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Abstract: Fiscal federalism refers to the attribution of public finance functions among different levels of government. We examine Portugal's metropolitan transportation sector through the fiscal federalist lens, in light of the country's decentralization efforts and new relevant legislation. We clarify basic principles of fiscal federalism and adapt them to the finance of metropolitan transportation systems - typically characterized by multiple jurisdictions, numerous externalities and equity concerns - showing the inadequacy of general practice. Portugal's overall public finance system partially adheres to fiscal federalist principles; the transportation sector less so. Metropolitan transportation faces particular troubles, with few direct user fees, prices inadequately reflecting costs, and heavy reliance on central government subsidies for public transportation investments and operations. A new law creating metropolitan transportation authorities is only modestly consistent with fiscal federalist principles, since it inadequately details financial responsibilities and remains under heavy central government control. Absent additional reforms, the new metropolitan authorities should aim to make the transportation finance system explicit and test incentive grants to induce inter-municipal cooperation.

Fiscal federalism and prospects for metropolitan transportation authorities in Portugal

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Highlights

- Derives general principles of fiscal federalism, adapting them to the metropolitan transportation finance context.

- Examining Portuguese metropolitan transportation through the fiscal federalist lens reveals problems with fiscal equivalency, equity, transparency, and fiscal stability.
- A new metropolitan transportation authority law will not likely ameliorate fundamental problem, due to unclear financial details.
- New authorities should begin with transport system finance analysis through the fiscal federalist lens and pilot grants for inter-municipal transport projects.

ABSTRACT

Fiscal federalism refers to the attribution of public finance functions among different levels of government. We examine Portugal's metropolitan transportation sector through the fiscal federalist lens, in light of the country's decentralization efforts and new relevant legislation. We clarify basic principles of fiscal federalism and adapt them to the finance of metropolitan transportation systems – typically characterized by multiple jurisdictions, numerous externalities and equity concerns – showing the inadequacy of general practice. Portugal's overall public finance system partially adheres to fiscal federalist principles; the transportation sector less so. Metropolitan transportation faces particular troubles, with few direct user fees, prices inadequately reflecting costs, and heavy reliance on central government subsidies for public transportation investments and operations. A new law creating metropolitan transportation authorities is only modestly consistent with fiscal federalist principles, since it inadequately details financial responsibilities and remains under heavy central government control. Absent additional reforms, the new metropolitan authorities should aim to make the transportation finance system explicit and test incentive grants to induce inter-municipal cooperation.

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1. Introduction

Fiscal federalism refers to the vertical structure of government authorities and the attribution of functions related to revenue collection and expenditures. While theoretical fiscal federalism offers well-defined principles for assigning responsibilities, in practice it faces several challenges, including institutional inertia and capacity, status quo political power and vested interests. Fiscal federalism's specific design requires transparency and flexibility, accounting for political, economic, and cultural conditions. Metropolitan transportation – which typically

crosses local jurisdictions, involves multiple institutions, introduces externalities, and requires public-sector participation – could, in theory, benefit from analysis through the fiscal federalist framework.

Portugal’s metropolitan transportation situation presents an opportune case for usefully applying the fiscal federalist optic. The sector depends heavily on central government, with discretionary annual appropriations from revenue sources un-linked to the sector or the geographic boundary of system benefits and costs. Since most of these accrue at a metropolitan scale, fiscal federalism suggests devolving administrative power and most financial responsibility to metropolitan-level institutions. While the Portuguese government has been decentralizing many services to *municipal* governments in recent years, the process has been relatively ad hoc, with municipalities attempting to do the possible with limited available mechanisms and in competition. Over the years national legislative efforts have attempted to create metropolitan-level (i.e., *inter-municipal*) administrative bodies, including for transportation. In early 2009 a new national law established the legal framework – including administrative and some financial responsibilities – for Metropolitan Transportation Authorities (*Autoridades Metropolitanas de Transportes*, or AMTs) in the nation’s two largest metropolitan areas, Lisbon and Porto.

