Partnership on Sustainable
Low Carbon Transport

Quick Wins on Transport, Sustainable Development and Climate Change

Kick-starting the Transformation of the Transport Sector

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Executive Summary

The recent adoption of the 2030 Sustainable Development Goals (SDGs) and the signing of the Paris Agreement on climate change have set, for us all, clearer long-term goals to improve human well-being, and have added a new level of urgency to implementing long-sought but little-realized steps toward these ends. Crucially, country-level Nationally Determined Contributions (NDCs) provide initial blueprints for national climate action, including in the transport sector, and the Lima-Paris Action Agenda (LPAA) transport initiatives can be a key part of efforts to implement the NDCs.

Yet these various initiatives alone will not be sufficient to sustain, and adapt to, the degree of global changes that will be required before 2030 and beyond; these changes are to be summarized in a decarbonization roadmap that is currently being developed with the support of various transport stakeholders and needed technical, behavioral, and regulatory transformations.

Thus, this report describes a course of immediate bold and ambitious action that will kick-start the transformation of the transport sector in the desired roadmap directions, and limit the lock-in effects of a high-carbon business-as-usual (BAU) scenario. It is in this spirit that the following list of 20 transport quick win actions have been proposed for implementation at scale in the pre-2020 period, which cohere with the global roadmap described above:
1. Accelerate deployment of tighter diesel fuel quality standards to reduce emissions of black carbon and other short-lived climate pollutants.
2. Accelerate phase-out of fossil fuel subsidies.
3. Expand car and (e-)bike sharing systems in primary and secondary cities.
4. Expand city transport official training programs to build local capacity for sustainable transport in primary and secondary cities.
5. Expand sustainable freight recognition schemes to reward proactive carriers and shippers.
6. Expand use of ICT applications for real-time travel information and route planning for walking, cycling, public transport and car sharing.
7. Formulate Sustainable Urban Mobility Plans (SUMPs) in primary and secondary cities.
8. Implement (ultra-) low emission zones, including car-free zones in city centers.
9. Implement zero-emissions (last-mile) urban freight through e-mobility and cycling solutions.
10. Improve freight efficiency (e.g. reduce empty load running by freight trucks) through route optimization, asset sharing between companies, and increased use of ICT solutions.
11. Increase quality, availability, reliability, frequency, and efficiency of bus-based transit.
12. Introduce and scale up pricing for car-related travel options (e.g. congestion/road charging, parking pricing) in primary and secondary cities.
13. Introduce carbon pricing for the transport sector where (sub-)national carbon markets currently exist or are under development.
14. Introduce car-free days and ciclovías (temporary street closures to encourage cycling and walking) in primary and secondary cities to build support for longer-term policies.
15. Invest in rural road maintenance and modern supply chains to reduce global food loss and waste.
16. Legislate and enforce stricter speeding regulations by operational and technical means to reduce emissions and road crashes.
17. Modernize ageing rail fleets and traction systems to increase efficiency.
18. Provide and improve walking and cycling infrastructure (e.g. connected walking paths, protected cycle lanes), reallocating roadspace where necessary.
19. Ramp up charging infrastructure to encourage expansion of electric vehicle fleets in primary and secondary cities.
20. Tighten fuel economy standards for passenger vehicles.

These pre-2020 actions span policy, regulatory and operational solutions for both human mobility and freight movement, thus providing a balanced toolbox to ramp up needed actions across transport themes and modes, and structuring efforts in three directions:

- Prompting decisions to expand the implementation of solutions which have already proven their efficiency at a smaller scale or with a less ambitious scope.
- Halting existing practices and/or regulations that run in directions opposite to what is required to set the global transport sector on a lower-carbon trajectory.
- Initiating without delay, and at relatively low cost, actions or decisions preparatory to full implementation of a global decarbonization roadmap.

It is essential to stress that quick wins are not stand-alone solutions; they are essentially pre-2020 steps towards the implementation of the de-carbonization roadmap. Therefore, implementing a full-blown transformation will require scaling up proven no-regret actions without delay, with some of the ensuing benefits arriving pre-2020 and others post-2020.

These quick wins have been selected through input from a broad set of transport experts and other stakeholders, and have been evaluated through multifaceted impact analysis. These actions have the potential to contribute toward reducing greenhouse gas (GHG) emissions, thereby moderating climate impacts, while at the same time providing key development co-benefits such as improved access, increased efficiency, and enhanced safety. While the quick wins enumerated here are mitigation-focused, it is acknowledged that continued consultations will be needed to identify quick wins on adaptation in discussions leading up to COP22.

The strong engagement from members and partners of the Partnership on Sustainable, Low Carbon Transport (SLoCaT) throughout the selection process is an encouraging sign that commitment to the quick wins will continue. However, if quick wins are to fulfill their long-term potential for significant contribution to climate change and the SDGs, they will require the support of strong champions to help to carry them from conception to implementation. Quick win champions can be selected from among LPAA initiatives and other active members of the global sustainable transport community, and quick wins can be further promoted through revised NDCs and an expanded set of LPAA initiatives.   SLoCaT is in the process of preparing an outreach strategy to promote the quick wins in consultation with enduring events on sustainable development and climate change, as part of a wider outreach strategy of the Paris Process on Mobility and Climate (PPMC), to help keep quick wins a continual presence throughout 2016 and beyond.

The quick wins proposed are intended to provide a broad and flexible set of actions to meet the needs of varied stakeholders. For example, it is acknowledged that a subset of the 20 proposed quick wins may be the subject of focus for different global processes (e.g. Habitat III stakeholders may focus on urban-oriented actions, while United Nations Conference on Trade and Development (UNCTAD) stakeholders may focus on freight-oriented actions). In addition, countries at various stages of development may prioritize a different subset of quick-win actions (e.g. more developed countries may focus on 'Avoid' strategies, while

emerging countries may focus more on 'Shift' and 'Improve' strategies). The flexibility of this set of short-term actions will be reflected in SLoCaT's quick win outreach efforts.

List of Abbreviations

2DS	2-Degree Celsius Scenario
6DS	6-Degree Celsius Scenario
ADB	Asian Development Bank
ASI	Avoid-Shift-Improve
BAU	Business-As-Usual
BESTFACT	Best Practice Factory for Freight Transport
BMT	Balázs Mór Plan
BRT	Bus Rapid Transit
CCO	Continuous Climb Operations
CDA	Continuous Descent Arrival
CDM	Clean Development Mechanism
CDO	Continuous Descent Operations
CO	Carbon Monoxide
CO2	Carbon Dioxide
CODATU	Cooperation for Urban Mobility in the Developing World
COP21	21st Conference of the Parties to the United Nations Climate Change
CPLC	Carbon Pricing Leadership Coalition
DALYs	Disability-Adjusted Life-Years
ECF	European Cyclists' Federation
EVs	Electric Vehicles
FAO	Food and Agriculture Organization
FE	Fuel Efficiency
FFSR	Fossil Fuel Subsidy Reform
GCAA	Global Climate Action Agenda
GDP	Gross Domestic Product
GFEI	Global Fuel Economy Initiative
GHG	Greenhouse Gas
GRSP	Global Road Safety Partnership
Gt	Gigaton
Habitat III	Third United Nations Conference on Human Settlements
HC	Hydrocarbons
HDDI	Heavy-Duty Diesel Vehicles and Engines Initiative
HDVs	Heavy-Duty Vehicles
HLAGST	High-Level Advisory Group on Sustainable Transport
IATA	International Air Transport Association
ICLEI	Local Governments for Sustainability
IEA	International Energy Agency
INDCs	Intended Nationally Determined Contributions
ITF	International Transport Forum
LCRS	Logistics Carbon Reduction scheme
LDVs	Light Duty Vehicles
LEZ	Low Emission Zones
LICs	Low-Income Countries

LPAA   Lima-Paris Action Agenda
MAC   Marginal Abatement Cost
MCB   Michelin Challenge Bibendum
MDB   Multilateral Development Bank
MICs   Middle-Income Countries
Mt   Megaton
NDCs   Nationally Determined Contributions
NGO   Non-Governmental Organization
NMT   Non-Motorized Transport
NOx   Nitrous Oxide
NPV   Net Present Value
NUA   New Urban Agenda
NUMP   National Urban Mobility Policies
PM   Particulate Matter
PPMC   The Paris Process on Mobility and Climate
SDGs   Sustainable Development Goals
SLCPs   Tighter Fuel Quality Standards to Reduce Black Carbon Emissions
SLoCaT   Partnership on Sustainable, Low Carbon Transport
SO2   Sulfur Dioxide
SUMP   Sustainable Urban Mobility Planning
SUMPs   Sustainable Urban Mobility Plans
TDM   Transport Demand Management
UEMI   Urban Electric Mobility Initiative
UIC   International Union of Railways
ULEZ   Ultra-Low Emissions Zones
UNFCCC   United Nations Framework Convention on Climate Change
VKT   Vehicle-Kilometres Travelled
WCA   World Cycling Alliance
WHO   World Health Organization

Table of Contents

List of Tables, Figures, and Boxes

I. Introduction to Quick Wins on Sustainable, Low Carbon Transport

A. Rationale for Quick Wins

There is broad consensus that the transport sector will be required to transform structurally in order to meet the ambition levels set by the Paris Agreement on climate change (i.e. a baseline 2-degree Celsius scenario (2DS) moving towards a 1.5-degree Celsius scenario) and the 2030 Global Agenda on Sustainable Development. This will require comprehensive technological, policy, institutional, and financial changes. Such a transformation will take time, and there is agreement that based on past and present experiences a series of no-regret or quick win actions can be identified for more immediate action.

By focusing on quick win actions, the transport sector acknowledges the need for short-term guidance for decision makers in the transport sector. Quick wins are a key component in the ongoing process of creating a Global Road Map to decarbonize the transport sector, which will provide stakeholders, especially within governments and the private sector, with guidance on comprehensive structural medium and long term actions on which to base transport policy and investments decisions. Such a medium and long term road map, in combination with the short term quick wins, can help to secure a 'zero net emission' economy soon after 2050 and thus achieve a 'well below 2°C' climate target, as called for in the Paris Agreement on climate change.

These quick win actions, to be implemented in the period 2016-2020, can be a direct contribution to the pre-2020 action on climate change, as called for in the main outcome document of the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change (COP21) in December 2015.[1]

Analysis shows that the required massive shift from unsustainable to sustainable transport will require quick wins focused on shifting investments in infrastructure at both country and city levels. To help make this happen, quick win actions (and the complementary decarbonization roadmap) can help prepare the implementation of NDCs announced by over 150 countries at COP21, which will take effect through national and sub-national policies when the new Paris Agreement on climate change comes into force in 2020.

The quick win actions also have a direct relevance for the implementation of transport related targets under the SDGs that are part of the 2030 Global Agenda on Sustainable Development. Seven out of the 17 SDGs contain direct or indirect transport targets. While we believe that global political momentum is currently with climate change, we also recognize that SDGs are in fact often significant drivers of local actions (e.g. local air quality issues necessitate policy changes that reduce GHG emissions as a co-benefit), as reflected in the integration of SDGs within the decarbonization roadmap.

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[1] See https://unfccc.int/resource/docs/2015/cop21/eng/l09.pdf, p. 15, Section IV ('ENHANCED ACTION PRIOR TO 2020').

This report is also intended as a means to test an analytical framework for the ongoing development of quick wins in the transport sector. This framework includes both a qualitative evaluation of quick wins against a set of key variables, as well as a broader strategic analysis which includes: an assessment of transport actions with respect to access, efficiency, safety, and environmental benefits; an alignment of transport quick wins with complementary processes such as NDC measures, Lima-Paris Action Agenda (LPAA) initiatives, Habitat III objectives; and an analysis of potential policy, capacity, and financing barriers to achieving quick wins at required pace and scale.

In creating and testing this analytical framework, it is acknowledged that the formulation of quick wins is an inherently subjective process. Quantitative data required to conduct an objective analysis of the above areas are often limited, and where data do exist (e.g. in the area climate change mitigation), they are subject to ranges of uncertainty due to various modeling assumptions. Furthermore, in contemplating a global scale-up of quick win actions, it is implausible to generalize potential features and barriers to proposed quick wins across a varied set of national and local contexts. Thus, the methodology and outcomes described in the following sections are intended to help inform an ongoing process on developing appropriate policy and investment packages on sustainable transport, which is to be refined and expanded in the years to come.

This report takes the following structure. Section II provides a detailed overview of each of the 23 quick wins assessed, describing them in relation to potential climate change and sustainable development impacts, as well as their current state of global implementation.

Section III analyzes each of the proposed quick wins through an impact assessment of variables relevant to Access, Efficiency, Safety and Environmental Benefits; Section IV describes potential barriers (and solutions) to scaling up quick wins at a global scale; and Section V assesses the alignment of proposed quick wins within global processes including NDCs, LPAA Initiatives, SDGs, and Habitat III processes.

Section VI describes the results of a stakeholder survey to elicit further input on the relevance of the various quick wins; Section VI details the selection of the final set of quick wins; and Section VII lays out an action plan to promote these 12 quick wins through global events and other channels. Finally, Section VIII offers general conclusions and recommended next steps.

B. Definition of Quick Wins

Quick wins are those actions that can be taken immediately and which move the transport sector in the right direction toward long-term transformation. Taking needed steps to reduce emissions from transport in the pre-2020 period is essential to putting the sector on the required trajectory to meet long-term mitigation targets, and quick wins can make valuable contributions toward putting the transport sector on a 'well-below 2DS' pathway.

To have a sector-wide impact, quick wins should address both passenger and freight transport, with a reasonable balance between the two. They should also have relevance to the 'Avoid-Shift-Improve' concept, which promotes a balanced set of transport strategies to 'avoid' unnecessary transport trips, 'shift' to more efficient modes, or 'improve' existing

trips through technical means. Quick wins should have been tested at scale and be known to be replicable with the possibility for large-scale impact. In addition, quick wins should be technically feasible in both developed and developing countries using available technologies. Furthermore, quick wins should be based on demonstrated successes of transport infrastructure and services, enabling policies, or capacity-building investments. Finally, while transport sector quick wins can provide guidance to decision makers on how to make direct and immediate contributions to climate change goals, quick wins should also reflect the fact that climate-mitigation actions on transport are often taken for other reasons than climate change, as associated sustainable development co-benefits (e.g. improved air quality, enhanced access to essential services and economic opportunities) are often the primary policy drivers.

At the same time, it is essential to stress that quick wins are not stand alone solutions; they are essentially pre-2020 steps towards the implementation of the de-carbonization roadmap (which is also aligned with SDGs in its goal to optimize economic benefits and human well-being). Therefore, implementing a full-blown transformation (the bulk of which will take place post-2020) will require programming and scaling-up proven no-regret actions without delay, with some of the ensuing benefits arriving pre-2020 and others post-2020.

Finally, it should be observed that the quick wins proposed in this document are focused solely on mitigation actions within the transport sector. While the need to adapt transport infrastructure and services to both observed and projected climate impacts has been consistently mentioned, no immediate actions on adaptation have been identified among the quick wins. Thus, it is acknowledged that continued consultations are needed to identify quick wins on adaptation in discussions leading up to COP22.

C. Process of Developing Quick Wins

The SLoCaT Partnership identified an initial set of potential quick wins with input from a broad set of stakeholders in the global sustainable transport community. With the above criteria in mind, SLoCaT arrived at a final list of 12 quick wins, which has been developed in the following phases:

1. Development of long list (100+ Quick Win Actions) (March 2016)
To compile the long list of 100+ quick wins, the SLoCaT Secretariat and consulting partners compiled an initial set of potential quick wins, and requested additional quick wins from all 90+ SLoCaT members through a members mailing, in conjunction with a targeted invitation to around 25 organizations (including each of the 15 LPAA initiatives and other key topic areas) to submit suggestions for quick win actions. This outreach yielded inputs from 19 organizations, across a broad set of transport stakeholders, thus culminating in a long list of 100+ quick wins (see Annex 1).

2. Development of short list (~40 Quick Win Actions) (April 2016)
In the second phase, SLoCaT grouped the long list into short list of roughly 40 quick wins based on several criteria, which included balancing potential quick win solutions among different modes (e.g. bus, rail, Non-Motorized Transport (NMT)) and themes (e.g. road safety, e-mobility, Transport Demand Management (TDM)); balancing examples from

different global regions (in developed and developing countries); and assessing the scalability and replicability (and crucially, "sellability") of the proposed entries in the long list. In this process, SLoCaT combined several entries in the long list into a set of multi-tiered entries in the short list (to capture a broader set of inputs), and further grouped this refined list under a set of 18 headings organized among modes and themes. Finally, noting gaps among certain modes and themes (e.g. aviation, shipping, road safety), SLoCaT engaged in a further round of targeted outreach in an attempt to fill these gaps (see Annex 1).

3. Development of list of ~25 Quick Win Actions (April-May 2016)
In a third phase of analysis, the shortlisted quick wins were subjected to a rapid literature review, which investigated assessments of documents and projected climate change and sustainable development impacts; relevant policy initiatives; potential case studies; and key organizations engaged in the area of each of the 40 proposed quick wins. This internal literature review was based on a preliminary internal search, with additional input from PPMC and SLoCaT partners to make this initial impact analysis more robust.

The literature review served as a basis for a more structured qualitative evaluation of the short list of 40 quick wins in a detailed matrix. The quick wins were evaluated across a series of categories and subcategories, including type (i.e. avoid, shift, improve); sector (passenger, freight); mode (e.g. bus, NMT, aviation); development benefits (e.g. access, efficiency, safety); environmental benefits (i.e. climate, air quality); features (e.g. rapid implementation, global scalability, technically feasibility); barriers (e.g. political, capacity, financial); and stakeholder support. Each quick win was assigned a qualitative value for each category, which was used as a basis to develop a set of ~25 possible quick wins (see Annex 1).

The proposed quick wins are grouped into the following five categories, which represent both the *type* of action and the *mode* to which the action most generally applies:

- Policy/Pricing Solutions;
- Technical/Regulatory Solutions;
- Operational/Capacity Solutions;
- Passenger Transport; and
- Freight Transport.

This grouping of quick-win actions has been formulated with the goal of achieving a balanced distribution among these categories in order to (1) allow more flexibility in applying quick wins across countries with a wide range of economic and political characteristics, and (2) achieve required focus on both passenger and freight transport to achieve optimal emissions reductions from each of these sub-sectors. This grouping is described further in the following section, which undertakes an impact assessment for each of the proposed quick wins and draws generalizations based on the categories proposed.

4. Expert Consultation (May-June 2016)

The Climate Action Summit in May 2016 created a forum for further discussion to generate key inputs for the selection of a final set of quick wins.[2] Since the conclusion of the Summit, SLoCaT has sought extensive feedback on the draft final set of 26 quick wins, by inviting those organizations that had submitted initial quick win suggestions to offer questions, comments, and additional information to further refine the set of draft final wins. In June 2016, SLoCaT solicited another round of consultation from a group of roughly 20 transport experts, who provided detailed comments on each of the proposed 26 quick wins to help refine and reformulate these actions as a set of 23 actions for input from a wider set of stakeholders (see Annex 2 for further description of the expert input process).

5. Stakeholder Survey (June-July 2016)

In July 2016, SLoCaT distributed a stakeholder survey with two primary objectives: to clarify the general purpose and direction of the quick win concept, and to obtain more detailed feedback on the feasibility of individual quick win actions   To maximize total responses, SLoCaT distributed both a full and a concise survey form to networks including SLoCaT Partnership members and other key SLoCaT partners. As a result, SLoCaT received feedback from more than 100 stakeholders, with the largest group of respondents from civil society, and significant inputs from the private sector and non-affiliated experts.

These responses established broader perspectives on the overall suitability of each of the quick wins, as well as assessing their perceived global scalability, technical feasibility, and potential policy and financial barriers (see Section VI for survey results), allowing quick wins to be reformulated to further clarify approach and scope.

6. Selection of Final 20 Quick Win Actions (July 2016)

In addition to inputs from the stakeholder survey, the actions in the refined list of 23 quick wins were subjected to a detailed (and where possible, quantitative) internal assessment in three areas, which include potential impacts in the areas of Access, Efficiency, Safety, and Environmental benefits, and potential obstacles to overcome identifying policy, capacity and financial barriers. Finally, the quick wins were assessed with regard to expected ease of implementation based on alignment with existing NDCs, LPAA transport initiatives, SDGs, and Habitat III process objectives.

Based on the steps described above, the SLoCaT Secretariat proposes a set of 20 transport quick wins, based on both the external process to determine feasibility (i.e. initial inputs, expert review, culminating in survey feedback) and the internal process to assess impacts (i.e. SLoCaT analysis of access, efficiency, safety and environmental impact). The algorithm for determining the final quick wins is further described in Section VII.

The quick wins proposed are intended to provide a broad and flexible set of actions to meet the needs of varied stakeholders. For example, it is acknowledged that a subset of the 20 proposed quick wins may be the subject of focus for different global processes (e.g. Habitat III stakeholders may focus on urban-oriented actions, while United Nations Conference on

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[2] See http://www.climateaction2016.org/ .

Trade and Development (UNCTAD) stakeholders may focus on freight-oriented actions). In addition, countries at various stages of development may prioritize a different subset of quick-win actions (e.g. more developed countries may focus on 'Avoid' strategies, while emerging countries may focus more on 'Shift' and 'Improve' strategies). The flexibility of this set of short-term actions will be reflected in SLoCaT's quick win outreach efforts.

II. Quick Wins Assessed

A. Quick Wins under Consideration

The process of expert consultation described in the previous section yielded a set of 23 transport quick wins (Table 1), which are described in more detail in the profiles in the following pages:

1.	Accelerate deployment of tighter diesel fuel quality standards to reduce emissions of black carbon and other short-lived climate pollutants.
2.	Accelerate phase-out of fossil fuel subsidies.
3.	Expand car and (e-)bike sharing systems in primary and secondary cities.
4.	Expand city transport official training programs to build local capacity for sustainable transport in primary and secondary cities.
5.	Expand sustainable freight recognition schemes to reward proactive carriers and shippers.
6.	Expand use of ICT applications for real-time travel information and route planning for walking, cycling, public transport and car sharing.
7.	Formulate Sustainable Urban Mobility Plans (SUMPs) in primary and secondary cities.
8.	Implement (ultra-) low emission zones, including car-free zones in city centers.
9.	Implement eco driving training (supported by on-board devices) for car, bus and rail fleet operators.
10.	Implement zero-emissions (last-mile) urban freight through e-mobility and cycling solutions.
11.	Improve freight efficiency (e.g. reduce empty load running by freight trucks) through route optimization, asset sharing between companies, and increased use of ICT solutions.
12.	Increase quality, availability, reliability, frequency, and efficiency of bus-based transit.
13.	Introduce and scale up pricing for car-related travel options (e.g. congestion/road charging, parking pricing) in primary and secondary cities.
14.	Introduce carbon pricing for the transport sector where (sub-)national carbon markets currently exist or are under development.
15.	Introduce car-free days and ciclovías (temporary street closures to encourage cycling and walking) in primary and secondary cities to build support for longer-term policies.
16.	Introduce policies to mandate optimal car and bicycle parking requirements in commercial and residential developments.
17.	Introduce smart cards for integrated fares on public transport and shared mobility systems where they exist.
18.	Invest in rural road maintenance and modern supply chains to reduce global food loss and waste.
19.	Legislate and enforce stricter speeding regulations by operational and technical means to reduce emissions and road crashes.
20.	Modernize ageing rail fleets and traction systems to increase efficiency.
21.	Provide and improve walking and cycling infrastructure (e.g. connected walking paths, protected cycle lanes), reallocating roadspace where necessary.
22.	Ramp up charging infrastructure to encourage expansion of electric vehicle fleets in primary and secondary cities.
23.	Tighten fuel economy standards for passenger vehicles.

Table 1: Final 23 Quick Actions Selected for Detailed Analysis by SLoCaT following Expert Consultation

We acknowledge that this initial selection of a quick wins is an inherently subjective process, though attempts have been made to open up the process to the greatest extent possible at various stages of the process (e.g. initial 'brainstorm', expert review, stakeholder survey). The process of implementing a final set of transport quick wins will be subject to continued discussion among relevant stakeholders throughout and beyond 2016.

B. Quick Win Profiles

The following profiles characterize each of the quick wins with the following elements:
- General summary of the proposed action;
- Potential application to passenger and/or freight transport;
- Potential application to various transport modes;
- Relevance to climate change objectives;
- Relevance to sustainable development objectives;
- Global deployment status; and
- Estimated GHG and air quality impacts.

1. ***Accelerate deployment of tighter diesel fuel quality standards to reduce emissions of black carbon and other short-lived climate pollutants.***

Extending the vehicle emissions and fuel-quality standards already in force in the largest vehicle markets throughout the rest of the world could reduce the number of premature deaths caused annually by vehicle fine particle emissions by 75% in 2030. Additionally, doing so would have the added benefit of reducing near-term climate impacts through reductions in black carbon and other short-lived climate pollutants, to the equivalent of 710 million metric tons of CO_2 annually.

Characterization:

Applicable to both passenger and freight transport, with the latter dominant due to proportionally greater air quality impacts from freight vehicles.

Action primarily focused on road transport (including both freight and passenger modes), but has potential correlates in rail, aviation and maritime.

Extending the vehicle emissions and fuel-quality standards already in force could reduce near-term climate impacts through reductions in black carbon and other short-lived climate pollutants to the equivalent of 710 million metric tons of carbon dioxide (CO_2) annually. Fast action to reduce short-lived climate pollutants has the potential to slow down the warming expected by 2050 by as much as 0.5°C.

Extending the vehicle emissions and fuel-quality standards already in force in the largest vehicle markets throughout the rest of the world could reduce the number of premature deaths caused annually by vehicle fine particle emissions by 75% in 2030. Fast action to reduce short-lived climate pollutants has the potential to prevent over two million premature deaths each year and avoid annual crop losses of over 30 million tons.

Status of deployment:

Historically, technical interventions to control diesel black carbon emissions in developed countries have relied on fuel quality improvements and vehicle emissions standards. Black carbon emissions are projected to decline due to policies implemented in the United States, Canada, Europe, and Japan; however, global emissions are projected to increase in the next decade as vehicle activity increases, particularly in East and South Asia.

Estimated Impact:

The World Health Organization (WHO) has estimated that in 2012 around 7 million people

died as a result of air pollution exposure. This finding more than doubles previous estimates and confirms that air pollution is now the world's largest single environmental health risk. Reducing air pollution could save millions of lives.[3] A recent analysis has also shown that if all regions accelerated their progress toward fuel quality and vehicle emission standards best practice policies, global emissions of health-related pollutants and short-lived climate pollutants could be cut by three-quarters below 2000 levels even with a 150% increase in vehicle activity.[4]

With science indicating that one kilogram of black carbon causes as much climate impact in the near term as 3,200 kilograms of CO2, diesel vehicles in particular are now a prime target for policies aimed at controlling black carbon emissions.[5] For example, in the global high shift scenario, in which governments significantly increase infrastructure and investments on high quality public transit, walking, and bicycling, the future growth in vehicle activity could still produce a four-fold increase in associated early deaths from urban traffic related air pollution by 2050.[6] However, about 1.4 million early deaths could be avoided annually by 2050 if countries commit to a global policy roadmap that requires the strongest vehicle pollution controls and ultra low-sulfur fuels. Cleaner buses alone would account for 20% of these benefits.

In Tokyo, more stringent particulate matter (PM) emissions standards caused PM10 levels to drop from 50Mg/m3 in the early 1990s to 23 Mg/m3 in 2009. Under the GFEI, Mauritius implemented measures to bring down diesel with a sulfur content of 5000 ppm to less than 50 ppm, and introduced unleaded petrol in September 2002.

2. Accelerate phase-out of fossil fuel subsidies.

Global fossil fuel subsidies total US$600 billion per year, and subsidy reform can help reduce and shift vehicle trips, thus decreasing emissions and air pollution. Consumer fossil fuel subsidy removal in the area of transport could have significant air quality impacts in rapidly growing cities in developing countries, as gasoline and diesel pollution in congested urban centers take a growing toll on public health.

Characterization:

As an economy-wide measure, fossil fuel subsidy reform (FFSR) has the potential to apply comparably to passenger and freight transport.

Fossil fuel subsidy reform applies to all motorized transport modes, including aviation and shipping.

Reduces GHG emissions by creating disincentives for conventional private motorization, and thus incentivizing shift to more efficient transport modes, and reducing unnecessary trips. By reducing market distortions, fossil fuel subsidy reform can also increase the reliability of fuel supplies for more sustainable transport modes (e.g. high-quality bus systems).

Supports sustainable development objectives by reducing vehicle traffic, and thus reducing

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[3] 7 million premature deaths annually linked to air pollution.
[4] Tightening vehicle and fuels standards to benefit global health and climate.
[5] See: http://www.unep.org/newscentre/default.aspx?DocumentID=2755&ArticleID=9700#sthash.W9Wj2N6P.dpuf .
[6] A Global High Shift Scenario: Impacts And Potential For More Public Transport, Walking, And Cycling With Lower Car Use.

air pollution and increasing road safety. Crucially enables subsidies to be re-directed toward sustainable transport measures and other supportive SDGs.

Status of deployment:

India, Indonesia and Egypt all undertook FFSR in 2015. Some countries have invested in social measures to offset the costs to citizens of rising oil prices during the process of reform (as in Indonesia, the Philippines and Iran). Other countries have chosen to invest back into the energy sector and towards renewables (such as Morocco and Ethiopia).

Estimated Impact:

At present the transport sector is the least diversified energy end-use sector, with about 93% of the sector driven by oil. It has been established that the market attractiveness of policies in favor of decarbonizing fuel depends upon the removal of fossil fuel subsidies,[7] as current fossil-fuel alternatives are likely to remain uncompetitive in market segments with subsidized fuels.[8] Current subsidy arrangements for oil in transport not only obscure the direct costs of producing and distributing fuels, they also neglect the costs incurred by negative externalities, and thus give unfair advantage to oil over cleaner fuels.[9]

The International Energy Agency (IEA)'s latest estimates indicate that fossil-fuel consumption subsidies worldwide amounted to $493 billion in 201.[10] However, completely eliminating fossil-fuel consumption subsidies in net importing countries within the next ten years, and in net exporting countries (with the exception of Middle East) by 2030, would make it possible to deliver a peak in global energy-related emissions by 2020. By eliminating fossil fuel subsidies, countries could derive an average 2-13% reduction in carbon emissions, and this reduction could be further increased if the savings are reinvested into energy efficiency and renewables.[11]

A study estimates that in Mexico, 34 million tons of CO_2 could be saved every year from 2014-2035, through a mix of Green Growth Transport measures including FFSR, giving a net present value (NPV) of USD $193,300 million in that period.[12] The fiscal space created by subsidy savings in Indonesia has allowed increased funding for state-owned enterprises, including in transport.

There is a large variation among mitigation estimates due to consideration of different sectors and diversity regarding the intensity of subsidisation. There are several co-benefits to fossil fuel reform, with evidence suggesting that the economic, social and environmental benefits of FFSR are significant, as resources could be used more efficiently. A combination of subsidy reform and corrective taxes on fossil fuels could result in a 23% reduction in air pollutants and a 63% decrease in deaths worldwide from outdoor fossil fuel air pollution,[13] and could also lead to an increase in global Gross Domestic Product (GDP) of up to 0.7% per year to 2050.[14]

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[7] IEA, Energy and Climate Change - World Energy Outlook Special Report.
[8] BP 2014, Energy Outlook 2035.
[9] Guiding Principles for Driving Sustainability in Transportation.
[10] Energy Subsidies.
[11] Tackling Fossil Fuel Subsidies and Climate Change: Levelling the energy playing field, IEA's Energy and Climate Change - World Energy Outlook Special Report.
12 Ibarrarán, Bassi, & Boyd, 2015.
[13] Getting Energy Prices Right: From Principle to Practice. International Monetary Fund.
[14] Fossil Fuel Subsidy Reform: From Rhetoric to Reality.

3. Expand car and (e-)bike sharing systems in primary and secondary cities.

Research suggests that car sharing may offer considerable environmental and social benefits, such as carbon emission reductions and greater use of alternative modes such as public transit, walking, and cycling, and reduced parking investments due to reduced ownership and use of vehicles. Surveys carried out in six European cities and three U.S. cities have indicated that car sharing could result in a 30% to 40% reduction in annual vehicle travel per driver, which could yield significant co-benefits.

Characterization:

Action applies specifically to passenger transport.

As noted in title, action applies to car and bike sharing, with limited potential for expansion to other modes.

Current evidence suggests that there is a minor to moderate level of impact on CO_2 emissions by bike sharing schemes, mainly due to significant shift from sustainable modes of transport like walking and public transport, and to the use of motorized fleets for bike maintenance and re-distribution. However, evidence also suggests that scaling-up bike share systems has led to dramatic increases in private bike use in many cities.

Car sharing has the potential to reduce car ownership, and in turn can reduce parking demand (and thus positively impact commercial and residential parking requirements in the long term). Bike sharing is associated with a decreased risk of bicycle injuries compared to private bike riding and offers the potential for positive effects on local economic activity.

Status of deployment:

Car sharing operations can be found in 33 countries on five continents for a total of approximately 4.8 million members. Europe accounted for a plurality of car sharing memberships, at 46%, with North America in second place at 34%.[15] Bike share schemes have been implemented in more than 800 cities worldwide, with China well in the lead; European cities contribute the bulk of the remainder, with the Americas quickly ramping up efforts, thus demonstrating a truly globally-scalable action.

Estimated Impact:

By extrapolating past trends in car sharing membership growth, the IEA has estimated that scaling-up car sharing programs could achieve average mitigation of about 0.45% of transport sector emissions by 2030. By 2050 about 25 million individuals could participate in car sharing, resulting in a reduction of about 11.81 million tons of CO_2.

4. Expand city transport official training programs to build local capacity for sustainable transport in primary and secondary cities.

Increased training, mentoring, and partnering programs for national and international city transport officials in the field of urban mobility can allow the community of mobility

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[15] Innovative Mobility Carsharing Outlook, Winter 2016.

decision-makers and practitioners to more comprehensively incorporate current knowledge, trends, and developments.

Characterization:

Capacity building efforts to date have primarily focused on passenger transport, but training modules could potentially be expanded to incorporate freight-focused topics.

Training can focus on a range of modes and themes, including bus, Bus Rapid Transit (BRT), and mass transit planning and regulation; non-motorized transport; public awareness and behavior change; and TDM.

Capacity building can help to address the challenges related to climate change mitigation in the transport sector, and can outline options and instruments to address these issues by presenting policy options and their potential to reduce CO2 emissions. Transport decision-makers in developing countries are increasingly confronted with extreme weather events, and training modules can raise awareness of expected impacts of climate change on urban transport and present possible adaptation measures.

Urban mobility is a basic necessity for the social and economic development of people, cities and countries. Capacity building aims at sharing knowledge on sustainable urban mobility planning, stakeholder involvement (public and private) and the importance of participatory inclusion during the process. Training can introduce various aspects from the use of financial resources at local levels, the alignment of local activities and societal goals and challenges in mobility planning.

Status of deployment:

Since 2003, GIZ SUTP has trained people from Africa, Asia and Latin America on topics ranging from fuel policies to public awareness, in 1 to 10-day courses to improve transport policies in those cities. In 10+ years of developing capacity in local governments, planners and citizens on sustainable urban transport, GIZ SUTP has delivered nearly 150 courses and has trained 5000 participants.

Planned and completed workshops include topics such as bus maintenance in Latin America, joint training courses in Asia with the Islamic Development Bank, and a module at the EcoMobility Festival in Johannesburg.

Estimated Impact:

Today, about 3.9 billion (equivalent to 54%) of the world's population resides in urban areas and projections suggest that world's population could add another 2.5 billion to urban populations by 2050.[16] Transport in urban areas accounted for about 2.3 Gigaton (Gt) of CO2 in 2010, about one third of carbon emissions and energy consumption from all segments of the transportation sector.[17] BAU projections suggest that urban transport energy consumption to double by 2050, despite ongoing vehicle technology and fuel-economy improvements.[18]

In many cities, transportation is the largest or second largest source of local air pollutants such as carbon monoxide (CO), sulfur dioxide (SO2), nitrous oxide (NOx), and PM. Urban air pollution is now linked to up to 1 million premature deaths and 1 million premature deaths

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[16] United Nations, Department of Economic and Social Affairs, Population Division (2014). World Urbanization Prospects: The 2014 Revision, CD-ROM Edition.
[17] A Global High Shift Scenario: Impacts And Potential For More Public Transport, Walking, And Cycling With Lower Car Use.
[18] IEA, A Tale of Renewed Cities.

each year, which costs approximately 2% of GDP in developed countries and 5% in developing countries.[19] Traffic congestion is another key source of urban transportation externalities with a share of 1-5% of GDP.[20] Planning sustainable urban mobility contributes significantly to the reduction of urban transport externalities, i.e. air pollution and road congestions, improves road safety, and favors more inclusive urban transport and more prosperous cities.

