# Project Information Document (PID)

Concept Stage | Date Prepared/Updated: 07-Nov-2022 | Report No: PIDC34401

## BASIC INFORMATION

### A. Basic Project Data

| Country | Project ID | Parent Project ID (if any) | Project Name |
|---|---|---|---|
| Peru | P178842 | | Lima Traffic Management and Sustainable Transport (P178842) |
| Region | Estimated Appraisal Date | Estimated Board Date | Practice Area (Lead) |
| LATIN AMERICA AND CARIBBEAN | Mar 13, 2023 | May 23, 2023 | Transport |
| Financing Instrument | Borrower(s) | Implementing Agency | |
| Investment Project Financing | MEF | ProTransito (Metropolitan Municipality of Lima) | |

Proposed Development Objective(s)

To increase transport system efficiency, environmental quality, and road safety in the intervention areas of the LMA.

## PROJECT FINANCING DATA (US$, Millions)

### SUMMARY

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|---|---|
| **Total Project Cost** | 169.20 |
| **Total Financing** | 100.00 |
| of which IBRD/IDA | 100.00 |
| **Financing Gap** | 69.20 |

### DETAILS

**World Bank Group Financing**

| | |
|---|---|
| International Bank for Reconstruction and Development (IBRD) | 100.00 |

| Environmental and Social Risk Classification | Concept Review Decision |
|---|---|
| Substantial | Track II-The review did authorize the preparation to continue |

## B. Introduction and Context

Country Context

1.  **Peru's gross domestic product (GDP) growth and poverty reduction slowed down markedly after the end of the commodity boom**. Between 2002 and 2013, Peru grew at an average rate of 6.1 percent per year. This high-growth period was supported by both external conditions and certain domestic factors. On the external side, high commodity prices favored Peru, a major exporter of minerals. On the domestic side, macro stability, manifested by a favorable fiscal position and low inflation, as well as trade and financial openness, generated confidence in investors. However, between 2014 and 2019, mining prices were less favorable, and growth slowed to an average of 3.1 percent per year. Similarly, after an outstanding improvement in welfare indicators seen since the early 2000s, progress in poverty and inequality reduction slowed down after 2013–14 due to a less favorable external context and lower economic growth. While a million people escaped poverty annually, on average, between 2004 and 2013, only 90,000 did so between 2014 and 2019.[1] Moreover, in 2019, poverty was 1.5 times higher among indigenous groups than among non-indigenous groups.

2.  **The COVID-19 shock led to a deep economic recession, reversing over 10 years of progress in poverty reduction.** Peru's economy contracted by 11 percent in 2020—the second sharpest in the region. Between 2020 and 2021, accumulated growth was close to zero percent, even with export prices rising again. The economic contraction induced by the COVID-19 shock led to an increase in the national poverty rate of 10.1 percentage points, reaching 30.1 percent, despite the roll-out of generous emergency cash transfers that mitigated a further poverty increase of 4 percentage points. The relative size of the middle class also fell dramatically, from 36.7 percent in 2019 to just 24.7 percent in 2020. The progress achieved in reducing inequality since 2014 was more than reversed due to the shock. These impacts were driven by a severe labor market shock, with 2.4 million jobs lost in 2020 and an increase in informality. The shock was more pronounced for women, who lost their jobs disproportionately, as they were more represented in the industries hardest hit by the pandemic. In 2020, the National Institute of Statistics and Informatics (Instituto Nacional de Estadistica e Informatica, INEI) estimated that female labor force participation dropped by 10 percentage points, while male labor force participation – by 6 percentage points.

3.  **While the contribution of total factor productivity to growth was low but positive in 2002-2013, between 2014 and 2019, on average, it was negative**, counteracting the positive effect of labor growth and capital accumulation. Also, in 2020–21, changes in total factor productivity undermined economic growth by reducing it by 1.1 percentage points.

4.  **Spatial disparities persist as one of Peru's main structural challenges, and developments since the mid-2010s reveal additional pressure points for urban areas.** The trend of the urbanization of poverty continues. In 2009, 46 percent of the poor lived in urban areas. This increased to 51 percent in 2015 and 57 percent in 2019. The COVID-19 shock exacerbated this trend, as it hit urban areas the hardest: poverty rose sharply in the Lima Metropolitan Area (LMA) and other urban areas in 2020, from 14.6 percent in 2019 to 22.3 percent in 2021, compared to rural areas where the poverty rate has returned to its pre-pandemic level of 40 percent.[2] Beyond the COVID-19 impact, this trend is also driven by demographic shifts. Internal migration has served, to some extent, as an adjustment mechanism for territorial gaps, as migrants move from poorer to richer areas. Those that migrate tend to be better off than those left behind. Between 2015 and 2020, net migration to the Lima region (Departamento*)* represented almost 30 percent of the average annual population growth

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[1] Estimates based on national poverty rates from INEI, and total population based on Estimates and Projections of the Total Population from INEI.
[2] Calculations based on the national poverty rate estimated by the National Household Survey's (Encuesta Nacional de Hogares, ENAHO).

during that period. In addition, there has been a sharp increase of Venezuelan migration to Peru over the past seven years, predominantly to urban areas. While in 2015 Peru hosted around 7,000 Venezuelan migrants, by 2022 the number had reached an estimated 1.32 million, one million of them having settled in the Lima region.[3]

5. **The country's economic institutions and the public financial management system at the national level have been resilient to recent political instability and are recognized as efficient. However, state capacity in other sectors remains limited, affecting the delivery of high-quality infrastructure and services.** Key macro-fiscal institutions like the Ministry of Economy and Finance (MEF) and the Central Bank have remained immune to the crisis like "islands of effectiveness"[4], which to some extent could be explained by the high capacity and continuity of experienced career staff. Further, the public financial management framework at the national level is consistent with international standards, budgeting practices meet most of the principles of the International Monetary Fund's Fiscal Transparency Code at a good or advanced level, and the country ranks 76 out of 100 in the Open Budget Survey, above most of its regional peers. Meanwhile, the low performance in public investment management, lack of coordination between different levels of government, and capacity gaps in the civil service are some of the key challenges. According to a recent survey conducted by the MEF,[5] 90 percent of the civil service staff have capacity gaps and require training, the situation being especially serious among regional and local governments.

