- Some cities already set explicit renovation-rate targets, showing that ambition exists even where delivery systems remain weak.
- Multi-owner and co-owned residential buildings are a major structural bottleneck for scaling retrofit.
- Retrofit is capital planning at city scale, not a marginal programme. In short: scale of required investment.
- Energy performance contracting can be a viable route for public portfolios when baseline and measurement systems are robust.

What is blocking progress

- Fragmented owners and decision-making (single homes, landlords, public portfolios) make standardisation hard.
- Projects are not bundled into investable pipelines with repeatable unit economics and stable demand signals.
- Procurement is not set up for throughput (framework lots, EPC models, quality gates, commissioning) and often rewards lowest price, not outcomes.
- Workforce and supply-chain throughput constraints cap transition rates.

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- Grid and heat-planning dependencies are not sequenced with retrofit pipelines (in part owing to timing mismatch).
- National heritage and safety regulations: These frameworks limit modifications to original materials, mandate complex approval processes, and often cause conflicts over fire safety, seismic retrofitting, and energy efficiency.
- Performance gap risk (predicted vs. measured savings) undermines trust and finance.
- Data, monitoring and measurements are too weak or inconsistent to prove progress, learn, and de-risk investment.

Demand signal: why this matters across Mission Cities

- Building retrofit ambition is widespread across Mission Cities, but the ability to deliver at scale differs sharply depending on governance conditions, ownership structures, procurement capacity, finance access and technical readiness.
- Climate City Contracts and related plans repeatedly show the same structural barriers: fragmented ownership across private and public portfolios, weak bundling of projects into pipelines, procurement systems that are not designed for throughput, performance-gap risks, and capacity constraints in supply chains and quality assurance.
- Across Mission Cities, the shared need is for public-portfolio retrofit models, district-scale retrofit approaches, one-stop-shop pathways for households and multi-owner buildings, EPC and performance-contracting templates, measurement protocols, resident journey tools, and clearer aggregation of demand for suppliers, financiers and workforce planning.
- Demand is not for one single retrofit model, but for a family of repeatable delivery products that different cities can adapt. To this end, there is a collective opportunity to turn retrofit from a series of one-off projects into a more industrialised, investable and transferable delivery system.

Impact & Learning Opportunities

Cities may learn how to:

- Move from one-off retrofit projects to repeatable, large-scale renovation programmes that bundle buildings, owners and interventions into clearer delivery pipelines.
- Tailor delivery models to different building and ownership realities, including public portfolios, private homes, landlords, multi-owner buildings and historically constrained stock.
- Improve procurement, commissioning, quality assurance and performance measurement so retrofit programmes are more trusted, more bankable and more likely to deliver real savings.
- Align retrofit delivery with grid readiness, heat planning, workforce capacity and resident engagement, rather than treating building upgrades in isolation.
- Create clearer demand signals for suppliers and financiers through standardised lots, templates, monitoring approaches and scalable programme design.

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9. Parking diets as a scalable transition lever

Challenge Area

Helping cities move from isolated parking removal decisions to repeatable parking diet programmes that reallocate street space towards cleaner, safer and more productive urban uses. Parking diets here refers to the systematic reduction, repricing or repurposing of parking and curb space, combined with alternative access, freight, accessibility and public-realm measures, rather than one-off schemes disconnected from wider mobility and place objectives. The goal is not simply to remove parking spaces, but to create end-to-end delivery models that reduce car dependence, unlock visible public value and make street-space reallocation easier to scale.

The problem [in short]

Cities cannot use parking reform as a meaningful transition lever because parking is still treated as a series of isolated, politically sensitive decisions rather than a managed system for reallocating street space, shaping travel behaviour and creating public value. Without clear ownership, enforcement, data and delivery models, reforms remain piecemeal and struggle to scale beyond pilots or contested local schemes.

Why parking diets matter for urban transition

- Across Mission Cities, parking policy repeatedly sits between multiple departments and actors, while implementation is undermined by weak enforcement, unclear decision rights and lack of shared monitoring.
- Many cities already have climate plans, mobility strategies and parking pilots, but reforms struggle to scale beyond one street at a time or contested local schemes.
- When cities delay, they risk both infrastructure and political lock-in: Temporary pilots remain fragile, myths harden, and curb space continues to underperform against public-value goals
- Parking-diet programmes need a stronger definition of what “done” looks like rather than a single pilot or design intervention. A mature programme should include a signed-off reallocation plan, implemented curb design, active enforcement, an MRV dashboard, a funding loop and a replication pack. Opportunity windows are open now through street-renewal cycles, safety programmes, bus-reliability commitments, climate-adaptation needs and growing pressure to deliver visible everyday benefits.
- Parking reform becomes more credible and manageable when it is measured through a clear set of countable units such as spaces removed or repurposed, curb metres reallocated, the share of parking that is priced or regulated, occupancy and turnover rates, deliveries served per hour, injuries, retail footfall and modal split.