5. *Expand sustainable freight recognition schemes to reward proactive carriers and shippers.*

Sustainable freight recognition programs can help to reinforce and disseminate best practices in urban freight transport, green logistics, co-modality, and e-freight. Potential areas of evaluation include freight vehicle operational efficiency, and improvements in sustainable distribution to reduce CO2 emissions, congestion, collisions and operator costs. Green freight performance benchmarking through key performance indicators can also assist cities to compare logistics performance and to identify solutions and suitable implementation opportunities.

Characterization:

 Exclusive focus on freight transport.

Focus on road freight transport, as well as rail, aviation, and maritime freight transport depending on scope of recognition program.

Since 2004, United States EPA SmartWay program has collectively achieved the following impacts: 72.8 million metric tons CO2 reductions, 1,458,000 tons NOx reductions, and 72,000 tons PM reductions.

The United States EPA SmartWay program has saved 170.3 million barrels of oil, which is equivalent to taking over 14 million cars off the road for a full year and saving USD $24.9 billion in fuel costs since 2004.

Status of deployment:

There is a significant lack of performance benchmarking among cities in the transport sector, and thus tools could assist cities in comparing their logistics performance and identifying potential solutions and investment opportunities. One of the goals of the Clean Air Asia organization for 2016 is that Asian cities of more than 1 million regularly collect and report key freight data.

The European Union initiative 'Best Practice Factory for Freight Transport' (BESTFACT) commenced in 2012 and is to be completed in 2016. The project is to examine best practices in urban freight transport, green logistics, co-modality, and e-freight, and has a broad modal scope, which includes road, rail, aviation, and maritime freight transport.

Estimated Impact:

Due to globalization, freight increasingly crosses borders and continents, and thus some factors that drive freight movements are largely beyond the control of any single government. There are multiple stakeholders involved in the freight sector and frequently

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[19] UNEP, Urban Air Pollution.
[20] World Bank, Cairo traffic is much more than a nuisance.

they have different objectives. The relationship between stakeholders is likely to interchange amongst conflicts, cooperation, competition and "co-opetition".[21] This necessitates developing partnerships and a recognition program.

A recognition program is often developed for motivating a defined set of stakeholders to change their behavior or performance in the direction strategically set by the organizer of the recognition program. A freight recognition program can be a simple labeling program,[22] a monitoring program,[23] or an awards program.[24] The impact on transport emissions of a country could be in the 0.2% to 2% range, depending upon the type of freight recognition program, parameters considered, market size, type, and number of stakeholders.

For example, the UK's Logistics Carbon Reduction scheme (LCRS) is a voluntary industry initiative to record, report, and reduce carbon emissions. LCRS has a voluntary target of 8% reduction in emissions by 2015 when compared to 2010 levels. The latest monitoring reports suggest that by 2013, they had reduced freight emission intensity to 15% below 2005 levels. In the United States, the SmartWay system has cumulatively saved about USD $16.8 billion in fuel savings, 52 Mt of CO_2 emissions (i.e. roughly 0.2% of 2010 transport emissions), 0.7 Mt of NOx emissions, and 37 kilo-tons of PM emissions from 2004 to 2013.[25]

6. *Expand use of ICT applications for real-time travel information and route planning for walking, cycling, public transport and car sharing.*

Real-time multimodal transit information and route-planning apps provide travelers with up-to-date information on transit options, stop locations, and scheduled and predicted arrival times. For example, an algorithm which calculates the best transfer points for a user to park her car and continue a trip by public transport can result in mode shift over time.

Characterization:

This action applies specifically to passenger transport; a comparable initiative to increase freight efficiency is described in a separate action entitled 'Improve freight efficiency….'

As noted, this action applies to walking, cycling, public transport, and car sharing.

A case study in Helsinki Capital Area using real time vehicle simulations has indicated that a driver can reduce their CO_2 emissions by more than 50% by considering factors such as time, emissions, cost, and distance for planning a trip that involves multiple means of transportation.[26]

Sustainable development benefits include improved coordination of mobility options, reduced travel times, and increased personal security through reduced wait times in potentially dangerous public spaces.

Status of deployment:

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[21] "Coopetition" is a state where competitors need to cooperate on developing a market before they can truly compete. Competitors may need to agree on standards, practices and industry-wide goals, for example, in order to develop a true market for competition and innovation. Urban Goods Transport.

[22] United States EPA SmartWay program.

[23] World Bank's Logistics Performance Index.

[24] Netherlands' Lean and Green Program.

[25] SmartWay Program Highlights.

[26] In-Vehicle Application for Multimodal Route Planning and Analysis.

The majority of global examples are concentrated in developed country cities based on available telecommunication infrastructure, with developing countries making strides based on appropriate technologies (e.g. through cab hailing apps).

Estimated Impact:

In the United Kingdom, widespread deployment of real-time public transport information along with targeted marketing could decrease car travel demand by 1.8% to 6.0% in urban areas. Evidence from the Chicago Transit Authority's Bus Tracker system establishes that the real-time transit information system has attracted a significant (if modest) number of new riders to the city's bus system, suggesting that real-time transit tools can serve not only to increase the satisfaction of existing transit riders, but also to entice new ones.

7. *Formulate Sustainable Urban Mobility Plans (SUMPs) in primary and secondary cities.*

Sustainable Urban Mobility Plans (SUMPs) can help developed, developing, and transitional cities and countries to design more livable and prosperous cities for all, as well as reduce congestion, road fatalities, noise and air pollution, and CO_2 emissions. SUMPs can assist in developing long-term urban green freight policy to guide regulatory development and infrastructure investments, and can require all major traffic generators to develop and implement site-based mobility plans to manage their accessibility.

Characterization:

SUMPs can apply equally to passenger and freight transport, and can be more effective when passenger and freight are combined within a comprehensive planning process.

SUMPs include all urban transport modes, including walking, cycling, public transport, private vehicles, and freight vehicles.

SUMPs have the potential to significantly reduce GHG emissions in urban areas by creating a more integrated urban mobility system, which helps to avoid unnecessary transport trips, shift passengers and goods to more efficient modes, and reduce trip lengths by improving access to key destinations. By increasing motorized and non-motorized transport options, SUMPs in effect can increase resiliency by increasing transport system redundancy.

A SUMP seeks to contribute to the development of an urban transport system which is accessible and meets the basic mobility needs of all users, as well as balancing and responding to the diverse demands for mobility and transport services by citizens, businesses and industry, thus meeting the needs for economic viability, social equity, health, and environmental quality.

Status of deployment:

The Cooperation for Urban Mobility in the Developing World (CODATU) 'MobiliseYourCity' initiative aims to engage at least 100 cities in elaborating a SUMP between 2016 and 2020 for both passengers and freight, reduce CO_2 emissions at least 50% by 2050, and build capacity to implement national sustainable urban mobility policies at the local level in 12-15 developing countries.

WBCSD and 15 member companies have developed the Sustainable Mobility Project 2.0, a globally applicable, data-driven multi-stakeholder approach for developing SUMPs. This process has been tested in Chengdu, Bangkok, Indore, Hamburg, Lisbon and Campinas.

In 2001 Budapest adopted a development plan for a city transport system, which was

reviewed in 2009. In 2013 the city decided to reconsider the entire strategic planning process and develop a new transport development strategy for Budapest, the Balázs Mór Plan (BMT).

The Green Zone for Transport in Santiago promotes sustainable urban transport through four initiatives: promoting zero or low emissions vehicles; developing a more efficient public transport system; promoting non-motorized transport; and increasing pedestrian spaces.[27]

Estimated Impact:

In many cities, transport is the largest or second-largest source of local air pollutants such as CO, SO2, NOx, and PM. Urban air pollution is now linked to up to one million premature deaths and one million pre-native deaths each year, which accounts for approximately 2% of GDP in developed countries and 5% in developing countries.[28] Traffic congestion is another key source of urban transportation externalities with a share of 1-5% of GDP.[29]

Planning sustainable urban mobility can contribute significantly to the reduction of urban transport externalities. For example, the EU Commission has estimated that the implementation of the comprehensive set of recommendations from the SUMP process in a given city can lead to a CO2 emission reduction of between 35% and 70% by 2040,[30] with projected savings in public and private capital and urban transport operating costs in excess of $100 trillion until 2050, and a potential reduction of about 6% of global transport CO2 emissions by 2030.[31]

8. Implement (ultra-) low emission zones, including car-free zones in city centers.

Low emission zones (LEZs) are a regulatory measure in which access is restricted in a defined area for polluting vehicles (i.e. vehicles with higher emissions cannot enter the area or have to pay higher charges for access). The main driver of LEZs is to reduce air pollutant emissions; particularly those with the greatest health impacts, while co-benefits of this strategy include reduced CO2 emissions and stimulated growth of low emission vehicles.

Characterization:

Action applies to both passenger and freight vehicles, but is likely to have greater implications for the latter due to generally lower emissions standards for high-duty vehicles (HDVs).

Action applies generally to cars and trucks, but has potential for expansion to public transport vehicles as well.

There would likely be no GHG emission benefits for most LEZ options; however, the introduction of Euro 4 vehicles could yield some carbon reductions.

Research from London and Berlin indicates that the implementation of an LEZ could result in approximately 15% reduction in NOx and a 30% reduction in PM10. A proposed ultra-low emission zone (ULEZ) in London is expected to deliver a 51% reduction in NOx

[27] ICLEI.
[28] UNEP, Urban Air Pollution.
[29] World Bank, Cairo traffic is much more than a nuisance.
[30] CODATU and France Nature Environment Mobility and Transport.
[31] Together towards competitive and resource-efficient urban mobility and A Global High Shift Scenario: Impacts And Potential For More Public Transport, Walking, And Cycling With Lower Car Use.

emissions, a 64% reduction in PM10 and a 15% reduction in CO2 emissions from road transport by 2020.

Status of deployment:

The majority of global examples are concentrated in European cities, though the concept is being explored in China as well, and Hanoi is considering a general motorbike ban.

Estimated Impact:

As described above.

9. *Implement eco driving training (supported by on-board devices) for car, bus and rail fleet operators.*

Eco driving programs include strategies such as driving steadily and defensively, avoiding unnecessary braking and gear changes, and driving in the highest possible gear and at the lowest possible number of revolutions. More efficient driving habits can reduce vehicle energy use by 10-15%. On regional trains, traction energy consumption has been seen to vary by as much as 25% between emissions due to operational constraints and driving style.

Characterization:

Eco-driving techniques can benefit both passenger and freight transport, and have long-term impact in commercial fleets, through IT applications that monitor real time fuel economy.

Eco-driving techniques can apply to public bus and rail vehicles, as well as private cars and freight trucks, as well as on maritime and inland waterways.

The European Climate Change Programme calculated an annual reduction potential of eco-driving of at least 50 million tons of CO2-emissions in Europe, saving about €20 billion. Data from the rail sector indicate an average of 5% CO2 emissions reduction from the power supplied to German intercity trains on a long-term basis. The potential for inland waterways has been estimated with fuel savings of 10-15.

Eco-driving leads to improved road safety and reduced costs of accidents. Eco-driving reduces noise pollution as well as local air pollution; the engine noise of one car driving with 4000 rpm equals the engine noise of 32 cars at 2000 rpm. In addition, eco-driving can also reduce driver and passenger stress.

Status of deployment:

Eco-driving has become a key element of national strategies to reduce CO2 emissions in a number of countries; notably the Netherlands, Austria, Germany, and Spain; it is also widely encouraged in Canada, Japan, and the United Kingdom. In some countries, eco-driving is linked to national CO2 reduction targets or reducing oil import dependency. Eco-driving can also be an important part of national road safety program.

11 months after eco-driving trainings, the German company Hamburger Wasserwerke achieved fuel consumption reductions of more than 6%; furthermore, accidents and related costs were diminished by more than 25%. The Dutch eco-driving program resulted in a cost-effectiveness of about €5 per avoided ton of CO2-emissions over a period of 10 years.

Estimated Impact:

Improvements in driving techniques could significantly improve the fuel efficiency of vehicles and reduce CO2 emissions in the long term, and can yield significant co-benefits

including reduced air pollution, better safety, and reduced noise and stress. IEA has estimated that eco-driving could reduce fuel consumption by about 5-10% on average if frequent training is provided to the driver.[32] In the freight sector, fuel efficiency improvements from eco-driving for HDVs are in the 5–20% range.[33]

Furthermore, at national levels, implementing eco-driving schemes could result in a 1-4% reduction in transport sector emissions by 2030, which is constrained by a lack of market size for eco-driving training, which is often restricted to few cities or fleets. For example, In Nigeria, about 30,000 truck drivers are considered for eco-driving training every five years as a carbon mitigation strategy and this could result in about 3.3% mitigation by 2030 and cumulative 10 Mt reduction from 2010 to 2035.[34]

10. Implement zero-emissions (last-mile) urban freight through e-mobility and cycling solutions.

Last-mile freight delivery has a high potential to incorporate electric or non-motorized transport to reduce impacts in the final leg of freight pathways. Technological solutions can be combined with freight demand management, which can encompass strategies such as staggering deliveries across time of day, mandating off-hour deliveries, and consolidating deliveries. Successful last-mile freight demonstration projects could be scaled up further, and could be implemented even more quickly with private sector support.

Characterization:

Action is focused on freight transport, though success in this area requires careful operational and planning coordination with a range of passenger modes.

An innovative zero-emission urban freight plan will require use of both motorized (electric) and non-motorized modes, including two-, three-, and four-wheelers as context-appropriate.

Urban freight contributes to 40-50% of total CO_2 emissions in China; thus, a move to zero-emission last-mile freight solutions can have a substantial impact. Latest estimates from the International Transport Forum (ITF) suggest that in OECD countries, freight transport is expected to grow between 50% and 130% between 2010 and 2050; in non-OECD countries, freight activity is expected to grow 250% to 550% in the same time span.

It is estimated that if all pre-Euro and Euro 1 freight vehicles were replaced with Euro 4 model compliant vehicles, significant improvements in roadside air quality would be realized, with vehicle emissions of RSP and NOx reduced by 74% and 38% respectively. A good example for scrapping old trucks is the one time incentive measure adopted by Hong Kong in 2007.

Status of deployment:

National or regional green freight programs are being established around the world with most modeled after the US SmartWay program. China is the first Asian country where a national program is being established; in addition, a growing number of green freight initiatives are being implemented in Japan, Australia, France, and the United Kingdom.

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[32] IEA, Transport Energy Efficiency.
[33] IPCC Fifth Assessment Report.
[34] Assessing Low-Carbon Development in Nigeria: An Analysis of Four Sectors.

Estimated Impact:

Freight travels through multiple jurisdictions, generating a disproportionate share of traffic related externalities such as congestion, air pollution, greenhouse gases, and traffic fatalities. Urban freight comprises one of the most cost-sensitive and emission intensive segments of the supply chain. Urban freight constitutes only fraction of total vehicle ownership (less than 10% in many developing cities), however, it constitutes a significant share of urban transport externalities (i.e. about 15-25 % share of urban vehicle kilometers, 20-40 % of motorized road-space occupation, 20-40 % of urban transport CO_2 emissions and about 30-50% of urban transport air pollutants in cities of developed economies and sometimes higher than 50% for cities in developing countries).[35] The expected growth in road freight movement has direct consequences for congestion, air pollution, and GHG emissions. Estimates reveal that every year €100 billion, or 1% of the EU's GDP, is lost to the European economy as a result of delays and pollution related to urban traffic.[36]

Since urban freight emits about 6% of all transport GHG emissions, a proportionate savings of 6% from the transport sector is possible by 2030.[37] For example, in the European Union, on average half of all motorized trips in cities that involve transport of goods could be shifted to (cargo) bikes, which could result in significant environmental and climate benefits.[38] In Copacabana, Rio de Janeiro, implementation of bike cargo has resulted in an annual savings of 300 tons of CO_2, 5 tons of CO, 630 kilograms of hydrocarbons (HC), and 360 kilograms of NOx. Furthermore, non-motorized delivery vehicles in Copacabana save 9,600 m2 of parking space.

The introduction of a zero emission electric vessel in Utrecht, the Netherlands, gave immediate emission reductions of 38 tons of CO_2, 31 kilograms of NOx and 6 kilograms of PM10. For total estimated city center emissions, this means decreasing CO_2 emissions by 13%, NOx emissions by 6% and PM10 emissions by 10% over the project lifespan. The 2011 Transport Sector White Paper set an ambitious target of achieving essentially CO_2 free city logistics in major urban centers by 2030 based on detailed investigations.[39] Thus, by promoting zero-emissions urban freight delivery, emissions could be significantly reduced.

11. Improve freight efficiency (e.g. reduce empty load running by freight trucks) through route optimization, asset sharing between companies, and increased use of ICT solutions.

Truck transport accounts for about 25% of global transport energy use. Every year American trucks travel empty for 50 billion miles, 28% of their total mileage, and in Europe a quarter of containers on the road are empty. Empty runs have high economic costs due

[35] A call to action on green freight in cities.
[36] ERTRAC, the European Road Transport Advisory Council, and ALICE, the Alliance for Logistics Innovation through Collaboration in Europe - "Urban Freight Research Roadmap"
[37] A call to action on urban logistics.
[38] Cyclelogistics.
[39] Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system.

to the wastage of fuel, time, labor, and traffic congestion involved. The UK transport industry could save over 40 million miles of empty journeys by making use of spare vehicle capacity.

Characterization:

This action has an exclusive focus on freight transport.

Empty runs are focused here on long-distance trucks, but can also apply to shipments by rail, air, and inland and maritime shipping.

HDVs (trucks, buses and coaches) produce about a quarter of CO_2 emissions from road transport in the EU and some 5% of the EU's total greenhouse gas emissions – a greater share than international aviation or shipping. Making use of spare vehicle capacity could cut UK carbon emissions by as much as 8% and contribute to a more sustainable transport industry.

Green freight programs, including reducing empty running, can accelerate the adoption of advanced technologies and strategies across the entire transport sector that save fuel, reduce costs for business, and lead to significant reductions of CO_2, black carbon, PM, and other air pollutant emissions. The most successful programs deliver major business benefits by incentivizing investments in fuel saving and emission reducing technologies, as well as operational strategies.

Status of deployment:

Digital technologies can help consolidate the fragmented and often inefficient trucking industry. Replacing shipping brokers with mobile-app platforms that dynamically match shippers' loads with available trucks and truckers can reduce empty loads. In 2014, USD $63 million was raised for seven online freight matching platforms, including $12 million for Transfix and $20 million for Truckloads. Teleroute is a pan-European online freight and vehicle exchange service that improves operational efficiency, with a goal to reduce empty running by 43%. Over 200,000 real-time freight and vehicle offers are posted every day on their freight exchange in 27 European countries. In the past 12 months alone, the online freight company Returnloads.net has saved UK haulage companies and couriers over 300,000 otherwise wasted journeys.

Estimated Impact:

Logistical activity accounts for roughly 5.5% of total GHG emissions.[40] Within the logistics sector, freight transport accounts for around 90% of total GHG emissions and 35-60% of logistics costs.[41] However, due to lack of adequate freight information, fragmentation of the freight industry, unbalanced freight movements, and oversupply in the trucking market, in many developed and developing countries, empty trips constitute 20-50% of overall freight trips.

By reducing empty trips, freight efficiency could be improved, leading to several co-benefits e.g. reduced logistics cost, reduced congestion, and reduced carbon and air pollutantsAn example of high co-benefits is found in the Henan Anyang Modern Logistics Information platform in China, which has helped trucking companies reduce the empty mile percentage from 53% in 2006 to 38% in 2008, resulting in an average empty trips reduction of about 44 million kilometers, and yielding fuel savings of 8.8 million liters, equivalent to about ¥52.7 million.[42]

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[40] World Economic Forum and Accenture (2009).
[41] See: http://www.delivering-tomorrow.com/mapping-a-decarbonization-path-for-logistics/ .
[42] See: www.8glw.com .

At a national level, this could result in 1-4% reduction in transport CO_2 emissions by 2030, considering market size and geographic imbalance of freight movement within each country. For example, Nigeria aims to develop an action plan to improve the efficiency of freight handling and transport, which is projected to result in a reduction in transport CO_2 emissions of about 3.8% by 2030.[43]

12. Increase quality, availability, reliability, frequency, and efficiency of bus-based transit.

Bus Rapid Transit (BRT) and other high-quality bus-based transit systems can deliver fast, comfortable, and cost-effective services, through a combination of dedicated lanes; off-board fare collection and expanded use of smart cards; and fast and frequent operations. Because high-quality bus systems include features similar to light rail and metro systems, they are more convenient and reliable than regular bus services, and are able to avoid causes of delay that typically slow regular bus services, such as being stuck in traffic and queuing to pay on board.
Characterization:
Action has direct focus on passenger transport, although the planning of high-quality bus systems requires the resolution of potential freight transport conflicts (i.e. delivery times and locations).
Action has direct focus on bus transport, though successful high-quality bus systems are often coordinated with connections to metro or light rail transport, and improvements to cycling and pedestrian facilities.
BRT projects registered in the Clean Development Mechanism (CDM) pipeline as of June 2011 have the potential to reduce more than 12.2 million tons of CO2 equivalent during their crediting periods, a 40% reduction over baseline conditions. Implementation of TransMilenio in Bogota, combined with new regulations on fuel quality, is estimated to save nearly 1 million tons of CO2 per year.
By reducing local pollutants, Metrobús Line 1 in Mexico City eliminates more than 6,000 days of lost work, 12 new cases of chronic bronchitis, and three deaths, saving an estimated USD $3 million per year. In Seoul, proximity to a BRT station increases property values by 5 to 10%, and rental prices decrease 1.3% for every minute of walking time from a BRT station.
Status of deployment:
BRT systems currently operate in more than 200 global cities, and have traditionally been implemented in the developing world, notably in Latin America and Asia, to provide high-capacity and high-quality transport at a fraction of the cost of metro rail systems. Bogota's TransMilenio system helped galvanize support for a national plan to expand BRT to eight other Colombian cities.
Estimated Impact:
Improving public transport systems (i.e. by decreasing travel times and improving transport services), could achieve a significant modal shift from private vehicle travel. The

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[43] Low-carbon development : opportunities for Nigeria.

most cost-effective urban transport strategy is often improvements to bus operations, by replacing inefficiently run small buses with high capacity, fuel efficient buses operated on dedicated rights-of-way.

Globally more than 200 cities have adopted Bus Rapid Transit (BRT) systems with over 5,300 BRT lane kilometers already in operation.[44] These systems often lead to more efficient utilization of scarce street space in terms of person-movements per meter of roadway.[45] By improving public transport systems, a 0.1% to 15% reduction in transport emissions could be achieved by 2030.[46]

Recent evidence suggests that development of 1,000 km of BRT lines in 15–20 cities across India within six years and would result in significant socio-economic-environmental benefits between 2013 and 2032 including the following:

- 1,100 to 1,350 reduced traffic fatalities per year;

- 1.9 to 2.3 million tons per year of CO_2 emissions reduction;

- Annual savings of 300 tons of black carbon;

- US$6.4 to 8.1 billion in macroeconomic benefits (over 20 years);

- 50,000 to 90,000 short-term jobs, rising to 128,000 permanent new jobs;

- More than 175 avoided deaths annually because of improved air quality;

- More than USD $500,000 in annually avoided crop losses due to air pollution;

- 500 million hours/year of time savings because of shortened trips.[47]

The TransMilenio BRT system in Bogotá has decreased average travel times by 32%, increased property values along the main line by 15-20%, and improved the health and safety of the community. The Guangzhou Bus Rapid Transit System yields a projected saving of 84,000 tons of CO_2 emissions per year and reduces 14 tons of particulate matter annually.

It is important, however, to note that not all public transport investment has the same potential to reduce CO_2 emissions. Poorly designed systems, which shift few motorized trips away from higher carbon modes of transport may cost more in embedded GHGs to build than they reduce over their lifetime of operations. Poorly operated services may produce higher CO_2 emissions per passenger-km than competing private motor vehicle transportation.[48]

13. Introduce and scale up pricing for car-related travel options (e.g. congestion/road charging, parking pricing) in primary and secondary cities.[49]

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[44] BRT data.

[45] Reducing Carbon Emissions from Transport Projects.

[46] High variations in carbon savings projection are due to a range of assumptions in activity, mode share, fuel intensity and carbon intensity of fuels.

[47] Climate Works Foundation, Climate Smart Development, World Bank Group.

[48] Reducing Carbon Emissions from Transport Projects.

[49] Although the proposed action has been broadened to include parking pricing, this analysis is focused solely on

Congestion charging refers to variable road tolls that are intended to reduce peak-period traffic volumes to optimal levels (i.e. higher prices are applied under congested conditions and lower prices are applied at less congested times and locations). Tolls can vary based on a fixed schedule, or they can be dynamic, changing depending on real-time levels of congestion. Tolls may also provide exemptions for zero-emission vehicles to help to drive e-mobility as a key mitigation strategy. Congestion charging can be implemented to raise revenue or as a demand management strategy to avoid the need to add roadway capacity.

Characterization:

Action impacts both passenger and freight transport relatively equally, though specific policy formulation can target particular vehicle types for higher (or lower) congestion charges.

Action is focused primarily on cars and trucks, though ideally a portion of revenue generated from congestion charging will be reinvested in public and non-motorized transport improvements.

A small reduction in urban-peak traffic volumes can provide a large reduction in congestion delays. A study modeling the effects of congestion pricing found that a fee averaging USD 19¢ per mile in congested conditions would reduce total vehicle trips by about 3.3%, but congestion delay would decline by 32%. An experiment involving time- and mileage-based pricing found that motorists reduced peak-period trips by 22%, peak mileage by 25% and total mileage by 12%.

By reducing total vehicle travel and traffic congestion, road pricing can provide significant energy conservation and emissions reductions, and therefore improved urban air quality. Congestion pricing benefits are potentially very large, because the policy is usually applied on the most congested urban roadways where socio-economic costs (e.g. driver stress, freight delays) are particularly high.

Status of deployment:

Congestion charging generally occurs on a city-by-city basis; thus there are no overarching policy initiatives to expand charging on a global basis. Implementation is currently limited to a handful of cities, with Singapore one of the few representatives from the global South.

Estimated Impact:

In many large cities, congestion costs are estimated to be 1-5% of national GDP. Average congestion costs in cities like Rio de Janeiro and São Paulo amounted to roughly USD $43 billion in 2013 (or about 2% of Brazil's entire GDP).[50] Considering high economic costs and externalities caused by traffic congestion, congestion charging aims to reduce congestion within a specified area and derive economic and social benefits.

Congestion charging could reduce national transport sector emissions 1-3% by 2030. For example, the London congestion charge, which was implemented in 2003 and costs about £45m to operate annually. Over its 10 years of operation, the scheme has generated over £1bn in net revenues. Furthermore, it has reduced the number of traffic accidents in London by 40% since 2003.[51] In addition to these co-benefits, this scheme has aided transport investments, with annual funding at about £194.2 million in 2013.

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congestion charging.

[50] Custo de congestionamentos no Rio e em São Paulo atinge R$ 98 bilhões, Industry Federation of the State of Rio de Janeiro.

[51] Congestion charge.

The [Stockholm Congestion Pricing](#) program has reduced traffic volumes by about 25%, removing 100,000 vehicles from the roads during peak business hours and increasing public transit ridership by 40,000 users per day. Due to the implementation of this scheme, retail sales in central Stockholm shops have increased significantly since 2005, reflecting increased purchases by residents who are more likely to shop locally than drive to the shops.

14. Introduce carbon pricing for the transport sector where (sub-) national carbon markets currently exist or are under development.

Carbon taxes tend to provide greater total benefits than many other energy conservation and emission reduction strategies, since they also yield co-benefits such as reduced congestion, road and parking costs, accidents, and sprawl. Implementation costs are minimal, since most jurisdictions already collect fuel taxes, and it is estimated that each 10% fuel price increase reduces total automobile deaths by 2.3%.

Characterization:

As an economy-wide measure, carbon taxes have the potential to impact both passenger and freight transport.

Carbon taxes can apply to all motorized transport modes, including aviation and shipping.

Currently about 40 countries and 23 cities, states, and provinces put a price on carbon; together, these cover the equivalent of some 7 billion tons of CO_2 – [a threefold increase over the past decade](#). Removing subsidies and fully taxing carbon could reduce global CO_2 emissions by 23%.

By removing subsidies and taxing carbon, government savings in revenue/taxation could be raised to the equivalent of 2.6% of global GDP, which could be re-directed toward sustainable transport measures and other complementary SDGs. Although fuel taxes are regressive, targeted tax reductions, cash rebates, and improved services for poor people tend to be extremely progressive, and revenue-neutral carbon taxes can also be progressive.

Status of deployment:

At its COP21 launch, 21 governments and more than 90 business and strategic partners had joined the [Carbon Pricing Leadership Coalition (CPLC)](#). On [April 15, 2016](#), the CPLC agreed to advance global progress on carbon pricing systems, and to regularly report on said progress. It called for accelerated business support for carbon pricing policies, including through the use of internal carbon prices.

A carbon tax of €15 per ton of CO_2 was introduced in [Ireland](#) in 2010, covering most emissions from non-traded sectors (including transport), which has since increased to €20 per ton. A tax of USD $5 per ton CO_2 is scheduled to take effect in [Chile](#) in 2018. The proposed tax only affects electricity and does not apply to the transport sector.

Estimated Impact:

Carbon pricing is based on the 'polluter pays' principle, i.e. it gives an economic signal which allows polluters to decide for themselves whether to discontinue their polluting activity, or continue polluting and pay for it, thereby stimulating innovations in technology

and markets.[52] Thus the impact of carbon pricing on transport CO_2 emissions could be significant, with an estimated 0.5-10% reduction in CO_2 emissions by 2030. High variation in emissions impact estimations may be due to assumptions involved in modes, market segment and carbon price.

In the United States, a comparison of expected light-duty vehicle (LDV) emissions modeled with and without carbon pricing shows a 3% reduction in CO_2 emissions and a 0.4% reduction in vehicle travel for LDVs.[53] In China, transport emissions mitigation could be in the range of 0.5-10% depending upon the carbon price, with significant air pollution mitigation co-benefits.[54] In 2050, under a 10 ¥/ton CO_2 tax scenario, the annual CO, HC, NOx, and PM emissions would be reduced by 0.68%, 0.66%, 0.55% and 0.49% respectively when compared with BAU. Under a 300 ¥/ton CO_2 tax scenario, they would be reduced by 15.1%, 14.1%, 10.1% and 8.3%, respectively, compared with BAU.

However, there is also evidence that if not planned properly, CO_2 taxation could be far less effective than fuel and energy taxations, or could even impose negative consequences on economies throughout the automotive sector.[55] However, if planned properly and if supported by additional complimentary policies such as the removal of fossil fuel subsidies, carbon taxes have a significant role to play in emissions mitigation, with potential for a global 23 % reduction in (economy-wide) CO_2 emissions.[56]

15. Introduce car-free days and ciclovías (temporary street closures to encourage cycling and walking) in primary and secondary cities to build support for longer-term policies.

Car-free days and ciclovías involve closing city streets to motorized traffic and opening them completely to pedestrians and cyclists, in order to promote physical activity and encourage people to use an alternative to private motorized transport as a part of their daily routine. It is important to note that car-free days and ciclovías provide a modest GHG emissions reduction benefit, as they are often voluntary and usually implemented across few streets for a limited duration; nevertheless, they can lead to longer-term transit behavioral change.

Characterization:

Both passenger and freight are subject to travel restrictions, with potential non-motorized beneficiaries in each area.

Travel restrictions are focused on motorized vehicles, with benefits accruing to non-motorized modes (cycling and walking).

CO_2 benefits from car-free days/ciclovías are likely to be less pronounced than the sustainable development benefits from reduced levels of congestion and local air

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[52] Pricing Carbon.
[53] Transportation Emissions Response to Carbon Pricing Programs.
[54] Achieving CO_2 emission reduction and the co-benefits of local air pollution abatement in the transportation sector of China.
[55] Roads toward a low-carbon future: Reducing CO_2 emissions from passenger vehicles in the global road.
[56] International Monetary Fund. (2014). Getting energy prices right: From principle to practice.

pollutants.

Airparif, which measures Paris pollution levels, said levels of NOx dropped by up to 40% in parts of the city during its first car-free day.   A report by the French Sénat (upper house of parliament), found that air pollution costs France €101.3bn (£75bn) a year due to negative health, economic and financial consequences.

Status of deployment:

Ciclovías are a strategy with reasonably balanced representation in the developing and developed worlds. In Seoul, residents are encouraged once a week to leave their cars at home as part of the city's No Driving Day program.[5] Due to this initiative, traffic volumes have been reduced by 3.7%, CO2 emissions by 10%, and fuel costs by $50 million annually. Economic analysis of ciclovía events in Bogota suggests that savings in direct medical costs ranged from USD $3.2 to USD $4.3 for every dollar invested in the Ciclovía program. 22 million people have participated in the European Car Free Day campaign and over 85% want it regularly repeated, with 44% of Paris residents requesting a weekly car free day.

Estimated Impact:

As discussed above.

16. Introduce policies to mandate optimal car and bicycle parking requirements in commercial and residential developments.

Many cities worldwide are abolishing parking minimums, and placing new ceilings on the number of new parking spaces allowed to be built, in order to reduce motorized vehicle travel. Research indicates a reduction of 10-30% in vehicle activity is caused by abolishing minimum criteria and implementing scientifically determined maximum parking requirements. This reduction in vehicle activity could result in emission reductions.

Characterization:

Action applies to passenger transport only, as freight transport involves a different set of parking considerations.

As implied in action title, an optimal mix of car and bicycle parking can help to reduce demand for the former while increasing supply of the latter.

In France it has been estimated that a comprehensive parking management policy (which includes limits, pricing etc.) can reduce GHG by 14% in France every year.[57]

Reduced car parking requirements can also reduce the cost of commercial and residential real estate, and provide more equitable transport funding for those who do not own private cars. It can also increase the walkability of an urban area by enabling denser, more attractive, and more pedestrian-oriented developments.

Status of deployment:

While the bulk of minimum parking requirement reform to date has been pursued in European and North American cities, the greatest potential future gains from such reforms are to be realized through progressive policies in rapidly motorizing developing cities, which in many cases also stand to lose a high baseline of cycling mode share.

Estimated Impact:

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[57] The Impact of Car Parking Policies on Greenhouse Gas Emissions.

It is important to note that if the maximum parking cap is set above levels of parking demand, it will have little effect on travel reductions. Furthermore, if maximum parking supply limits are too restrictive and not mandated across an entire city, they may encourage development to shift to areas beyond the bounds of the restriction. New evidence from London suggests that removal of minimum parking requirements might have played a stronger role than the establishment of parking maximums in reducing parking supply of 0.76 spaces per dwelling unit.[58]

17. Introduce smart cards for integrated fares on public transport and shared mobility systems where they exist.

Closer integration of public and non-motorized transport modes and fare systems can help to save travel time and increase system connectivity. Reduction in fare processing time is one of the major benefits of smart card systems for both users and operators. If fare cards are integrated among operators region-wide, riders can enjoy seamless travel across a metropolitan area. Long-term impacts include increased public transport and non-motorized transport usership, which translates to decreased CO_2 emissions and improved air quality.

Characterization:

Action is focused on passenger transport, though success in this area requires avoiding conflicts with freight transport modes.

Action is focus on integration of public transport chiefly with non-motorized access and egress modes.

Real-time transit information and fare integration can increase ridership and thus reduce CO_2 emissions. In case studies of fare integration in eight European cities, public transport ridership rose from 4% to 33%. In New York, an integrated fare system, increased weekday ridership by more than 12% on the subway and by more than 40% on the bus between 1994 and 1999.

Real-time transit information can increase real and perceived security on public transport systems. A customer survey regarding a real-time transit vehicle arrival display system in Helsinki revealed that 95% of respondents found the system useful, and 68% felt that the system increased their level of comfort.

Status of deployment:

Real-time transit information and fare integration are more prevalent in the developed world. Passengers access real-time arrival and departure information through dynamic signs at stops and stations, or through the internet on smartphones. As smartphones have become more prevalent, they have made scheduling information and route planning apps more accessible to passengers, although technology gaps remain.

Estimated Impact:

Integrating public transport with other modes (especially walking and cycling) could lead to enhancement of the catchment area of the transit stops and attractiveness of the transit mode, thus enhancing the benefits of all the connected modes i.e. encouraging more walking and bicycling as well as more public transport use. Through complementary

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[58] See: http://www.sciencedirect.com/science/article/pii/S0965856414001815.

policies and investments, integration of two or more modes would result in people reaching their destination quicker, with more comfort, and at less cost; more importantly, this would transform the modal share of public transit, walking and cycling.