6. **Peru has made significant progress in advancing gender equality over the past two decades; however, Peruvian women could benefit from improved accessibility to better jobs.** Data shows that even if Peru leads the Latin American region in terms of female labor force participation, exceeding 70 percent, the quality of jobs among women is lower than among men. Women are underrepresented in wage employment (38.3 percent of women compared to 53.2 percent of men), overrepresented in informal employment (a difference of 5 percentage points), and overrepresented in non-remunerated family work.[6]

7. **Peru's transport infrastructure is very exposed and vulnerable to climate impacts, requiring better adaptation strategies to improve the efficiency of respond to climate events (emergency response).** During the 2003–19 period, Peru was affected by 61,708 emergencies caused by natural hazards (intense rains, floods, droughts, earthquakes, and landslides). For example, in the El Niño Costero floods of 2017,[7] 46 percent of the road network and 759 bridges were damaged, and 18 percent of the road network and 449 bridges were destroyed, with annual national losses estimated at US$4 billion. Climate change will intensify these events with maximum monthly rainfall projected to increase by between 15 and 25 millimeters and maximum temperature by between 0.8 and 2.0°C by 2050.[8] Recent natural phenomena—such as El Niño—have shown that insufficient preparation and response capacity at the subnational level are still issues: only 13 regions (52 percent of the total), 28 provinces (14 percent) and 39 districts (2 percent) have disaster prevention plans. In the El Niño Costero floods of 2017, Lima was the region with the second largest number of districts under emergency (145 districts), and 17 out of these districts were in the urban area of the LMA.

[3] Venezuelan migrants have mainly settled in the northern Coastal Regions of Peru, the geographical area closest to the point of entry by land into the country, as well as Lima. Specifically, the Regions of Tumbes, Piura, La Libertad, and Lima host the highest number of Venezuelans.

[4] Bryan Levy, *Working with the Grain* (Oxford, UK: Oxford University Press, 2014), https://workingwiththegrain.com/.

[5] MEF, "Diagnóstico de conocimientos (SERVIR)," 2020.

[6] Rubiano Matulevich, E.C. & Galeano Servian, D.M, "Peru: Country Gender Scorecard (English)," LAC Country Gender Scorecards FY22, World Bank Group, Washington, DC, 2021, http://documents.worldbank.org/curated/en/596511645685683159/Peru-Country-Gender-Scorecard.

[7] INDECI 2017.

[8] World Bank, "Peru: Climate Projections," https://climateknowledgeportal.worldbank.org/country/peru/climate-data-projections

Sectoral and Institutional Context

8.  **The rapid urban development and strong immigration have not been accompanied by the provision of efficient urban transport systems and services that ensure adequate access to economic and social opportunities, particularly for the poor**. About 30 percent of Peru's population live in the LMA (10 million in 2022),[9] of whom 73 percent commute by public transport, amounting to 12.1 million daily trips, and there is limited supply to serve this demand in an efficient, safe, and inclusive manner. The conventional bus transit system includes 560 routes operated by some 32,000 buses, minibuses, and vans. Modern mass transit service is limited to two corridors—Lima's Bus Rapid Transit (BRT), called Metropolitano, and Metro Line (ML) 1—both carry about 1 million trips per day. The Metropolitano BRT line began commercial operation in 2011 with a 26 kilometers (km) north-south corridor and is now being extended by 10 km to the north, with World Bank financial support.[10] ML 1,[11] a 34.6 km north-south elevated rail transit line (with a different alignment than the Metropolitano) began commercial operations in 2010. Nearly 91 percent of LMA's commuters are still dependent on inefficient and unsafe means of public transport, sometimes requiring multiple transfers that add to the total trip cost. Among other factors, these transport gaps hamper access to services, markets, and jobs, especially for the poor. LMA's low-income households live predominantly in the urban periphery, with poor transport access to centers where jobs, education, health, and other services are concentrated. Consequently, they must make a considerable investment in terms of time and out-of-pocket expenses to reach these destinations, which is often unaffordable or unrealizable due to time and budget constraints. Improving transport access to economic and social opportunities, especially for low-income population and women (as discussed below), is therefore a top investment and policy priority.

9.  **As a result of the COVID-19 pandemic, part of the population has shifted to lower-occupancy transport modes, including personal cars, worsening LMA's traffic congestion, environmental pollution, and road safety.** The latest data from a perception survey conducted before and during the pandemic (not a strictly representative travel behavior survey for the LMA) suggest that 20.9 percent of the population during the pandemic traveled by minibus (combis) or vans (coasters) compared to 29 percent pre-pandemic, 18.4 percent walked (compared to 16.9 percent pre-pandemic), 14 percent rode the bus (compared to 19.3 percent pre-pandemic), 11.7 percent used their own personal cars (compared to 10.4 percent pre-pandemic), and 6.2 percent traveled by bicycle (compared to 3.7 percent pre-pandemic).[12] Already before the pandemic, the sum of daily trips in low occupancy vehicles (LOVs), such as formal and informal taxis, minibuses or *colectivos*, and other motor vehicles such as motorcycles (mototaxis), represented over 50 percent of total public transport trips in the LMA,[13] and major transport corridors were already severely congested. Congestion costs were estimated at 1.8 percent of Peru's GDP (El Comercio 2019),[14] and the LMA is usually ranked among the worst cities in the world in terms of traffic congestion.[15] The increase in LOV use will worsen this outlook and will also contribute to an increase in environmental pollution and greenhouse gas (GHG) emissions. In 2018, the

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[9] INEI 2022.

[10] Lima Metropolitano BRT North Extension (P170595).