While the AMTs were created to support the devolution of transportation administration to an “appropriate” functional level, effective AMTs will require adopting fiscal federalism. We consider this a relatively universal condition: a more fiscal federalist-consistent metropolitan-level transportation system will produce “better” outcomes. While we cannot test such a hypothesis with a single case, the Portuguese situation illuminates key issues and challenges, with the fiscal federalist perspective clarifying pathways for enhancing current reforms in

Portugal. The case may offer lessons for others grappling with similar challenges. Application of a fiscal federalist lens to the problem may offer generalizable lessons, particularly by analyzing additional cases similarly. Ultimately, we aim to show how to improve metropolitan transportation administration and performance *via* the finance system.

The next section introduces the concept of fiscal federalism and its relevance to transportation. The third section describes the context and structure of Portugal's transportation finance and administration system and analyzes it through the fiscal federalist lens. The fourth section assesses the new AMT Law, its implementation to date, and its strengths and weaknesses. We follow with a brief discussion of lessons learned and opportunities for the AMT framework to enable metropolitan transportation more consistent with fiscal federalism. A final section concludes.

2. Metropolitan Transportation Finance: Theory and Practice

The finance system plays a pivotal role in the efficiency, fiscal stability, and equity of metropolitan¹ transportation. For transportation users, prices paid should reflect relevant resource costs to society, thereby improving efficiency. For planners, a system operating with inaccurate prices will distort planning decisions (e.g., Vickrey, 1969) while an explicit and transparent user-based pricing and revenue system signals justifiable investments and ensures stable revenues. The finance system can also structure incentives for metropolitan transportation integration: among sectors, such as land use and transportation; among modes, such as private and public

¹ Here metropolitan refers specifically to an urban-regional transportation system that crosses more than one local government (e.g., municipality) boundary.

transportation; and among and between local, regional, and national governments. Finally, finance plays a key role in social equity.

2.1. Public Goods, Decentralization, and Fiscal Federalism

Public finance originates in the concept of a public good, which, in economic terms, is *non-rivalled* and *non-excludable*. In practice, few goods are purely “public.” Whether societies treat a certain good as public or private depends on a combination of history, culture, laws, ideology, etc. (Douglas, 1992; Kaul y Conceição, 2006).

Decentralization relates to public finance implementation. Theoretical justifications for fiscal decentralization start with Tiebout (1956) and the idea that a person will choose to live in the local jurisdiction that provides her utility-maximizing combination of public goods and tax rates – an economically efficient outcome. Related arguments for decentralization include: increasing accountability and government responsiveness, creating incentives for local innovation in service provision, reducing interest group power, building local capacity, and improving regional balance of development (e.g., Bahl, 2008). Arguments against decentralization include: threats to national economic stability due to local government profligacy (Tanzi, 1995); failure to account for inter-jurisdictional externalities, such as transportation networks crossing political/administrative boundaries; inefficient tax/subsidy competition among local jurisdictions; and diluted technical capability (e.g., Bucovetsky, 1991; Prud’homme, 1995; Bahl, 2008).

2.1.1. Decentralization, Coordination, and Fiscal Federalism

Policy/service domains such as transportation, land use, and public health tend to be organized functionally (i.e., vertical silos), with potentially different appropriate geographic

scales of administration. In practice, these sub-systems are interrelated (i.e., inter-sectoral spillovers), requiring some form of inter-sector collaboration or integration (e.g., May et al. 2005; Stead, 2008). The typical metropolitan challenge: national government is too “distant” from the local context to adequately serve the metropolitan “good,” while municipal governments have inadequate incentives to think and act beyond their own borders. Fiscal federalism offers a formal way to identify how the public finance system can induce effective metropolitan governance. Bird and Slack (2007) review various forms of metropolitan governance structure – from consolidated, to two-tier, to voluntary, to special districts – and their implications for fiscal structures.

Critical factors in assigning sub-national responsibilities relate to the nature of the service in question (e.g., public or private), the spatial extent of relevant externalities, and/or the existence of scale economies in service production. Regarding revenues, theory supports central government control over highly redistributive taxes, taxes on mobile capital, and taxes on natural resources, while “local” control should roughly correspond with user fees (for services) and taxes on non-mobile capital (e.g., land) (Oates, 1993). This allows for efficiency and administrative ease in revenue collection. For service provision, sub-national governments in a decentralized fiscal system will often have to provide more local services than those which can be funded entirely locally (due to, e.g., the presence of externalities). This introduces the need to coordinate with adjacent and/or higher-level political entities via, for example, financial transfers to resolve problems of horizontal (“equal treatment of equals”) and vertical equity (“unequal treatment of unequals”) and inter-jurisdictional pricing and delivery (e.g., for goods with spillovers or externalities).