By creating a multi-modal system, about a 9% reduction in transport CO2 emissions can be achieved by 2030. For example, a BRT study evaluated six different scenarios of improvement options (i.e. BRT mode share increases from 5 to 10%, walking mode share increases from 20 to 25%, bicycle mode share increases from 5 to 10% through a multi-modal package of BRT, pedestrian upgrades, and cycleways). The scenario with a broader package of measures produced over 12 Mt of CO2 reductions at a cost of approximately USD $30/ton.

In the case of individual improvement of modes, there is a significant competition between BRT and other modes, thus restricting the carbon efficiency of the system. In Southampton, England, surveys of the users of bus arrival time information indicated that about 3% of riders would use the bus system more often as a result of having this information, and in San Francisco, a survey of commuters revealed that, of those aware of traffic congestion prior to their departure, 7.1% changed mode to public transport.

18. Invest in rural road maintenance and modern supply chains to reduce global food loss and waste.

Curbing food waste will not only boost food security, but will also improve livelihoods, reduce GHG emissions, and save land and water. Reliable transport is an essential factor in reducing food loss, which requires additional investments in rural road construction and maintenance, and the increased availability of rural transport services to provide regular all-season means for getting agricultural products safely to domestic and global markets.

Characterization:

Action focused primarily on freight transport, acknowledging that in rural areas, produce from smallholders is often commingled among mixed passenger-freight vehicles.

Action focused primarily on motorized modes of road transport, though improvements to rural roads also increases the effectiveness of intermediate modes of transport that provide 'first mile' access for agricultural products.

According to a study by the UN Food and Agriculture Organization (FAO), food loss and waste accounts for about 3.3 Gt of greenhouse gas emissions every year, an annual emission level only exceeded by China and the United States.[59] In addition, large amounts of water and fertilizer go into the production of this food, creating further GHG emissions.[60]

Globally, food worth USD $750 billion is lost or wasted each year throughout the supply chain, and reducing food loss and waste could help to reduce financial burdens on the world's most vulnerable people. In Sub-Saharan Africa alone, the World Bank estimates that a 1% reduction in post-harvest losses could lead to economic gains of USD $40 million

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[59] Food Wastage Footprint: Summary Report, FAO.

[60] 'What's Food Loss and Waste Got to Do with Sustainable Development? A Lot, Actually', World Resources Institute.

each year, which will depend in part upon more reliable rural transport options.[61]

Status of deployment:

45% of the land area in low-income countries (LICs) and 51% in the lower middle-income countries (MICs) is located more than five hours away from the next market.   About half the agricultural area in these remote regions has sufficient agricultural potential, but lacks infrastructure for proper integration into the wider economy; thus, additional strides must be made.

In India, the Prime Minister's Rural Roads Program was launched in 2000 with the aim to provide all weather farm-to-market connectivity to all population centers of more than 500 people. A key development has been more transparent and rational organization and planning procedures, which allows road funds to be used to increase efficiency and sustainability.

Estimated Impact:

Rural road quality improvements are a crucial means of access for rural people to employment opportunities and essential services. While improvement of rural roads may necessitate some nominal increases in construction emissions, these are small relative to the benefits in terms of improved access to hospitals, education, markets, and services for otherwise isolated and often poor rural communities. Providing access to such services is likely to raise rural incomes, reduce urban migration and facilitate rural development.

Mitigation assessments suggest that by improving and maintaining rural roads, about a 3% CO_2 mitigation rate is possible in the transport sector by 2030. For example, emission modeling on rural access road projects by the Asian Development Bank (ADB) indicates that rural roads development and rehabilitation projects were found to have a neutral or slightly reduced effect on CO_2 emissions compared with the BAU scenario.

Rural road improvement projects improve the efficiency of traffic flow and reduce low-speed high carbon intensity travel with a modest induced traffic impact. Furthermore, periodic maintenance projects can have a CO_2 emissions reduction impact of 5- 10% or more, as maintenance reduces surface roughness, thus also reducing road user costs, air pollution, and travel time.[62]

19. Legislate and enforce stricter speeding regulations by operational and technical means to reduce emissions and road crashes.

Introducing lower speed limits on motorways and urban roads can lead to significant reductions in road accident deaths and also reduce fuel consumption, noise pollution, CO_2 and air pollutant emissions. The magnitude of reductions depends on a number of factors including vehicle fleet composition, technologies deployed, driving behavior, frequency and magnitude of speeding, congestion, and traffic diversion due to reduced speed.

Characterization:

Action applies to both passenger and freight vehicles.

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[61] Ibid.
[62] Reducing Carbon Emissions from Transport Projects.

Application is limited to motorized modes, with main focus on private cars, though this action also has potential application to public transport vehicles (e.g. long-distance buses).

CO2 benefits are likely to be limited as compared to sustainable development benefits, but tangible reductions in carbon emissions can be gained by operating motor vehicles at lower speeds.

Speeding regulation is introduced to attempt to improve traffic safety. The World Health Organization identifies speed control as one of various interventions likely to contribute to a reduction in road casualties and recommends that governments set and enforce appropriate speed limits, as well as enhance programs of law enforcement with public information and education campaigns (e.g., on the dangers of speeding and the social and legal consequences of doing so). Speed limits may also be set in an attempt to reduce the environmental impact of road traffic (i.e. vehicle noise, vibration, emissions).

Status of deployment:

HGVs in the UK have been subject to mandatory 97 km/h speed limiters since the early 1990s, which was subsequently revised to 90 km/h during EU harmonization. Some heavy goods vehicle operators (typically big-name retailers) further reduce their HGV limiters from 90 km/h to a lower speed, typically 85 or 80 km/h, in a claimed bid to reduce fuel consumption and emissions. Globally, all heavy vehicles in developing economies in South America, Latin America and Africa have speed limiters in heavy vehicles.

Estimated Impact:

It has been estimated that tightening highway speed limits from 120 to 110 km/h could deliver fuel savings of 12–18%, assuming 100% compliance with speed limits. However, relaxing these assumptions to a more realistic figure implies a saving of just 2–3%. For trucks, a speed reduction from 90 km/h to 70-80 km/h could yield 3-8% reductions in CO2 emissions, and meaningful reductions can also be achieved by reducing urban speed limits.

20. Modernize ageing rail fleets and traction systems to increase efficiency.

Older train fleets tend to be based on older, less efficient technologies. In today's context it would be inappropriate to use them for a period of over 30 years, but basic economics often prevents them from being replaced before the end of their natural life spans. However, these systems can be modernized by retrofitting newer technologies, especially newer traction power systems that are more powerful and more efficient; this transition can be accomplished quickly and at a relatively low cost.

Characterization:

Action has potential to increase rail efficiency for both passenger and freight transport.

Action is focused specifically on rail, but can have impact co-benefits for other modes through increased reliability/decreased conflicts and potentially reduced air pollution.

Rail investments have great potential to decrease future transport emissions, due to the relative efficiency of this mode. Rail infrastructure carries 10 times more transport units per km than road, using roughly 11 times less energy per unit. Each dollar invested in rail yields 3 to 10 times less CO2 emissions, while carrying 3.5 times more transport units. The UIC Low Carbon Rail Transport Challenge provides incentives to increase rail efficiency at a global scope.

Railway modernization can have important safety as well as energy-saving benefits. For

example, the construction of grade separations between railways and roads throughout Israel is intended primarily to increase safety. There have been several accidents on level crossings, when road vehicles have become stuck on the railway track.

Status of deployment:

A consortium of 18 partners representing major stakeholders across Europe is working together on the EU-funded MERLIN Project to develop a pan-European railway energy management system, with five case studies in four European countries helping evaluate various aspects of improved energy management. The UIC Low Carbon Rail Transport Challenge provides incentives to increase rail efficiency at a global scale.

Estimated Impact:

Over the past two decades, rail freight fuel efficiency improvement was double road freight fuel efficiency improvement. Many developed and developing countries are establishing mode share and energy efficiency improvement targets (i.e. expansion of railway networks along with energy efficiency improvements). While the planning and construction of new rail infrastructure can take several years and is often cost intensive, the addition of energy saving elements to existing infrastructure can be done much more quickly and is thus of great interest for railway companies, rail manufacturers, and operators.

Modernizing rail fleets and tracking systems could result in 0.3-3% reduction in national transport emissions by 2030. India has targeted a 15% improvement in energy efficiency and a mode share increase from 36% to 45 % by 2020, and has targeted a shift to electricity with 80% of rail freight and 60% of passenger traffic projected to run on electric energy by 2030.[63] The Canadian rail sector has targeted not only reduction in the intensity of greenhouse gas emissions from rail operations but also aims to monitor and reduce criteria air contaminants.[64] Australia has estimated that rail fuel efficiency improvements have the capability to reduce transport CO_2 emissions, by increasing the penetration of a range of energy saving technologies such as regenerative braking, fuel cells or heat exchangers.[65] A metro modernization contract by Alstom in Mexico City demonstrated a 35% reduction in energy consumption, increased the expected lifetime of tires by around 15%, and yielded €500,000 of annual savings through electric braking.

The International Railway Association (UIC) has proposed an ambitious transport sector challenge in the framework of the green growth agenda and climate change perspective for 2030 and 2050, i.e. to reduce specific final energy consumption (50% by 2030 and 60% by 2050) and specific average CO_2 emissions from train operations (50% by 2030 and 75% by 2050), all relative to a 1990 baseline.[66] As of October 2015, the UIC Low Carbon Rail Transport Challenge had registered projects to increase rail modal shift in Argentina, Bangladesh, China, Colombia, India, and Uzbekistan.

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[63] Indian railways, Vision 2020.
[64] Memorandum of Understanding (MOU) between Transport Canada and the Railway Association of Canada for Reducing Locomotive Emissions.
[65] Greenhouse Gas Abatement Potential of the Australian Transport Sector.
[66] UIC Low Carbon Rail Challenge.

21. Provide and improve walking and cycling infrastructure (e.g. connected walking paths, protected cycle lanes), reallocating roadspace where necessary.

'Complete streets' are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists, and transit riders of all ages and abilities. A more equitable allocation of roadspace will make it easier to cross the street, walk to shops, and bicycle to work. At the same time, complete streets allow buses to run on time and make it safer for pedestrians to access train stations, while continuing to accommodate motorists.

Characterization:

Action is primarily focused on passenger transport, but a successful Complete Streets policy must accommodate needs for freight deliveries at appropriate times and locations to maintain a vibrant urban economy.

Action spans all land based motorized and non-motorized modes, with important emphasis on pedestrian and cycling infrastructure, which often receive less total roadspace than motorized modes.

28% of all trips in US metropolitan areas are one mile or less, yet 65% of these trips are now made by automobile, in part because of incomplete streets that make it dangerous or unpleasant to walk, bicycle, or take transit. Complete Streets would help convert many of these short automobile trips to multi-modal travel, and other studies have calculated that 5-10% of urban automobile trips can reasonably be shifted to non-motorized transport.

Policies to increase the acceptability, appeal, and safety of active urban travel, and discourage travel in private motor vehicles, would provide larger health benefits than would policies that focus solely on lower-emission motor vehicles, as confirmed by separate models that linked transport scenarios in London and Delhi with physical activity, air pollution, and risk of road traffic injury.

Status of deployment:

Complete Streets have been widely implemented in much of Northern Europe, and with some success in other parts of the world. However, in much of the developing world, automobile-focused transport infrastructure is outpacing efforts to balance roadspace for all transport modes; thus, there is great potential to reduce negative impacts through a rapid implementation of complete streets.

In Portland, Oregon, new transit investments and continued improvements to bicycling and walking infrastructure have thus far resulted in per capita CO_2 emissions reductions of 12.5%. Ultimately, Portland's Complete Streets and associated land use policies yield carbon savings worth between USD $28 and USD $70 million annually.

Estimated Impact:

The Compact of Mayors, the largest coalition focused on helping mayors combat climate change, recently announced that partner cities and towns can deliver half of the global urban potential GHG emissions reductions available by 2020.[67] However, this would require rapid transformation of the transport sector in cities. This is possible by reallocating urban space and investments to walking, cycling, and public transit.

Evidence suggests that more than USD $100 trillion in cumulative public and private spending could be saved, and 1,700 Mt of annual CO_2 —a 40% reduction of urban

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[67] Climate Leadership at the Local Level: Global Impact of the Compact of Mayors.

passenger transport emissions—could be eliminated by 2050 if the world expands urban public transport, walking, and cycling. By increasing public transport, walking, and cycling trips, about 50% of urban vehicle travel could be avoided in 2050, as compared with a baseline scenario. This could result in about 1 to 10% reduction in countries transport sector emissions by 2030.[68] This could also lead to significant health benefits due to reduced cardiovascular and respiratory disease from air pollution and road accident reductions.

Furthermore, there are significant benefits expected from increased physical activity. Research in London and Delhi has established that reduction in CO2 emissions through an increase in active travel and reduced use of motor vehicles had larger health benefits (7,332 disability-adjusted life-years (DALYs) in London, and 12,516 in Delhi in 1 year) than from the increased use of lower-emission motor vehicles (160 DALYs in London, and 1696 in Delhi).[69] The combination of active travel and lower-emission motor vehicles would give the largest benefits (7,439 DALYs in London, 12,995 in Delhi), notably from a reduction in the number of years of life lost from heart disease.

22. *Ramp up charging infrastructure to encourage expansion of electric vehicle fleets in primary and secondary cities.*

The global uptake of electric vehicles (EVs) will depend on a number of factors, including advances in vehicle and battery technologies, reduced costs from economies of scale, enabling policy environments, and government incentives. The widespread availability of charging infrastructure is a necessary condition for a broad global rollout of EVs, which will increase the attractiveness of EVs across market segments, and will allow EV integration into larger urban transport systems (e.g., as last-mile solutions from public transport hubs).

Characterization:

Action has potential application to both passenger and freight transport, though current charging technologies are more efficient for relatively smaller passenger vehicles.

Action applies specifically to on-road motorized vehicles, which can include two-, three-, and four-wheelers.

The IEA suggests that if transport is to contribute to a CO2 target consistent with a 2DC stabilization pathway, technologies such as plug-in hybrid, battery electric vehicle and fuel cell vehicles would have to reach an annual market share of about 30% of global LDV sales in a balanced Avoid/Shift/Improve 2DC scenario by 2030. To achieve maximum CO2 reduction, renewable energy would have to be scaled up in global power generation.[70]

In its latest estimates, WHO indicates that outdoor air pollution causes 3.7 million premature deaths worldwide per year. People living in LICs and MICs disproportionately experience the burden of outdoor air pollution, with 88% of the 3.7 million premature deaths occurring in these countries. As transport is amongst the major sources of outdoor air pollution, the transition to electric-mobility will contribute towards reducing the

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[68] High variation (i.e. 1 to 10%) is due to diverse socio-economic and transport diversity in cities and due to assumed policies and investments.
[69] Public health benefits of strategies to reduce greenhouse-gas emissions: urban land transport.
[70] Urban Electric Mobility Initiative

associated mortality and economic losses.[71])

Status of deployment:

As one of the Action Areas of the UN Climate Summit, the Urban Electric Mobility Initiative (UEMI) aims to boost the share of electric vehicles in annual sales to 30% (2-3 wheelers and LDVs) and to integrate electric mobility into a wider concept of sustainable urban transport, which will achieve a 30% reduction of GHGs in urban areas by 2030.

Estimated Impact:

For global energy-related emissions to peak latest by 2020, the IEA has estimated that the share of petroleum-based transport fuels needs to be decreased from 94% to 87% between 1990 and 2030.[72] IEA has estimated that to reach a 2DS scenario, sales of EVs, which currently constitute less than 1% of car sales worldwide, will need to exceed 40% of total passenger car sales by 2040. This would require the scaling-up of EV infrastructure and implementation of several complementary policies such as the removal of fossil fuel subsidies, and carbon pricing. In the absence of complementary policies, it would be very difficult for countries to reach these targets, i.e. 40% of total passenger car sales by 2040. For example, in Germany, a commitment to achieve an EV share of 20% of new registrations by 2020 appears overly optimistic, based on EV share of less than one percent in 2014.[73]

If EV penetration is increased, it could provide 0.3-9% mitigation potential in national transport CO_2 emissions by 2030. Furthermore, the transport sector can benefit greatly from decarbonizing efforts in the electricity sector. IEA estimates that renewable energy could become the leading source of electricity by 2030 and the carbon intensity of the power sector is projected to improve by 30% during the same period.[74]

A case study of 18 Japanese cities explored the application of EVs in various contexts, including the deployment of quick charging stations and developing EVs for cold climates, and a 2010 goal to deploy 1,500 vehicles every fiscal year was estimated to reduce CO_2 emissions by approximately 2,500 tons yearly.   In Colombia, mitigation proposals consider that if 15% EV market penetration and 30% EV market penetration were reached by 2040, this would result in savings of about 10.4 Mt and 19 Mt of CO_2 respectively.[75] EV case studies have also been conducted in Singapore, Bangalore, Berlin and London.

23. Tighten fuel economy standards for passenger vehicles.

More fuel efficient vehicles consume less oil and reduce CO_2 emissions. Other benefits include air quality improvements and additional resources for other sustainable development priorities.

Characterization:

Fuel economy improvements can arise in both passenger and freight vehicles, though the latter is likely to be a longer-term process and thus is not included in this action.

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[71] Ibid.
[72] IEA, Energy and Climate Change - World Energy Outlook Special Report.
[73] Renewable energy and transport - Decarbonising Fuel in the Transport Sector.
[74] IEA, Energy and Climate Change - World Energy Outlook Special Report.
[75] Plan de Acción Sectorial de Mitigación (PAS).

Fuel economy efforts to date have focused on cars and trucks but have the potential to be extended across transport modes, including buses, trains, and aviation/maritime vehicles.

More fuel-efficient vehicles could consume less oil (54 billion barrels by 2050) and reduce CO_2 emissions (33 Gt in total by 2050) globally. Achieving the Global Fuel Economy Initiative (GFEI) target is estimated to account for almost one third of the CO_2 reductions necessary to switch individual motorized passenger transport from a 6 degree Celcius (6DS) to a 2DS emission trajectory.

Fuel economy improvements from conventional internal combustion engine cars can save USD $2 trillion in un-used fuel over the next decade (and up to UDS $8 trillion by 2050), freeing up valuable resources for other development priorities, such as education, health, infrastructure, or the promotion of other transport technologies or modes such as electric vehicles.

Status of deployment:

As of early 2016, 27 developing countries are at various stages of developing fuel economy policies with the support of the GFEI. GFEI has built a network of 65 countries to build capacity by sharing good practices, and is broadening its scope to include HDV fuel economy policy development and the promotion of electric vehicles.

Estimated Impact:

The transport sector now accounts for about 23% (7.3 Gt) of annual global energy-related CO_2 emissions (32 Gt). This is a significant rise (about 120%) from 3.3 Gt/year during the 1970s, and to achieve a 2DS scenario, CO_2 emissions from transport would need to decline to 5.7 Gt annually.[76] However, projections suggest that the global motorized vehicle fleet is set to triple by 2050.

Considering high growth in the vehicle population, in order to achieve deep reductions in transport sector carbon emissions (i.e. to achieve peak energy related emissions by 2020), progressive fuel economy standards must be implemented so that global average fuel consumption for new LDVs is reduced to around 4 liters per 100 km in 2030, a reduction of 50% relative to 2005. For new freight trucks, standards need to be adopted to achieve a 30% reduction in average vehicle fuel consumption per truck relative to current vehicle fuel efficiency. In order to achieve this, annual average increase in fuel economy (L/100km) must reach 2.7% for LDVs and 2.0% for HDVs[77].

Simply doubling the fuel economy of the global vehicle fleet would provide significant climate benefits, as it would reduce emissions of CO_2 by about 1.5 Gt/year by 2050. It would also result in savings in annual oil import bills of USD $400 million/year in 2050, and a net saving of USD $8 trillion between 2010 and 2050. It would also lead to high co-benefits (i.e. reduced fossil fuel dependence, reduced emissions of short-lived climate pollutants including black carbon, and improved air quality).[78]

In January 2016, the Kingdom of Saudi Arabia implemented new LDV fuel economy standards for all new and used passenger vehicles and light trucks, whether domestic or imported. Kenya has adopted a scheme for imported second-hand vehicles to raise taxes

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[76] The two-degree scenario (2DS) involves putting in place an emissions trajectory which would result in at least a 50% chance of limiting average global temperature increase to 2°C.
[77] IEA, Energy and Climate Change - World Energy Outlook Special Report.
[78] GFEI's 100 Countries Supporting Improved Fuel Economy.

on older vehicles by 150% and lower taxes on newer vehicles by 30%. At national levels, implementing fuel economy standards or improving fuel economy policies could result in a 6% to 22% reduction in transport CO_2 emissions by 2030, depending on policies and standards considered and intensity of penetration of fuel efficient vehicles. For example, in the ASEAN region, implementing fuel economy standards for LDVs and HDVs could result in CO_2 reductions of 27% by 2035,[79] while similar strategies could yield a 5.7% reduction in Mexico by 2030.[80]

C. Potential Quick Win Groupings

The 23 quick wins profiled in the previous section can be grouped along different variables, depending on the perspective of the organization grouping the wins.

For example, quick wins can be grouped by relevance to 'Avoid-Shift-Improve' (ASI) strategies, which are designed to 'Avoid' unnecessary transport trips, 'Shift' to more efficient modes, or 'Improve' existing trips through technical means, as shown in Table 2 (on a scale of (H)igh, (M)edium, and (L)ow).

This table reveals that the majority of the proposed 23 quick wins are Improve- and Shift-oriented and less Avoid-oriented, which is logical: Avoid-oriented actions generally take more time as by nature they are designed to effect long-term behavioral shifts. This grouping could therefore be used to prioritize quick win actions with greater potential to create a behavioral shift over time (e.g. placing relatively more emphasis on 'Avoid'- and 'Shift'-oriented actions, and relatively less emphasis on 'Improve'-oriented actions) to ensure that quick wins are not limited to quick fixes (i.e. technical solutions with no broader societal benefits).

In addition, it is observed that a number of quick wins have potential impacts in all three of the ASI categories (e.g. 'Expand car and (e-)bike sharing systems,' 'Formulate Sustainable Urban Mobility Plans (SUMPs),' 'Expand city transport official training programs'). Thus, this grouping could also be useful in prioritizing individual actions that have a broad set of impacts both in type and degree.

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[79] Improving Vehicle Fuel Economy in the ASEAN Region.
[80] It considers only LDV vehicles.

Action	Avoid	Shift	Improve
1. Accelerate deployment of tighter diesel fuel quality standards to reduce emissions of black carbon and other short-lived climate pollutants.			H
2. Accelerate phase-out of fossil fuel subsidies.			M
3. Expand car and (e-)bike sharing systems in primary and secondary cities.	M	H	M
4. Expand city transport official training programs to build local capacity for sustainable transport in primary and secondary cities.	M	M	L
5. Expand sustainable freight recognition schemes to reward proactive carriers and shippers.		H	M
6. Expand use of ICT applications for real-time travel information and route planning for walking, cycling, public transport and car sharing.	L	M	
7. Formulate Sustainable Urban Mobility Plans (SUMPs) in primary and secondary cities.	M	H	L
8. Implement (ultra-) low emission zones, including car-free zones in city centers.		M	H
9. Implement eco driving training (supported by on-board devices) for car, bus and rail fleet operators.			M
10. Implement zero-emissions (last-mile) urban freight through e-mobility and cycling solutions.		M	H
11. Improve freight efficiency (e.g. reduce empty load running by freight trucks) through route optimization, asset sharing between companies, and increased use of ICT solutions.		L	H
12. Increase quality, availability, reliability, frequency, and efficiency of bus-based transit.		H	M
13. Introduce and scale up pricing for car-related travel options (e.g. congestion/road charging, parking pricing) in primary and secondary cities.	M	H	L
14. Introduce carbon pricing for the transport sector where (sub-)national carbon markets currently exist or are under development.	H	H	H
15. Introduce car-free days and ciclovías (temporary street closures to encourage cycling and walking) in primary and secondary cities to build support for longer-term policies.		H	
16. Introduce policies to mandate optimal car and bicycle parking requirements in commercial and residential developments.	L	M	
17. Introduce smart cards for integrated fares on public transport and shared mobility systems where they exist.		H	
18. Invest in rural road maintenance and modern supply chains to reduce global food loss and waste.		M	M
19. Legislate and enforce stricter speeding regulations by operational and technical means to reduce emissions and road crashes.		L	
20. Modernize ageing rail fleets and traction systems to increase efficiency.		L	H
21. Provide and improve walking and cycling infrastructure (e.g. connected walking paths, protected cycle lanes), reallocating roadspace where necessary.		H	
22. Ramp up charging infrastructure to encourage expansion of electric vehicle fleets in primary and secondary cities.			H
23. Tighten fuel economy standards for passenger vehicles.			H

Table 2: Distribution of Quick Wins by Avoid-Shift-Improve

As another example, quick wins could be grouped by different stakeholder groups (e.g. national and local governments, private sector, NGOs, and development banks) according to potential degrees of involvement (on a scale of (H)igh, (M)edium, and (L)ow), as shown in Table 3.

It is observed in the table that there are some actions which have a high degree of national government involvement and lower involvement from other stakeholders (e.g. 'Accelerate phase-out of fossil fuel subsidies,' 'Introduce carbon pricing for the transport sector'). Thus, this grouping could be used to prioritize actions that rely more on central government authority, and thus can potentially be scaled up in a shorter timeframe.

It is also noted that there are a number of actions that require a lower degree of central government involvement and a higher degree of commitment from the private sector and/or development banks (e.g. 'Introduce smart cards for integrated fares on public transport,' 'Expand car and (e-)bike sharing systems,' 'Ramp up charging infrastructure to encourage expansion of electric vehicle fleets'). Thus, this grouping could alternately be used to identify those actions that offer a greater opportunity to attract more non-public funding for implementation, in conjunction with a policy push from local government.

On the other hand, it is also observed that several actions involve a medium to high degree of involvement across the stakeholder spectrum (e.g. 'Implement zero-emissions (last-mile) urban freight,' 'Accelerate deployment of tighter diesel fuel quality standards'). Such actions may take relatively more time to scale up in practice as they require more coordination across a varied set of actors, while at the same time they may be prove to be more successful in the long run after achieving broader buy-in. Thus, this grouping can help to influence not only the selection and prioritization of quick wins, but can also help to guide the promotion and implementation of quick wins, as further discussed in Section VII.

Action	Nat'l Gov't	Local Gov't	Private sector	NGOs	Dev'ment Agencies
1. Accelerate deployment of tighter diesel fuel quality standards to reduce emissions of black carbon and other short-lived climate pollutants.	H	M	H	M	M
2. Accelerate phase-out of fossil fuel subsidies.	H	L	L	M	L
3. Expand car and (e-)bike sharing systems in primary and secondary cities.	L	H	H	L	M
4. Expand city transport official training programs to build local capacity for sustainable transport in primary and secondary cities.	L	H	L	M	M
5. Expand sustainable freight recognition schemes to reward proactive carriers and shippers.	M	L	H	L	L
6. Expand use of ICT applications for real-time travel information and route planning for walking, cycling, public transport and car sharing.	L	M	H	L	L
7. Formulate Sustainable Urban Mobility Plans (SUMPs) in primary and secondary cities.	M	H	L	M	H
8. Implement (ultra-) low emission zones, including car-free zones in city centers.	L	H	M	M	L
9. Implement eco driving training (supported by on-board devices) for car, bus and rail fleet operators.	M	H	H	L	L
10. Implement zero-emissions (last-mile) urban freight through e-mobility and cycling solutions.	M	H	H	M	M
11. Improve freight efficiency (e.g. reduce empty load running by freight trucks) through route optimization, asset sharing between companies, and increased use of ICT solutions.	H	L	H	M	L
12. Increase quality, availability, reliability, frequency, and efficiency of bus-based transit.	L	H	M	M	H
13. Introduce and scale up pricing for car-related travel options (e.g. congestion/road charging, parking pricing) in primary and secondary cities.	L	H	M	M	M
14. Introduce carbon pricing for the transport sector where (sub-)national carbon markets currently exist or are under development.	H	L	L	M	L
15. Introduce car-free days and ciclovías (temporary street closures to encourage cycling and walking) in primary and secondary cities to build support for longer-term policies.	L	H	L	M	L
16. Introduce policies to mandate optimal car and bicycle parking requirements in commercial and residential developments.	L	H	M	L	L
17. Introduce smart cards for integrated fares on public transport and shared mobility systems where they exist.	L	H	H	L	M
18. Invest in rural road maintenance and modern supply chains to reduce global food loss and waste.	H	H	M	L	H
19. Legislate and enforce stricter speeding regulations by operational and technical means to reduce emissions and road crashes.	M	H	M	M	L
20. Modernize ageing rail fleets and traction systems to increase efficiency.	M	H	H	L	H
21. Provide and improve walking and cycling infrastructure (e.g. connected walking paths, protected cycle lanes), reallocating roadspace where necessary.	L	H	L	M	M
22. Ramp up charging infrastructure to encourage expansion of electric vehicle fleets in primary and secondary cities.	L	H	H	M	H
23. Tighten fuel economy standards for passenger vehicles.	H	L	H	M	L

Table 3: Role of Various Stakeholders in Advancing Quick Wins

III. Quick Wins Impact Assessment

The 23 identified quick wins individually and collectively are key to realizing four strategic goals for the Transport sector:

- **Goal 1:** Secure **access for all** to economic and social opportunities through greater mobility.
- **Goal 2:** Increase the **efficiency of transport systems** and the services they provide.
- **Goal 3:** Improve the **safety of mobility**—to support the achievement of the SDG target of halving the number of global deaths and injuries from road traffic accidents.
- **Goal 4:** Respond to **environmental impacts**, as set in the Paris Agreement (mitigation and adaptation) and other global and national agreements.

SLoCaT believes that a comprehensive assessment in each of these four areas is important, though it is acknowledged that some areas are more suitable for quantitative detailed assessments (e.g. GHG emission reductions and co-benefits). Thus, in this draft of the report, the environmental dimension received relatively greater emphasis, and a more detailed and balanced assessment of the remaining areas (i.e. Access, Efficiency, Safety) is planned. Please also note that no formal economic or financial analysis is made in the following impact assessments, which are based on sketch estimation methods.

A. Access Impacts

Universal access to economic and social opportunities is essential, and transport is vital to provide access to jobs and services. Improved access is correlated with improvements in maternal health, participation in education and human development. A crucial aspect of sustainable transport is to allow access to markets, economic opportunities, health care, and education, thus increasing equity and reducing poverty, especially for women, young people, and vulnerable groups. Large and small enterprises can benefit from enhanced accessibility to a wider pool of labor and other material inputs that can result in expanded production, new investment, and the creation of new jobs.

Based on various sources, SLoCaT has defined the following for 'Access' assessment criteria, which are used to evaluate the 23 proposed quick wins in Table 4 below:

- Increase consumer access (e.g. economic, social, educational opportunities, health care).
- Increase producer access (e.g. to wider labor pool, raw materials, markets).
- Increase equity (e.g. for women/girls, young people, vulnerable groups) and reduce poverty (e.g. increases food security).
- Optimize/rationalize land use patterns (i.e. make best use of existing land use and drive more efficient/compact land uses in the future), thereby optimizing future access in a more sustainable manner.

Quick Wins Impact Assessment: Access	Increase consumer access	Increase producer access	Increase equity/ reduce poverty	Optimize/ rationalize land use
A. Policy/Pricing Solutions				
1. Accelerate global phase-out of fossil fuel subsidies.			X	X
2. Implement (ultra-) low emission zones, including car-free zones in city centers.			X	X
3. Introduce and scale up pricing for car-related travel options (e.g. congestion/road charging, parking pricing) in primary and secondary cities.			X	X
4. Introduce carbon pricing for the transport sector where (sub-)national carbon markets currently exist or are under development.			X	X
5. Introduce car-free days and ciclovías (temporary street closures to encourage cycling and walking) in primary and secondary cities to build support for longer-term policies.			X	X
6. Introduce policies to mandate optimal car and bicycle parking requirements in commercial and residential developments.				X
B. Technical/Regulatory Solutions				
7. Accelerate deployment of tighter diesel fuel quality standards to reduce emissions of black carbon and other short-lived climate pollutants.			X	
8. Expand use of ICT applications for real-time travel information and route planning for walking, cycling, public transport and car sharing.	X		X	
9. Legislate and enforce stricter speeding regulations by operational and technical means to reduce emissions and road crashes.			X	
10. Tighten fuel economy standards for passenger vehicles.			X	
C. Operational/Capacity Solutions				
11. Expand city transport official training programs to build local capacity for sustainable transport in primary and secondary cities.	X	X	X	X
12. Formulate Sustainable Urban Mobility Plans (SUMPs) in primary and secondary cities.	X	X	X	X
13. Implement eco driving training (supported by on-board devices) for car, bus and rail fleet operators.				
14. Modernize ageing rail fleets and traction systems to increase efficiency.	X	X		
15. Ramp up charging infrastructure to expand electric vehicle fleets in primary and secondary cities.	X	X		
D. Passenger Transport				
16. Expand car and (e-)bike sharing systems in primary and secondary cities.	X		X	X
17. Increase quality, availability, reliability, frequency, and efficiency of bus-based transit.	X	X	X	X
18. Introduce smart cards for integrated fares on public transport and shared mobility systems where they exist.	X	X	X	X
19. Provide and improve walking and cycling infrastructure (e.g.	X	X	X	X

Quick Wins Impact Assessment: Access	Increase consumer access	Increase producer access	Increase equity/ reduce poverty	Optimize/ rationalize land use
connected walking paths, protected cycle lanes), reallocating road space where necessary.				
E. Freight Transport				
20. *Expand sustainable freight recognition schemes to reward proactive carriers and shippers.*		X		
21. *Implement zero-emissions (last-mile) urban freight through e-mobility and cycling solutions.*		X	X	X
22. *Improve freight efficiency (e.g. reduce empty load running by freight trucks) through route optimization, asset sharing between companies, and increased use of ICT solutions.*		X		
23. *Invest in rural road maintenance and modern supply chains to reduce global food loss and waste.*	X	X	X	X

Table 4: 'Access' Criteria Evaluation of Quick Wins

Based on the evaluation above, SLoCaT offers the following observations on the quick wins relative to the 'Access' dimension:

- Nearly all quick wins have the potential to increase equity through a combination of reducing vehicle-kilometers travelled (VKT) by private cars, increasing public and non-motorized transport options, and/or reducing air pollution, which tends to have a disproportionate impact on the most vulnerable populations.
- Pricing and regulatory strategies do little to increase consumer and producer access, but have significant positive impacts on equity/poverty and land use criteria.
- Passenger transport quick wins received optimal scores for the 'Access' criterion.

B. Efficiency Impacts

There is a continued need for efficient investment decisions and efficient services to minimize use the of energy and to create efficient and connected international and domestic supply chains, in contrast to traditional approaches in the transport sector (e.g. subsidies for fossil fuels) that encourage wasteful energy use, promote inefficient land use patterns, and increase global GHG emissions.

Improvements in transport efficiency can unlock capital for new investments that directly support sustainable development. Increased transport efficiency can also promote effective private sector participation in transport and other infrastructure, and more efficient services can tap finance, knowledge, and technology, alongside achieving improved whole-of-life investment and O&M decisions.

Based on various sources, SLoCaT has defined the following four 'Efficiency' assessment criteria, which are used to evaluate the final 23 quick wins in Table 5 below:

- Increase transport provision per unit invested for users (e.g. coordinate fares).
- Increase transport provision per unit invested for providers (e.g. optimize capacity, increase private sector participation, unlock capital for investment).

- Improve/streamline supply chains (e.g. coordinate local/regional/global actors, increase private sector participation).
- Improve whole-of-life investments (e.g. enhance asset management processes, reduce air pollution and energy use).