[11] In December 2010, the Government of Peru (GoP), seeking to expand the mass transit network, approved the Metro Network Plan for Lima and Callao (Supreme Decree No. 059-2010-MTC), which includes five lines that increase the proposed length of the total metro network to 168 kilometers. The Lima Metro Line 2 (ML 2) is under construction with support from International Financial Institutions (IFIs). Lima Metro Line 3 (ML 3) and Metro Line 4 (ML4) are both currently at conceptual stage.

[12] Lima Como Vamos, "Informe urbano de percepción ciudadana en Lima y Callao 2021," https://www.limacomovamos.org/wp-content/uploads/2021/12/EncuestaLCV2021.pdf.

[13] Transitemos Foundation, 2017.

[14] According to Transitemos (2019), 38 percent of the working class loses 90 minutes per day during commuting because of congestion.

[15] See analyses by INRIX, TomTom, Moovit.

World Health Organization (WHO) recognized Lima as a city with a high degree of environmental pollution, including in terms of poor air quality and high noise levels.

10. **Road traffic fatalities and injuries in Peru and the LMA are worsening as the motorization rate increases, also affecting human capital and productivity.** In the years before the pandemic, around 100,000 traffic incidents were officially recorded every year in Peru, and over 3,500 people lost their lives in the 29,000 registered traffic incidents involving fatalities.[16] The WHO suggests that this number could be an underestimation and that traffic fatalities in Peru were higher, at around 4,300 annually. In 2021, 3,032 traffic deaths were officially reported in the country, and 349 of those were in the LMA.[17] Of those fatalities, more than half (52.7 percent) were pedestrians, 22.9 percent were motorcyclists, and 4.9 percent were cyclists.[18] In addition to the toll exacted on human health and well-being, road traffic incidents also result in increased morbidity and mortality-related lost productivity, property damage and destruction, legal and judicial costs, and out-of-pocket and public health care expenditures. The socio-economic costs of road deaths, serious injuries, and disabilities have a disproportionate impact on the poor and other vulnerable urban transport users who tend to walk or use bicycles or motorcycles. Road safety issues are estimated to cost the equivalent of 4.6 percent of Peru's GDP every year.[19]

11. **Women bear a disproportionate burden in terms of the availability, safety, and personal security of urban transport infrastructure and services, which may prevent them from accessing certain economic and social opportunities.** According to Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ, the German agency for international cooperation), 93 percent of women in the LMA rely on public transport, especially women that work outside their homes. Public transport systems are a major topic of concern, as almost 70 percent of female passengers are reported to have been sexually harassed, according to a study carried out by the Thomson Reuters Foundation and YouGov[20] and confirmed by more recent official data from the Ministry of Transport and Communications (MTC). Women in the LMA do not feel comfortable riding conventional transit services and therefore avoid using them, which reduces their ability to access economic and social opportunities. Women are disproportionally affected by the lack of available transport options[21] given their daily schedules and, on average, lower incomes and decision making within the household. Together with gender norms and time poverty, transport deficiencies add to the list of factors that discourage women from joining the wider labor market, forcing them into parttime, low-wage jobs nearer home, or encouraging them to opt out of paid work altogether.[22] For instance, when looking for a job, women often prefer job proximity over job quality, taking up opportunities that are informal but closer to home and have flexible hours and that release them from the burden of traveling longer distances using transport services that are unavailable, expensive and unsafe.[23] Women in the LMA have been found to be willing to pay 30 percent more than men to save time in public transport.[24]

12. **Bicycle use in the LMA has increased since the start of the COVID-19 pandemic even though there are around 300 km of bicycle lanes that are unconnected and have poor-quality infrastructure design and**

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[16] INEI, "Accidentes de Transito,": https://m.inei.gob.pe/estadisticas/indice-tematico/traffic-accidents/

[17] The traffic fatalities are 3.5 per 100,000 habitants in the LMA. This rate is lower than the one in other cities of the region, such as Bogota (7.2), Mexico City (10), Fortaleza (14), and Guadalajara (24), and similar to the one in Buenos Aires (3.7). However, the reason could be an underestimation in the official data.

[18] Observatorio Nacional de Seguridad Vial, Dirección de Seguridad Vial del MTC, 2021. https://www.onsv.gob.pe/

[19] This is an unofficial Global Road Safety Facility (GRSF) estimate.

[20] Thomson Reuters Foundation and YouGov (2014). Of the 16 cities analyzed in the study, Lima's public transport system was ranked as the third-most unsafe for women.

[21] In addition to the personal security issue, most of the public transport services are designed based on the needs and travel patterns of men (commuting trips). Many women tend to have different travel patterns, with different trip purposes and destinations, and find fewer transit services that serve their needs.

[22] Dominguez, et.al. "Why does she move? A study of women's mobility in Latin American cities?. 2020," Washington: World Bank: https://openknowledge.worldbank.org/handle/10986/33466

[23] Ibid.

[24] Data from an upcoming World Bank analytical work that surveyed women in the LMA.

**unsafe intersections.** The use of bicycles in the LMA rose from 3.7 percent of total trips before the pandemic to 6.2 percent in 2021[25] (from perception surveys, the actual mode share might be 50 percent lower). Women account for just 18 percent of the bicycle users in the LMA.[26] There are currently around 300 km of bicycle lanes, not connected, and few of them serving as last-mile connections to mass transit stations, and just a handful of BRT stations have integrated bike parking facilities.[27] Despite recent achievements (in 2019 there were 200 km of bike lanes), there is still a long way to go to improve the conditions of LMA's cycling infrastructure in order to consolidate a connected, low-stress network and make it more gender-inclusive. Addressing road safety at key intersections along arterial avenues and collector streets is important to consolidate the growth in cycling demand, particularly for women and people of all ages and abilities. Another key step is to provide safe last-mile bicycle infrastructure connectivity to mass transit stations, schools, markets, and key public space destinations.