2.1.2. *Relevant Principles of Fiscal Federalism*

Fiscal equivalence provides the key theoretical link between administrative and fiscal responsibilities: public goods' beneficiaries should match with those who pay (Olson, 1969), implying sub-national production and resource generation for numerous public goods. Fiscal equivalence and user fee financing can lead to improved *efficiency*, especially if prices closely match marginal costs and price signals guide investment and management decisions; and *fiscal stability*, by helping to secure sufficient resources for the relevant service and jurisdiction. Prices should also reflect *externalities*, whether inter-system, intra-system, and/or inter-jurisdictional. Even with increased administrative and fiscal autonomy, sub-national governments must still face “*hard budget constraints*,” that is spending limits, to ensure adequate consideration of costs and benefits in the case of transfers from higher level governments. The inter-related dimension of *equity* introduces additional challenges, including because societies judge many goods to be public and/or “basic rights” (e.g., clean water). Applying these principles should lead to more accountable and transparent service investment, operation, and pricing.

2.2. *Fiscal Federalism and Metropolitan Transportation*

Scholars of fiscal federalism often focus on specific local issues, such as education (Calabrese et al, 2012) or tax competition (Brueckner, 2004), but rarely examine in detail the transportation sector. On the other hand, transportation scholars focusing on finance issues rarely apply, explicitly, the fiscal federalist lens. But, metropolitan transportation merits application of this lens, as it:

- is typically, *multi-jurisdictional*, crossing numerous local governments, implying the need for inter-jurisdictional transfers or some other level of administration, normally below the national and state/provincial, but above the local/municipal;

- produces numerous *externalities*, positive and negative, which might include labor productivity benefits due to increased mobility, air pollution costs, inter-modal network effects between public and private transportation modes, and congestion; and,
- involves *equity* concerns, such as those relating to societal values about mobility as a public good.

Transportation systems, generally, employ three types of finance mechanisms: direct user fees, such as tolls and fares; indirect user/beneficiary fees/taxes, which might include fuel excise taxes, vehicle registration and licensing fees, and some forms of land value-related mechanisms, such as impact fees and betterment levies; and general taxation, such as sales, income and property taxes.² Ideally, the use of these instruments should be guided by the principle of price equal to full marginal social cost, such that:

- infrastructure construction, and maintenance and congestion costs, are recovered via time-, place-, and vehicle type-specific prices;
- energy prices cover the full resource cost and environmental effects directly related to use (such as greenhouse gas emissions);
- local environmental impacts (e.g., air pollution costs) are reflected in environmental fees;
- local agglomeration and accessibility benefits are regained from land value taxation; and,

² These categories are not “clean” in reality. Taxes on fuels or vehicles that reflect a jurisdiction’s general sales tax (e.g., VAT) should not be treated as an indirect transportation user tax; any special excise taxes, however, should be (provided they are not levied explicitly for some other purpose, such as an “education fund”). At the same time, some jurisdictions have special sales tax components earmarked specifically for the transportation sector; some governments may also have a component of the general property tax (e.g., VAT) similarly earmarked.

- redistributive objectives are achieved through other mechanisms (e.g., World Bank, 1996).

At least for roadways, this system would ensure “efficient” use, and provide an adequate source of financing (Mohring and Harwitz, 1962; Small, 1993).³

In practice, few direct user charges, with the exception of public transport fares and tolled roads, and no *precise* user charges tend to be employed. For roadways, despite increases in the use of private concessions for metropolitan roadway infrastructure (see Zegras, 2006) – which normally introduce some form of marginal cost pricing via tolling – users typically pay for use through a mix of indirect mechanisms (e.g., fuel taxes) and general taxation. Since fuel consumption is relatively inelastic with respect to price, many governments use fuel taxes as a general revenue source rather than a transportation-specific source. Governments sometimes use vehicle ownership fees and fuel taxes to redistribute income. Public transportation fares are often subsidized, indirectly by subsidizing suppliers or directly by subsidizing certain user groups – these may not always achieve socioeconomic equity objectives (e.g., Serebrisky et al, 2009). Public transportation subsidies can also be justified in the presence of: scale economies, since the right-of-way and capital investment costs are largely insensitive to demand volumes; returns to scale of frequency, the so-called “Mohring effect”; and, under-priced alternatives, in this case the lack of a fully congestion-priced private vehicle system (e.g., Nelson et al., 2007).