Quick Wins Impact Assessment: Efficiency	Increase transport per unit investment for users	Increase transport per unit investment for providers	Improve/ streamline supply chains	Improve whole-of-life investments
A. Policy/Pricing Solutions				
1. Accelerate global phase-out of fossil fuel subsidies.			X	X
2. Implement (ultra-) low emission zones, including car-free zones in city centers.			X	X
3. Introduce and scale up pricing for car-related travel options (e.g. congestion/road charging, parking pricing) in primary and secondary cities.			X	X
4. Introduce carbon pricing for the transport sector where (sub-) national carbon markets currently exist or are under development.			X	X
5. Introduce car-free days and ciclovías (temporary street closures to encourage cycling and walking) in primary and secondary cities to build support for longer-term policies.				X
6. Introduce policies to mandate optimal car and bicycle parking requirements in commercial and residential developments.				X
B. Technical/Regulatory Solutions				
7. Accelerate deployment of tighter diesel fuel quality standards to reduce emissions of black carbon and other short-lived climate pollutants.			X	X
8. Expand use of ICT applications for real-time travel information and route planning for walking, cycling, public transport and car sharing.	X	X		X
9. Legislate and enforce stricter speeding regulations by operational and technical means to reduce emissions and road crashes.			X	X
10. Tighten fuel economy standards for passenger vehicles.	X	X	X	X
C. Operational/Capacity Solutions				
11. Expand city transport official training programs to build local capacity for sustainable transport in primary and secondary cities.	X	X	X	X
12. Formulate Sustainable Urban Mobility Plans(SUMPs) in primary and secondary cities.	X	X	X	X
13. Implement eco driving training (supported by on-board devices) for car, bus and rail fleet operators.	X	X	X	X
14. Modernize ageing rail fleets and traction systems to increase efficiency.	X	X	X	X
15. Ramp up charging infrastructure to expand electric vehicle fleets in primary and secondary cities.	X	X	X	X
D. Passenger Transport				
16. Expand car and (e-)bike sharing systems in primary and secondary cities.	X			X

Quick Wins Impact Assessment: **Efficiency**	Increase transport per unit investment for users	Increase transport per unit investment for providers	Improve/ streamline supply chains	Improve whole-of-life investments
17. Increase quality, availability, reliability, frequency, and efficiency of bus-based transit.	X	X		X
18. Introduce smart cards for integrated fares on public transport and shared mobility systems where they exist.	X	X		X
19. Provide and improve walking and cycling infrastructure (e.g. connected walking paths, protected cycle lanes), reallocating road space where necessary.	X	X		X
E. Freight Transport				
20. Expand sustainable freight recognition schemes to reward proactive carriers and shippers.		X	X	X
21. Implement zero-emissions (last-mile) urban freight through e-mobility and cycling solutions.		X	X	X
22. Improve freight efficiency (e.g. reduce empty load running by freight trucks) through route optimization, asset sharing between companies, and increased use of ICT solutions.		X	X	X
23. Invest in rural road maintenance and modern supply chains to reduce global food loss and waste.	X	X	X	X

Table 5: 'Efficiency' Criteria Evaluation of Quick Wins

Based on the evaluation above, SLoCaT offers the following observations on the quick wins relative to the 'Efficiency' dimension:

- There is generally a more consistent/equitable distribution of quick wins around 'Efficiency' assessment criterion than among other criteria (i.e. this is not a distinguishing criterion).
- Nearly all quick wins improve whole-of-life investments, which perhaps is not a surprising observation given the fundamental selection criteria of the quick win process.
- Operational/capacity solutions receive optimal scores for the 'Efficiency' criterion.

C. Safety Impacts

Transport safety is an imperative for achieving SDGs, with strong implications for community health, local and national economies, and roadway congestion. Road traffic crashes are a leading cause of non-fatal injury, disability, and premature death, thus urgent action is needed to achieve the ambitious SDG target for road safety of halving the number of deaths and injuries by 2020. In addition, it is necessary to increase the safety of non-road and non-motorized transport modes, and to increase the personal security of all users of a transport system.

SLoCaT has broadened the scope of 'Safety' beyond 'road safety' in defining the following **'**Safety' assessment criteria, based on various sources, which are used to evaluate the 23 quick wins in Table 6 below:

- Reduce transport-related injuries/deaths (e.g. reduce VKT, increase use of safer public transport, reduce ambient air pollution).

- Increase safety from <u>user</u> perspective (e.g. reduce travel speed, improve vehicle safety, shift travel behavior).
- Increase safety from <u>provider</u> perspective (e.g. improve infrastructure safety, implement safety policies).
- Increase personal security of transport users/providers (e.g. increase actual and/or perceived well-being, increase fleet reliability, reduce assault/robbery/harassment).

Quick Wins Impact Assessment: **Safety**	Reduce transport-related injuries/deaths	Increase safety from user perspective	Increase safety from provider perspective	Increase security of transport users and providers
A. Policy/Pricing Solutions				
1. Accelerate global phase-out of fossil fuel subsidies.	X	X	X	
2. Implement (ultra-) low emission zones, including car-free zones in city centers.		X		
3. Introduce and scale up pricing for car-related travel options (e.g. congestion/road charging, parking pricing) in primary and secondary cities.	X	X	X	
4. Introduce carbon pricing for the transport sector where (sub-) national carbon markets currently exist or are under development.	X	X	X	
5. Introduce car-free days and ciclovías (temporary street closures to encourage cycling and walking) in primary and secondary cities to build support for longer-term policies.	X	X	X	
6. Introduce policies to mandate optimal car and bicycle parking requirements in commercial and residential developments.	X	X		
B. Technical/Regulatory Solutions				
7. Accelerate deployment of tighter diesel fuel quality standards to reduce emissions of black carbon and other short-lived climate pollutants.	X	X	X	
8. Expand use of ICT applications for real-time travel information and route planning for walking, cycling, public transport and car sharing.				X
9. Legislate and enforce stricter speeding regulations by operational and technical means to reduce emissions and road crashes.	X	X	X	
10. Tighten fuel economy standards for passenger vehicles.				
C. Operational/Capacity Solutions				
11. Expand city transport official training programs to build local capacity for sustainable transport in primary and secondary cities.	X	X	X	X
12. Formulate Sustainable Urban Mobility Plans(SUMPs) in primary and secondary cities.	X	X	X	X
13. Implement eco driving training (supported by on-board devices) for car, bus and rail fleet operators.	X	X	X	
14. Modernize ageing rail fleets and traction systems to increase efficiency.				
15. Ramp up charging infrastructure to expand electric vehicle fleets in primary and secondary cities.	X			X

Quick Wins Impact Assessment: Safety	Reduce transport-related injuries/deaths	Increase safety from user perspective	Increase safety from provider perspective	Increase security of transport users and providers
D. Passenger Transport				
16. Expand car and (e-)bike sharing systems in primary and secondary cities.	X	X		X
17. Increase quality, availability, reliability, frequency, and efficiency of bus-based transit.	X	X	X	X
18. Introduce smart cards for integrated fares on public transport and shared mobility systems where they exist.	X	X		X
19. Provide and improve walking and cycling infrastructure (e.g. connected walking paths, protected cycle lanes), reallocating road space where necessary.	X	X	X	
E. Freight Transport				
20. Expand sustainable freight recognition schemes to reward proactive carriers and shippers.	X		X	
21. Implement zero-emissions (last-mile) urban freight through e-mobility and cycling solutions.	X		X	
22. Improve freight efficiency (e.g. reduce empty load running by freight trucks) through route optimization, asset sharing between companies, and increased use of ICT solutions.				
23. Invest in rural road maintenance and modern supply chains to reduce global food loss and waste.	X	X	X	X

Table 6: 'Safety' Criteria Evaluation of Quick Wins

Based on the evaluation above, SLoCaT offers the following observations on the quick wins relative to the 'Safety' dimension:

- Nearly all quick wins have the potential to reduce transport-related injuries and deaths through either direct impacts (e.g. reducing VKT) or indirect impacts (e.g. reducing air pollution).
- Actions to increase personal security are fewer but are crucial to maintain and expand viable alternatives to private cars (which are perceived to be safer than they actually are) and increase attractiveness of public transport (which is generally perceived to be less safe than it actually is, under most conditions).

D. Environmental Impacts

Environmental impacts include energy saving fuel economy improvements, and reductions in particulate matter and air pollution. The Paris Agreement on climate change has established a global action plan aiming to limit the global average temperature rise to well below 2DS; at the same time, the resilience of transport and supporting infrastructure must be enhanced in a way compatible with nationally-defined climate adaptation plans.

SLoCaT offers here a combined assessment of climate change mitigation implications and co-benefits derived from the proposed quick wins under a common category of 'Environmental Impacts.' This analysis is based on the application of sketch methods to

quantify possible emissions from proposed short-term actions, acknowledging that in certain cases quantification is very difficult. Since quantitative data for GHG emissions are more readily available than comparable qualitative data on Access, Efficiency, and Safety, this section of the analysis is somewhat more detailed than the previous sections.

It also crucial to note, however, that until recently the United Nations Framework Convention on Climate Change (UNFCCC) process has focused primarily on mitigation, while the emerging consensus is that increasing the adaptive capacity of passenger and freight transport infrastructure and services will become increasingly critical as the climate changes, even with mitigation measures in place. Investing in mitigation reduces the need to invest in adaptation, and investing in adaptation caters for gaps in mitigation action. Thus it is important to acknowledge that while the current quick wins list focuses chiefly on mitigation, we recognize the importance of seeking to supplement the list with adaptation resilience, and disaster risk reduction focused quick wins in the future.

A recent SLoCaT analysis of a BAU emission scenario for 138 countries reveals that a continuation of current transport activity trends without low carbon policy interventions could lead to a 55% increase in transport CO_2 emissions by 2030 when compared with 2010 levels.[81] In order to determine the sketch impact of implementing the proposed 23 quick wins, a literature review was carried out to identify the possible mitigation impact of the proposed 23 quick win interventions by 2030.[82] Data were collated from 34 countries and regions and from more than 50 mitigation studies. For two of the proposed quick wins – namely 'Expanding city transport official training programs to build local capacity,' and 'Accelerating deployment of tighter fuel quality standards to reduce black carbon emissions and other short-lived climate pollutants (SLCPs)' – no CO_2 mitigation quantifiers were found, and thus these actions are not considered in the CO_2 sketch analysis.

Based on the review for 2030 impact estimation, three scenarios – maximum, average and minimum impact levels – were considered based on observed mitigation impact. These scenarios depict possible sketch impacts of implementation of quick wins when implemented in the immediate term at a global level. These scenarios contain an inherent range of uncertainty, as they have not been investigated based on micro-level bottom-up assessments in individual countries, but rather are based on macro level assessments at the global level, with quantifiers derived from a comprehensive review of external studies. Thus it was found that the difference between maximum and minimum scenarios varied over a wide range (i.e. about 70%), due to a number of factors (e.g. magnitude and intensity of measure considered, market segment considered, socio-economic characteristics, modes considered, assumptions in travel activity, mode share, fuel intensity and carbon intensity of fuels).

It is also important to note that the relative importance of each of the quick wins to total changes in emissions will vary with demand and intensity of policy interventions. Not all emission-sensitive parameters would respond similarly to a given stimulus, and each quick win may directly or indirectly influence other quick wins positively (and sometimes even

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[81] Emission Reduction Potential in the Transport Sector by 2030.

[82] Although the target timeframe of quick wins is 2020, estimated mitigation impact is based on 2030 projections, as many benefits from pre-2020 action will accrue after 2020, and reliable projection data are not currently available beyond 2030.

negatively).[83] For example, increased fuel efficiency may lead to more travel demand and may also prevent to some extent mode shift to public transit as driving becomes cheaper. Thus, to estimate an aggregate impact of quick wins, a multiplicative impact rather than an additive impact was considered (i.e. implementation of one quick win would lead to lowering of savings from implementation of other quick wins). This can be considered as a general approximation, and more detailed country-level investigations and further analysis is needed to derive more accurate aggregate emission mitigation estimations for 2030.

With the above assumptions and caveats in mind, Table 7 shows an estimated range of mitigation impacts of various strategies in percentage terms:

Quick Wins: CO$_2$ Emission Impact at 2030[84]	*Maximum Impact*	*Average Impact*	*Minimum Impact*
A. Policy/Pricing Solutions			
1. Accelerate global phase-out of fossil fuel subsidies.	*13%*	*7.5%*	*2%*
2. Implement (ultra-) low emission zones, including car-free zones in city centers.*	*1%*	*1%*	*1%*
3. Introduce and scale up pricing for car-related travel options (e.g. congestion/road charging, parking pricing) in primary and secondary cities.	*2.5%*	*1.7%*	*1.3%*
4. Introduce carbon pricing for the transport sector where (sub-) national carbon markets currently exist or are under development.	*10%*	*5.3%*	*0.5%*
5. Introduce car-free days and ciclovías (temporary street closures to encourage cycling and walking) in primary and secondary cities to build support for longer-term policies.	*0.2%*	*1%*	*2%*
6. Introduce policies to mandate optimal car and bicycle parking requirements in commercial and residential developments.*	*0.3%*	*0.3%*	*0.3%*
B. Technical/Regulatory Solutions			
7. Accelerate deployment of tighter diesel fuel quality standards to reduce emissions of black carbon and other short-lived climate pollutants).**	*Considerable*	*Considerable*	*Considerable*
8. Expand use of ICT applications for real-time travel information and route planning for walking, cycling, public transport and car sharing.*	*1%*	*1%*	*1%*
9. Legislate and enforce stricter speeding regulations by operational and technical means to reduce emissions and road crashes.	*1%*	*1.8%*	*2.7%*
10. Tighten fuel economy standards for passenger vehicles.	*9%*	*5%*	*1%*
C. Operational/Capacity Solutions			
11. Expand city transport official training programs to build local capacity for sustainable transport in primary and secondary cities.	*-*	*-*	*-*
12. Formulate Sustainable Urban Mobility Plans (SUMPs) in primary and secondary cities.	*5%*	*6.5%*	*8%*
13. Implement eco driving training (supported by on-board devices) for car, bus and rail fleet operators.	*3.4%*	*2%*	*1%*
14. Modernize ageing rail fleets and traction systems to increase	*2.9%*	*1.3%*	*0.3%*

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[83] We define emission-sensitive parameters as ASIF parameters - travel activity (A) in passenger kilometers (or ton-km for freight) across all modes; the mode share (S); the fuel intensity of each mode (I) in liters per passenger-km (or ton-km for freight); and the carbon content of the fuel or emission factor (F), in grams of carbon or pollutant per liter of fuel consumed. Schipper, Lee, and Culine Marie-Lilliu. 1999. Transportation and CO2 Emissions: Flexing the Link A Path for the World Bank. World Bank Environmentally and Socially Sustainable Development.

[84] Although the target timeframe of quick wins is 2020, estimated mitigation impact is based on 2030 projections, as many benefits from pre-2020 action will accrue after 2020, and reliable projection data are not available beyond 2030..

Quick Wins: CO_2 Emission Impact at 2030[84]	Maximum Impact	Average Impact	Minimum Impact
efficiency.			
15. Ramp up charging infrastructure to expand electric vehicle fleets in primary and secondary cities.	8.8%	4.8%	0.3%
D. Passenger Transport			
16. Expand car and (e-)bike sharing systems in primary and secondary cities.	0.2%	0.4%	0.7%
17. Increase quality, availability, reliability, frequency, and efficiency of bus-based transit.	15.3%	4.2%	0.1%
18. Introduce smart cards for integrated fares on public transport and shared mobility systems where they exist.*	9%	9%	9%
19. Provide and improve walking and cycling infrastructure (e.g. connected walking paths, protected cycle lanes), reallocating road space where necessary.	3%	1%	0.3%
E. Freight Transport			
20. Expand sustainable freight recognition schemes to reward proactive carriers and shippers.*	2%	2%	2%
21. Implement zero-emissions (last-mile) urban freight through e-mobility and cycling solutions.*	6%	6%	6%
22. Improve freight efficiency (e.g. reduce empty load running by freight trucks) through route optimization, asset sharing between companies, and increased use of ICT solutions.	3.9%	2.5%	1.1%
23. Invest in rural road construction/maintenance to sharply reduce global food loss/waste.*	2.7%	2.7%	2.7%

Table 7: Estimated GHG Mitigation Impact of Quick Wins (% Reduction)

* No (or not enough) case studies could be found to arrive at differentiated impact assessment across a maximum, average and minimum scale.

** No quantified CO2 emission impacts are given for the quick win "Accelerate deployment of tighter fuel quality standards to reduce black carbon emissions (SLCPs)".[85]

Figure 1 shows the potential impact of projected reductions in absolute terms:

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[85] With science indicating that one kilogram of black carbon causes as much climate impact in the near term as 3,200 kilograms of carbon dioxide, diesel vehicles, in particular, are now a prime target for policies aimed at controlling black carbon emissions. The transportation sector is a major contributor to black carbon emissions and was responsible for 19% of global black carbon emissions in 2000, contributing to 3.2 million deaths per year. Evidence suggests that introducing low and ultra-low sulfur fuels along with equivalent vehicle emission standards would reduce cumulative black carbon emissions by 7.1 million tons by 2050, and annual PM2.5 emissions by over 85%, resulting in 100,000 fewer yearly premature deaths in 2020, and 470,000 in 2050, and net climate benefits equivalent to preventing 14 trillion miles of travel by passenger vehicles. (CCAC - Heavy-Duty Diesel Vehicles and Engines Initiative (HDDI)).
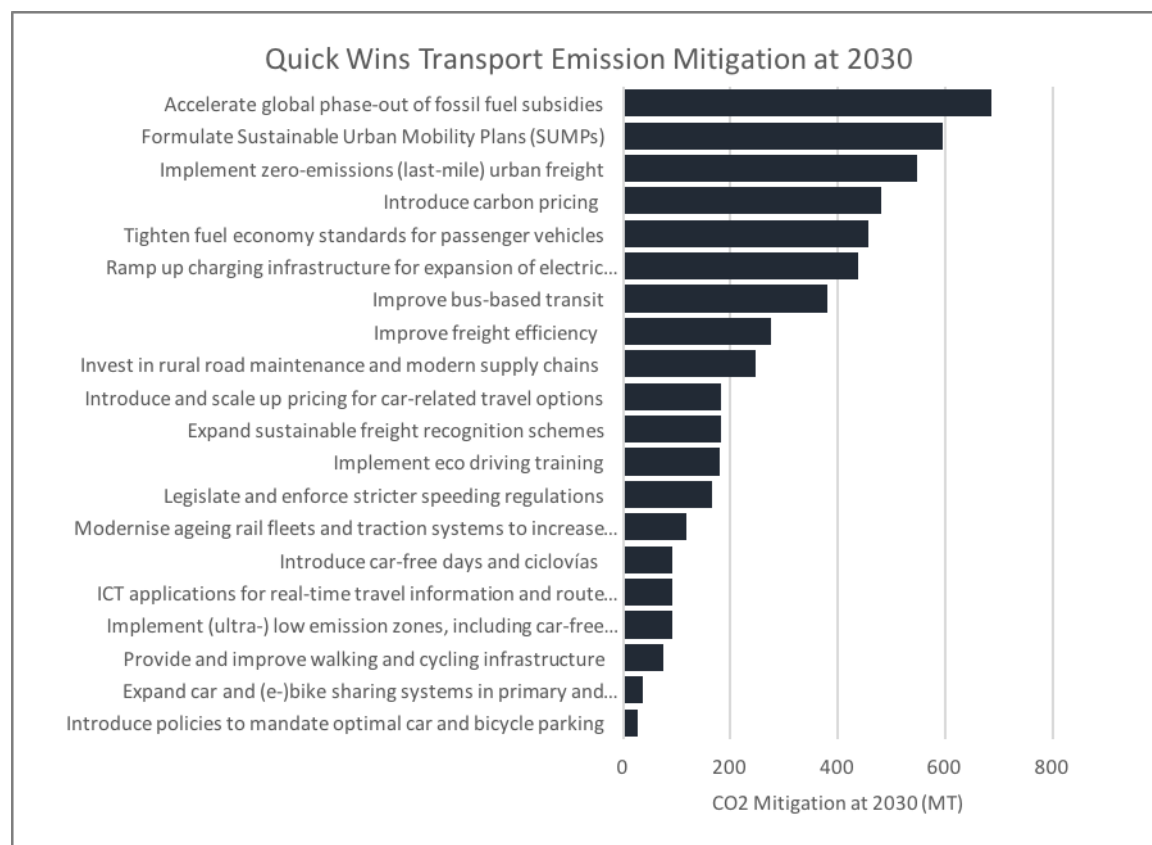
Figure 1: Estimated GHG Mitigation Impact of Quick Wins (Absolute)[86]

By implementing all the quick wins globally, an average reduction of 58% carbon emissions mitigation (compared to BAU) is possible by 2030. However, it is important to note that this is only a hypothetical scenario and may not be realistic considering that this scenario is developed by adding individual average impacts of mitigation for different quick wins (based on different studies) which are largely from the period 2005 to 2010, and thus already assume high deviation in emissions by 2016, as well as neglecting the impact of individual quick wins on other quick wins. As a result, the lowest impact scenario (i.e. the cumulative total of only low impacts of individual strategies) with a 27% deviation from BAU is therefore more realistic, as it is within range of the low carbon scenario (a deviation of 24% from BAU) derived by SLoCaT based on review of more than 350 studies from 138 countries. If all the quick wins were implemented as per the international best practices, it would have the potential to close the 2DS emission gap by 2030.

E. Summary of Impact Analysis

Table **8** summarizes the relative contribution of each of the proposed 23 quick wins to each of the four primary assessment criteria on a 0 (◯) to 4 (●) scale, based on evaluations in previous tables in this section:

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[86] Although the target timeframe of quick wins is 2020, estimated mitigation impact is based on 2030 projections, as many benefits from pre-2020 action will accrue after 2020, and reliable projection data are not available beyond 2030.

Quick Wins Impact Assessment: **Summary**	Access	Efficiency	Safety	Environment (Climate)	Average Impact[87]
A. Policy/Pricing Solutions					
1. Accelerate global phase-out of fossil fuel subsidies.	◑	◑	◕	◕	◕
2. Implement (ultra-) low emission zones, including car-free zones in city centers.	◑	◑	◔	◔	◑
3. Introduce and scale up pricing for car-related travel options (e.g. congestion/road charging, parking pricing) in primary and secondary cities.	◑	◑	◕	◔	◑
4. Introduce carbon pricing for the transport sector where (sub-)national carbon markets currently exist or are under development.	◑	◑	◕	◕	◕
5. Introduce car-free days and ciclovías (temporary street closures to encourage cycling and walking) in primary and secondary cities to build support for longer-term policies.	◑	◔	◕	◔	◑
6. Introduce policies to mandate optimal car and bicycle parking requirements in commercial and residential developments.	◔	◔	◑	◔	◔
B. Technical/Regulatory Solutions					
7. Accelerate deployment of tighter diesel fuel quality standards to reduce emissions of black carbon and other short-lived climate pollutants.	◔	◑	◕	●	◕
8. Expand use of ICT applications for real-time travel information and route planning for walking, cycling, public transport and car sharing.	◑	◕	◔	◔	◑
9. Legislate and enforce stricter speeding regulations by operational and technical means to reduce emissions and road crashes.	◔	◑	◕	◔	◑
10. Tighten fuel economy standards for passenger and freight vehicles.	◔	●	○	●	◑
C. Operational/Capacity Solutions					
11. Expand city transport official training programs to build local capacity for sustainable transport in primary and secondary cities.	●	●	●	●	●
12. Formulate Sustainable Urban Mobility Plans(SUMPs) in primary and secondary cities.	●	●	●	◕	●
13. Implement eco driving training (supported by on-board devices) for car, bus and rail fleet operators.	○	●	◕	◔	◑
14. Modernize ageing rail fleets and traction systems to increase efficiency.	◑	●	○	◔	◑
15. Ramp up charging infrastructure to expand electric vehicle fleets.	◑	●	◑	◑	◕
D. Passenger Transport					
16. Expand car and (e-)bike sharing systems in primary and secondary cities.	◕	◑	◕	◔	◑
17. Increase quality, availability, reliability, frequency, and efficiency of bus-based transit.	●	◕	●	◑	◕
18. Introduce smart cards for integrated fares on public transport and shared mobility systems where they exist.	●	◕	◕	●	●
19. Provide and improve walking and cycling infrastructure (e.g. connected walking paths, protected cycle lanes), reallocating road space where necessary.	●	◕	◕	◕	◕
E. Freight Transport					

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[87] 'Average impact' is based on a simple average of each of the four preceding categories.

20.	*Expand sustainable freight recognition schemes to reward proactive carriers and shippers.*	◔	◑	◑	◔	◑
21.	*Implement zero-emissions (last-mile) urban freight through e-mobility and cycling solutions.*	◑	◑	◑	◑	◑
22.	*Improve freight efficiency (e.g. reduce empty load running by freight trucks) through route optimization, asset sharing between companies, and increased use of ICT solutions.*	◔	◔	◔	◔	◑
23.	*Invest in rural road construction/maintenance to sharply reduce global food loss/waste.*	●	●	●	◑	●

Table 8**: Summary of Quick Wins Relative to Four Primary Assessment Criteria**

Based on the impact assessment described in the previous sections, we can draw general conclusions among five main categories of quick wins based on the summary in Table 8:

- *Policy/Pricing Solutions*: Pricing strategies tend to score high on 'Efficiency' and 'Environment' criteria, but relatively lower on 'Access' and 'Safety' dimensions.
- *Technical/Regulatory Solutions and Operational/Capacity Solutions*: have the broadest and most consistent impacts across assessment categories.
- *Passenger Transport*: Passenger transport has the potential to score highly across all four evaluation criteria dimensions.
- *Freight Transport*: Freight transport strategies receive consistent marks for 'Efficiency' and 'Environment' criteria, but are more variable along 'Access' and 'Safety' dimensions.

Based on the above summary, it is recommended to strike an approximate balance among the five thematic and modal strategies in the ultimate selection of a final set of quick wins, to ensure reasonable coverage across the four primary assessment criteria (i.e. Access, Efficiency, Safety, Environment). This will produce a set of actions that can be applied across a broad range of country contexts, and that will ultimately produce a set of primary and secondary impacts which will benefit a more equitable share of the societal spectrum.

IV. Assessment of Barriers to scaling up implementation of Quick Wins

While it is crucial to determine the projected impact of each of the quick wins with respect to Access, Efficiency, Safety and Environmental Impacts, it is likewise important to identify actual or perceived barriers to implementing these actions at a global scale, and to identify potential solutions in order to overcome these barriers. Overcoming barriers can be facilitated by identifying strong champions to help coordinate efforts for each quick win at a global level (e.g.GFEI, UEMI), by aligning these champions with regional and local counterparts to ensure the successful on-the-ground application of quick wins despite actual or perceived obstacles to their implementation.

This section of the analysis addresses each quick win that is determined to be average or above average with regard to policy, capacity or financial barriers within the initial screening process (see Annex 1 for more details on the evaluation matrix), and proposes potential solutions for overcoming actual or perceived barriers to each of these actions, as shown in Table 9: Quick Win Policy Barriers and Potential Solutions, Table 10, and Table 11.

- ● Policy Barriers

Policy barriers are those which indicate a lack of enabling legislation/factors, a bias toward one policy goal over another, or a lack of political will in the face of popular opposition, as further described in the second column of Table 9.

Name Quick Win	Actual or Perceived Barriers	Potential Policy Solutions
Accelerate global phase-out of fossil fuel subsidies.	- Political risk to elected officials overturning status quo - Existing vehicle fleets and land use biased toward cheap fuel	- Make subsidy rollback 'revenue-neutral' - Re-invest in social measures (e.g. Indonesia, Philippines, Iran) - Re-invest in renewable energy sector (e.g. Morocco, Ethiopia)
Formulate Sustainable Urban Mobility Plans (SUMPs) in primary and secondary cities.	- Government control over transport planning processes - Lack of coordination among jurisdictions in large cities	- Create opportunities for sharing good practices (esp. South-South cooperation where possible)
Introduce and scale up pricing for car-related travel options (e.g. congestion/road charging, parking pricing) in primary and secondary cities.	- Seen as additional taxation - Restricts use of private cars - Benefits not apparent before implementation - Technological constraints	- Introduce pricing under trial period (e.g. Stockholm) - Reinvest revenues in public transport and roadway infrastructure (e.g. London) - Use variable parking pricing as proxy for cordoned pricing zones
Introduce carbon pricing for transport sector where (sub-)	- Seen as additional taxation - Transport is difficult sector in which to apply carbon pricing	- Make carbon taxes revenue-neutral (e.g. British Columbia) - Phase in ramp-up period

national carbon markets currently exist or are under development.	-	- Leverage regional carbon trading programs
Invest in rural road construction/maintenance to reduce global food loss/waste.	- Policy bias toward urban transport - Bias toward rural transport infrastructure over services - Bias toward construction over maintenance	- Mandate rural access in national road building programs (e.g. India) - Incorporate maintenance in local employment programs (e.g. Nepal)
Provide and improve walking and cycling infrastructure (e.g. connected walking paths, protected cycle lanes), reallocating road space where necessary.	- Political pressure to maintain status quo for private cars - Planning bias for vehicle over passenger throughput - Fewer cars, less parking perceived threat to merchants	- Demonstrate economic benefits of more passenger throughput - Demonstrate health benefits of multi-modal transport options

Table 9: Quick Win Policy Barriers and Potential Solutions

Potential solutions to policy barriers can be seen in balancing costs with complementary benefits in pricing policies, demonstrating a broader scope of benefits in TDM policies, and leveraging national mandates and regional cooperation to catalyze local action.

- Capacity Barriers

Capacity barriers are those that indicate a lack of technical or operational expertise, or a lack of human resources to enforce policies or ensure their long-term impacts, as further described in the second column of Table 10.

Name Quick Win	Actual or Perceived Barriers	Potential Capacity Solutions
Implement eco driving training (supported by on-board devices) for car, bus and rail fleet operators.	- Training impacts decline quickly over time - Perceived lack of impact	- Create economic incentives, rewards programs - Increase private sector involvement
Formulate Sustainable Urban Mobility Plans(SUMPs) in primary and secondary cities.	- Lack of precedence for participatory planning processes	- Increase capacity through technical assistance (esp. South-South cooperation)
Improve freight efficiency (e.g. reduce empty load running by freight trucks) through route	- Lack of access to technological tools - Lack of operational protocols	- Increase technological and operational capacity through technical assistance (esp. South-South cooperation)

64

optimization, asset sharing between companies, and increased use of ICT solutions.		
Introduce and scale up pricing for car-related travel options (e.g. congestion/road charging, parking pricing) in primary and secondary cities.	- Lack of access to technological tools - Lack of operational protocols	- Implement targeted outreach on road pricing good practices by global champions

Table 10: Quick Win Capacity Barriers and Potential Solutions

Potential solutions to capacity barriers include expanding the efforts and reach of global champions, increasing private sector involvement, and leveraging regional cooperation to catalyze local action.

- ## Financial Barriers

Financial barriers are those that indicate high upfront costs, lack of focus on whole-of-life costs, or biases in budgeting, as further described in the second column of Table 11.

Name Quick Win	**Actual or Perceived Financing Barriers**	**Potential Financing Solutions**
Implement zero-emissions (last-mile) urban freight through e-mobility and cycling solutions.	- High up-front cost for EV purchase/conversion and charging infrastructure	- Pair with urban revenue-generating actions (e.g. congestion charging) - Increase private sector involvement
Invest in rural road construction/maintenance to sharply reduce global food loss/waste.	- Bias toward urban transport in national budgets - Lack of budget allocated to preventative maintenance	- Allocate proportional budget to maintain global food security. - Increase private sector participation (e.g. global food industry and conglomerates)
Modernize ageing rail fleets and traction systems to increase efficiency.	- Bias toward replacement at end of useful life, despite economic gains	- Focus MDB efforts on supplying low-cost loans for rail vehicle retrofits - Increase private sector involvement
Provide and improve walking and cycling infrastructure (e.g. connected walking paths, protected cycle lanes), reallocating road space where necessary.	- Limited local budgets for Complete Streets	- Incorporate Complete Streets into national budget allocations
Ramp up charging infrastructure to	- High up-front cost for EV purchase/conversion and	- Pair with urban revenue-generating actions (e.g.

expand electric vehicle fleets in primary and secondary cities.	charging infrastructure	congestion charging)

Table 11: Quick Win Financial Barriers and Potential Solutions

Potential solutions to financial barriers include cross-subsidizing transport provision with pricing solutions, increasing the involvement of multilateral development banks (MDBs) and the private sector in facilitating proposed actions, and reallocating budgets to reflect the proportional impact of sustainable transport solutions.

It is observed that several of the quick wins projected in Table 7 which have the greatest potential carbon reductions are also noted as having one or more actual or perceived barriers in the preceding tables (e.g. 'Carbon pricing for transport', 'Phase-out of fossil fuel subsidies,' 'Sustainable Urban Mobility Planning processes,' 'Provide and improve walking and cycling infrastructure'). In these cases, the barriers identified can in fact be an opportunity to double down on existing efforts to accelerate the uptake of these solutions, ideally by an order of magnitude.

In sum, known solutions exist to each of the barriers described; the greater challenge is to apply these solutions at a global scale across varied operational and political contexts. By scaling up regional and sub-regional cooperation in the areas of policy and capacity, and by increasing global financing efforts (including strong private sector involvement), it is possible to tailor the general solutions described in the preceding tables to local conditions.

- ## Observations and Conclusions

While potential solutions exist to nearly all actual and perceived barriers, these solutions are often context-dependent or limited to a specific set of case studies. To implement quick wins at scale, it is necessary to make these solutions more palatable to a broader range of countries and conditions; thus capacity building and peer sharing becomes even more important in helping to counter apparent obstacles with tested solutions.

V. Enabling the Implementation of Potential Quick Wins: Alignment within Global Processes

Quick win actions will be most effectively implemented if leveraged in conjunction with ongoing global processes on climate change and sustainable development. This section thus explores the potential for aligning quick wins with NDCs, the LPAA Transport Initiatives, the UN SDGs, and the UN Habitat III process.

- ### Aligning the Quick Wins with Nationally-Determined Contributions (NDCs)

The NDCs submitted by over 150 countries prior to COP21 outline actions that will be taken by these countries, starting from 2020, to mitigate and adapt to climate change. Over 70% of the NDCs include transport related mitigation actions, many of which will also help to realize the SDGs and the goals outlined previously.[88] Though the treatment of transport strategies in NDCs varies widely, a significant number of countries provide a reasonable degree of detail to support an analysis of transport quick wins.

The transport community should actively support a successful implementation of the NDCs. This will be helped by the development of a global roadmap to decarbonize the transport sector, which provides all stakeholders, including the private sector, with a medium and long term scenario on which to base policy and investments decisions. For maximum leverage on the climate aspect, quick wins should be more thoroughly incorporated into NDCs, which are framing national commitments to implement the Paris Agreement on climate change.

An initial observation is that there is a significant mismatch between the quick wins described in this report and the majority of country climate strategies, with more than a quarter of NDCs not directly linked to any quick wins, and roughly three quarters containing fewer than five quick wins, as shown in Figure 2. This reveals an opportunity to incorporate a greater number of transport strategies with significant pre-2020 mitigation potential into revised NDCs and forthcoming detailed implementation plans. A selection of countries with a significant number of quick wins incorporated in their NDCs is shown in Figure 3.