13. **The National Government and the Metropolitan Municipality of Lima (MML) have undertaken significant efforts in recent years to improve the governance and institutional context for transit service provision, traffic management, and road safety in the LMA.** In December 2018, Law No. 30900 created the Lima-Callao Urban Transport Authority (Autoridad de Transporte Urbano para Lima y Callao, ATU). ATU's principal legal mandate is to conduct the institutional, operational, physical, and fare integration of transit systems and implement a financial sustainability strategy for the integrated transit network in Lima and Callao. Traffic management is still under the mandate of the MML and the Callao Provincial Municipality. In 2016, to improve traffic management at intersections, the MML created ProTransito,[28] a special project agency for optimizing, modernizing, and integrating LMA's traffic management and control systems around a modern Traffic Control Center (TCC). In terms of road safety, in 2017 the MTC adopted the Strategic National Plan for Road Safety.[29] Two years before, in 2015, the National Road Safety Observatory (Observatorio Nacional de Seguridad Vial, ONSV) had been created to coordinate efforts around the collection of systematized and homogenized data on fatal and non-fatal traffic injuries in the country.

14. **In recent years, the traffic management system in the LMA has been partially modernized, but the investment gap is still substantial and there is a need to comprehensively address technological challenges.** Since 2017, the MML, through ProTransito, has been implementing an Integrated Traffic Management Plan to improve traffic management in the LMA's intersections, mainly by modernizing and integrating existing traffic lights under the TCC (centralizing). As of today, there are 751 intersections (49 percent) centralized with the TCC in the LMA out of a total of 1,532 intersections with traffic lights. The MML manages 1,461 intersections (95 percent) of the total while the other 71 intersections (5 percent) are managed by ATU for the operation of the BRT Metropolitano corridor. Out of the 1,461 intersections managed by the MML, 710 are managed by the Urban Mobility Department (Gerencia de Movilidad Urbana, GMU) with substantial technological limitations: intersections are not centralized with the TCC, and there are issues with the interoperability of traffic controllers' protocols and capacity of communication systems, among others (see annex). In addition to the challenge of modernizing existing traffic light intersections managed by MML-GMU and integrating them to the TCC to be managed by ProTransito, there is a need to expand the system's coverage to approximately 3,000 intersections.[30] Given the separation of responsibilities among these entities (ProTransito, ATU, GMU), existing traffic light solutions differ in terms of architecture (not all intersections are

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[25] Lima Como Vamos, "Informe urbano de percepción ciudadana en Lima y Callao. 2021"
[26] Observatorio Nacional de Seguridad Vial, Dirección de Seguridad Vial del MTC, 2021.
[27] World Bank, "Integración de transporte público masivo e infraestructura ciclista en Lima, 2021" elaborated by Steer.
[28] Decree No. 017 of December 30, 2016.
[29] Supreme Decree No. 019-2017-MTC.
[30] The World Bank is providing technical assistance to evaluate and estimate the investment gap of expanding the LMA's traffic management system. The results will be available at the appraisal stage of the operation.

centralized) with lack of coordination and inefficiency. Moreover, the traffic management system implemented by ProTransito includes three different traffic management applications that integrate traffic controllers from different suppliers.

15. **Besides technological issues, traffic management in the MML has been influenced by a principle of motorized traffic flow efficiency rather than road safety concerns.** ProTransito's planning, prioritization and implementation of interventions have not been informed by the Safe Systems approach to road safety. In line with the recently adopted sectoral strategies and plans for road safety in the MML (as presented below), these interventions need to include a comprehensive scope of adequate geometric street design and signaling to prioritize pedestrians, cyclists, and transit. Many of the LMA's intersections and streets still lack proper signaling to protect vulnerable users or to manage speed limits, and the MML does not adequately leverage the use of data analytics to inform and guide road safety interventions.

16. **Peru's per capita GHG emissions have been growing rapidly, driven by the transport sector and the vehicle fleet of the LMA.** Total emissions in Peru increased by 79 percent between 1990 and 2018, compared to an overall growth of 13 percent in the Latin America and the Caribbean (LAC) region. Transport is the fastest-growing sector in terms of emissions due to motorization trends: 44 percent growth of the vehicle fleet[31] and 123 percent growth in emissions between 2000 and 2016. 92 percent of the transport GHG emissions came from road transport, which are concentrated in the LMA with more than half (52 percent) of the national vehicle fleet.[32]

17. **With the support of the World Bank and other international financial institutions, the Government has initiated a number of actions to address some of these sectoral challenges:**

● **Developed by the MML and the Ministry of Housing, Construction and Sanitation (Ministerio de Vivienda, Construcción y Saneamiento, MVCS), the city council recently approved LMA's Metropolitan Development Plan 2040 (PLANMET 2040)[33] that guides and regulates sustainable urban development in metropolitan Lima.** PLANMET 2040's urban planning proposal comprises a number of instruments for land use regulation, urban mobility systems, open spaces, urban facilities, and urban infrastructure, among other things. It includes as one of its strategic objectives the implementation of traffic calming zones in areas that require urban regeneration due to the impact of metropolitan traffic (Strategic Objective 9.2), and the integration of bicycle infrastructure with transit and the implementation of a bike-share system (Strategic Objective 9.1). Under the same strategic objective for road safety, emissions, and congestion (Strategic Objective 9.2), PLANMET 2040 calls for the implementation of the TCC with an integrated network of traffic lights in coordination with local district municipalities. These strategic objectives and interventions from PLANMET 2040 are also aligned with the upcoming MML's Road Safety Plan for 2022–24.

● **In 2020, the World Bank provided analytical and advisory support to the MML with the proposal to update the Bicycle Infrastructure Plan and develop a connected bicycle network of 1,383 km by 2040**.[34] The Bank support also included a proposal to adopt a Bicycle Strategy with policy recommendations to promote its use, particularly among women.[35] The Bicycle Infrastructure Plan also focused on bringing value added in terms of urban transport multimodal integration (bicycle and public transport) with last-mile connectivity

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[31] MTC, General Office of Budget and Planning. Data does not include motorcycles.

[32] GIZ, "Sistematización de la estimación del parque vehicular de transporte terrestre circulante a nivel nacional. Estimación por principales ciudades," 2019.