Analytical, institutional, and political complications exist. Valuing externalities remains a challenge. Infrastructure-supplying “agents” are often multiple and fractured across responsibilities (e.g., construction, maintenance), modes (road, rail) and government levels.

³ Assuming, again, the absence of scale economies or dis-economies, and that proportional increases in capacity and demand leave the unit of congestion unchanged.

Formally established, transparent transportation budgets – with fees recognized as prices by users – rarely exist, leaving different levels of government scrambling for resources (Zegras, 2003) and muddying debates regarding taxes, user fees, subsidies, “rights” to mobility, etc. This situation almost certainly exerts a negative impact on system sustainability. We now illuminate these complexities with a fiscal federalist light on the Portuguese case.

3. Fiscal Federalism in Portugal

As Portugal has decentralized, challenges to fulfilling fiscal federalist principles remain, impacting efficiency, fiscal stability, and equity. The transportation sector epitomizes these challenges.

The 1976 Constitution of Portugal established a framework for three levels of sub-national government: regional, municipal, and *freguesia* (a municipal government sub-division⁴). A 1998 national referendum rejected the creation of regionally elected administrations (Syrett and Silva, 2001), thus, two elected levels of government exist: central and municipal. According to Inman (2007), Portugal represents a “unitary democracy,” with no politically independent Provincial governments,⁵ no guaranteed Provincial representation in the national legislature, and a relatively low share of total government revenues raised sub-nationally (thus little “policy discretion”); characteristics shared with countries like Chile and New Zealand.

A number of regional authorities depend on the national government for administrative and financial support. None have measurably progressed key aspects of fiscal federalism. Five regional development commissions (*Comissões de Coordenação e Desenvolvimento Regional* -

⁴ The remainder of this paper ignores the *freguesia*, due to its limited responsibility for transportation.

⁵ The Autonomous Regions of the Azores and Madeira are the exceptions.

CCDR) correspond to EU statistical geographies and EU Cohesion Fund planning and distribution, but these centrally appointed bodies do not match metropolitan scales.⁶ Various incarnations of metropolitan organizations have been formally established by law. Most recently, a 2008 law (*Assembleia da República*, 2008) established the Metropolitan Areas of Lisbon and Porto (AML and AMP, respectively), identifying 18 and 16 (respectively) municipalities legally constituting the associations (Figure 1). The law attributes these associations vague practical powers, such as to “participate in public entities of metropolitan scope” including in transportation and to “ensure the coordination of actions” among municipal and central governments, including for “mobility and transport.” The AML and AMP depend entirely upon the municipal and central governments for financing. Within five months of the new metropolitan areas law, another law established Metropolitan Transportation Authorities (AMTs) for Lisbon and Porto. While the respective AMTs coincide with the AML and AMP constituent municipalities, they constitute an entirely separate governing structure. To date, the AML and AMP serve primarily coordination and information consolidation roles. The AMTs for Greater Lisbon and Greater Porto have yet to be fully implemented (see section 4).

The country’s model of metropolitan governance remains loosely coordinated constituent municipal activities, with few and fragmented metropolitan administrative powers, subsidiarity to municipal governments (Oliveira, 2009; Rayle and Zegras, 2012), and a lack of public finance autonomy.

Table 1 summarizes the acronyms used to refer to the relevant institutions in Portugal.

⁶The European Union (EU) also plays a supra-national government role, although with limited powers and budgetary size in comparison with a “typical” central government (see Oates, 2002).

3.1. *Public Finance Basics*

Relative to other OECD countries, Portugal's sub-national governments account for a small share of total government spending (12.8% vs. an average of 34% for 26 selected OECD countries); this share has barely changed since 1985 (Ahmad et al., 2008). The central government is responsible for some municipal services, while municipalities are responsible for planning and urban development, local roadways, public transportation (except for Lisbon, Porto, and now, Coimbra), public housing, and other typical local services (Câmara Municipal de Coimbra, 2007; Câmara Municipal de Lisboa, 2006, 2007; Câmara Municipal do Porto, 2007), sometimes in financial cooperation with the central government.