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[88] See: http://www.ppmc-transport.org/overview_indcs/ .
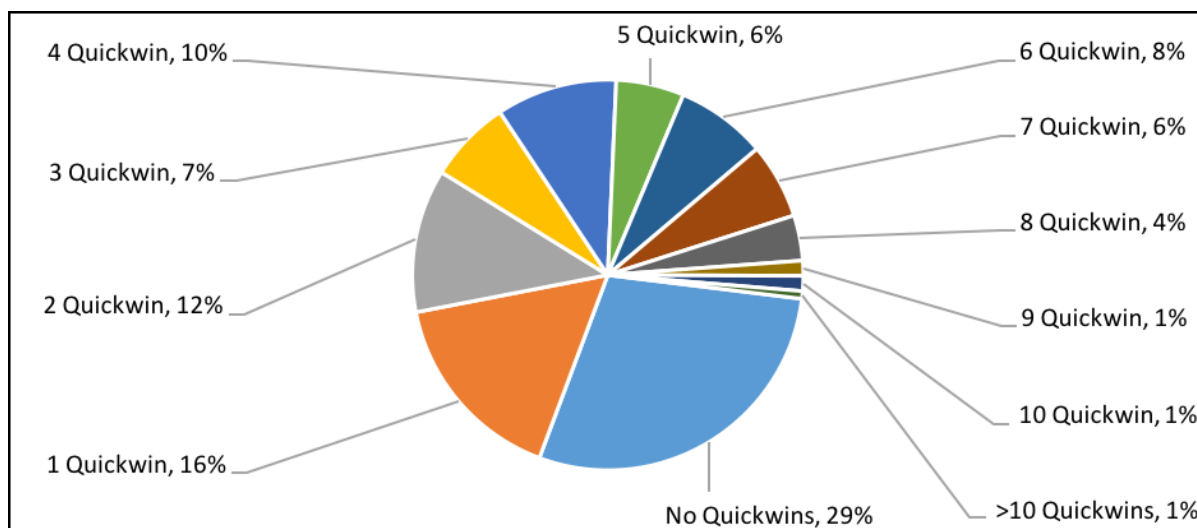
Figure 2: Number of Quick Wins in NDCs
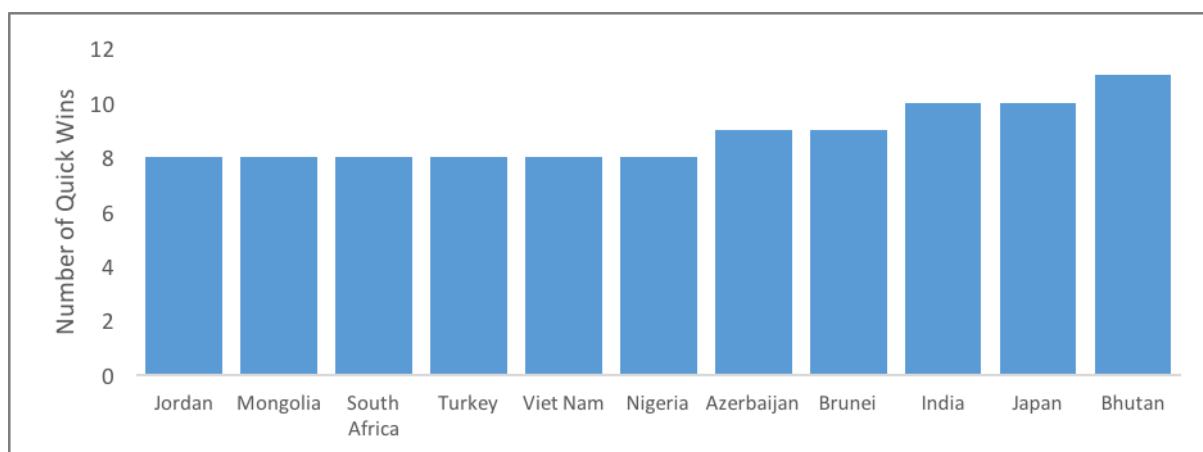
Figure 3: Country NDCs and Quick Wins

Furthermore, a SLoCaT analysis of linkages between quick wins and NDCs in over 150 NDCs reveals an uneven incorporation of proposed actions, through the correlation of these variables on the basis of direct linkage and probable linkage shown in Figure 4.[89]

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[89] Note that the remaining eight quick wins are represented in 1% or fewer of all NDCs, and thus are collected under the 'Other' category.
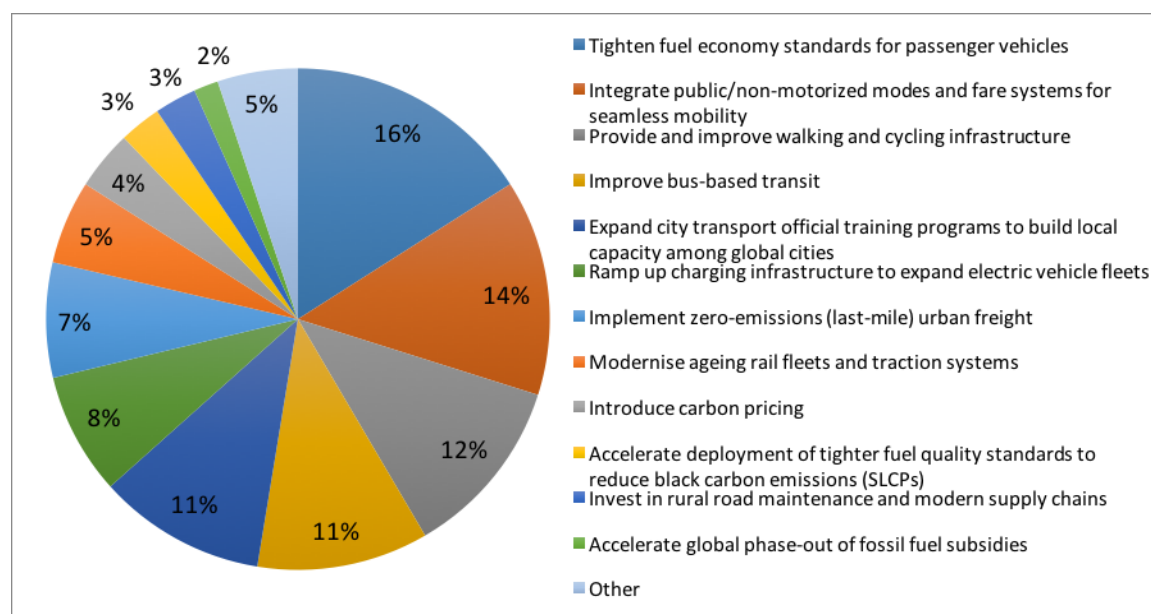
Figure 4: Linkage of Quick Wins to NDCs

The mapping of proposed quick wins to NDCs yields the following key observations:

- NDCs represent a broad array of quick wins, and the most popular represent a balance of different themes and modes (e.g. 'Tightening fuel economy standards', which appear in 16% of NDCs investigated; 'Integrating transport modes and fare systems' (14%); 'Improving walking and cycling infrastructure' (12%); 'Improving bus-based public transport' (11%); and 'Expanding city transport official training' (11%).

- NDCs are more focused on urban than rural transport, as demonstrated by the popularity of quick wins such as 'Integrating transport modes and fares' (14%) and 'Provide and improve walking and cycling infrastructure' (12%).

- Policy/Pricing Solutions are relatively neglected in NDCs, as demonstrated by the little emphasis given to 'Carbon pricing' (4%), 'Fossil fuel subsidy reform' (2%), and 'Congestion charging' (<1%, not shown in Figure 4).

Furthermore, a mapping of individual quick wins to global regions (Table **12**) reveals that some quick wins enjoy near-universal regional distribution (e.g. 'Tighten fuel economy standards for passenger vehicles,' 'Provide and improve walking and cycling infrastructure,' 'Improve bus-based transit'), suggesting that these actions are particularly ripe for rapid implementation.

Top 5 Quick Wins by Regional Distribution	
East Asia & Pacific	
1	Tighten fuel economy standards for passenger vehicles.
2	Integrate public/non-motorized modes and fare systems for seamless mobility.
3	Ramp up charging infrastructure to expand electric vehicle fleets.
4	Provide and improve walking and cycling infrastructure.
5	Improve bus-based transit.

Europe & Central Asia

1	Tighten fuel economy standards for passenger vehicles.
2	Ramp up charging infrastructure to expand electric vehicle fleets.
3	Integrate public/non-motorized modes and fare systems for seamless mobility.
4	Provide and improve walking and cycling infrastructure.
5	Implement zero-emissions (last-mile) urban freight.

Latin America & Caribbean

1	Tighten fuel economy standards for passenger vehicles.
2	Expand city transport official training programs to build local capacity.
3	Integrate public/non-motorized modes and fare systems for seamless mobility.
4	Provide and improve walking and cycling infrastructure.
5	Improve bus-based transit.

Middle East & North Africa

1	Tighten fuel economy standards for passenger vehicles.
2	Integrate public/non-motorized modes and fare systems for seamless mobility.
3	Modernise ageing rail fleets and traction systems.
4	Expand city transport official training programs to build local capacity among global cities.
5	Improve bus-based transit.

North America

1	Tighten fuel economy standards for passenger vehicles.
2	Ramp up charging infrastructure to expand electric vehicle fleets.
3	Implement zero-emissions (last-mile) urban freight.

South Asia

1	Integrate public/non-motorized modes and fare systems for seamless mobility.
2	Provide and improve walking and cycling infrastructure.
3	Modernise ageing rail fleets and traction systems.
4	Ramp up charging infrastructure to expand electric vehicle fleets.
5	Expand city transport official training programs to build local capacity.

Sub-Saharan Africa

1	Integrate public/non-motorized modes and fare systems for seamless mobility.
2	Tighten fuel economy standards for passenger vehicles.
3	Provide and improve walking and cycling infrastructure.
4	Improve bus-based transit.
5	Expand city transport official training programs to build local capacity.

Table 12: Top Quick Wins by Regional Distribution

In summary, to maximize the impact and accelerate the uptake of quick wins, it is essential to develop and promote those quick wins that are most well represented in the existing NDCs (e.g. fuel economy standards, multimodal mobility, integrated transport fares). Additionally, for those quick wins which are determined to have significant impact on climate change but with little emphasis in NDCs (e.g. quick wins categorized under Policy/Pricing Solutions), it is crucial to engage with countries at national or regional levels

to ensure that they are more closely incorporated into detailed NDC implementation plans.

- Aligning the Quick Wins with Lima Paris Action Agenda (LPAA) Transport Initiatives

For rapid implementation and broad scalability, a quick win must have the support of one or more champion organizations or initiatives; in this respect, the LPAA transport initiatives (now also referred to as the Global Climate Action Agenda (GCAA) initiatives) are key catalysts for the proposed quick wins. These initiatives are intended to accelerate pre-2020 action by sub-national and non-state actors, and thus are a natural springboard for promoting the quick wins at local levels, where the bulk of implementation takes place.

The 15 LPAA initiatives cover a range of transport subsectors, and complement the proposed quick wins in a variety of ways. [90] For example, some initiatives are helpful in supporting for *a range of quick wins*, which include the following examples:
- *Global Green Freight Action Plan:* All Freight Transport quick win actions.
- *MobiliseYourCity:* All urban-focused Passenger and Freight Transport quick win actions; 'Formulate Sustainable Urban Mobility Plans in primary and secondary cities'.
- *UITP Declaration on Climate Change Leadership:* All public-transport focused Passenger Transport quick win actions.
- *ITS for the Climate:* All quick win Technical Solutions.
- *World Cycling Alliance (WCA) and European Cyclists' Federation (ECF) Commitment:* All cycling-focused quick win actions.

Other LPAA initiatives are more relevant to quick wins on *a one-to-one relationship*, including the following examples:
- *Global Fuel Economy Initiative:* 'Tighten fuel economy standards for passenger vehicles'.
- *C40 Clean Bus Declaration:* 'Increase quality, availability, reliability, frequency, and efficiency of bus-based transit'.
- *UIC Low-Carbon Sustainable Rail Transport Challenge:* 'Modernize ageing rail fleets and traction systems to increase efficiency'.
- *Urban Electric Mobility Vehicles Initiative (UEMI) and ZEV Alliance:* 'Ramp up charging infrastructure to encourage expansion of electric vehicle fleets in primary and secondary cities'.

As LPAA transport initiatives are transitioning from the initial phase of organizational development, considerable effort is now being made to expand the partner network through outreach and coalition building. For example, several of the initiatives have set quantified targets to reach a certain number of signatories or committed partners within a certain timeframe (e.g. GFEI, MobiliseYourCity) while some initiatives seek to enhance cooperation with state actors and the private sector to consolidate implementation channels (e.g. ITS for Climate, UIC Low Carbon Sustainable Rail Transport Challenge). The promotion of quick wins by LPAA initiatives (and likewise the promotion of LPAA initiatives

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[90] See: http://www.ppmc-transport.org/transportinitiatives/ .

in the context of quick wins) is thus a natural alliance to accelerate transport climate action and make progress toward both objectives.

LPAA initiatives actively incorporate approaches such as capacity building (e.g. ACA, GFEI and WCA and ECF Commitment), awareness campaigns (e.g. UITP and Worldwide Taxis4SmartCities), technical committees (e.g. LC2RTI and Navigating a Changing Climate), and establishing centers of excellence to support partners (Navigating a Changing Climate). These efforts also provide natural avenues to promote quick wins (individually and collective) on a broad scale through existing channels.

With finalization of the quick wins, it thus essential to closely coordinate with the above (and other related) LPAA initiatives for maximum leverage in ramping up these actions at sufficient pace and scale, in order to achieve significant pre-2020 progress and establish more sustainable emissions trajectories in both developed and developing countries.

- Aligning the Quick Wins with Sustainable Development Goal (SDG) Targets

Quick wins are a key asset to the implementation of the SDGs, a process which is now underway following the adoption of the SDGs (and associated targets and draft indicators) in September 2015. The targeted 2030 timeframe for SDG implementation will require quick win actions to kick start progress towards the SDGs, including in the transport sector, which is explicitly or implicitly incorporated into 8 of the 17 SDGs.

The SLoCaT Partnership has identified five SDG targets with direct implications for the transport sector, and seven SDG targets with indirect implications for transport; Table 13 demonstrates linkages between the 23 quick wins and these 12 SDG targets:

Quick Wins: Linkages to Transport-Focused SDGs	Sustainable Development Goals (SDGs) (Direct Targets)					Sustainable Development Goals (SDGs) (Indirect Targets)						
	3	7	9	11	12	2	3	6	11	12	13	13
	3.6 Road Safety	7.3 Energy Efficiency	9.1 Sustainable Infrastructure	11.2 Urban Access	12.c Fuel Subsidies	2.3 Agricultural Productivity	3.9 Air Pollution	6.1 Access to Safe Drinking Water	11.6 Sustainable Cities	12.3 Food Loss and Waste	13.1 Climate Change Adaptation	13.2 Climate Change Mitigation
A. Policy/Pricing Solutions												
1. *Accelerate global phase-out of fossil fuel subsidies.*		■			■		■					■
2. *Implement (ultra-) low emission zones, including car-free zones in city centers.*	■			■			■					■
3. *Introduce and scale up pricing for car-related travel options (e.g. congestion/road charging, parking pricing) in primary and secondary cities.*	■	■		■			■				■	■
4. *Introduce carbon pricing for the*		■	■		■		■		■		■	■

Quick Wins: Linkages to Transport-Focused SDGs	Sustainable Development Goals (SDGs) (Direct Targets)					Sustainable Development Goals (SDGs) (Indirect Targets)						
	3	7	9	11	12	2	3	6	11	12	13	13
	3.6 Road Safety	7.3 Energy Efficiency	9.1 Sustainable Infrastructure	11.2 Urban Access	12.c Fuel Subsidies	2.3 Agricultural Productivity	3.9 Air Pollution	6.1 Access to Safe Drinking Water	11.6 Sustainable Cities	12.3 Food Loss and Waste	13.1 Climate Change Adaptation	13.2 Climate Change Mitigation
transport sector where (sub-) national carbon markets currently exist or are under development.		X	X		X		X		X		X	
5. *Introduce car-free days and ciclovías (temporary street closures to encourage cycling and walking) in primary and secondary cities to build support for longer-term policies.*	X	X		X			X		X			X
6. *Introduce policies to mandate optimal car and bicycle parking requirements in commercial and residential developments.*	X	X	X				X		X		X	
B. Technical/Regulatory Solutions												
7. *Accelerate deployment of tighter diesel fuel quality standards to reduce emissions of black carbon and other short-lived climate pollutants.*		X					X		X			X
8. *Expand use of ICT applications for real-time travel information and route planning for walking, cycling, public transport and car sharing.*	X	X		X			X		X			X
9. *Legislate and enforce stricter speeding regulations by operational and technical means to reduce emissions and road crashes.*	X	X					X		X			X
10. *Tighten fuel economy standards for passenger and freight vehicles.*		X			X		X					X
C. Operational/Capacity Solutions												
11. *Expand city transport official training programs to build local capacity for sustainable transport in primary and secondary cities.*	X	X	X	X	X		X		X		X	
12. *Formulate Sustainable Urban Mobility Plans(SUMPs) in primary and secondary cities.*	X	X					X		X			
13. *Implement eco driving training (supported by on-board devices) for car, bus and rail fleet operators.*		X					X					X
14. *Modernize ageing rail fleets and traction systems to increase efficiency.*		X					X					X
15. *Ramp up charging infrastructure to expand electric vehicle fleets.*		X	X				X					X
D. Passenger Transport												
16. *Expand car and (e-)bike sharing systems in primary and secondary*	X	X		X			X		X			X

73

Quick Wins: Linkages to Transport-Focused SDGs	Sustainable Development Goals (SDGs) (Direct Targets)					Sustainable Development Goals (SDGs) (Indirect Targets)						
	3	7	9	11	12	2	3	6	11	12	13	13
	3.6 Road Safety	7.3 Energy Efficiency	9.1 Sustainable Infrastructure	11.2 Urban Access	12.c Fuel Subsidies	2.3 Agricultural Productivity	3.9 Air Pollution	6.1 Access to Safe Drinking Water	11.6 Sustainable Cities	12.3 Food Loss and Waste	13.1 Climate Change Adaptation	13.2 Climate Change Mitigation
cities.	■	■		■			■		■			■
17. Increase quality, availability, reliability, frequency, and efficiency of bus-based transit.	■	■	■				■		■			
18. Introduce smart cards for integrated fares on public transport and shared mobility systems where they exist.	■	■	■	■			■		■			
19. Provide and improve walking and cycling infrastructure (e.g. connected walking paths, protected cycle lanes), reallocating road space where necessary.	■	■	■	■			■		■			
E. Freight Transport												
20. Expand sustainable freight recognition schemes to reward proactive carriers and shippers.	▨	■					■		■			
21. Implement zero-emissions (last-mile) urban freight through e-mobility and cycling solutions.	▨	■		■			■					
22. Improve freight efficiency (e.g. reduce empty load running by freight trucks) through route optimization, asset sharing between companies, and increased use of ICT solutions.		■				■	■		■	■	■	■

Table 13: Linkage of Quick Wins to Transport-Related SDG Targets

The mapping of proposed quick wins to the SDG targets yields the following key observations:

- Policy/Pricing Solutions provide a distributed impact across a range of direct and indirect SDG targets.
- Technical/Regulatory Solutions provide a more narrowly distributed impact, which is focused primarily in the areas of energy efficiency, air pollution, and climate change mitigation.
- Operational/Capacity Solutions and Passenger Transport actions are closely aligned, with a more comprehensive coverage of direct transport targets and a sparser coverage of indirect transport targets. Freight Transport actions complement these sets of actions by providing broader coverage of indirect targets and a sparser coverage of direct targets.

Thus, for maximum impact on rapid implementation of SDGs and associated transport-relevant targets, the final set of quick wins should maintain a strong focus on actions in the areas of Policy/Pricing Solutions, Operational/Capacity Solutions, and Passenger Transport. The linkage between quick wins and SDG targets can be further leveraged by working at regional and national levels to incorporate the transport quick wins targeting these areas into national SDG implementation plans (and ideally prioritized within INDCs to address SDG targets related to energy efficiency, fossil fuel subsidies, and climate change).

- Aligning the Quick Wins with Habitat III Imperatives

Habitat III is the United Nations Conference on Housing and Sustainable Urban Development held in October 2016, which culminated in the adoption of a New Urban Agenda (NUA). Habitat III is an opportunity to focus on the important challenge of how cities, towns and villages are planned and managed, in order to fulfill their role as drivers of sustainable development, and prepare an implementation agenda to balance economic, environmental and social development, which must be supported by near-term actions in the transport sector.

Potential linkages between proposed quick wins and key objectives of the Habitat III discourse are shown in Table 14 (sorted primarily by 'Urban access'):

Quick Wins: Linkages to Habitat III Discussions	Quick Wins Evaluation Criteria with specific relevance to Habitat III discussions (0-5 scale)			
	Urban access	Equity/ Gender	Road safety	Air quality
1. Introduce smart cards for integrated fares on public transport and shared mobility systems where they exist.	5	5	3	4
2. Provide and improve walking and cycling infrastructure (e.g. connected walking paths, protected cycle lanes), reallocating road space where necessary.	5	4	4	4
3. Introduce smart cards for integrated fares on public transport and shared mobility systems where they exist.	5	3	3	3
4. Introduce and scale up pricing for car-related travel options (e.g. congestion/road charging, parking pricing) in primary and secondary cities.	4	1	3	4
5. Modernize ageing rail fleets and traction systems to increase efficiency.	4	3	4	4
6. Expand use of ICT applications for real-time travel information and route planning for walking, cycling, public transport and car sharing.	4	3	2	4
7. Expand city transport official training programs to build local capacity for sustainable transport in primary and secondary cities.	4	3	4	4
8. Formulate Sustainable Urban Mobility Plans(SUMPs) in primary and secondary cities.	4	3	3	4
9. Increase quality, availability, reliability, frequency, and efficiency of bus-based transit.	4	4	3	5
10. Improve freight efficiency (e.g. reduce empty load running by freight trucks) through route optimization, asset sharing between companies, and increased use of ICT solutions.	4	2	3	5
11. Expand sustainable freight recognition schemes to reward proactive	4	3	3	4

Quick Wins: Linkages to Habitat III Discussions	Quick Wins Evaluation Criteria with specific relevance to Habitat III discussions (0-5 scale)			
	Urban access	Equity/ Gender	Road safety	Air quality
carriers and shippers.				
12. *Implement zero-emissions (last-mile) urban freight through e-mobility and cycling solutions.*	4	4	3	5
13. *Accelerate global phase-out of fossil fuel subsidies.*	3	1	2	4
14. *Introduce carbon pricing for the transport sector where (sub-)national carbon markets currently exist or are under development.*	3	1	2	3
15. *Introduce policies to mandate optimal car and bicycle parking requirements in commercial and residential developments.*	3	2	2	3
16. *Introduce car-free days and ciclovías (temporary street closures to encourage cycling and walking) in primary and secondary cities to build support for longer-term policies.*	3	4	5	4
17. *Ramp up charging infrastructure to expand electric vehicle fleets in primary and secondary cities.*	3	3	0	5
18. *Tighten fuel economy standards for passenger vehicles.*	2	0	0	4
19. *Implement (ultra-) low emission zones, including car-free zones in city centers.*	1	2	4	5
20. *Legislate and enforce stricter speeding regulations by operational and technical means to reduce emissions and road crashes.*	1	2	5	3
21. *Accelerate deployment of tighter diesel fuel quality standards to reduce emissions of black carbon and other short-lived climate pollutants.*	0	3	0	5
22. *Implement eco driving training (supported by on-board devices) for car, bus and rail fleet operators.*	0	3	4	3
23. *Invest in rural road maintenance and modern supply chains to reduce global food loss and waste.*	0	3	4	1

Table 14: Linkage of Quick Wins to Habitat III Objectives

Quick wins are an important tool to show that there are practical, tested and successful sustainable transport measures that can deliver short term benefits at the local level, and thus can help to ensure that sustainable transport secures the place it deserves in the discussions and the outcome text. Many of the quick wins support several focus areas of the Habitat III discussion such as inequality, engagement, economic development and improving access to goods and services.

For example, 'Formulate Sustainable Urban Mobility Plans (SUMPs) in primary and secondary cities' provides opportunities for traditionally marginalized social groups to participate in mobility planning in order to ensure that mobility services meet their needs. In addition, revenue from road pricing (e.g. 'Introduce and scale up pricing for car-related travel options (e.g. 'Congestion/road charging, parking pricing in primary and secondary cities') could be used to improve walking, cycling and public transport, so that as well as reducing car use this action has an effect of economic redistribution from car users to other users of the transport system.

The 'quick' aspect of the quick wins is also particularly important for urban areas with democratically elected mayors who often wish to deliver noticeable action on a 3-4 year

timeframe to improve their chances of re-election. Of particular value are actions that can be visibly implemented, (e.g. 'Provide and improve walking and cycling infrastructure, reallocating road space where necessary', 'Ramp up charging infrastructure to expand electric vehicle fleets') and those that can be measurably quantified (e.g. '25 km of bus lanes,' '200 publicly accessible electric charging stations') even if the actual benefits (e.g. improved speed and reliability of buses or better air quality) are harder to demonstrate. On the other hand, an action such as 'Implement eco driving training (supported by on-board devices) for car, bus and rail fleet operators' is much less visible but may have greater benefits.

A successful outcome of Habitat III will catalyze cities throughout the world to implement a roadmap to ensure sustainable urban development, which will require additional resources and local capacity building in the coming years.[91] In this context, transport quick wins will be invaluable in helping global cities make meaningful progress in the short term, and have a broader catalyzing and knock-on effect on other policy areas in the long term.

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[91] The SLoCaT Partnership is working actively to ensure the contribution and role of sustainable transport is properly recognized in the Habitat III processes and output. As well as being a valuable supporting tool in formal and informal negotiations, the quick wins will be presented during the Transport Days that will be hosted by SLoCaT at the Preparatory Committee 3 in Surabaya and at Habitat III in Quito to highlight the critical contribution of sustainable transport to urban development.

VI. Results of Quick Win Stakeholder Survey

A. Survey Distribution Channels

Following a round of expert input to further refine a set of 26 quick win actions (see Annex 1 for more details), SLoCaT developed a survey to elicit feedback from a broader range of transport stakeholder perspectives to help narrow the selection to a final list of quick wins. To maximize total responses, SLoCaT distributed both a full survey form and a concise survey form through to the following networks:

- SLoCaT Partnership members;
- Other SLoCaT partners (e.g. Covenant of Mayors, C40 Cities);
- ICLEI EcoMobility cities;
- VREF Centres of Excellence; and
- WRI country offices.

Web links to the surveys were also distributed through the SLoCaT Twitter feed, which prompted further feedback and discussion on the survey content and structure.

B. Survey Responses

Both the full and concise versions of the survey have two primary objectives:
- Clarify general purpose and direction of quick win concept and application.
- Obtain more detailed feedback on the feasibility of individual quick win actions.

At the conclusion of the study period, SLoCaT had received 24 responses to the full survey and 87 responses to the concise survey. The largest group of respondents was from civil society, with significant inputs from the private sector and non-affiliated experts, and lesser representation from other groups, as shown in Figure 5.
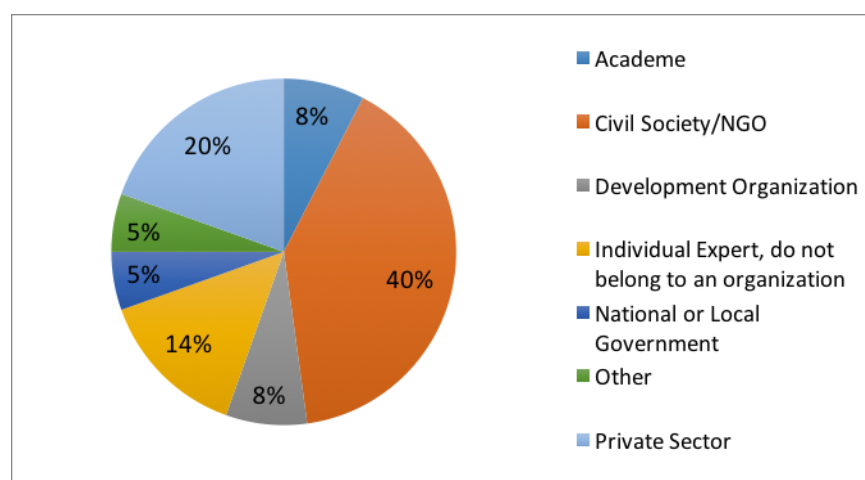

Figure 5: Breakdown of Respondents to Full and Concise Stakeholder Surveys

In the both the concise and full surveys, respondents were asked a series of general questions on the quick win concept and process, which revealed the following overall outcomes for the combined set of respondents:

- Roughly 87% of all respondents feel that transport quick-win actions are either somewhat or very suitable for advancing global action on sustainable development and climate change, suggesting that the general level of support for the quick win concept is quite robust.
- Roughly 73% of all respondents feel that 10 or fewer transport quick win actions should be communicated to policy makers to balance options and simplicity, revealing a reasonably strong preference for limiting quick wins to a small number, even at the expense of more flexibility in applying quick wins in difference country and city contexts.
- Roughly 79% of all respondents either somewhat or strongly agree that transport quick-wins should strike a balance among different transport modes (e.g. bus, rail, walking, cycling), signaling a strong sentiment that a final set of quick wins should not be based solely on the merits of individual quick wins.
- Roughly 83% of all respondents either somewhat or strongly agree that quick wins should be easily implementable in both developed and developing countries (and should build upon tested examples in each country type), revealing a strong preference to select quick wins that are generally universally applicable.

Following the general questions above, both the full and concise surveys asked respondents to answer the following question for each of the 23 quick wins proposed:

"Overall, to what extent would you recommend this quick-win action for achieving sustainable development goals and climate change objectives by 2020?"

A compilation of 'favorable' ratings from the combined full and concise surveys yields the ordering of quick wins shown in Figure 6, which are sorted primarily by 'I would strongly recommend this action' and secondarily by 'I would somewhat recommend this action'.
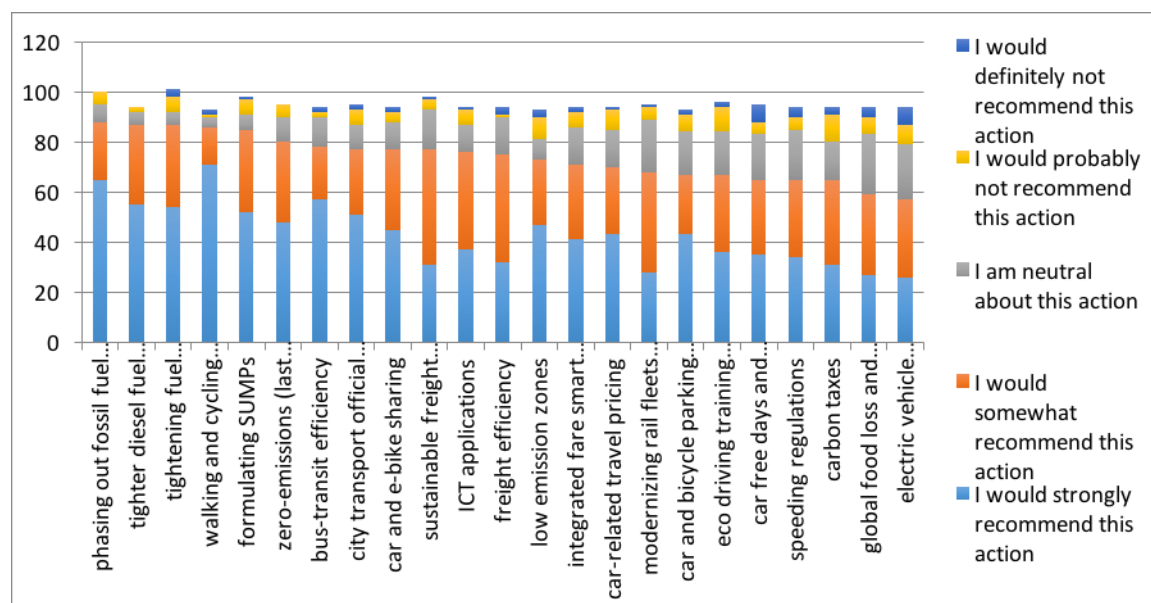
Figure 6: Favorable Overall Ratings, Combined Full and Concise Surveys

This graph reveals a highest preference to actions that focus on macro policy measures, multimodal urban transport strategies, and capacity building and recognition programs. Actions scoring less well at the other end of the spectrum include improvement measures (EV infrastructure, modernization of rail systems), regulations (speeding regulations, carbon taxes), and rural transport enhancements (global food loss and waste).

Further distinctions are observed in analyzing responses by organization type and by developed or developing country transport focus.

Among respondents from civil society and the private sector, there is general agreement on measures such as phasing out fossil fuel subsidies and tightened diesel and fuel economy standards. [92] However, civil society respondents (Figure 7) give relatively higher ratings to measures such as walking and cycling infrastructure, formulating SUMPs, and speeding regulations, which have broader implications for sustainable development. In contrast, private sector respondents (Figure 8) give relatively higher ratings to measures such as car-related travel pricing, low-emissions zones, and eco-driving training, which are more automobile focused and offer potential to apply technological solutions to incentivize lower-carbon travel behavior.

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[92] The comparison is focused on these two groups as they contain a significant number of respondents with a natural constituency (i.e. as opposed to the catch-all group 'Individual Experts').
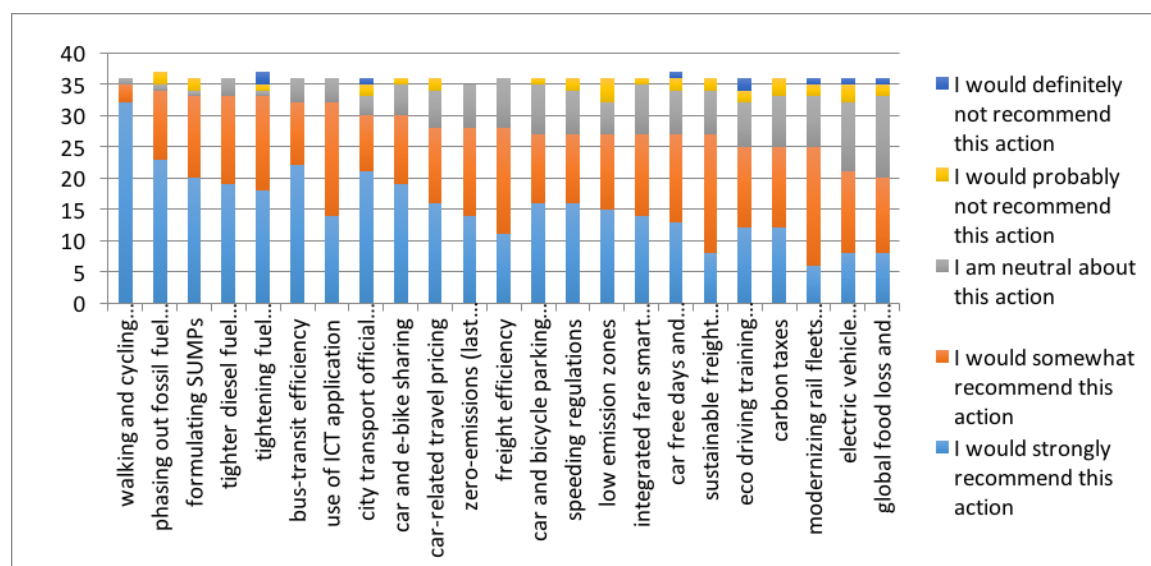
Figure 7: Favorable Overall Ratings, Civil Society Respondents
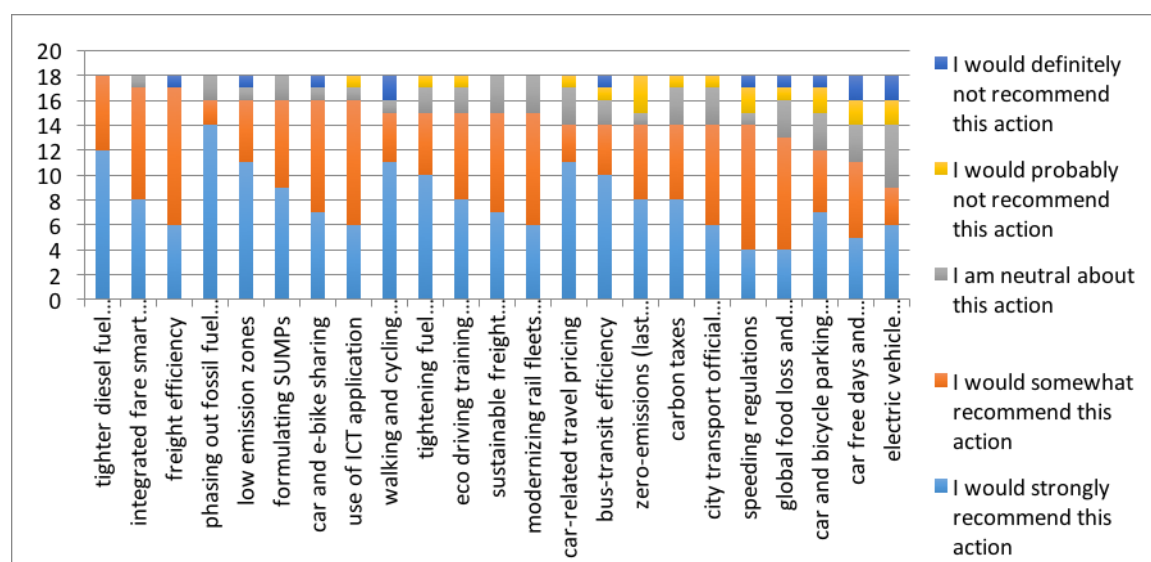
Figure 8: Favorable Overall Ratings, Private Sector Respondents

There is general agreement among developed and developing country-focused respondents on common measures such as tightening fuel economy standards and phasing out fossil fuel subsidies, among others. However, respondents focusing on transport in developed countries (Figure 9) gave relatively higher ratings to measures such as integrated fare smart cards, use of ICT applications, and carbon taxes, which have been widely implemented in developed countries but less so in developing countries. In contrast, developing country-focused respondents (FigurFigure 10) gave relatively higher ratings to measures such as walking and cycling infrastructure, bus transit efficiency, and zero-emissions freight measures, which have implications for transport equity and local air quality.
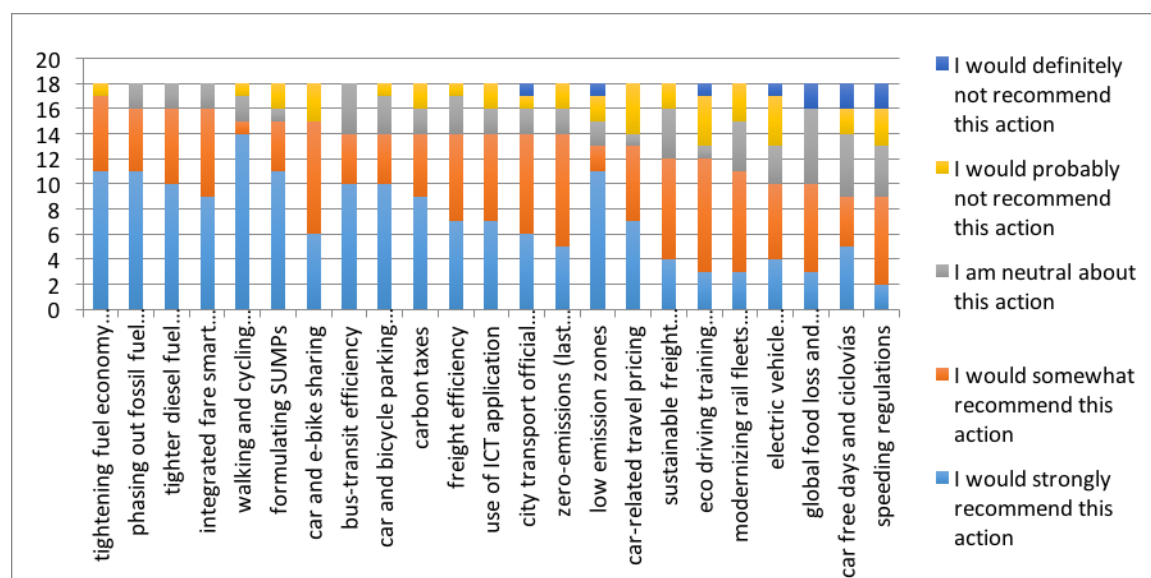
Figure 9: Favorable Overall Ratings, Developed Country-Focused Respondents
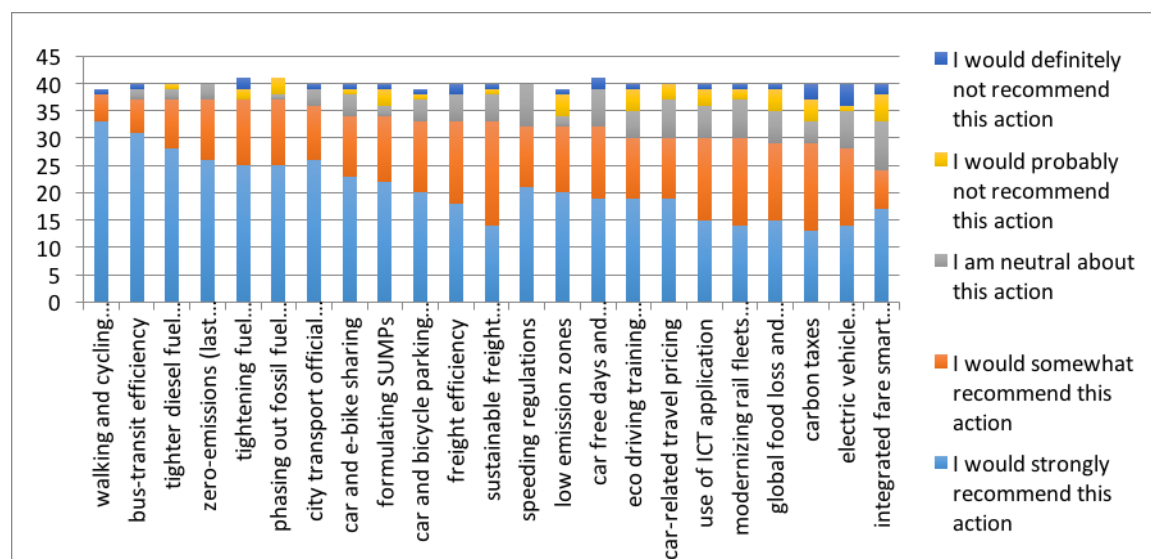
Figure 10: Favorable Overall Ratings, Developing Country-Focused Respondents

In the full survey, each of the proposed quick win actions was additionally assessed with respect to the following four metrics, which can be used to supplement the broader set of responses described in the figures above:

- *Global scalability*: Action can be implemented at scale in both developing and developed countries by 2020.
- *Technical feasibility*: Action can be implemented with existing technologies that can be replicated in different country contexts by 2020.
- *Policy barriers*: Implementing action at scale will require passing enabling legislation or addressing political opposition.
- *Financial barriers*: Implementing action at scale will require mobilizing financial resources or building skill and/or expertise at national and/or local levels.