[33] Approved on September 14, 2022, by Ordinance No. 2499-2022.

[34] World Bank, *Propuesta de actualización del Plan de Infraestructura Cicloviaria para Lima y Callao* (Washington, DC: World Bank, 2020), https://documents1.worldbank.org/curated/en/294041589874919754/pdf/Propuesta-de-actualizacion-del-Plan-de-Infraestructura-Cicloviaria-para-Lima-y-Callao.pdf.

[35] World Bank, *Propuesta y recomendaciones para la formulación de una estrategia para la Bicicleta en Lima Metropolitana*. (Washington, DC: World Bank, 2020), https://documents1.worldbank.org/curated/en/804721589870386400/pdf/Propuesta-y-recomendaciones-para-la-formulacion-de-una-estrategia-para-la-Bicicleta-en-Lima-Metropolitana.pdf. Note: The proposal is still pending formal approval.

improvements and bike parking facilities in existing and future mass transit stations. The plan and the strategy aimed to increase the bicycle mode share in the LMA to 12 percent and reduce GHG emissions by 0.64 metric tons of carbon dioxide equivalent (MtCO2eq) per year by 2030. The Plan supported the MML's COVID response approach for pop-up bike lanes during the pandemic, adding almost 100 km of new bike lanes during these two years. Currently there are around 300 km of unconnected bicycle lanes and an additional 114 km will be built with grant resources from the German government by 2024 (an agreement was signed in 2021 between the MML and the German state-owned investment and development bank, KfW). The KfW funds will only finance bike lane infrastructure, and the MML needs to find other sources to finance the dedicated bicycle traffic light systems along these new bike lanes, as well as road safety improvements at intersections to ensure low-stress continuity for cyclists.

- **In 2021, the ONSV published, for the first time, in collaboration with the Traffic Division of the National Police, georeferenced and standardized data of traffic fatalities for the whole country.** The ONSV also launched a pilot in one of the 43 districts of the LMA covering data for 2021, including on non-fatal traffic injuries. Data originating from the ONSV represent a first step toward having a reliable baseline for road safety in the LMA and will inform relevant measures and focalize interventions, especially at intersections with a high traffic fatality risk.

- **Peru's GHG emissions mitigation efforts have been increasing, as demonstrated by its latest Nationally Determined Contribution (NDC) and the country's commitment to achieve carbon neutrality by 2050.** The targets for GHG reduction set in the first NDC implementation plan (NDC-PI) with respect to the business-as-usual scenario were increased in the latest NDC submitted in December 2020, from 20-percent to 30-percent reduction by 2030 for the unconditional target, and from 30-percent to 40-percent reduction for the conditional goal. Peru's NDC adaptation measures were reinforced in the National Adaptation Plan[36] released in June 2021, which for the first time identified transport and tourism as priority sectors, along with agriculture, water, forests, fisheries and aquaculture and health.

18. **A comprehensive and programmatic approach to improving traffic management to support sustainable transport in the LMA has the potential to address these sectoral challenges and contribute to the decarbonization of the urban transport sector in Lima, as well as to its adaptation.** Many of the LMA's intersections and streets still lack proper signaling to protect vulnerable users or to manage speed limits, and the MML does not adequately leverage the use of data analytics to inform and guide road safety interventions. The improvement of the city's traffic management system represents both a major challenge and an important opportunity to support sustainable urban transport operations. Improving traffic management in the LMA, where the majority of these road-transport-related emissions are concentrated, will have the potential to contribute to the country's NDC targets and commitments to achieve carbon neutrality by 2050. The strategy of integrating traffic operations and road safety to prioritize transit and non-motorized transport (NMT) is expected to leverage service improvements that in turn can promote a modal shift from personal motorized vehicles or LOV to low-carbon transit systems and active modes, including cycling. Achieving LMA's ambitious decarbonization objectives in the sector will require sustained and sizable public resources over a long period of time, including investments for the: (i) extension of the bicycle network; (ii) improvements of the BRT system; and (iii) integration of the bicycle and mass transit infrastructure. An integrated traffic management system in the LMA could also improve the efficiency of response to climate events (emergency response) and significantly reduce the potential economic losses of future natural hazards.

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[36] Ministerial Resolution No. 096-2021-MINAM of June 9, 2021: https://www.gob.pe/institucion/minam/normas-legales/1955977-096-2021-minam

Relationship to CPF

19. **The proposed Program is aligned with the draft Country Partnership Framework (CPF) for Peru (FY23-FY27).** The Program Development Objective (PrDO) of the proposed Multiphase Programmatic Approach (MPA) contributes to increasing safe, green, and gender-inclusive urban transport access to job opportunities in the LMA, along with sound traffic management for efficient operations. The MPA program is relevant for the High-Level Objective (HLO) 1, "Increased access to quality economic opportunities for workers and entrepreneurs" (potential to contribute to the HLO1 indicators of "proportion of workers with formal jobs" and "average labor productivity" in the LMA); Objective 2, "Expand access to services to and quality of public services"; and Objective 3, "Strengthen institutional capacity and effectiveness at national and subnational levels", as well as HLO3, "Increased resilience to shocks. The Program will also contribute to strengthening institutional capacity in the MML and the coordination between the different authorities involved in urban transport planning and provision, traffic management, and road safety. By supporting the consolidation of growth in NMT and making the urban transport system safer and more inclusive, the Program also has the potential to contribute to HLO3—"Increased resilience to shocks," an indicator of GHG emission intensity—as it increases the modal share of sustainable and greener modes of transport in the LMA.