What is blocking progress

Common barriers:

- Split authority and unclear ownership: Transport sets rules, public works builds, with no single programme owner.
- Rules without consequences: Weak or under-resourced enforcement collapses credibility.
- Data gaps enable myths: Lack of occupancy/turnover evidence makes debate emotional rather than decision-grade.
- Pilot fragility: Tactical trials have no scale gates and do not convert into permanent programmes.

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- Freight and access conflict: Deliveries, trades and drop-offs are displaced if loading and time-windows are not designed.
- Payments and user friction: Confusing apps, poor signage, and broken machines undermine legitimacy.
- Equity backlash risk: Reforms fail if pricing, permits and accessibility needs are not paired with credible alternatives and hardship/exemption design.
- Public resistance: Widespread behavioural reliance on a car, with parking seen as an entitlement and a public good.

Demand signal: why this matters across Mission Cities

- Not every city has the same parking problem, but multiple cities face structurally similar transition barriers.
- Across Mission Cities, parking reform appears less as a standalone policy issue than as a recurring barrier to wider goals around mode shift, street-space reallocation, freight access, safety, greening and public value.
- The collective demand signal is strongest where cities need end-to-end workflows that connect baseline evidence, design, regulation, enforcement, visible public-value gains and replication to the next corridor or neighbourhood.
- Many cities already have climate plans, mobility strategies and pilot interventions, but parking remains institutionally fragmented, politically sensitive and operationally inconsistent, with weak enforcement, unclear ownership and insufficient data often undermining progress. The same pattern ends up repeating itself: reforms exist, but they struggle to scale beyond isolated streets, temporary pilots or contested local decisions.
- Demand is not for one universal parking scheme, but for common delivery models and replicable evidence that make parking diets easier to design, justify, implement and scale. This includes curb inventory schemes, occupancy-study methods, corridor-selection rubrics, legal and pricing templates, exemption and accessibility frameworks, enforcement SOPs, data dictionaries, dashboard models and stakeholder toolkits.

Impact and learning opportunities

Cities may learn how to:

- Convert emotionally charged parking debates into decision-grade baselines for reform.
- Bundle rules, design, enforcement together so reforms hold.
- Create legitimacy via visible public-realm value realisation and transparent revenue recycling.
- Manage freight, accessibility and equity as core design constraints.

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Description of Acronyms

Acronym	Meaning
AC	Air Conditioning
ARANER	District cooling company/reference (unclear context)
CCC	Climate City Contract
CCCR	City Commercial Centre Re-Conceptualisation
CLMS	Copernicus Land Monitoring Service
CO_2	Carbon dioxide
DSO	Distribution System Operator
EEA	European Environment Agency
EIB	European Investment Bank
EPC	Energy Performance Contract
ESCO	Energy Service Company
EU	European Union
EV	Electric Vehicle
EAFO	European Alternative Fuels Observatory
GHG	Greenhouse Gas emissions
GIS	Geographic Information System
GUHVI	Global Urban Heat Vulnerability Index
HDV	Heavy-Duty Vehicle
ICCT	International Council on Clean Transportation
IMO	International Maritime Organization
LEZ	Low Emission Zone
LGV	Light Goods Vehicle
MRV	Measurement, Reporting and Verification (not explicitly defined in document)
NBS	Nature-Based Solutions
NHESS	Natural Hazards and Earth System Sciences (journal)
NOx	Nitrogen oxides
NZC	NetZeroCities (Mission support platform)
$PM_{2.5}$	Fine particulate matter (air pollutant)
PPP	Public-Private Partnership
RFF	Resources for the Future (research institution)
SLA	Service Level Agreement
SOP	Standard Operating Procedure
SKU-like	Stock Keeping Unit–like (standardised delivery packages, conceptual usage)
TSO	Transmission System Operator
UCC	Urban Consolidation Centre
UHI	Urban Heat Island
UVAR	Urban Vehicle Access Regulation
WRI	World Resources Institute
ZEZ	Zero Emission Zone

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