The first pair of metrics examines potential (positive) features of the proposed quick wins, as shown in Figure 11 (global scalability) and Figure 12 (technical feasibility). The actions in these figures are sorted primarily by 'It is very easy/feasible to implement this action…' and secondarily by 'It is somewhat easy/feasible to implement this action…'.
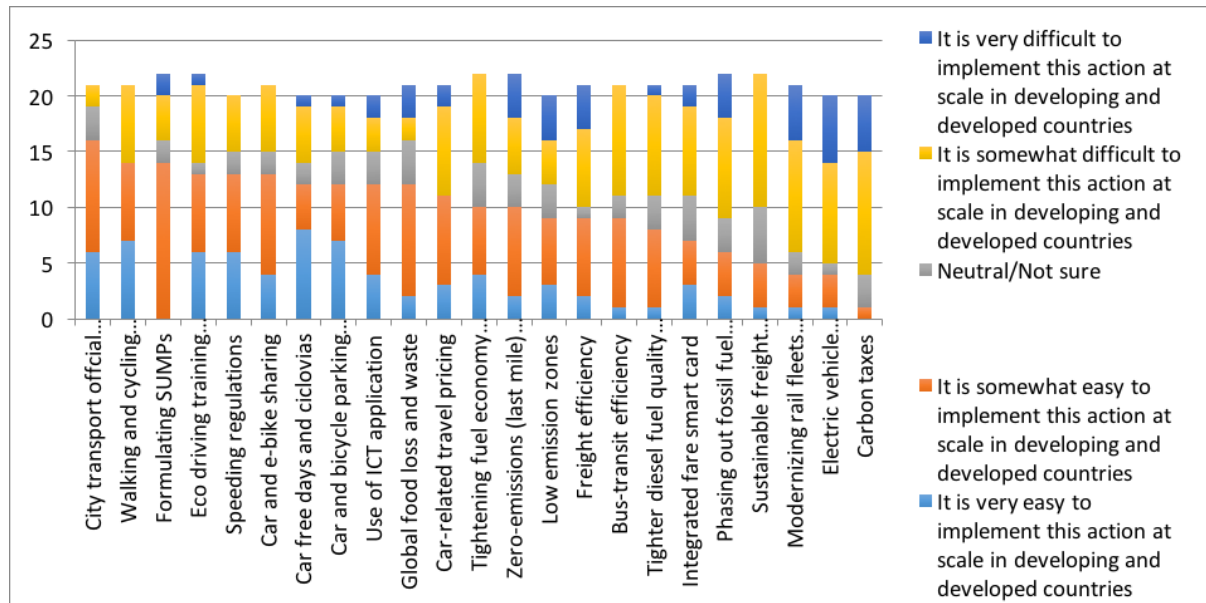
Figure 11: Favorable Global Scalability Ratings
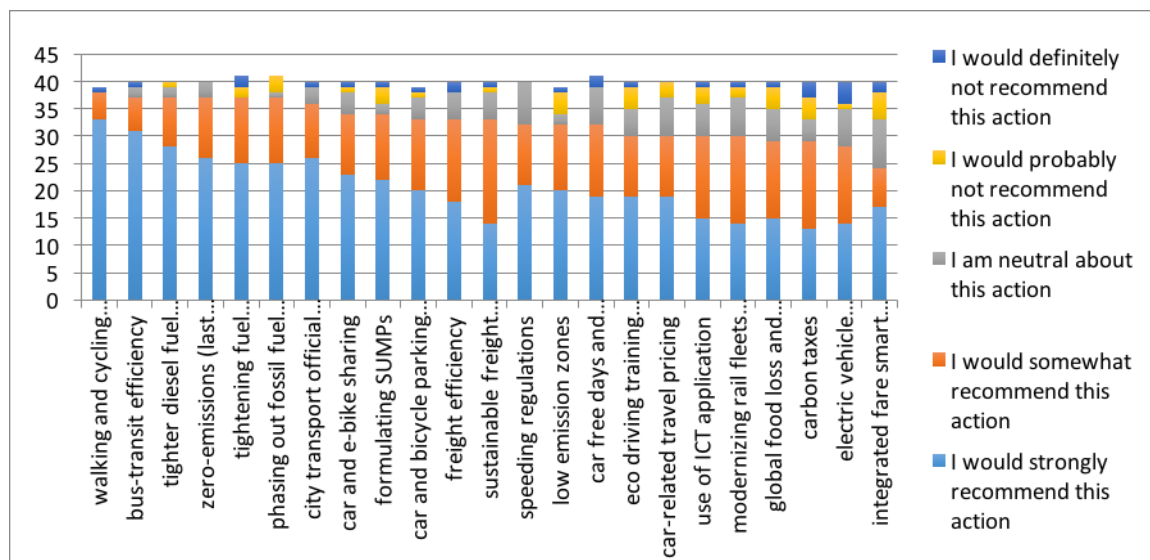
Figure 12: Favorable Technical Feasibility Ratings

As shown in these figures, city transport official training, walking and cycling infrastructure, speeding regulations, and car and e-bike sharing receive high ratings for both global scalability and technical feasibility. This suggests that these actions would enjoy relatively universal applicability, if ultimately advanced based on overall favorability and other merits.

The second pair of metrics examines potential (negative) barriers to the proposed quick wins, as shown in Figure 13 (policy barriers) and Figure 14 (financial barriers). The actions in these figures are sorted primarily by 'There are significant barriers to this action' and secondarily by 'There are minor barriers to this action.'
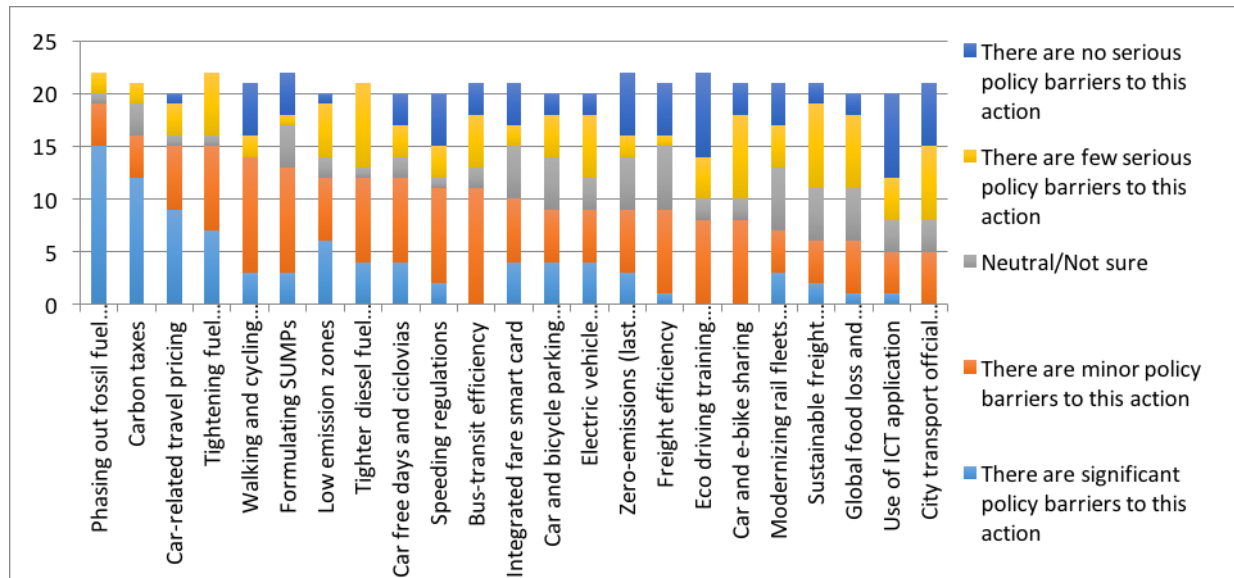
Figure 13: Unfavorable Policy Barriers Ratings
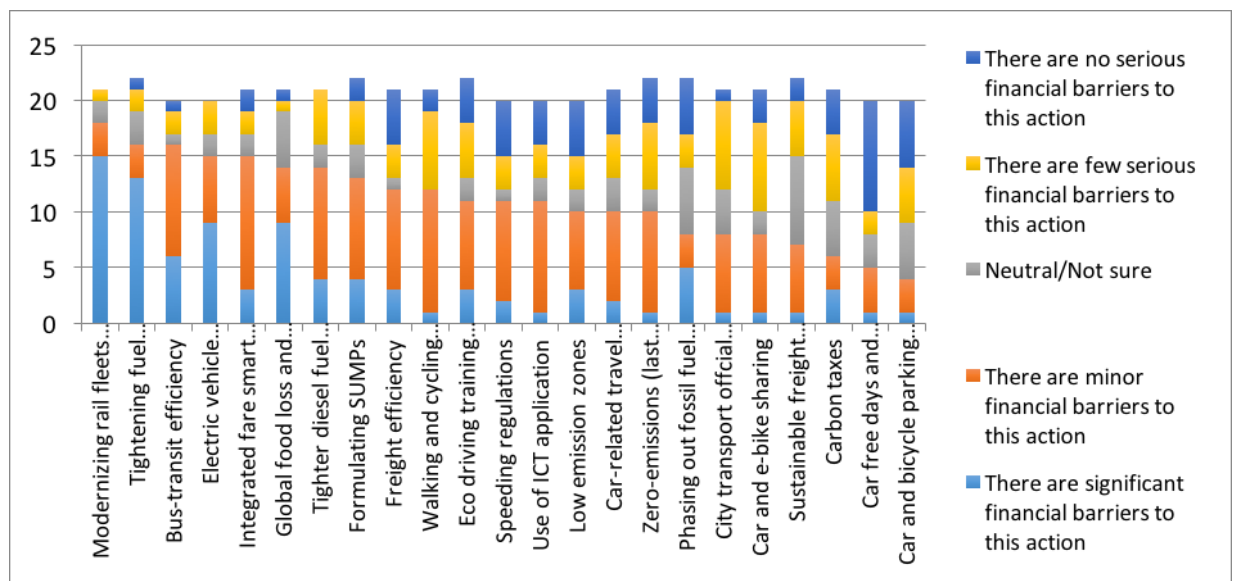
Figure 14: Unfavorable Financial Barriers Ratings

As shown in these figures, tightening fuel economy standards and formulating SUMPs receive high ratings for both policy and financial barriers, although these are also among the highest-rated actions from an overall perspective. This suggests that additional attention must be given to overcoming existing or perceived barriers to allow these actions to achieve their full quick win potential.

VII.   Overall Assessment of Quick Wins

A. Synthesis of Quick Wins

Based on the evaluation process described in the previous chapters, the SLoCaT Secretariat proposes here a refined set of 20 transport quick wins. This selection is based on both the external process to determine feasibility (i.e. initial inputs, expert review, culminating in survey feedback) and the internal process to assess impacts (i.e. SLoCaT analysis of Access, Efficiency, Safety and Environment).

The final selection of quick wins is shown in Table 15, which consists of the following elements to give an overview of factors considered:

- 'Survey' results (orange columns): 'Suitability' ratings combine both full and concise stakeholder survey results, and 'Scalability/Feasibility' and 'Policy/Finance Barriers' are limited to full survey results (i.e. concise survey did not include these questions). Inputs are assessed on a H(igh), M(edium), L(ow) scale.
- 'Impact' (purple column): Corresponds to average ratings for each action in the SLoCaT-internal impact assessment, from the final column in Table **8** above.
- 'Overall assessment' of each action (green column): Derived from the combination of inputs from the orange and purple columns in this table, based on a screening algorithm which is described in more detail in Table 16 and **Error! Reference source not found.** below.

Quick Wins: **Final Selection**	Survey Elements			Impact	Overall Assessment
	Suitability	Scalability/ Feasibility	Policy/Finance Barriers		
1. Formulate Sustainable Urban Mobility Plans (SUMPs) in primary and secondary cities	H	M	H	●	
2. Implement zero-emissions (last-mile) urban freight through e-mobility and cycling solutions	H	M	L	◔	
3. Provide and improve walking and cycling infrastructure (e.g. connected walking paths, protected cycle lanes), reallocating roadspace where necessary.	H	H	H	◕	
4. Increase quality, availability, reliability, frequency, and efficiency of bus-based transit.	H	M	M	◕	
5. Accelerate phase-out of fossil fuel subsidies	H	M	M	◔	
6. Accelerate deployment of tighter diesel fuel quality standards to reduce emissions of black carbon and other short-lived climate pollutants	H	L	H	◕	
7. Expand car and (e-)bike sharing systems in primary and secondary cities	H	H	L	◑	

#						
8.	Expand city transport official training programs to build local capacity for sustainable transport in primary and secondary cities	M	H	L	●	
9.	Tighten fuel economy standards for passenger vehicles	H	L	H	◑	
10.	Introduce and scale up pricing for car-related travel options (e.g. congestion/road charging, parking pricing) in primary and secondary cities	M	M	M	◑	
11.	Expand sustainable freight recognition schemes to reward proactive carriers and shippers.	M	L	L	◑	
12.	Improve freight efficiency (e.g. reduce empty load running by freight trucks) through route optimization, asset sharing between companies, and increased use of ICT solutions.	M	L	M	◐	
13.	Invest in rural road maintenance and modern supply chains to reduce global food loss and waste	L	H	M	●	
14.	Introduce smart cards for integrated fares on public transport and shared mobility systems where they exist	L	L	M	●	
15.	Ramp up charging infrastructure to encourage expansion of electric vehicle fleets in primary and secondary cities	L	L	M	◕	
16.	Introduce carbon pricing for the transport sector where (sub-) national carbon markets currently exist or are under development	L	L	M	◕	
17.	Legislate and enforce stricter speeding regulations by operational and technical means to reduce emissions and road crashes.	L	H	M	◑	
18.	Introduce car-free days and ciclovías (temporary street closures to encourage cycling and walking) in primary and secondary cities to build support for longer-term policies	L	H	M	◑	
19.	Implement eco driving training (supported by on-board devices) for car, bus and rail fleet operators	L	M	L	◑	
20.	Expand use of ICT applications for real-time travel information and route planning for walking, cycling, public transport and car sharing.	L	L	L	◑	
21.	Implement (ultra-) low emission zones, including car-free zones in city centers.	L	L	M	◑	
22.	Modernize ageing rail fleets and traction systems to increase efficiency	L	L	M	◑	
23.	Introduce policies to mandate optimal car and bicycle parking requirements in commercial and residential developments	L	M	L	◔	

Table 15: Selection of Final Quick Wins

86

Key to Table 15:

L = Low rating based on survey results
M = Medium rating based on survey results
L = High rating based on survey results
◔ = Low impact on Access, Efficiency, Safety, and Environment
◑ = Medium impact on Access, Efficiency, Safety, and Environment
◗ = High impact on Access, Efficiency, Safety, and Environment
● = Very high impact on Access, Efficiency, Safety, and Environment
  = Selected in final list of quick wins
  = Eliminated from final list of quick wins

The ratings in Table 15 are based on the criteria shown in Table 16, which specify thresholds for each of the values ascribed to Suitability, Scalability/Feasibility, Policy/Financial Barriers and Impact:

	H(igh)	M(edium)	L(ow)
Suitability	Top 10 for all survey segments	Top 20 for all survey segments	Bottom 5 in any survey segment
Scalability/ Feasibility	Top 10 for both scalability and tech feasibility	Top 10 for either scalability or tech feasibility	Top 10 for neither scalability nor tech feasibility
Policy/Financial Barriers	Top 10 for both political and financial barriers	Top 10 for either political or financial barriers	Top 10 for neither political nor financial barriers
Impact	Average of Access, Efficiency, Safety, Environmental (from SLoCaT internal impact assessment in Table 8)		

Table 16: Criteria for Assessing Final Quick Wins

Based on the ratings for each of the above categories, an overall assessment for each quick win is determined by sorting the actions in Table 15 based on the following hierarchy: *Suitability > Impact > Scalability > Barriers.*

In making a decision to reduce the list to a final set of 20 quick win actions (to better facilitate presentation and marketing to policy makers), SLoCaT took into consideration the following factors, in addition to the core criteria presented in Table 15:

- o Balance of actions focused on passenger transport and freight transport
- o Balance of actions focused on different passenger transport modes
- o Balance of actions focused on infrastructure, policy, and technical solutions
- o Means of enforcement to ensure compliance with action on global scale
- o Presence of champion organization to coordinate promotion of action
- o Qualitative comments (in addition to quantitative input) from survey respondents

With these criteria in mind, the following three actions have been eliminated from the final list of quick wins. This does not imply that they are not important actions, but simply have not been prioritized among the 20 actions slated for broader promotion.

14. Introduce smart cards for integrated fares on public transport and shared mobility systems where they exist.

SLoCaT's recommendation is to eliminate this action, as it is not likely to be scalable in developing countries in a pre-2020 time frame, as reflected in relevant stakeholder comments:

- *This is very feasible and important in cities like New York. While in theory it is important for all cities, in practice there are significant institutional barriers in cities like Nairobi, which tried to implement a smart card in its current fragmented and poorly regulated transport system. The institutional, legal and regulatory capacity is simply not there. Transport authorities do not even exist in many cities. So this is a good action for many cities - in others there is a need to build up a basic institutional environment which is a prerequisite for managing integrated multi-modal systems and a fare card system.*
- *This really only works where there is formal public transport - presently it is still very expensive and complicated. I am not sure it qualifies for me as a QUICK win - certainly important but not easy to implement quickly, where is it possible it is already an option so not sure what added value this would bring.*
- *Integrated ticketing and smart cards have been identified as important interventions for mobility in African cities, but there are serious challenges as much of the transport is informal and cash-based, and there is user-resistance to the smart cards that have been trialed for BRT for example. Smart-phone based systems are probably better (as you don't have to load money that is then becomes unavailable should you need to use it for something other than transport).*

19. Implement eco driving training (supported by on-board devices) for car, bus and rail fleet operators

SLoCaT's recommendation is to eliminate this action, as it is not likely to be implementable and enforceable on a global scale and thus would not have reliable impact over time, as reflected in relevant stakeholder comments:

- *More important perhaps as way to raise awareness than as technical measure - people unlearn green behaviour quickly. To make it really effective in itself it a substantial cultural shift may be needed, which is more of a challenge for policy system*
- *Financial barriers - may be minor in total, but the burden of cost would lie with the public (if on-board devices will be implemented) and that's what makes it more difficult*
- *This would be very possible to do (non threatening) but the problems are that there are serious problems with infrastructure (potholes etc) and incentives for drivers so training will not likely change behavior-maybe if combined with support for improved road conditions/design and safety training this could make sense.*
- *Eco driving programmes are quite low hanging fruit and require little resources compared to technology or infra but they need consistent and long term programmes. Problem is who pays? Needs gov commitment to freight operators.*
- *Similar actions have been attempted with paratransit fleets in African cities, to great political and owner opposition. It's a much-needed intervention, but not a quick win. But not impossible though - perhaps I'd make it a priority action nonetheless.*
- *The cost for such trainings would be difficult for some governments to carry. Private sector would need to step in as partner for paying trainings.*
- *This has low impact and is not so easy to maintain in time.*

23. Introduce policies to mandate optimal car and bicycle parking requirements in commercial and residential developments

SLoCaT's recommendation is to eliminate this action, due to a number of variables that require resolution before implementing on a global scale, as reflected in relevant stakeholder comments:

o *Good idea but must be coupled with improved public transit alternatives.*
o *Main barrier is maximum or minimum levels and how to work with developers especially in developing world but a really important one*
o *Not until there are sufficient alternatives to private car travel for those who use the parking facilties.*
o *Very easy, but doubt the actual real impact*
o *Difficult to regulate, particularly in developing countries.*

Carbon Pricing and Quick Wins

At COP21, carbon pricing was at the center of discussion as a key strategy in reaching the long-term targets of the Paris Agreement. While carbon pricing is a clear imperative (both for transport and other sectors) that has gained increasing support over time (particularly from the business sector), it remains to be seen whether governments and communities and ready to take this leap at sufficient scale to move the climate needle in the immediate term.

Expert consultation showed a lack of consensus for carbon pricing, noting among other comments that "The process of overcoming the barriers [to carbon pricing] would take years in many countries. The topic is a political football," and "Because willingness to pay for mobility is high, a carbon price would need to be very high (simulations say we would need 200 euros/kg CO2) to influence travel patterns."

Despite reasonable support for the concept, the quick wins stakeholder survey results placed carbon pricing among the bottom five actions in overall favorability, global scalability, and technical feasibility. In addition, carbon pricing ranked second among actions seen as unfavorable due to high policy barriers.

The medium- and long-term success of carbon pricing is more likely if actions such as fuel economy standards, road pricing and fossil fuel subsidy reform are implemented in the short term, to send market signals and build needed political support.

While carbon pricing has not risen to the top among quick wins, it must remain an essential component of a long-term decarbonization road map for the transport sector, and therefore requires further discussion at COP22 and beyond.

Box 1: Carbon Pricing and Quick Wins

As noted in Section III (Impact Analysis), it is recommended to strike an approximate balance among the five thematic and modal strategies in the ultimate selection of a final set of quick wins, in order to produce a set of actions that can be applied across a broad range

of country contexts, and that will ultimately produce a set of primary and secondary impacts that accrue to a more equitable share of the societal spectrum. It is noted that the final set of quick wins contains two actions from each of the thematic categories (i.e. Policy/Pricing, Technical/Regulatory, and Operational/Capacity Solutions), and three actions from each of the modal categories (i.e. Passenger and Freight Transport Strategies); thus the actions proposed appear poised to deliver both increased impact and enhanced equity.

It is also noted that some of the most highly ranked of the final quick wins require overcoming substantial policy, financial, and capacity barriers (e.g. Introduce and scale up pricing for car-related travel options, 'Provide and improve walking and cycling infrastructure', 'Formulate SUMPs'). While such barriers are real, they are not insurmountable; thus it is suggested to refer here once again to Section IV (Assessment of Barriers), which proposes tested solutions to each of the barriers identified.

B. Implementing Quick Wins

Decision makers need guidance on what they can do in the short-term to move forward with the implementation of sustainable transport, and quick wins provide a framework for scaling up solutions rapidly at both local and national levels.

Since varied cities and countries have differing circumstances and requirements, the 20 quick wins selected are intended to give local and national policy makers a menu to choose from (assuming that 5-6 quick wins may be initially prioritized for each), and will aim to develop both expert and peer support to ensure that the comprehensive set of quick wins can be applied to each particular city and/or country context over time.

At the l*ocal level*, quick wins can guide sustainable mobility planning in cities of varying sizes and contexts, as illustrated in the following scenarios illustrating prioritization of immediate quick wins in working toward implementation of a broader set of universal actions, as shown in Box 2:

Local Application of Quick Wins

Scenario A: Large city (public transport-focused, in developing country)
Large, dense urban areas can draw on a subset of immediate quick wins including the following:
- Formulate Sustainable Urban Mobility Plans (SUMPs).
- Implement zero-emissions (esp. last-mile) urban freight.
- Expand car and (e-)bike sharing systems in primary and secondary cities.

Scenario B: Intermediate city (car-focused, in developed country)
Smaller, less dense, and more car-dependent conurbations are likely to draw on a different subset of priority quick wins including the following:
- Increase the reliability, frequency, and efficiency of bus-based transit.
- Introduce and scale up pricing for car-related travel options (e.g. congestion/road charging, parking pricing) in primary and secondary cities.
- Provide and improve walking and cycling infrastructure (e.g. connected walking paths, protected cycle lanes), reallocating roadspace where necessary.

Box 2: Local Application of Quick Wins

At the *national level*, quick wins may be prioritized differently in varying country contexts, as illustrated by the following scenarios for a generic developed and developing country, as shown in Box 3.

National Application of Quick Wins

Scenario C: Developed country
National mobility planning efforts in a developed country may include the following priority quick wins, among others:
- Tighten fuel economy standards for passenger vehicles.
- Expand city transport official training programs to build local capacity for sustainable transport in primary and secondary cities.
- Improve freight efficiency (e.g. reduce empty load running by freight trucks) through route optimization, asset sharing between companies, and increased use of ICT solutions.

Scenario D: Developing country
National planning efforts in a developing country may include a different subset of priority quick wins, including the following:
- Accelerate phase-out of fossil fuel subsidies.
- Expand sustainable freight recognition schemes to reward proactive carriers and shippers.
- Accelerate deployment of tighter diesel fuel quality standards to reduce black carbon emissions (SLCPs).

Box 3: National Application of Quick Wins

The SLoCaT Partnership and member organizations with an on-the-ground presence in local and national planning efforts will strive to connect candidate cities and countries in order to integrate quick wins into sustainable transport planning efforts, by offering support to determine the most suitable actions for each particular context, as described in Section VIII on proposed quick win outreach strategies.

VIII.   Action Plan to Promote Quick Wins

If quick wins are to take hold and fulfill their potential for significant contribution to climate change and SDGs, they will require the support of champions to help to carry them from conception to implementation. The strong engagement from SLoCaT members and partners throughout the initial quick win selection process is an encouraging sign that commitment to the proposed action will continue, and it is essential to maintain this level of involvement in the coming months to keep this a dynamic process.

SLoCaT is thus involved in an ongoing process of preparing an outreach strategy to promote the quick wins in consultation with enduring events on sustainable development and climate change. This promotion will be part of a wider outreach strategy of the PPMC, which will use channels including banners and posters to promote the quick wins during upcoming events; a dedicated page on the re-launched PPMC website; and an ongoing Twitter campaign which will help to keep the quick wins a continual presence throughout 2016.

The following represents a first cut at a promotion plan for quick wins, which will be followed by a more detailed plan in the coming months.

A.   Quick Win Champions and Coordinating Bodies

Quick win outreach will be primary led by a set of 'quick win champions,' who will assist in the development of quick win promotional materials, and who will act as primary channels of consultation with national and local decision to drive adoption and implementation of the proposed quick-win actions. These champions' efforts will be supported by coordinating bodies, who will help in part to connect the efforts of different global champions to decision makers in a specific country or city context.

1.   Quick win champions

Champions may be drawn initially from LPAA initiatives, as described in the previous section, for example, fuel economy could be led by GFEI (with support of GFEI partners); SUMPs could be led by CODATU (with support of development banks (e.g. CAF, GIZ) and NGOs (WBCSD, ICLEI)). Other champions will be sought out to shepherd the remaining quick wins to ensure that momentum toward rapid implementation is maintained, as shown in the proposed allocation of lead and support organizations in Table 17.

Quick Win Action	Lead Organization	Support Orgs
1. Formulate Sustainable Urban Mobility Plans (SUMPs) in primary and secondary cities.	CODATU	MDBs (e.g. CAF, GIZ), NGOs (e.g. WBCSD, ICLEI)
2. Implement zero-emissions (last-mile) urban freight through e-mobility and cycling solutions.	Smart Freight Centre	GGFAP Partners
3. Provide and improve walking and cycling infrastructure (e.g. connected walking paths, protected cycle lanes), reallocating roadspace where necessary.	Walk21 (walking) ECF-WCA (cycling) (co-leads)	WRI ICLEI

4.	Increase quality, availability, reliability, frequency, and efficiency of bus-based transit.	UITP	ITDP
5.	Accelerate phase-out of fossil fuel subsidies.	IISD Global Subsidies Initiative	Nordic Council of Ministers
6.	Accelerate deployment of tighter diesel fuel quality standards to reduce emissions of black carbon and other short-lived climate pollutants.	ICCT	ICCT Partners
7.	Expand car and (e-)bike sharing systems in primary and secondary cities.	Despacio	ICLEI
8.	Expand city transport official training programs to build local capacity for sustainable transport in primary and secondary cities.	GIZ (CAPSUT program)	CODATU
9.	Tighten fuel economy standards for passenger vehicles.	GFEI (FIA Foundation)	GFEI Partners
10.	Introduce and scale up pricing for car-related travel options (e.g. congestion/road charging, parking pricing) in primary and secondary cities.	ITS for Climate	WRI Private sector
11.	Expand sustainable freight recognition schemes to reward proactive carriers and shippers.	WBCSD	Smart Freight Centre Clean Air Asia
12.	Improve freight efficiency (e.g. reduce empty load running by freight trucks) through route optimization, asset sharing between companies, and increased use of ICT solutions.	VREF Sustainable Urban Freight Systems	Smart Freight Centre
13.	Invest in rural road maintenance and modern supply chains to reduce global food loss and waste	DFID	IFRTD
14.	Ramp up charging infrastructure to encourage expansion of electric vehicle fleets in primary and secondary cities	UN-Habitat	Private sector
15.	Introduce carbon pricing for the transport sector where (sub-) national carbon markets currently exist or are under development	World Bank	World Resources Institute
16.	Legislate and enforce stricter speeding regulations by operational and technical means to reduce emissions and road crashes.	FIA Foundation	Private sector
17.	Introduce car-free days and ciclovías (temporary street closures to encourage cycling and walking) in primary and secondary cities to build support for longer-term policies	Despacio	World Cycling Alliance
18.	Expand use of ICT applications for real-time travel information and route planning for walking, cycling, public transport and car sharing.	ITDP	Private sector
19.	Implement (ultra-) low emission zones, including car-free zones in city centers.	Michelin Challenge Bibendum	ICLEI, CODATU
20.	Modernize ageing rail fleets and traction systems to increase efficiency	International Union of Railways	Private sector

Table 17: Suggested Lead and Support Organizations to Promote Quick Wins

The SLoCaT secretariat would play a lead role in this respect, with the central support of SLoCaT partners with established channels for national policy dialogue (e.g. MDBs, ITF) and partners with established country and/or city networks (e.g. ITDP, EMBARQ, ICLEI).

B. Consultation with (Sub-)National Entities

As noted above, the quick win champions will provide a channel to promote and support quick wins through further development of NDCs with national delegations, and through expanded implementation of LPAA initiatives with local policy makers.

1. NDCs

In response to a call to produce enhanced NDCs by 2018, quick wins can be used to support the reformulation of NDCs in one of two ways. First, quick wins can be important instruments to guide the reformulation of NDCs (e.g. to add more specificity and to fill gaps in a more generic first-round NDC submissions). Second, quick wins can be used to complement the existing strategies within NDCs (e.g. to complement the approaches defined in more 'Shift'-focus vs. more 'Improve'-focused NDCs).

Quick wins are already represented in some NDCs, as shown in Figure 15, in which a general NDC transport strategy (e.g. 'Parking Reform') is correlated to one or more quick wins (e.g. 'Introduce and scale up pricing for car-related travel options'). This correlation shows that there is ample room for growth in NDCs for strategies correlated to quick wins (i.e. the most widely-represented strategy, 'Bus Improvements/BRT,' is contained in less than one quarter of all NDCs submitted), and that several final quick wins are not currently well represented in NDCs (e.g. 'Expand city transport official training programs;' 'Expand car and (e-)bike sharing systems'). In addition, NDC transport strategies are not evenly distributed across high-, medium-, and low-income countries (e.g. Fuel economy standards are disproportionately represented in the NDCs of high-income countries), thus presenting an opportunity for the promotion of quick wins to create a more balanced landscape.
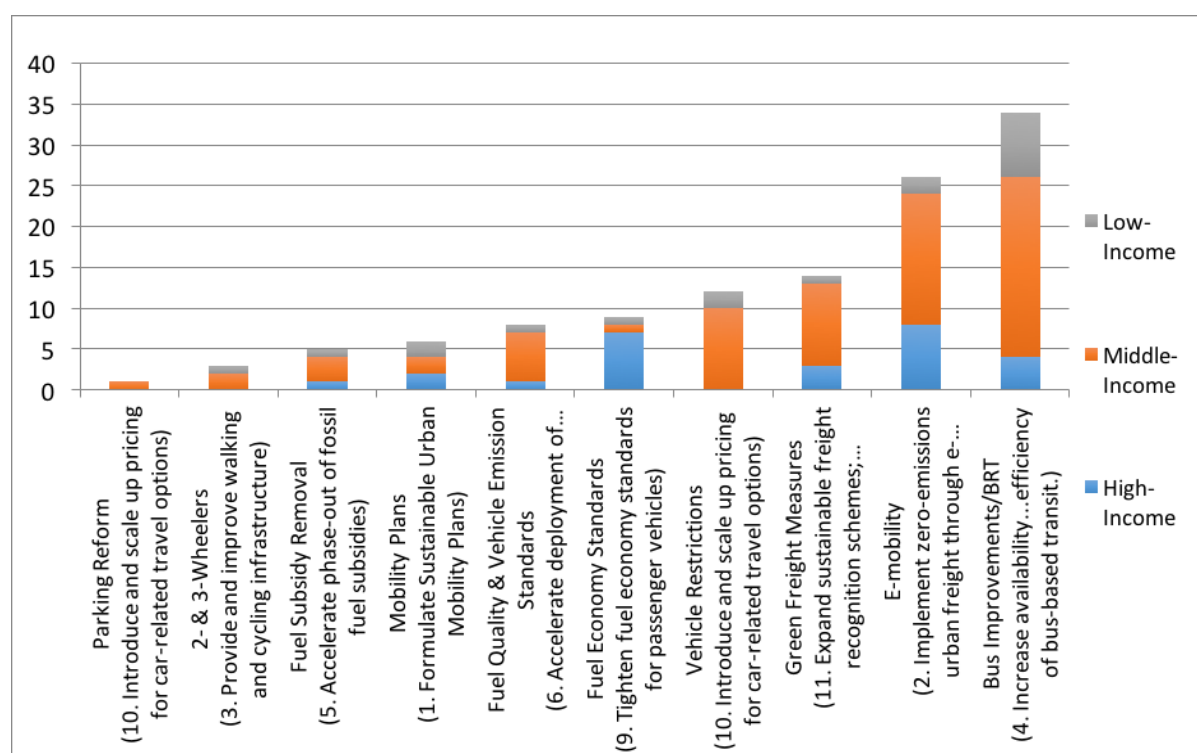

Figure 15: Incorporation of Selected Quick Wins into NDCs

Quick wins can be further incorporated into NDCs in the following ways:

- Developing and distributing a "toolkit" for national delegations to incorporate quick wins into detailed NDC implementation plans through a menu of sustainable transport options.
- Defining an outreach plan to coordinate the country-by-country development of NDCs at a regional scale, which may be galvanized by national 'NDC champions' with well-developed NDCs (e.g. Peru, Mexico, Morocco, Ethiopia, Indonesia, Jordan), as highlighted in SLoCaT COP21 daily reports.