20. **The proposed Program is fully aligned with the World Bank's twin goals; the Green, Resilient and Inclusive Development (GRID) framework; the World Bank's Climate Change Action Plan (CCAP); and the Latin America and Caribbean RoadMap for Climate Action.** It supports the reduction of urban poverty and contributes to shared prosperity by improving the transport mobility and access of those socioeconomic groups that disproportionately rely on transit, walking, and cycling to access job and educational opportunities. The Program contributes directly to each dimension of the GRID, including by investing in sustainable transport (Green), risk reduction (Resilient), and access to infrastructure (Inclusive). The Program focuses on climate adaptation and mitigation in two of the five key systems prioritized in the CCAP ("Transport" and "Cities"), and directly addresses one of the main pillars of transitioning the transport system ("Mobility and Access"). Additionally, it will contribute to the decarbonization of the urban transport sector in Lima, in line with the recommendations of the recently completed LAC RoadMap and Peru's Country Climate and Development Report (CCDR), which identifies investments and prioritization of mass transit and bicycle infrastructure as a key strategy to achieve carbon neutrality by 2050. The Program will reduce GHG and local pollutant emissions by increasing active mobility mode share and by reducing inefficient motor vehicle circulation and congestion along key corridors and local streets.

21. **The proposed Program will also contribute to the removing constraints for more and better jobs and enhancing women's voice and agency, in alignment with the pillars of the World Bank's 2016–23 Gender strategy.**[37] As explained above, by increasing access to safe and gender-inclusive bicycle infrastructure, the Program will support closing the gap on the use of this sustainable mode of travel among LMA's female residents. The Program will develop and adopt gender-sensitive citizen engagement mechanisms to promote best practices for gender-inclusive cycling infrastructure to reduce the gender gap among bicycle users. Finally, the Program will support the MML in identifying the barriers and root causes of women's underrepresentation in the managerial and technical positions of the MML's agencies in charge of planning, designing, and implementing traffic management and road safety interventions for active mobility.

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[37] World Bank, "Gender Strategy 2016–23: Gender Equality, Poverty Reduction, and Inclusive Growth," 2016: https://documents1.worldbank.org/curated/en/820851467992505410/pdf/102114-REVISED-PUBLIC-WBG-Gender-Strategy.pdf

## C. Proposed Development Objective(s)

To increase transport system efficiency, environmental quality, and road safety in the intervention areas of the LMA.

Key Results (From PCN)

22. **Phase 1 of the MPA aims to increase transport system efficiency, environmental quality, and road safety in the intervention areas of the LMA.** Phase 1 will partially close the gap of integrated and modernized traffic lights, implement a revamped TCC, and improve road safety at intersections —targeted to transit and bicycle corridors— including through speed management and traffic calming. The improvements of the traffic management system will also support future road capacity dynamic charging schemes (e.g., on-street parking and dynamic congestion charging) to generate new revenue sources and improve the sustainability of Program investments.[38] The following phases of the MPA will continue to close the gap of integrated traffic lights, close the investments gap of the Bicycle Infrastructure Plan, improve existing mass transit infrastructure and services (Metropolitano BRT), and support the integration of bicycle infrastructure and public transport, including services such as bike-share systems and bike parking facilities at mass transit stations. The Program will also help ProTransito improve its managerial and financial autonomy and therefore its ability to rapidly respond to external shocks, as well as to strengthen MML's road asset management capacity to improve the reliability of its infrastructure in the long run, better serving the priorities for urban transport set by ATU.

23. The PDO-level indicators and some of the proposed intermediate indicators for MPA Phase 1 are listed below.

*Proposed PDO Indicators for MPA Phase 1*

*Transport system efficiency in the intervention areas:*
  – Travel efficiency (congestion index) in the intervention areas.

*Environmental quality in the intervention areas:*
  – Active mobility trips (walking and cycling) in intervention areas, disaggregated by gender.
  – Concentration of local pollutant emissions in the intervention areas.
  – Urban transport related GHG emissions savings in the intervention areas.

*Road safety in the intervention areas:*
  – Traffic fatalities and serious injuries in the intervention areas, disaggregated by gender and travel mode/type of victim.

*Some proposed intermediate outcome indicators for MPA Phase 1*

  – Areas of interventions following universal accessibility international standards, including urban furniture, pedestrian crossings, lighting, traffic lights, etc. (*disability-inclusive design*)
  – Number of attendees of workshops; citizen engagement and communications activities, and trainings activities (*institutional capacity and citizen engagement*)
  – Number of motorized vehicles exceeding the maximum speed limit in the intervention areas (*compliance with road safety regulations*).

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[38] The Bank is conducting analytical and advisory services to support the MML in the identification of enabling conditions and policy options for these new revenue generation sources and improve the sustainability of the Program investments.

## D. Concept Description

24. **Phase 1 will consist of the following components that will continue to be implemented under the following phases until the investment gap of each component is closed:**

25. **Component 1: Expansion and modernization of the traffic light system (US$ 90.4 million financed by the International Bank for Reconstruction and Development [IBRD]).** The intersections covered by Component 1 will receive field equipment, which will allow for better traffic management to increase road safety and travel efficiency. This includes centralized modern traffic lights for vehicles, pedestrians, and cyclists; sensors; controllers; 360° rotating cameras for traffic control; braille plates and acoustic repeaters; and variable messaging panels. Component 1 consists of 10 investment projects already deemed feasible by Invierte.pe and with the Unique Investment Code (Código Único de Inversiones, CUI),[39] including 565 intersections in 20 LMA districts. These intersections have been prioritized to cover major transit corridors and the existing and projected bike lane infrastructure in the LMA. The interventions will also include improvements of intersection geometry, signaling and street demarcation for those intersections where pedestrian and cyclist flows conflict with motorized traffic in the primary (metropolitan) road network. Finally, as part of project preparation, the potential for the integrated traffic lights system to enhance disaster emergency response in LMA will also be evaluated and concrete recommendations for next steps will be provided (such as in terms of protocols and capacity building needs for ProTransito). Overall, Component 1 will reduce traffic congestion, improve travel times (including for public transport users), reduce environmental pollution, and improve road safety for vulnerable transport users (pedestrians and cyclists). By improving the traffic conditions and safety for public transport and NMT users, the Component will contribute to mode shift from private motorized vehicles to these sustainable modes, consolidating the growing bicycle trips in particular, and thus result in a reduction in GHG emissions. By improving disaster and emergency response, the Component will also contribute to climate adaptation.

26. **Component 2: Implementation of an automated Traffic Violation Detection and Control System (US$17.3 million financed by the IBRD).** Component 2 will implement an automated traffic violation detection and control system that will allow authorities to identify and fine vehicle owners not complying with traffic regulations, such as traffic lights, maximum speed limits, illegal parking, and the use of dedicated or segregated bus lanes. The main focus of this system is to change driving behavior by concentrating on speed, the most important risk factor of traffic fatalities. The component will support the implementation of a network of 1,545 cameras in 303 centralized intersections, equipping those intersections with an automated detection system to register traffic violations, as well as the associated vehicle information. These will be located at places with high road safety risks and on the main public transport and bike lane corridors. The component will finance the management system for video detectors, a violation management system (software), the cinemometers (speed control cameras), and equipment for the revamped TCC to accommodate the new violation detection and control systems, training, and supervision of works and deployment of systems. The focalization of cameras for the Automated Traffic Violation Detection Control System will be assisted by the newly developed ONSV, which since 2021 is reporting georeferenced data of traffic incidents in the LMA, disaggregated by sex and mode of travel to inform road safety public policy. Component 2 will contribute to increased road safety; the traffic violation detection and control system is expected to complement traffic management efforts and help reduce traffic congestion, improve travel times, and reduce GHG and local pollutant emissions.

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[39] Pre-investment studies for the investment project approved and declared feasible through the national system (IVIERTE.PE).

27. **Component 3: Safe streets and intersections (US$51,5 million partially financed by the IBRD).** Component 3 has three subcomponents with different intervention focus areas.

   - The first subcomponent, Promotion of Immediate Traffic Action Plans (Planes de Acciónes Inmediatas de Tráfico, PAIT), focuses on improving road safety for pedestrians and cyclists at high-conflict intersections within the primary (metropolitan) road network, through the use of roadway and public space reconfiguration.[40] This subcomponent will finance the pre-investment, design studies, and interventions for 295 preselected intersections (black spots where traffic fatalities are historically high, from the newly developed ONSV geo-database of traffic incidents in the LMA) based on their potential to improve the safety of cyclists and other vulnerable users.

   - The second subcomponent seeks to implement Traffic Calming Zones (Zonas de Tráfico Calmado, ZTC) gradually throughout the LMA's local districts, in line with PLANMET 2040's Strategic Objective 9.2 for reinforcing road safety and last-mile connectivity around key urban attractors such as health and education facilities, as well as parks and public markets. The subcomponent will finance the pre-investment and design studies, as well as the pilot implementation under a tactical urbanism approach of three to five zones in districts with varied urban environment characteristics and socioeconomic profiles. The design of public space applying tactical urbanism will include a gender perspective to improve the quality and safety of its use, especially for women. Strategies will be developed in conjunction with women organizations in Lima to promote women's usage of public space. The design will also consider options for enhanced resilience to climate events, promoting adaptation. The final selection of these zones and pilots will be confirmed during project appraisal.

   - The third subcomponent will focus on financing Complete Streets interventions and key bike/pedestrian infrastructure connections like NMT-dedicated bridges. Under MPA Phase 1, this subcomponent will finance three investment projects that are already feasible in Invierte.pe with CUI, with detailed engineering designs and environmental licenses approved by the local authority. The pedestrian facilities and associated intersections and pedestrian bridges are planned to be disability-inclusive, ensuring suitable curb and surface design to take disabled users' needs into account.

28. Overall, Component 3 will promote safety and transport efficiency for NMT users and thereby contribute to mode shift to cycling and walking from private motorized modes, resulting in reduced overall urban transport GHG and local pollutant emissions.

29. **Component 4: Program management and capacity building (US$10 million financed by the IBRD).** This component will support pending detailed engineering designs for Phase 1 projects, pre-investment studies for subsequent phases of the MPA, a comprehensive Monitoring & Evaluation program to inform the learning and feedback for subsequent phases of the MPA, specialized consultants to support MPA implementation, training and institutional capacity-building activities, and overall MPA program management with a staffed Program Implementation Unit (PIU) distributed across ProTransito, GMU, and the Municipal Toll Management Company of Lima (Empresa Municipal Administradora de Peaje de Lima, EMAPE). The component will feature a strong focus on increasing technical capacities within metropolitan and local authorities for road safety and traffic management. Engagement events, workshops, and other institutional strengthening efforts will include subjects related to the planning, design, and implementation of projects and interventions with innovative approaches related to the road safety of active mobility users. The component will also feature support across all program components for public and citizen engagement and communications strategies and campaigns. In addition, this component will finance analysis of the mobility barriers that women in LMA face for using

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[40] Intersections preselected under this component that during the pre-investment phase are deemed to also require installation of integrated traffic lights will be moved to Component 1.

bicycles and will develop a Gender Action Plan to address said barriers, including but not limited to incorporating women's priorities in the design of public spaces to be intervened by the Program, including gender based violence prevention environmental design, training of women in bicycle use, and the definition of a mechanism to present complaints of sexual harassment in spaces related to active mobility that links with existing protocols to respond to sexual harassment in public transport.