2. LPAA (GCAA) Initiatives

As noted, many quick wins have current or potential nexuses with the LPAA (GCAA) Initiatives, as shown in Table 18. This demonstrates that existing global efforts can be leveraged to scale up quick wins even more rapidly.

Quick Win Action	Relevant LPAA Initiatives
1. Accelerate deployment of tighter diesel fuel quality standards to reduce emissions of black carbon and other short-lived climate pollutants.	Global Green Freight Action Plan
2. Accelerate phase-out of fossil fuel subsidies.	Global Fuel Economy Initiative
3. Expand car and (e-)bike sharing systems in primary and secondary cities.	Urban Electric Mobility Initiative WCA-ECF Commitment
4. Expand city transport official training programs to build local capacity for sustainable transport in primary and secondary cities.	MobiliseYourCity
5. Expand sustainable freight recognition schemes to reward proactive carriers and shippers.	Global Green Freight Action Plan UIC Low Carbon Rail Transport Challenge
6. Formulate Sustainable Urban Mobility Plans (SUMPs) in primary and secondary cities.	MobiliseYourCity UITP Declaration on Climate Change Leadership C40 Clean Bus Declaration ITS for Climate
7. Implement zero-emissions (last-mile) urban freight through e-mobility and cycling solutions.	Global Green Freight Action Plan Urban Electric Mobility Initiative WCA-ECF Commitment ZEV Alliance
8. Improve freight efficiency (e.g. reduce empty load running by freight trucks) through route optimization, asset sharing between companies, and increased use of ICT solutions.	Global Green Freight Action Plan ITS for Climate
9. Increase quality, availability, reliability, frequency, and efficiency of bus-based transit.	UITP Declaration on Climate Change Leadership C40 Clean Bus Declaration
10. Introduce and scale up pricing for car-related travel options (e.g. congestion/road charging, parking pricing) in primary and secondary cities.	MobiliseYourCity ITS for Climate
11. Provide and improve walking and cycling infrastructure (e.g. connected walking paths, protected cycle lanes), reallocating roadspace where necessary.	WCA-ECF Commitment MobiliseYourCity (Proposed LPAA walking initiative)
12. Tighten fuel economy standards for passenger vehicles.	Global Fuel Economy Initiative
13. Invest in rural road maintenance and modern supply chains to reduce global food loss and waste	Low Carbon Road and Road Transport Initiative Global Green Freight Action Plan
14. Ramp up charging infrastructure to encourage expansion of electric vehicle fleets in primary and secondary cities	Urban Electric Mobility Initiative (UEMI) ZEV Alliance MobiliseYourCity

15. Introduce carbon pricing for the transport sector where (sub-) national carbon markets currently exist or are under development	All relevant LPAA initiatives
16. Legislate and enforce stricter speeding regulations by operational and technical means to reduce emissions and road crashes.	ITS for Climate Low Carbon Road and Road Transport Initiative
17. Introduce car-free days and ciclovías (temporary street closures to encourage cycling and walking) in primary and secondary cities to build support for longer-term policies	World Cycling Alliance and European Cyclists' Federation Commitment (Proposed pedestrian initiative)
18. Expand use of ICT applications for real-time travel information and route planning for walking, cycling, public transport and car sharing.	All relevant LPAA initiatives ITS for Climate
19. Implement (ultra-) low emission zones, including car-free zones in city centers.	Global Green Freight Action Plan ITS for Climate
20. Modernize ageing rail fleets and traction systems to increase efficiency	UIC Low Carbon Rail Transport Challenge UITP Declaration on Climate Change Leadership

Table 18: Incorporation of Quick Wins into LPAA Initiatives

Quick wins can be further promoted through LPAA initiatives in the following ways:

- Incorporating direct linkages to quick wins into existing LPAA promotional materials
- Defining channels for interaction between (non-)state actors (e.g. action champions, coordinating bodies).
- Investigating opportunities to incorporate quick wins in the ongoing development of LPAA (GCAA) initiatives, through close coordination with the French and Moroccan governments.

C. Processes and Events for Promoting Quick Wins

2016 offers a number of key opportunities to promote quick wins, including discrete events such as COP22 and Habitat III. Outreach efforts for 2017 and beyond will be detailed in a forthcoming update to the Quick Win Action Plan.

1. Habitat III and lead-up events

Quick wins will be promoted in the Habitat III Prepcom 3 in Surabaya in July 2016, both by distributing an updated quick win flyer, and by incorporating quick wins into discussion in key sessions of Transport Day Surabaya (see also above description of Transport Day Marrakech).

Quick wins will also be a primary topic for the SLoCaT Partnership and the sustainable transport community at the Habitat III conference in Quito in October 2016, notably by highlighting this concept in the Quito Action Plan on Sustainable Urban Mobility (QAPSUM) (e.g. "Sustainable urban transport offers many options for significant and rapid progress toward sustainable development and climate change goals/targets..."), and by incorporating quick wins into discussion in key sessions of Transport Day Surabaya (see also above description of Transport Day Marrakech).

2. COP22 Marrakech and lead-up events

Quick wins will be a central focus of SLoCaT efforts at COP22 Marrakech in November 2016 (and potentially in lead-up events in Bonn inter alia), which are to include the following:

a. High-Level Sustainable Transport Event:

Quick wins are to be promoted at a planned high-level event at COP22 analogous to the LPAA Transport Focus thematic event at COP21. This will necessitate proposing quick wins as a potential focus in High Level Champions consultation process. Quick wins can be packaged for this high-level event in the following ways:

- Reframing quick wins according to the priorities of the COP22 high-level champions, e.g. from an Africa perspective (e.g. reallocating roadspace); promoting the role of women (e.g. promoting collective transport which increases gender equity); and increasing focus on adaptation (e.g. increasing climate resilient transport options).
- Present 'Marrakech Declaration on Rapid Transport Climate Action' with broad endorsement of quick wins (to pattern after Warsaw Declaration, build on QAPSUM).

b. Transport Day

Quick wins are to be promoted in plenary session(s) either through keynotes by PPMC/SLoCaT representatives or as incorporated into the overarching statements of speakers in different sectors (e.g. national delegates, private sector). Quick wins would also be a topic for pragmatic, applied and interactive breakout sessions led by champions of individual quick win actions (e.g. GFEI, CODATU, UIC) and with the participation of ministers to illustrate the potential to incorporate quick wins into NDC implementation strategies.

c. COP22 Side Events

Quick wins are to be a focus of COP22 side events promoting the PPMC 2016 agenda (i.e. in conjunction with the global roadmap on transport decarbonization), and are to be incorporated as a supplementary topic into any events targeting city transport officials (e.g. focusing on opportunity for sustainable transport training programs (e.g. CAPSUT)); the private sector (e.g. highlighting the potential profitability of quick wins); and youth (e.g. capitalizing on growing energy for rapid climate action).

d. COP22 Promotional Materials

Quick wins will be highlighted in standalone bold graphics for each of the final 12 quick wins, which are to be displayed in a dynamic and visually appealing way (e.g. suspended from the ceiling) in the booths/presentation spaces of SLoCaT and partners. Quick wins can also be incorporated into promotional materials to be distributed at events and from display booths, potentially to be based upon Moroccan cultural traditions (e.g. trading cards; interlocking puzzle pieces; bracelets or other accessories).

e. COP22 Reporting and Outreach

Following on COP20 Lima and COP21 Paris, SLoCaT will issue daily reports on relevant developments for sustainable transport during COP22 Marrakech. Each of the planned 12 daily reports will promote a single transport quick win, which will also be highlighted through a banner on the PPMC/SLoCaT website, to draw the attention of a wider audience. SLoCaT will also promote the quick wins graphics via Twitter leading up to and throughout COP22.

3. SDG Follow-up Processes

Quick wins will be an important element within follow-up processes to the 2030 Agenda on Sustainable Development (SDGs). SLoCaT will strive to incorporate quick wins in tracking and discussion of SDG targets and indicators, as a key strategy in making rapid progress

toward transport-related targets and indicators such as those related to sustainable urban mobility, energy efficiency, and air quality. Finally, quick wins will be an essential element of follow-up engagement with national and local governments (e.g. in defining sub-regional indicators to complement global SDG indicators).

4.   High-Level Advisory Group on Sustainable Transport (HLAGST)

Quick wins are to be heavily promoted in the HLAGST process, potentially through organizing a dedicated session on PPMC de-carbonization roadmap/quick wins during the HLAGST conference in Turkmenistan in November 2016, and by incorporating each of these topics as central themes in the HLAGST report due for release in December 2016. In additional, SLoCaT intends to create a customized briefing document on quick wins for the incoming Secretary General (with support of UN DESA colleagues, if plausible) to help to equip the new administration to make rapid progress in the area of sustainable transport.

5.   ITF Decarbonising Transport Project

SLoCaT is an active partner in the emerging ITF Decarbonising Transport Project, and as such will strive to promote the quick win concept in the development of the project through ITF's call for "Active participation in defining transport's path to carbon neutrality "(see 'Partner Benefits' section). More specifically, SLoCaT will seek to include quick wins among inputs to ITF modeling efforts (and to contribute continuous support to and review of these efforts) to ensure that short-term actions help to set the trajectory for a zero-emissions sector by 2050.

6.   Michelin Challenge Bibendum (MCB)

Finally, quick wins are to be incorporated as a primary theme of the next MCB Global Summit, to be held in Summer 2016, possibly in North America. As a co-leader of the PPMC, Michelin is well positioned to highlight the potential role of the private sector in realizing quick wins, and to underscore the potential profitability of quick wins to global manufacturers, in partnership with other strategic MCB participants (e.g. NGOs, MDBs, and national and local decision makers).

D. Promotional Materials, Knowledge Products and Interactive Fora

The SLoCaT Partnership will work in concert with quick wins champions (and other coordinating bodies) to create promotional materials and knowledge products to accelerate the implementation of quick wins in the short term, and to provide online fora to support the refinement of quick wins in the medium to long term.

1.   Quick Wins Promotional Materials

Promotional materials will include (but not be limited to) the following:
- Dedicated webpage listing the 20 quick wins, each with links to a separate page giving a detailed profile of the quick win (i.e. in parallel to the LPAA Transport Initiatives page (and corresponding sub-pages) on the PPMC website), as well as identifying champions for each action and describing planned follow-up activities.
- Press release/partner mailings to announce official launch of quick wins campaign (planned for Habitat III in October 2016 or COP22 in November 2016).
- Twitter campaign with set of graphical tweets for ready distribution by partner orgs

- Quick wins brochure (4-page, full-color).
- Canned tweets for ongoing distribution via partner organizations.
- Merchandise/swag for Habitat III and COP22 (see above).

2. Quick Win Knowledge Products

Knowledge products to support the implementation of the quick wins will be distributed on the SLoCaT/PPMC websites:

- Toolkit/menu for national delegations to incorporate quick wins into detailed NDC implementation plans.
- Script for incorporating quick wins into regional dialogues on climate change and sustainable development.
- Analysis of potential NDC-quick win synergies in updated SLoCaT NDC report (forthcoming).

3. Quick Wins Interactive Fora

Provide interactive fora for ongoing development of quick wins, also to be hosted on the SLoCaT/PPMC websites:

- Campaign for endorsement of quick wins through interactive survey form (cf. Warsaw Declaration), to target cross-sectorial endorsers (e.g. member states, NGOs, private sector).
- Interactive peer sharing area to catalog quick wins accomplishments and share best practices (cf. NAZCA portal).
- Platform to elicit input to further refine application of quick win actions over time.

E. Quick Win Evaluation Metrics

Finally, the SLoCaT Partnership will define a series of evaluation metrics to measure progress toward quick wins, which are to be defined in partnership with quick win champions and coordinating bodies. These metrics are to measure accomplishments along three dimensions: (1) internal outputs, (2) external outcomes, and (3) external impacts.

- **Internal outputs** refer to the concrete actions and specific deliverables produced by each quick win's partners and network. These internal outputs mostly focus on: outreach and coalition building, capacity building, knowledge development, and policy-making/ policy instruments. Examples of metrics to measure internal outputs include the number of SUMPs defined through CODATU's MobiliseYourCity initiative, and the level of funding dedicated to the initiative.

- **External outcomes** refer to the specific results anticipated by the implementation of the quick win. External outcomes are intended to influence relevant stakeholders beyond the initiatives' immediate network and partners, such as transport users and policy- makers, with impacts on the city, country, or sectorial level. These outcomes are largely focusing on policy intervention and implementation. Examples of metrics to measure external outcomes include the number of countries with fuel economy standards in place, and the percentage of those countries on target to double global average fuel economy by 2050 (as defined in GFEI's 2016 Fuel Economy State of the World).

- **External impacts** refer to the significant effects and influence anticipated by a given quick win action in the context of climate change and sustainable development. These impacts are quantified end results on the global level in terms of GHG emission reduction/ prevention, energy-related impacts, and financial/economic benefits. Examples of metrics to measure external impacts include % decrease in energy consumption and/or CO_2 emissions through modernizing rail fleets (as defined in the UIC Low Carbon Sustainable Rail Transport Challenge).

IX. Conclusions

A. Motivation for Quick Wins

The recent adoption of the 2030 SDGs and the signing of the Paris Agreement on climate change have added a new level of urgency to implementing long-sought but little-realized steps toward these ends. While country-level NDCs provide initial blueprints for national climate action, including in the transport sector, and the LPAA transport initiatives can be a key part of efforts to implement the NDCs, these initiatives alone will not be sufficient to sustain the degree of global changes that will be required before 2030 and beyond.

What is also required is immediate bold and ambitious action that will kick-start the transformation of the transport sector and limit the lock-in effects of a high-carbon BAU scenario, as described in the de-carbonization roadmap. It is in this spirit that the final 20 quick wins have been proposed. As noted, these actions span five broad areas, which provide a balanced toolbox to ramp up needed actions across themes and modes.

It is essential to stress that quick wins are not stand alone solutions; they are essentially pre-2020 steps towards the implementation of the de-carbonization roadmap. Therefore, implementing a full-blown transformation will require scaling up proven no-regret actions without delay, with some of the ensuing benefits arriving pre-2020 and others post-2020.

B. Potential of Quick Wins

These quick wins have the potential to contribute in varying degrees towards reducing GHG emissions and thus moderating the impact of climate change, while at the same time providing key development co-benefits such as improved access, efficiency, and safety (which have implications in specific areas such as air quality improvements, poverty reduction, and personal security). By implementing all transport quick wins globally, a 27% reduction is possible from BAU. If all the quick wins are implemented as per the international best practices, it would have the potential to close the 2DS emission gap by 2030.

While acknowledging the promise of the quick wins, it is also essential at this stage in the process to acknowledge their shortcomings, and to establish that more and still broader discussion will be needed in the coming months, which may lead to additional quick wins being formulated. For example, it is acknowledged that there is currently a strong bias towards climate change mitigation actions among quick wins, and that the ongoing development and implementation of this concept must also reflect a crucial commitment to adapt transport infrastructure and services to observed and anticipated climate change impacts.

 In addition, the current set of quick wins has a somewhat limited coverage of infrastructure related measures, and there could be merit in extending construction/maintenance related quick wins to other infrastructure/assets (e.g. intermodal systems, terminals, rail) to leverage efficiency gains of co-modality. Finally, the current list does not include

data/measurement related quick win actions, which are key for implementation as well as for benchmarking, verification, reporting, and other purposes.

Therefore, based on the process established and lessons learned to date, it will be possible to set clearer guidelines and criteria that any additional quick wins will need to meet.

C. Assessment of Quick Wins

The current impact analysis of quick wins covers uncharted ground, as previous efforts have focused largely on single variables (e.g. marginal abatement cost (MAC) curves limited to USD $/ton carbon removed), while the summary in Table **8** represents a multivariate analysis that cuts across data sources and evaluation criteria, creating a more heterogeneous outcome. It is acknowledged that different stakeholders (e.g. those focused on climate change vs. road safety) will bring different perspectives to the analysis, and thus the selection of quick wins is essentially an exercise in rationalizing choices, rather than making comparisons among best options on a purely quantitative basis.

Ongoing discussion on the development of quick wins will help to refine the analytical framework, which will ideally be complemented by more robust data sets and objective indicators to allow for a more balanced assessment of potential impacts across the four goals of Access, Efficiency, Safety, and Environment.

D. Continuing Discussion on Quick Wins

While this process has provided a starting point to develop insight on the relative potential impact among quick wins, it is clear that further efforts are needed to address shortcomings in the current analysis. Although the impact assessment applied is relevant to a fairly wide selection of quick wins, it is obviously not exhaustive, and it is necessary to resolve the current imbalance between climate change and sustainable development aspects of the analysis.

The SLoCaT Partnership recognizes that more consultation is needed to establish buy-in from the global transport community for each of the proposed transport quick wins, which will be a key factor in determining the pace and scale of their uptake, and thus the ultimate success of their implementation. With the steps detailed above, the quick wins can become a focal point for the global transport community to coordinate efforts and to bring longstanding climate change and sustainable development goals nearer to fruition.

Annex 1: Overview of Quick Wins Development Process

A. Methodology for Developing Five Stages of Quick Win Actions [93].

1. Development of Long List (123 actions)
   - Completed internal SLoCaT compilation of potential quick wins (including inputs from SLoCaT secretariat and consulting partners)

   - Requested additional quick wins from all (90+) SLoCaT members, plus targeted requests to 23 organizations, including LPAA initiatives and other key topic areas

   - Received multiple inputs from 16 organizations, creating a list of 123 proposed quick wins (including initial SLoCaT contributions)

2. Development of Short List (35 actions)
   - Filtered long list into short list of 35 quick wins, based on the following criteria:
     - Balanced potential quick win solutions among different modes (rail, NMT) and themes (e.g. road safety, e-mobility)
     - Balanced examples from different regions (developed and developing)
     - Determined scalability/replicability/"sellability" of proposed entries

   - Combined several entries from long list into single entries on short list

   - Filled acknowledged gaps among some modes and themes (e.g. aviation, shipping, road safety)

3. Development of Assessment List (26 actions)
   - Ranked list of 35 actions through detailed qualitative assessment through an evaluation matrix based on the following criteria (100-pt scale):
     Distribution Criteria (15 pts)
       - Type: (Avoid, Shift, Improve) (6 pts)
       - Sector: (Passenger, Freight) (2 pts)
       - Mode: (Bus, Rail, NMT, Passenger car, Freight truck, Aviation, Shipping) (7 pts)

     Evaluation Criteria (85 pts)
       - Development Benefits (30 pts)
         - Access: (Rural access, Urban access, Nat'l/regional access, Equity/Gender) (10 pts)
         - Efficiency: (10 pts)
         - Safety (10 pts)
       - Environmental Benefits (20 pts)
         - Climate Respect: (GHG reduction, Climate adaptation) (15 pts)

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[93] It is proposed to make the Excel file that supports analysis available at the PPMC website following finalization of report, pending concurrence from World Bank.

- Air Quality (5 pts)
  - Features: (Rapid Implement, Scalability, Low-/Negative-Cost, Tech Feasibility) (30 pts)
  - Barriers: (Policy, Capacity, Financial) (-30 pts)
  - Support: (Robust Analysis, Stakeholder support) (5 pts)

- Filtered above to create a list of 23 actions (as at the Climate Action Summit in May 2016) based on the following criteria:
  - Total Score > 50
  - GHG benefit > Average GHG benefit of other actions
  - Features > 60% of possible points

- Reweighted values for above criteria to further prioritize actions that are rapidly implementable (e.g. that have low policy, capacity, and financial barriers)

- Reinstated six actions for expert input based on reweighting scheme described in previous point

4. Development of Expert Review list (23 actions)
- Conducted internal assessment of 26 actions, based on a High, Medium, Low ranking for each the following criteria (as described in previous section):
  - Mitigation Impact
  - Development Impact
  - Features
  - Barriers

- Assigned recommended status for each of 23 actions (i.e. Green (advance), Yellow (reconsider), Red (eliminate)

- Requested input from 15 global experts to respond to SLoCaT assessments, offer additional comments, and suggest additional actions

- Reformulated actions (titles/descriptions) based on expert input

- Eliminated three actions from further consideration (i.e. aviation, maritime, road safety), cutting the list from 26 to 23

5. Development of Final List (20 actions)
- Distributed full and concise version of stakeholder survey to SLoCaT members and strategies, and other relevant lists of transport stakeholders

- Received more than 25 responses to full survey and more than 90 responses to concise survey, which assessed overall suitability of actions (full and concise); and global scalability/technical feasibility of action, and political/financial barriers to action (full survey only)

- Combined results of stakeholder survey with results of internal impact assessment for each action (with respect to Access, Efficiency, Safety, and Environmental Impacts) to filter previous list of 23 actions to a final list of 20 actions

B. Formulation of Quick Win Actions

Table 19 displays the formulation of quick wins across each of the five stages of development:

I. Long List March 2016 (123 actions)	II. Short List April 2016 (35 actions)	III. Assessment List April- May 2016 (26 actions)	IV. Expert Review May-June 2016 (23 actions)	V. Survey/Final Selection June -July 2016 (20 actions)
1. Pricing Strategies				
Accelerate phase-out of fossil fuel subsidies	Accelerate global phase-out of fossil fuel subsidies	Accelerate global phase-out of fossil fuel subsidies	Accelerate phase-out of fossil fuel subsidies	Accelerate phase-out of fossil fuel subsidies
Introduce carbon pricing for global transport sector	Introduce carbon pricing for transport sector	Introduce carbon pricing for transport sector	Introduce carbon pricing for the transport sector where (sub-)national carbon markets currently exist or are under development	Introduce carbon pricing for the transport sector where (sub-)national carbon markets currently exist or are under development
Parking pricing and policies	Expand parking pricing policies to reduce VKT			
Introduce congestion pricing/ use pricing as a lever to influence behavior	Introduce congestion/road charging in major global cities	Introduce congestion/road charging in major global cities	Introduce and scale up pricing for car-related travel options (e.g. congestion/road charging, parking pricing) in primary and secondary cities	Introduce and scale up pricing for car-related travel options (e.g. congestion/road charging, parking pricing) in primary and secondary cities
Congestion/road pricing				
Pay-as-you-drive insurance				
2. Vehicle Standards and Maintenance				
Global Fuel Economy Initiative	Tighten fuel economy standards for passenger and freight vehicles	Tighten fuel economy standards for passenger and freight vehicles	Tighten fuel economy standards for passenger vehicles	Tighten fuel economy standards for passenger vehicles

I. Long List March 2016 (123 actions)	II. Short List April 2016 (35 actions)	III. Assessment List April- May 2016 (26 actions)	IV. Expert Review May-June 2016 (23 actions)	V. Survey/Final Selection June -July 2016 (20 actions)
Shift from 2-stroke to 4-stroke two and three wheelers				
Fuel economy policy pathway planning				
Enforcement of vehicle standards				
Vehicle emissions and fuel quality standards	Accelerate deployment of tighter fuel quality standards to reduce black carbon emissions (SLCPs)	Accelerate deployment of tighter fuel quality standards to reduce black carbon emissions (SLCPs)	Accelerate deployment of tighter diesel fuel quality standards to reduce emissions of black carbon and other short-lived climate pollutants	Accelerate deployment of tighter diesel fuel quality standards to reduce emissions of black carbon and other short-lived climate pollutants
Vehicle tire standards and maintenance	Enforce vehicle tire standards for vehicle efficiency			
3. TDM Strategies: Incentives and Disincentives				
Parking policy and management				
Vehicle registration limits	Implement vehicle registration limits/quotas for reduced car ownership			
Vehicle restrictions (e.g. odd/even)	Mandate vehicle use restrictions globally for decreased VKT			
Telecommuting/telework	Implement telecommuting policies for reduced travel demand			
Promotion of public transport				
4. TDM: Urban Form and Policy				
Urban design for safe, efficient, attractive walking/cycling				

I. Long List March 2016 (123 actions)	II. Short List April 2016 (35 actions)	III. Assessment List April- May 2016 (26 actions)	IV. Expert Review May-June 2016 (23 actions)	V. Survey/Final Selection June -July 2016 (20 actions)
Roadspace reallocation	(Re)allocate roadspace for walking/cycling/transit and reduce urban speed limits	(Re)allocate roadspace for walking/cycling/transit and reduce urban speed limits	Provide and improve walking and cycling infrastructure (e.g. connected walking paths, protected cycle lanes), reallocating roadspace where necessary.	Provide and improve walking and cycling infrastructure (e.g. connected walking paths, protected cycle lanes), reallocating roadspace where necessary.
(Ultra) Low emission zones	Implement (ultra-)low emission zones in city centers	Implement (ultra-)low emission zones in city centers	Implement (ultra-) low emission zones, including car-free zones in city centers	Implement (ultra-) low emission zones, including car-free zones in city centers
Car-free zones				
Car-free days	Introduce car-free days/ciclovías in major global cities	Introduce car-free days/ciclovías in major global cities	Introduce car-free days and ciclovías (temporary street closures to encourage cycling and walking) in primary and secondary cities to build support for longer-term policies	Introduce car-free days and ciclovías (temporary street closures to encourage cycling and walking) in primary and secondary cities to build support for longer-term policies
EcoMobility World Festival				
Development and building permit revisions	Mandate maximum parking requirements in new/renovated properties	Mandate maximum parking requirements in new/renovated properties	Introduce policies to mandate optimal car and bicycle parking requirements in commercial and residential developments	
Public transport value capture	Enable (land) value capture for global public transport systems			
5. Public Transport Improvements				
Deliver mass transit through Bus Rapid Transit (BRT)	Promote increase of bus based public transport (e.g. high-quality, including BRT, bus systems)	Promote increase of bus based public transport (e.g. high-quality, including BRT, bus systems)	Increase quality, availability, reliability, frequency, and efficiency of bus-based transit	Increase quality, availability, reliability, frequency, and efficiency of bus-based transit
BRT systems				
Improved bus transit facilities				

I. Long List March 2016 (123 actions)	II. Short List April 2016 (35 actions)	III. Assessment List April- May 2016 (26 actions)	IV. Expert Review May-June 2016 (23 actions)	V. Survey/Final Selection June -July 2016 (20 actions)
Integrated fare systems				
Public transport fare reform/subsidies				
Park-and-ride at bus/rail facilities	Implement park-and-ride facilities to extend reach of high-quality bus/rail networks			
Last-mile passenger shuttles for workplaces, campuses				
Public transport priority				
Public transport access in public buildings				
6. Rural and Regional Transport Improvements				
Invest in rural roads to reduce food loss/waste	Invest in rural road construction/maintenance to sharply reduce global food loss/waste	Invest in rural road construction/maintenance to sharply reduce global food loss/waste	Invest in rural road maintenance and modern supply chains to reduce global food loss and waste	Invest in rural road maintenance and modern supply chains to reduce global food loss and waste
Regional trade facilitation				
Incorporate dedicated, separated infrastructure for safe walking and cycling in all new rural roads				
7. Non-Motorized Transport				
Bicycle-mass transit integration	Integrate public/non-motorized modes and fare systems for seamless mobility	Integrate public/non-motorized modes and fare systems for seamless mobility	Introduce smart cards for integrated fares on public transport and shared mobility systems where they exist	
Incorporate cycling into mobility systems				
Reallocate roadspace in cities to walking and cycling				
Reallocate road-building budgets to dedicated space for walking and cycling				
Implementation of NMT (Non-Motorized Transport) Master Plan for Kochi				
Case Study: Plan Maestro Metropolitano de la Bicicleta del Valle de Aburrá				

I. Long List March 2016 (123 actions)	II. Short List April 2016 (35 actions)	III. Assessment List April- May 2016 (26 actions)	IV. Expert Review May-June 2016 (23 actions)	V. Survey/Final Selection June -July 2016 (20 actions)
Public bike systems				
Increase/improve bike parking facilities				
8. Technological Solutions				
Mapping Urban Transport Systems				
Require intelligent speed adaptation in cars				
Real-time transit information systems	Expand use of real-time transit information and multimodal route planning apps for seamless mobility	Expand use of real-time transit information and multimodal route planning apps for seamless mobility	Expand use of ICT applications for real-time travel information and route planning for walking, cycling, public transport and car sharing.	Expand use of ICT applications for real-time travel information and route planning for walking, cycling, public transport and car sharing.
Multimodal route planning apps				
ICT applications for freight/logistics	Reduce empty load running by freight trucks	Reduce empty load running by freight trucks	Improve freight efficiency (e.g. reduce empty load running by freight trucks) through route optimization, asset sharing between companies, and increased use of ICT solutions	Improve freight efficiency (e.g. reduce empty load running by freight trucks) through route optimization, asset sharing between companies, and increased use of ICT solutions
ITS for traffic smoothing				
9. Infrastructure Improvements/Maintenance				
Upgrade infrastructure (to minimize congestion, increase % of paved roads)				
Maintain existing urban/rural roadways				
10. Freight Transport - Efficiency Strategies				
Maximize the use of more sustainable (greener/climate friendly and climate resilient) freight modes (rail and water) and exploiting the relatively long haul lengths.	Shift long-distance freight from road to water/rail to increase efficiency			
Consolidate freight loads to maximize vehicle utilization (across all modes)				
Minimize empty running (by relaxing cabotage, online freight exchanges etc.)				

I. Long List **March 2016** **(123 actions)**	II. Short List **April 2016** **(35 actions)**	III. Assessment List **April- May 2016** **(26 actions)**	IV. Expert Review **May-June 2016** **(23 actions)**	V. Survey/Final Selection **June -July 2016** **(20 actions)**
Provide support facilities for freight driver welfare, training, advice etc.				
Establish vehicle maintenance facilities along freight transport and trade routes				
Enforce relevant freight regulations (e.g. on overloading, speeding, under-maintenance)				
Minimize urban impacts along routes (e.g. build bypasses, introduce low emission zones)				
Run demonstration projects to raise awareness of new freight technologies and business practices as well as harness their benefits				
Develop a sustainable (green/climate friendly and resilient) freight financing program (e.g. retrofitting or scrapping of older trucks)				
Promote the clustering of production and distribution facilities along the route to consolidate flows and rationalize supply chains				
Efficient last-mile freight delivery	Promote zero-emissions urban (last-mile) freight delivery	Promote zero-emissions urban (last-mile) freight delivery	Implement zero-emissions (last-mile) urban freight through e-mobility and cycling solutions	Implement zero-emissions (last-mile) urban freight through e-mobility and cycling solutions
Implement innovative local freight demonstration projects				
"Freight Demand Management"				
11. Freight Transport - Tools and Data				
Develop sustainable (green/climate friendly and climate resilient) freight recognition schemes to reward proactive carriers and shippers	Develop sustainable freight recognition schemes to reward proactive carriers and shippers	Develop sustainable freight recognition schemes to reward proactive carriers and shippers	Expand sustainable freight recognition schemes to reward proactive carriers and shippers	Expand sustainable freight recognition schemes to reward proactive carriers and shippers

I. Long List March 2016 (123 actions)	II. Short List April 2016 (35 actions)	III. Assessment List April- May 2016 (26 actions)	IV. Expert Review May-June 2016 (23 actions)	V. Survey/Final Selection June -July 2016 (20 actions)
Develop tools to measure performance and externalities including environmental and climatic impacts.				
Develop means, tools, methods to cost freight sustainability measures				
Generate data to support the establishment of a "green logistics observatory"				
Green freight performance benchmarking				
Sustainable freight transport data program (KPIs)				
Best practice transfer and recognition program in freight sector				
12. Transport Efficiency Improvements				
Minimize the environmental impact of individual modes (e.g. vehicle focus)				
Traffic signal synchronization				
Eco-driving techniques for on-road vehicles	Implement eco driving programs	Implement eco driving programs	Implement eco driving training (supported by on-board devices) for car, bus and rail fleet operators	
13. Renewable Fuels				
Scale up renewable energy share in transport (electric mobility, hydrogen, biofuels)				
Renewable low-carbon biofuels				
Promote switching to greener fuels in the freight sector (e.g. install refueling)				
CNG and BIOGAS green transport fuel in Johannesburg				
14. E-Mobility Strategies				
Shift urban bus fleets to hybrid and electric				

I. Long List March 2016 (123 actions)	II. Short List April 2016 (35 actions)	III. Assessment List April- May 2016 (26 actions)	IV. Expert Review May-June 2016 (23 actions)	V. Survey/Final Selection June -July 2016 (20 actions)
Shift urban taxi fleets to electric				
New low-floor, hybrid or electrical, buses and mini-buses to complement or replace the existing fleet of public and private buses plying in Greater Kochi, and feed the metro stations by providing first and last mile connectivity				
E-mobility subsidies (vehicles and infrastructure)	Ramp up charging infrastructure to expand electric vehicle fleets	Ramp up charging infrastructure to expand electric vehicle fleets	Ramp up charging infrastructure to encourage expansion of electric vehicle fleets in primary and secondary cities	Ramp up charging infrastructure to encourage expansion of electric vehicle fleets in primary and secondary cities
Increased use of e-bikes/scooters				
15. Transport Sharing Strategies				
Taxi driver online e-learning platform				
Car sharing systems	Expand shared vehicle systems to reduce car ownership in global cities	Expand shared vehicle systems to reduce car ownership in global cities	Expand car and (e-)bike sharing systems in primary and secondary cities	Expand car and (e-)bike sharing systems in primary and secondary cities
Ridesharing programs (carpools, vanpools)				
Expansion of on-demand services (e.g. Uber)				
16. Safety Improvements				
Maximize travel on 3-star or better roads and modes for all road users	Maximize travel on 3-star or better roads and modes for all road users	Maximize travel on 3-star or better roads and modes for all road users		
Speed reductions	Enforce speeding regulations through operational and technical means to increase efficiency/safety	Enforce speeding regulations through operational and technical means to increase efficiency/safety	Legislate and enforce stricter speeding regulations by operational and technical means to reduce emissions and road crashes.	Legislate and enforce stricter speeding regulations by operational and technical means to reduce emissions and road crashes.
Minimum 3-star journeys for pedestrians worldwide				
Four and Five Star National Highways				
Safety audits for accident-prone roadways				

I. Long List March 2016 (123 actions)	II. Short List April 2016 (35 actions)	III. Assessment List April- May 2016 (26 actions)	IV. Expert Review May-June 2016 (23 actions)	V. Survey/Final Selection June -July 2016 (20 actions)
Road safety design parameters				
Road safety education campaigns				
Driver education/enforcement to increase bike/ped safety				
Improved roadway lighting				
Vehicle safety standards				
17. Mobility Planning Policies				
Sustainable Mobility Project 2.0				
Site base mobility management				
Establish a transparent and participative Sustainable Urban Mobility Planning (SUMP) process	Establish open Sustainable Urban Mobility Planning processes in large and medium-sized global cities	Establish open Sustainable Urban Mobility Planning processes in large and medium-sized global cities	Formulate Sustainable Urban Mobility Plans (SUMPs) in primary and secondary cities	Formulate Sustainable Urban Mobility Plans (SUMPs) in primary and secondary cities
Freight SUMPs				
NAMA Zona Verde para el Transporte en Santiago				
18. Rail Improvements				
Strategies to Reduce Energy Consumption in Urban Rail Systems	Implement energy efficiency strategies in urban rail systems			
Management of Energy for Smarter Railway Systems in Europe: an Integrated Optimisation approach				
Promote more implementation of efficient rail operating modes				
Maximize occupancy rate in trains/promote modal shift				
Renovation of rail systems	Modernize ageing rail fleets and traction systems to increase efficiency	Modernize ageing rail fleets and traction systems to increase efficiency	Modernize ageing rail fleets and traction systems to increase efficiency	Modernize ageing rail fleets and traction systems to increase efficiency
Clean rail energy sources				
Promote new rail technologies				

I. Long List March 2016 (123 actions)	II. Short List April 2016 (35 actions)	III. Assessment List April- May 2016 (26 actions)	IV. Expert Review May-June 2016 (23 actions)	V. Survey/Final Selection June -July 2016 (20 actions)
Internalization of External Costs / polluter pays				
Simplification of border crossing to develop freight corridors				
19. Aviation Improvements				
Global offsetting scheme for aviation				
Commercialization of sustainable alternative aviation fuels				
ICAO aviation system block upgrades	Continuous climb and descent operations for aviation	Continuous climb and descent operations for aviation		
20. Shipping Improvements				
Working with Nature	Slow steaming to reduce fuel consumption in maritime transport	Slow steaming to reduce fuel consumption in maritime transport		
21. Peer Collaboration Programs				
City transport official training programs	Expand city transport official training programs to build local capacity among global cities	Expand city transport official training programs to build local capacity among global cities	Expand city transport official training programs to build local capacity for sustainable transport in primary and secondary cities	Expand city transport official training programs to build local capacity for sustainable transport in primary and secondary cities
Transport recognition programmes				

Table 19: Formulation of Quick Wins across Five Stages of Development

Annex 2: Expert Consultation on Quick Wins

In May and June 2016, SLoCaT approached 15 experts in varying fields of sustainable mobility to assess the set of 26 proposed quick wins described in stage three.