30. **Project beneficiaries and focus**. Components 1 and 2 are estimated to directly and indirectly benefit a total of 5.789 million inhabitants in 25 districts, including Villa El Salvador, El Agustino, San Juan de Lurigancho, Villa Maria del Triunfo, Ate, San Juan de Miraflores, and La Victoria, seven of the most populated and poorest according to Peru's monetary poverty indicator by district (INEI).[41] This means that approximately 45 percent of potential indirect beneficiaries are residents from poor urban families at socioeconomic levels C and D (low income), reflecting the project beneficiaries' high level of vulnerability. Component 3 estimates to potentially benefit 9.353 million inhabitants. Direct beneficiaries of the area of influence of the different interventions will be calculated during appraisal.

| Legal Operational Policies | Triggered? |
| --- | --- |
| Projects on International Waterways OP 7.50 | No |
| Projects in Disputed Areas OP 7.60 | No |

Summary of Screening of Environmental and Social Risks and Impacts

31. **The standards of the Environmental and Social Framework (ESF) applicable to Phase 1 of the MPA are ESS 1, 2, 3, 4, 6, and 8. The overall environmental and social risk rating is Substantial under the WB's ESF.** Based on the available information, the Program's environmental risk classification is considered to be Moderate. Given the nature and scale of activities, low to moderate environmental, health and safety (EHS) risks and impacts are expected under Components 1 through 3, mainly associated with the implementation of the traffic light infrastructure at high vehicular and pedestrian traffic intersections and accessibility improvement including reconstruction of existing pavement and sidewalks. These are expected to be: (i) temporary and/or reversible; (ii) not significant nor complex/large; and (iii) not expected to cause serious adverse effects to human health and/or the environment. Based on the review of available documentation, and preliminary discussions with EMAPE and Protransito, key anticipated potential EHS risks and impacts during the execution of program works, and program operation, are related to: (i) overall nuisances to communities due to noise and vibration, dust, traffic congestion, and waste generation; (ii) potential adverse impacts to houses and other infrastructures next/close to construction activities due to vibrations; (iii) occupational health and safety issues: unskilled workforce, poor labor and working conditions and risk of occupational accidents; (iii) inadequate sourcing and transportation of construction materials, as well as inadequate transportation and disposal of surplus materials from the reconstruction of pavements and sidewalks; (iv) inadequate management of e-waste generated during equipping of controllers, cameras, repeaters, and traffic lights; (v) risks of third-party accidents due to increased vehicular traffic and inadequate protection of construction sites; (vi) potential impacts on chance archaeological finds and/or cultural heritage areas; (vi) potential incremental and cumulative impacts and risks associated with other current and future projects located in the

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[41] https://www.inei.gob.pe/media/MenuRecursivo/publicaciones_digitales/Est/Lib1718/Libro.pdf

same area of intervention; and (vi) impacts on urban green areas, which in turn negatively affects local communities in terms of landscape, recreation, etc. During Program preparation potential environmental liabilities will be assessed and, if necessary, corresponding mitigation measures will be described in the Program's E&S instrument. Environmental risks of the consecutive phases of the MPA are expected to be similar to those of this first phase, considering interventions will also be located within MML districts, and are expected to be of similar nature and scope. However, environmental risks for future phases of the MPA will be assessed as part of the preparation of each of the subsequent phases, and the corresponding rating will be adjusted as and if necessary.

32. **The social risk rating is considered as Substantial because of the following factors:** (i) temporary access restrictions to areas where the civil works will be conducted, some of which may last for several months and could create adverse economic impacts for local businesses and informal mobile vendors, as well as impacts due to fiber optic installations for the traffic cameras, which involve excavations that may limit the ability of residents and business customers to move around and park vehicles in those areas; (ii) community health and safety risks, particularly in relation to the risk of increased accidents for (a) the local residents that need to move across the construction areas; (b) movement of vehicles and machinery during the construction works; and (c) risks of accidents for pedestrians and bicyclists at the road intersections, which could potentially intensify during the civil and other project works; (iii) risk of discontent and protests from certain sectors of the population with the increased levels of traffic surveillance, particularly among public transport drivers, to be enabled by the traffic cameras that may lead to increased fines for them. The key elements associated with the social risk rating are the sensitivity of some expected project locations, the diversity of social risks, and the limited capacity of the Borrower to manage the social risks of the project in accordance with the ESF. These risks are particularly intensified by a context in which some of the subprojects being considered may present a significant level of social sensitivity and risk of opposition by some neighborhood groups, as well as by high levels of traffic informality in the city of Lima, in which many drivers and pedestrians do not obey the traffic light signals and that may lead to accidents, and a context characterized by significant levels of citizen insecurity, especially for project workers. The Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) risk rating is considered to be Low.

33. To adequately address and mitigate EHS and social (EHSS) risks and impacts during the implementation of MPA Phase 1, the Borrower will prepare an Environmental and Social Management Framework (ESMF), which will validate and further assess the main EHSS risks and impacts and develop the necessary measures and procedures for their adequate management. Due to their scope and technical characteristics, interventions are not subject to the national Environmental Impact Evaluation System (SEIA). In this sense, in order to comply with the ESF, and as will be detailed in the ESMF, stand-alone specific Environmental and Social Management Plans (E-ESMPs) will need to be developed in compliance with relevant ESSs. Subprojects under subcomponents 3.2 and 3.3 already have an environmental instrument approved within the national framework. In these cases, Supplementary Environmental and Social Management Plans (S-ESMPs) will need to be developed, as preliminary assessment suggests that these existing instruments do not meet all applicable ESF requirements. The ESMPs and S-ESMPs will be drafted, consulted, finalized, adopted, and disclosed by the Borrower prior to the start of works, during project execution. In addition, the Borrower will prepare and disclose prior to Program Appraisal: (i) a draft Environmental and Social Commitment Plan (ESCP), describing the timelines and commitments for the preparation and implementation of all needed Environmental and Social (E&S) instruments, training and capacity building actions, staffing arrangements for the PIU, and other relevant E&S measures; and (ii) a Stakeholder Engagement Plan (SEP), which will incorporate a project-specific Grievance Redress Mechanism (GRM).

34. The PIU will be distributed across ProTransito, GMU, and EMAPE, and corresponding arrangements will be further defined at Appraisal. A preliminary assessment indicates that EMAPE has the ability to adequately manage the social and environmental aspects of this Program, in accordance with the national regulations, but would need specific institutional strengthening measures to reach ESF standards for this operation, considering its performance as the PIU of the WB's BRT project. Protransito's capacity to manage the environmental and social risks of the Program in accordance with the ESF is limited. This special project currently does not have social or environmental specialists and does not have a grievance mechanism either. The same applies in the case of GMU. E&S capacity of the three agencies will be further assessed during preparation, and the necessary strengthening activities identified, budgeted under C4, and reflected in the Program's ESCP.

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