Expert feedback has been received from the following 13 individuals and organizations (designated by initials for attribution of below comments and suggestions), who have collectively provided (a) general comments on the overall set of proposed quick wins; (b) specific comments on individual quick wins, and (c) novel quick wins:

- Heather Allen (HA), Consultant, SLoCaT Partnership
- Holger Dalkmann (HD), WRI
- Bernhard Ensink (BE), ECF-WCA
- Nicolas Estupiñan (NE), CAF
- Aimee Gauthier (AG), ITDP
- Barry Howe (BH), Alstom
- Sunny Kodukula (SK), ICLEI
- Mathias Merford (MM), GIZ
- Patrick Oliva (PO), Michelin
- Carlosfelipe Pardo (CP), Despacio
- Sophie Roizard (SR), WBCSD
- Bronwen Thornton (BT), Walk 21
- Philip Turner (PT), UITP

SLoCaT responses to input received include the following options:
1. Change the formulation of a quick win, as described further in this document (noting that we aim to maintain precision in defining actions and to avoid over-conflation);
2. Change the way the quick win is treated in the forthcoming revised summary report (i.e. from an analytical perspective); or
3. Incorporate comments into a separate public outreach process (i.e. in promoting the quick wins to a broader audience) when the final set of quick wins is determined.

A. Expert General Comments
SLoCaT received the following general comments from experts consulted, which can be grouped into a number of sub-categories:

Comments on Terminology
- Instead of non-motorized transport, it is becoming more common (and more positive) to say **active travel/mobility**, active modes or to just say walking and cycling. (BT)
- The use of terminology 'Passenger' and 'Freight' is a bias to public transit, vehicles, etc.; suggest **'People and Freight'** (i.e. to better reflect the contribution of walking and cycling) (BT)

SLoCaT response: The reformulation of quick wins reflects the above suggestions to make actions as inclusive and multimodal as possible.

Comments on Policy/Stakeholders

- In general, it would be good to **link quick wins with NDCs** – we could have country champions for QW's. (PT)

SLoCaT response: Potential linkages with NDCs will be investigated in the revised quick win report, and the framework will be designed to interface to the extent possible with existing processes (e.g. climate change). The analysis will investigate direct and indirect links between proposed quick wins and transport mitigation and adaptation strategies described in individual countries' NDCs, to highlight opportunities for rapid implementation of these strategies in national contexts. The analysis will parallel a recent SLoCaT analysis of linkages between NDCs and LPAA transport initiatives.

- Analysis shows that we need a massive shift from unsustainable into sustainable transport; thus, [focusing quick win recommendations] on **national investments** (shifting investments in infrastructure) could help. (HD)

SLoCaT response: Though this comment is somewhat broader than the scope of the quick wins, a focus on national investments is suggested in a quick win on sustainable urban mobility plans (SUMPs), which can in turn be supported by national urban mobility policies (NUMPs). The revised quick win report will also provide recommendations for incorporating local and national policy to support the rapid implementation of quick wins.

- Currently almost all initiatives seem to be focus on government – I am missing any strong consolidated action from **private sector** (e.g. on fuel efficiency) (HD)

SLoCaT response: There is a clear role for the private sector to support a number of the quick wins, along with other non-state actors, as shown in Table 3, as indicated by numerous actions with a high degree of involvement from a broad set of stakeholders.

Comments on Methodology

- We have to somehow reflect that different actions have an entirely different relevance for the countries. I strongly recommend to **stress relevance for emerging and least developed countries** – this would also allow a far more differentiated analysis on what are the top 23 [quick wins], and would allow far more targeted communications. (HD)

SLoCaT response: We recognize the need to reflect different levels of development with respect to the proposed quick wins. While the primary aim of the project is to formulate global (universal) quick wins, it is understood that the subset of quick wins selected (as well as the manner these actions are implemented and operationalized) may be different based on individual country contexts and conditions. The 'Output of Quick Wins' section below gives several illustrative case studies of how this might be applied in practice under different country contexts, and this issue will be further addressed in the revised quick wins report.

- I suggest to look at least in a qualitative manner to the **cost of action** (e.g. while the direct costs of carbon pricing are minor, the investment in EV would require a large scale investment which might compete with other action for the sector) (HD)

SLoCaT response: Proxy indicators for 'cost of action' are included in the analysis matrix through the variables 'Low-/negative cost' (under 'Features') and 'Financial barriers' (under 'Barriers'). These specific variables were incorporated into the more general 'Features' and 'Barriers' ratings in the proposed matrix circulated for expert feedback. This will be called out more explicitly in the revised quick win report, since cost is a key factor in determining application of quick wins, especially in developing country contexts.

- Although this [process] is solely focusing on transport, I would at least mention in the introduction that **wider activities are needed to fundamentally change the sector** (e.g. role of land-use for urban mobility) (HD)

SLoCaT response: We feel that a discussion of this topic would generally go beyond the scope of the quick wins analysis, but particular cross-sectorial conditions needed to realize each proposed action (e.g. required increases in renewable energy generation to support potential benefits from EV charging infrastructure) may be mentioned in the revised report where relevant.

Grouping/ranking of quick wins
- Rank the quick wins in the order of first **Avoid, then Shift, then Improve**. (BE)

SLoCaT response: Table 2 organizes quick wins in terms of Avoid-Shift-Improve orientation, which will complement the analysis of NDC actions from this perspective, and will help to draw connections between these processes.

- The current "20 quick wins" must be re-formulated, clustered and complemented by their relevance to kick-start the transformation to put us on the global roadmap track. The "no-delay decisions" should be regarded as a series of powerful "no-brainers" to embark vigorously, well before 2020 in the de-carbonization process. (HD)

SLoCaT response: In our view, all of the proposed quick wins are 'no-delay decisions." Quick wins are not intended to replace other actions in the PPMC global de-carbonization road map, but rather are intended to complement the actions, by putting us on track for a 'zero net emission' economy early in the second part of the century, and in some cases to trigger more long-term action to de-carbonize the transport sector, to attain a 'well below 2°C' target by century end. In addition, although all quick wins are seen as pre-2020 actions, this doesn't mean everything that the proposed set of quick wins includes all that needs to be done during this period. Thus, the proposed quick wins should be viewed internally and promoted externally as being *ambitious* but not *comprehensive*.

- I would classify "quick wins" - that I would name something like "no-delay decisions for transport/mobility transformation" - in the 4 following categories:
  - *Category A:* Winning solutions which must be encouraged and expanded; some "relatively easy" like expansion of cycling, ride sharing, LEZ, electric 2 wheelers, some "not so easy" like electric infrastructure, carbon pricing.
  - *Category B:* What must be stopped (because it goes in the opposite direction of what we want, or because it hampers progress at hand); fossil fuel subsidies, regulations forbidding trucks to travel loaded most of the time, flaring etc.
  - *Category C:* Education/communication towards encouraging behavioral change and understanding of new policies; eco-driving, academic programs.
  - *Category D:* Global new cooperative programs to be initiated (for which time is of the essence): global offsetting strategies, 10 kWh/100 km EV cooperative research program etc. (PO)

SLoCaT response: Our position is that since there are many potential manners of clustering (e.g. by stakeholder involvement or Avoid-Shift-Improve orientation, as previously discussed), we feel that it is still too early in the process to arrive at a definite clustering. For this reason, we suggest keeping quick wins 'unclustered' in the final framework to maximize flexibility, which will be discussed further in the report. Thus, we do not advocate a specific way of clustering thee actions, while recognizing that clustering may be useful in marketing quick wins to a broader audience, but this will come at later stage.

However, we recognize that while each quick win action must stand on its own merit, many have common elements and are linked in important ways (e.g. 'reducing speed limits' may be seen as a complementary strategy to 'reallocating road space', and implementing 'car-related pricing strategies' may be a precursor to 'phasing out fossil fuel subsidies').

B. Proposed New Quick Win Actions

Expert input also yielded the following suggestions for new quick-win actions (Table 20), which have been incorporated into existing actions as noted (see also sample profiles in Table 22).

Proposed Quick Win	Description	SLoCaT Response
Provide infrastructure for walking and cycling and transit (BT)	Addresses urgent need for footpaths in poorer countries and bike lanes in wealthier cities. Can promote: Global Street Design Guide (NACTO), Safer by Design (WRI) and many others. Enrique Peñelosa built/sealed walkways/footpaths through housing so people could access BRT - no reallocation but good provision.	Included as novel quick-win action 'Provide and improve walking and cycling infrastructure (e.g. connected walking paths, protected cycle lanes), reallocating roadspace where necessary.'
Make sure walking paths are unobstructed, comfortable, and connected (AG)	The walking environment is critical for both sustainable transport and sustainable development. There is a strong correlation between ridership on transit and the walking environment.	Included as novel quick-win action 'Provide and improve walking and cycling infrastructure (e.g. connected walking paths, protected cycle lanes), reallocating roadspace where necessary.'
National governments help ensure the integration of land use planning and transport planning with enabling policies (AG)	If the target is national governments, this is one that is important – but I am not sure what the exact mechanism is or if there is just one.	Incorporated into 'Formulate SUMPs' action, in context of complementary National Urban Mobility Policies (NUMPs) to support SUMPs
National Actions (BT)	Many of these actions are at city level; also value in promoting national action plans (we are focusing on this for walking, e.g. Austria, Norway), funding frameworks etc.	Incorporated into 'Formulate SUMPs' action as National Urban Mobility Policies (NUMPs) in context of complementary National Urban Mobility Policies (NUMPs) to support SUMPs
Implement a data sharing platform to allow route optimization and asset sharing between companies (SR)	Initial data collection and modeling work shows aggregate emission reduction potential of up to 57.5% that is currently not deployed. Initiative will physically demonstrate a working technical and business model solution.	Incorporated into 'Reduce empty load running' action.
Public bike share (BT)	Can be integrated into the vehicle share idea, which [originally] presented as only cars	Incorporated into 'Expand car and (e-)bike sharing systems' action.
International Data Standard for measuring walking (BT)	The draft report notes a lack of monitoring or data capture wins in the list.	Incorporated into comments for 'Expand use of ICT'
Invest in creating and maintaining employment opportunities for young people and women in the transport sector with a focus on low carbon opportunities (HA)	Increasing the diversity of those working in the sector can help increase the speed and rate that sustainable transport can help deliver on the cross cutting aspects of the SDGs	Incorporated into comments on 'Training city officials' action.

Table 20: Expert-Suggested Additional Quick Wins

120

C. Expert Input on Individual Actions

Table 21 describes individual quick wins as categorized as Green (advance), Yellow (re-evaluate), and Red (eliminate), as informed by expert input. The Green- and Yellow-nominated actions (i.e. all but the final three) were circulated to a wider set of stakeholders through an online survey (see following section), to narrow down actions to a final set of 20 quick wins to create a balanced portfolio of short-term sustainable mobility strategies.

C. Expert Input on Individual Actions

Reformulated Action	Original Rating	Revised Rating
1. Tighten fuel economy standards for passenger vehicles	Green	Green
2. Implement zero-emissions (last-mile) urban freight through e-mobility and cycling solutions	Green	Green
3. Expand car and (e-)bike sharing systems in primary and secondary cities	Green	Green
4. Introduce policies to mandate optimal car and bicycle parking requirements in commercial and residential developments	Green	Green
5. Accelerate deployment of tighter diesel fuel quality standards to reduce emissions of black carbon and other short-lived climate pollutants	Yellow	Green
6. Increase quality, availability, reliability, frequency, and efficiency of bus-based transit.	Yellow	Green
7. Implement (ultra-) low emission zones, including car-free zones in city centers.	Yellow	Green
8. Expand use of ICT applications for real-time travel information and route planning for walking, cycling, public transport and car sharing.	Yellow	Green
9. Legislate and enforce stricter speeding regulations by operational and technical means to reduce emissions and road crashes.	Yellow	Green
10. Provide and improve walking and cycling infrastructure (e.g. connected walking paths, protected cycle lanes), reallocating roadspace where necessary.	New action, with 'Reallocate Roadspace'	Green
11. Accelerate phase-out of fossil fuel subsidies	Green	Yellow
12. Formulate Sustainable Urban Mobility Plans (SUMPs) in primary and secondary cities	Green	Yellow
13. Expand sustainable freight recognition schemes to reward proactive carriers and shippers.	Green	Yellow
14. Implement eco driving training (supported by on-board devices) for car, bus and rail fleet operators	Green	Yellow
15. Modernize ageing rail fleets and traction systems to increase efficiency	Green	Yellow
16. Expand city transport official training programs to build local capacity for sustainable transport in primary and secondary cities	Green	Yellow
17. Introduce smart cards for integrated fares on public transport and shared mobility systems where they exist	Green	Green
18. Introduce carbon pricing for the transport sector where (sub-)national carbon markets currently exist or are under development	Yellow	Yellow
19. Introduce and scale up pricing for car-related travel options (e.g. congestion/road charging, parking pricing) in primary and secondary cities	Yellow	Yellow
20. Introduce car-free days and ciclovías (temporary street closures to encourage cycling and walking) in primary and secondary cities to build support for longer-term policies	Yellow	Yellow
21. Ramp up charging infrastructure to encourage expansion of electric vehicle fleets in primary and secondary cities	Yellow	Yellow
22. Improve freight efficiency (e.g. reduce empty load running by freight trucks) through route optimization, asset sharing between companies, and	Red	Yellow

increased use of ICT solutions.	🟥	🟨
23. Invest in rural road maintenance and modern supply chains to reduce global food loss and waste	🟥	🟨
24. Expand use of slow steaming to reduce fuel consumption in maritime transport	🟥	🟥
25. Maximize travel on 3-star or better roads and modes for all road users	🟥	🟥
26. Continuous climb and descent operations for aviation	🟥	🟥

Table 21: Reformulated quick wins with revised ratings

Table 22 is an example profile describing the reformulation of quick win actions based on expert input, which describe the degree of expert consensus, compile expert comments, and summarize the opportunities and challenges of the quick win based on expert input.

1.
Revised formulation (Rating): Tighten fuel economy standards for passenger vehicles (Green)
Original formulation (Rating): Tighten fuel economy standards for passenger and freight vehicles (Green)
Degree of expert consensus: Strong consensus, with simultaneous push for complementary measures on fuel quality and vehicle subsidies

Expert comments
 	
• Arguments in favor of action
 	
    o Wide agreement on action
 	
    o Regarding sustainable development impact, widening the focus of this measure on air quality standards (EURO etc.) could increase environmental and health benefits
 	
• Arguments against action
 	
    o N/A
 	
• Other comments
 	
    o Need a strong support from national governments
 	
    o [Could benefit from] complementary measures (e.g. financial incentives to support the purchase of related more expensive vehicles (hybrid, hydrogen);

SLoCaT summary Well-defined process, strong global champions (e.g. GFEI). <u>Suggested focus on</u> passenger vehicles before 2020, with parallel focus on consumer support for more efficient vehicles.

Table 22: Sample Reformulated Quick-win Actions Based on Expert Input

Annex 3: Emission Reduction Potential of Proposed Transport Measures in NDCs

Table 23 compiles national and regional sources for quantifying emissions reduction potential of quick wins (as presented in Table 7 above).

Country	Mitigation Strategy	CO2 Transport Mitigation below BAU in 2030	Reference
Argentina	Good Management Practice	7%	2da Comunicación Nacional de la República Argentina a la Convención Marco de las Naciones Unidas sobre Cambio Climático
Argentina	Speed Control	3%	2da Comunicación Nacional de la República Argentina a la Convención Marco de las Naciones Unidas sobre Cambio Climático
Argentina	Mode shift from Road to rail	5%	2da Comunicación Nacional de la República Argentina a la Convención Marco de las Naciones Unidas sobre Cambio Climático
Argentina	Peak Shifting	4%	2da Comunicación Nacional de la República Argentina a la Convención Marco de las Naciones Unidas sobre Cambio Climático
Australia	Improvement in FE of LDV's	7%	Opportunities to reduce light vehicle emissions in Australia
Australia	Improvement in FE of HDV	2.50%	Opportunities to reduce light vehicle emissions in Australia
Australia	Urban road pricing and other pricing incentives	1.30%	Opportunities to reduce light vehicle emissions in Australia
Australia	Urban design	0.35%	Opportunities to reduce light vehicle emissions in Australia
Australia	Freight mode shift and improved logistics	1.10%	Opportunities to reduce light vehicle emissions in Australia
Australia	Rail fuel efficiency Improvement	0.30%	Opportunities to reduce light vehicle emissions in Australia
Australia	Improvement in FE of HDV	2%	https://bitre.gov.au/collaboration/files/alctf_technical_report.pdf
Australia	Congestion Pricing	2.50%	Greenhouse gas abatement potential of the Australian transport sector
Australia	Parking Charges	0.15%	Greenhouse gas abatement potential of the Australian transport sector
Australia	Rail technology improvement	0.30%	Greenhouse gas abatement potential of the Australian transport sector
Australia	Telecommuting	0.75%	Greenhouse gas abatement potential of the Australian transport sector
Australia	walk + Cycle	0.55%	Greenhouse gas abatement potential of the Australian transport sector

Australia	Eco-driving	**1.20%**	Greenhouse gas abatement potential of the Australian transport sector
Australia	Improvement in FE of LDV's	**2.60%**	Greenhouse gas abatement potential of the Australian transport sector
Australia	Aviation technology	**1.85%**	Greenhouse gas abatement potential of the Australian transport sector
Australia	Carbon Pricing	**8.50%**	Modeling a Carbon Price
Australia	Improvement in FE of LDV's	**8%**	Improving Australia's vehicle fuel efficiency
Australia	Carbon Pricing	**8%**	Modeling a Carbon Price
Austria	Improvement in FE of LDV's and HDVs	**13%**	Road to 2030: how EU vehicle efficiency standards help member states meet climate targets
Bangladesh	Improvement in FE of HDVs and LDVs	**7.50%**	Low-Carbon Society Development towards 2025 in Bangladesh
Belgium	Improvement in FE of HDVs and LDVs	**15%**	Road to 2030: how EU vehicle efficiency standards help member states meet climate targets
Belgium	Improvement in FE of HDVs and LDVs	**22%**	Pathways to World Class Energy efficiency in Belgium
Belgium	Improvement in FE of HDVs and LDVs	**7.50%**	Scenarios for a Low Carbon Belgium by 2050
Brazil	Freight Mode shift to rail	**8%**	https://sustainabledevelopment.un.org/content/documents/847LowCarbon_Fulldoc.pdf
Brazil	Passenger Mode shift Urban	**1.30%**	Brazil Low-carbon Country Case Study
Brazil	BRT	**7.50%**	Brazil Low-carbon Country Case Study
Brazil	Integrated Public Transport + Parking + Congestion Charge	**4.20%**	Brazil Low-carbon Country Case Study
Brazil	Improve Walking and Cycling	**1%**	Brazil Low-carbon Country Case Study
Brazil	Freight Management	**2%**	Brazil Low-carbon Country Case Study
Brazil	LDV FE Improvement	**10%**	Pathways for a Low Carbon Economy for Brazil
Brazil	HDV FE Improvement	**6%**	Pathways for a Low Carbon Economy for Brazil
Bulgaria	Improvement in FE of HDVs and LDVs	**6%**	Road to 2030: how EU vehicle efficiency standards help member states meet climate targets
Chile	Fuel Tax for Vehicles	**2%**	https://www.thepmr.org/system/files/documents/20121130_Final%20Report%20PMR%20Activity%204.pdf

126

Chile	Eco-driving	1%	Partnership for Market Readiness - Chile
Chile	Scrappage	20%	Partnership for Market Readiness - Chile
China	HDV and LDV FE standards	15%	Oil consumption and CO2 emissions in China's road transport: current status, future trends, and policy implications
China	Constraining vehicle registration	15%	http://www.tsinghua.edu.cn/publish/dae/4364/20101220102833065470806/26)%20Fuel%20conservation%20and%20GHG%20(Greenhouse%20gas)%20emissions%20mitigation%20scenarios.pdf
China	Reducing Vehicle Travel	8%	Fuel conservation and GHG (Greenhouse gas) emissions mitigation scenarios for China's passenger vehicle fleet
China	HDV and LDV FE standards	12%	Vehicle-use intensity in China: Current status and future trend
China	Carbon Tax	0.50%	Achieving CO2 emission reduction and the co-benefits of local air pollution abatement in the transportation sector of China
China	Carbon Tax	10%	Achieving CO2 emission reduction and the co-benefits of local air pollution abatement in the transportation sector of China
China	Fuel Tax	3.50%	Achieving CO2 emission reduction and the co-benefits of local air pollution abatement in the transportation sector of China
China	BRTS	0.80%	Achieving CO2 emission reduction and the co-benefits of local air pollution abatement in the transportation sector of China
China	Electrification of transport	6.00%	Projection of energy use and greenhouse gas emissions by motor vehicles in China: Policy options and impacts
China	Rail Electrification	2.94%	Energy Saving and Emission Reduction Estimations of Electrified Railways in China
Ethiopia	Electric Rail	21.71%	Ethiopia climate resilient green economy strategy
Ethiopia	BRT	0.10%	Ethiopia climate resilient green economy strategy

Ethiopia	Electric Vehicles	0.34%	Ethiopia climate resilient green economy strategy
Ethiopia	Fuel Efficiency Standards	7.80%	Ethiopia climate resilient green economy strategy
Ethiopia	Biofuels	2.20%	Ethiopia climate resilient green economy strategy
Mexico	Bus system optimization	9.00%	Estudio sobre la Disminución de Emisiones de Carbono (MEDEC)
Mexico	Urban densification	4.09%	Estudio sobre la Disminución de Emisiones de Carbono (MEDEC)
Mexico	Bus rapid transit	1.20%	Estudio sobre la Disminución de Emisiones de Carbono (MEDEC)
Mexico	Non-motorized transport	1.66%	Estudio sobre la Disminución de Emisiones de Carbono (MEDEC)
Mexico	Border vehicle inspection	3.20%	Estudio sobre la Disminución de Emisiones de Carbono (MEDEC)
Mexico	I&M in 21 cities	3.03%	Estudio sobre la Disminución de Emisiones de Carbono (MEDEC)
Mexico	Fuel economy standards	5.74%	Estudio sobre la Disminución de Emisiones de Carbono (MEDEC)
Mexico	Road freight logistics	3.94%	Estudio sobre la Disminución de Emisiones de Carbono (MEDEC)
Mexico	Railway freight	5.49%	Estudio sobre la Disminución de Emisiones de Carbono (MEDEC)
Colombia	Electrifying public transport fleet	2.07%	Plan De Acción Sectorial De Mitigación (Pas) Sector Transporte
Colombia	Mode shift in freight to rail	0.57%	Plan De Acción Sectorial De Mitigación (Pas) Sector Transporte
Colombia	Mode shift in freight to waterways	2.49%	Plan De Acción Sectorial De Mitigación (Pas) Sector Transporte
Colombia	NMT Improvement	0.26%	Plan De Acción Sectorial De Mitigación (Pas) Sector Transporte
Colombia	Scrapping trucks older than 20 years	0.08%	Plan De Acción Sectorial De Mitigación (Pas) Sector Transporte
Colombia	Replacing public transport fleet with hybrid	2.61%	Plan De Acción Sectorial De Mitigación (Pas) Sector Transporte
Colombia	Promoting transit oriented development	0.26%	Plan De Acción Sectorial De Mitigación (Pas) Sector Transporte
Colombia	Promoting electric vehicles (private)	1.03%	Plan De Acción Sectorial De Mitigación (Pas) Sector Transporte
Colombia	Replacing convention with electric taxis	0.10%	Plan De Acción Sectorial De Mitigación (Pas) Sector Transporte
Nigeria	Rail Freight Improvement	0.30%	Low-carbon development : opportunities for Nigeria (English)
Nigeria	Freight logistics improvement	3.40%	Low-carbon development : opportunities for Nigeria (English)
Nigeria	Eco Driving	3%	Low-carbon development : opportunities for Nigeria (English)
Nigeria	Improvement in FE of HDVs and LDVs	18%	Low-carbon development : opportunities for Nigeria (English)
EU-27	Energy Efficiency	14%	Energy Roadmap 2050

India	Increased Freight Share of Railways	**9.20%**	Low Carbon Strategies for Inclusive Growth
India	Non-motorized & Public Transport	**10%**	Low Carbon Strategies for Inclusive Growth
India	Fuel Efficiency of Vehicles	**7.20%**	Low Carbon Strategies for Inclusive Growth
India	BRTS	**0.38%**	Low Carbon Strategies for Inclusive Growth
Indonesia	Electric Vehicle	**5.75%**	Indonesia's greenhouse gas abatement cost curve Dewan Nasional Perubahan Iklim, Indonesia
ASEAN	Incentives to high occupancy and load factors	**2%**	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Revenue neutral scheme	**2%**	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	CO2 emission charge	**2%**	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Route and parking guidance systems	**1%**	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Communication systems	**1%**	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Luggage deposit	**1%**	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Internet and mobile technology	**1%**	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Awareness raising campaigns	**1%**	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Involvement of industry to reduce transport	**1%**	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Travel plans	**12%**	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Discussion for travel plans	**1%**	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Replacement of ownership with car clubs, rental and sharing schemes	**30%**	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Car free area	**25%**	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Promotion of 'regional' consumer markets	**1%**	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Promotion of company networking and industrial districts	**1%**	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Information system on the "CO2 content" of all goods	**1%**	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Labels with declaration of regional origin	**1%**	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)

ASEAN	Environmental impact assessment for major political decisions	1%	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Differentiated road pricing and increases in road transport costs	1%	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Exchange of knowledge and information	1%	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Urban design focused on reducing the need to travel	20%	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Improved conditions for walking, cycling and public transport	10%	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Progressive reduction of space available for cars	18%	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Upgrading of local urban facilities, amenities and recreational areas	1%	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Promotion of local destinations for leisure travel	1%	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Fuel price (10%)	4%	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	Fuel price (25%)	10%	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	I-12.Ecological Driving, Speed limitation	1%	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	I-12.Ecological Driving, Monitoring systems for speed limitation check	1%	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	I-12.Ecological Driving, Driving licence test for ecological driving	1%	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	I-12.Ecological Driving, Speed limitation in certain local area	1%	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	I-12.Ecological Driving, Design low speeds into layouts	1%	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	I-14.Air fuel efficiency improvement, Fuel efficiency improvement	26%	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
ASEAN	I-15.Ship fuel efficiency	30%	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)

	improvement,		
ASEAN	I-13.Congestion Relief,	1%	Study of Long-Term Transport Action Plan for ASEAN region (LPA project)
Australia	Electric Vehicle Transition	14%	APEC Energy Demand and Supply Outlook – 5th edition
China	Electric Vehicle Transition	5%	APEC Energy Demand and Supply Outlook – 5th edition
Korea	Electric Vehicle Transition	10%	APEC Energy Demand and Supply Outlook – 5th edition
Chile	Electric Vehicle Transition	4%	APEC Energy Demand and Supply Outlook – 5th edition
Peru	Electric Vehicle Transition	6%	APEC Energy Demand and Supply Outlook – 5th edition
Indonesia	Electric Vehicle Transition	5%	APEC Energy Demand and Supply Outlook – 5th edition
Philippines	Electric Vehicle Transition	3%	APEC Energy Demand and Supply Outlook – 5th edition
Japan	Electric Vehicle Transition	6%	APEC Energy Demand and Supply Outlook – 5th edition
Singapore	Electric Vehicle Transition	-23%	APEC Energy Demand and Supply Outlook – 5th edition
Vietnam	Electric Vehicle Transition	4%	APEC Energy Demand and Supply Outlook – 5th edition
Thailand	Electric Vehicle Transition	5%	APEC Energy Demand and Supply Outlook – 5th edition
Australia	#5 Natural Gas Vehicle Transition	16%	APEC Energy Demand and Supply Outlook – 5th edition
China	#5 Natural Gas Vehicle Transition	8%	APEC Energy Demand and Supply Outlook – 5th edition
United States	#5 Natural Gas Vehicle Transition	19%	APEC Energy Demand and Supply Outlook – 5th edition
Korea	#5 Natural Gas Vehicle Transition	7%	APEC Energy Demand and Supply Outlook – 5th edition
Chile	#5 Natural Gas Vehicle Transition	6%	APEC Energy Demand and Supply Outlook – 5th edition
Peru	#5 Natural Gas Vehicle Transition	5%	APEC Energy Demand and Supply Outlook – 5th edition
Mexico	#5 Natural Gas Vehicle Transition	16%	APEC Energy Demand and Supply Outlook – 5th edition
Canada	#5 Natural Gas Vehicle Transition	15%	APEC Energy Demand and Supply Outlook – 5th edition
New Zealand	#5 Natural Gas Vehicle Transition	12%	APEC Energy Demand and Supply Outlook – 5th edition
Indonesia	#5 Natural Gas Vehicle Transition	5%	APEC Energy Demand and Supply Outlook – 5th edition
Philippines	#5 Natural Gas Vehicle Transition	4%	APEC Energy Demand and Supply Outlook – 5th edition
Japan	#5 Natural Gas Vehicle Transition	8%	APEC Energy Demand and Supply Outlook – 5th edition
Singapore	#5 Natural Gas Vehicle Transition	-25%	APEC Energy Demand and Supply Outlook – 5th edition
Vietnam	#5 Natural Gas Vehicle Transition	3%	APEC Energy Demand and Supply Outlook – 5th edition
Russia	#5 Natural Gas Vehicle Transition	15%	APEC Energy Demand and Supply Outlook – 5th edition

Thailand	#5 Natural Gas Vehicle Transition	3%	APEC Energy Demand and Supply Outlook – 5th edition
Australia	#8 Fixed Urban Land	22%	APEC Energy Demand and Supply Outlook – 5th edition
China	#8 Fixed Urban Land	12%	APEC Energy Demand and Supply Outlook – 5th edition
United States	#8 Fixed Urban Land	30%	APEC Energy Demand and Supply Outlook – 5th edition
Korea	#8 Fixed Urban Land	7%	APEC Energy Demand and Supply Outlook – 5th edition
Chile	#8 Fixed Urban Land	10%	APEC Energy Demand and Supply Outlook – 5th edition
Peru	#8 Fixed Urban Land	4%	APEC Energy Demand and Supply Outlook – 5th edition
Mexico	#8 Fixed Urban Land	23%	APEC Energy Demand and Supply Outlook – 5th edition
Canada	#8 Fixed Urban Land	24%	APEC Energy Demand and Supply Outlook – 5th edition
New Zealand	#8 Fixed Urban Land	16%	APEC Energy Demand and Supply Outlook – 5th edition
Indonesia	#8 Fixed Urban Land	8%	APEC Energy Demand and Supply Outlook – 5th edition
Philippines	#8 Fixed Urban Land	7%	APEC Energy Demand and Supply Outlook – 5th edition
Japan	#8 Fixed Urban Land	11%	APEC Energy Demand and Supply Outlook – 5th edition
Singapore	#8 Fixed Urban Land	0%	APEC Energy Demand and Supply Outlook – 5th edition
Vietnam	#8 Fixed Urban Land	4%	APEC Energy Demand and Supply Outlook – 5th edition
Russia	#8 Fixed Urban Land	17%	APEC Energy Demand and Supply Outlook – 5th edition
Thailand	#8 Fixed Urban Land	10%	APEC Energy Demand and Supply Outlook – 5th edition
United States	Telecommuting	1.50%	Transportation Implications of Telecommuting
Israel	Fuel Efficiency	18.80%	Greenhouse gas emission abatement in Israel
Israel	Electric	8.80%	Greenhouse gas emission abatement in Israel
Kazakhstan	Public transport (modernized buses)	4.84%	The Demand for Greenhouse Gas Emissions Reduction Investments: An Investors' Marginal Abatement Cost Curve for Kazakhstan
Ukraine	Public transport (modernized buses)	1%	Greenhouse gas abatement in Ukraine
Ukraine	Passenger Road transport (increased fuel efficiency, hybrid and electric vehicles, LPG)	25%	Greenhouse gas abatement in Ukraine
Ukraine	Freight Road transport (increased fuel efficiency, preventative maintenance)	1%	Greenhouse gas abatement in Ukraine
Kenya	Improved passenger stock	3.2%	Kenya's Climate Change Action Plan: Mitigation

Country	Measure	%	Source
Kenya	Improved HDV stock	4.2%	Kenya's Climate Change Action Plan: Mitigation
Kenya	Biofuel	9.2%	Kenya's Climate Change Action Plan: Mitigation
Kenya	Public Transport	15.3%	Kenya's Climate Change Action Plan: Mitigation
Kenya	Freight shift to Rail	4.2%	Kenya's Climate Change Action Plan: Mitigation
Philippines	Traffic Management	1.5%	A Strategic Approach to Climate Change in the Philippines
Philippines	Congestion Pricing	1.3%	A Strategic Approach to Climate Change in the Philippines
Philippines	BRT	4.9%	A Strategic Approach to Climate Change in the Philippines
Philippines	I&M	2.6%	A Strategic Approach to Climate Change in the Philippines
Philippines	Biofuels	18.3%	A Strategic Approach to Climate Change in the Philippines
Philippines	Road Maintenance and Improvement	2.7%	A Strategic Approach to Climate Change in the Philippines
Chile	Oil Up	8.20%	ForFITS
Chile	Shift	0.50%	ForFITS
Chile	Tech	6.30%	ForFITS
Mauritius	Continuous climb and descent operations for aviation	0.10%	Mauritius Aviation Action Plan
Global	Slow Steaming	0.5%	Smarter Steaming Ahead Policy options
Global	Slow Steaming	3%	Costs and benefits of regulated slow steaming & Emission reduction potential in shipping
Global	Slow Steaming	2%	Report: Slower steaming could cut ship emissions by 15%
Global	Subsidy Removal	11%	IISD Global Subsidies Initiative – Fossil Fuel Subsidies
Global	Subsidy Removal	13%	IEA World Energy Outlook Special Report, Energy and Climate Change
Thailand	VKT based taxation	6%	Trends in Thailand CO2 emissions in the transportation sector and Policy Mitigation
Thailand	Establishment of standards on fuel consumption in modern cars	4%	Trends in Thailand CO2 emissions in the transportation sector and Policy Mitigation
Thailand	Scrappage of old Cars	3%	Trends in Thailand CO2 emissions in the transportation sector and Policy Mitigation
Thailand	Speed limit on highways and motorways	3%	Trends in Thailand CO2 emissions in the transportation sector and Policy Mitigation
Thailand	Minimize empty journeys of trucks	3%	Trends in Thailand CO2 emissions in the transportation sector and Policy Mitigation
Thailand	Reforms of bus operations (bus lanes, ITS and Smart	6%	Trends in Thailand CO2 emissions in the transportation sector and Policy Mitigation

	Card, central administration center and quality improvement)		
Thailand	electric trains for mass transportation systems	**5.8%**	Trends in Thailand CO2 emissions in the transportation sector and Policy Mitigation
Thailand	promote the use of environmentally friendly cars	**2.5%**	Trends in Thailand CO2 emissions in the transportation sector and Policy Mitigation

Table 23: Sources for Quantifying Emissions Reduction Potential of Quick Wins