Taxing power generally follows fiscal federalist principles: the national government controls taxes on businesses, labor, and sales, while municipalities can levy land and real estate taxes, user fees on local transit, and a small share of corporate taxes. Central government controls various special taxes on fuels, motor vehicles, and alcohol, among others (see Nelson, 2008), as well as road tolls through its infrastructure concessions program. Although municipalities have relative autonomy in establishing the tax base and rate (OECD, 1999), municipal revenues constitute a small portion (4%) of total government revenues (OECD, 2007). The central government administers the tax system, including collection (and transfer) of most municipal taxes.

The central government redistributes domestic general revenues to improve, among municipalities, vertical equity (accounting for differences in public service costs) and horizontal equity (providing comparable funding levels to comparable municipalities). This includes formula funding and discretionary grants for infrastructure investments (the *Programa de Investimentos e Despesas de Desenvolvimento da Administração Central*, PIDDAC). PIDDAC

funds are transferred directly to the administrator of the capital project, whether a national ministry, a municipality, or a state-owned enterprise (MFAP, 2010a). Such programs may not always meet desired outcomes. First, the PIDDAC program is discretionary, with funding highly dependent on political processes. Second, transfers to the state owned-enterprise sector (*Sector Empresarial do Estado*, SEE), such as support for public transport, might favor the two largest metropolitan areas, Lisbon and Porto (see section 3.3).

Portugal generally benefits from transfers under the EU's Cohesion Policy,⁷ designed to minimize horizontal imbalances among member states. These include general funds for economic convergence, regional competitiveness, and cross-border cooperation, as well as specific sectoral funds such as the trans-European transportation networks (TEN-T).⁸

Table 2 summarizes the strengths and weaknesses of the Portuguese political system vis-à-vis fiscal federalism.

3.2. *Transport Finance and Metropolitanism: Description*

Two central government ministries control most national and sub-national transportation planning, finance, and investment: Finance (*Ministerio das Finanças*, or MF) and Economics and Employment, through its Secretary of State for Public Works, Transport, and Communications (*Secretário de Estado das Obras Públicas, Transportes e Comunicações*, or

⁷ Portugal is a net beneficiary, receiving €3.95 billion in transfers compared to €2.31 billion in contributions, accounting for about 3% of the country's total €84 billion forecast public expenditures (MFAP, 2010a).

⁸ These include the high-speed railway axis of southwest Europe (Priority Axes 3 and 19), the multimodal axis connecting the Iberian Peninsula with the rest of Europe (Priority Axis 8), and the freight railway axis from Portuguese container ports to Madrid and Paris (Priority Axis 16) (European Commission, 2005).

SEOPTC).⁹ The MF authorizes all funding and disbursement and regulates the SEE, which controls several key transportation assets across modes and jurisdictions. The SEOPTC is primarily responsible for planning and regulation, including regulating public-private highway concessions. The Mobility and Land Transport Institute (*Instituto da Mobilidade e dos Transportes Terrestres* or IMTT), an independent national agency, supervises and regulates public transportation systems, primarily rail and public transportation, while the Roadway Infrastructures Institute (*Instituto de Infra-Estruturas Rodoviárias IP* or InIR) regulates the highway concession system. Figure 2 depicts the national transportation institutional landscape. As mentioned, CCDRs play a regional planning role in EU investments but have little additional power. Municipalities have the typical responsibilities for local transportation, including local street networks and related activities such as parking, signage, and pedestrian infrastructure. Municipalities also have local public transportation system responsibilities, except in the major metropolitan areas of Lisbon and Porto, where the SEE provides many public transit services.

Transportation finance in Portugal only indirectly links costs to prices and benefits. With the partial exceptions of tolled highways and public transport fares and parking prices, most transportation resources come from general taxes – linked to the geography of transportation activity only insofar as tax revenues relate to population density and economic activity and that these, in turn, relate to transportation intensity. Two national vehicle taxes—a circulation tax and

⁹ Until 2011, the Ministry of Finance went by the name Finance and Public Administration and the SEOPTC was a separate Ministry since subsumed by the Ministry of Economy. The national ministry responsible for the agriculture, ocean, environment, planning, and regional development (*Ministério do Agricultura, do Mar, e do Ordenamento do Território*) coordinates national and metropolitan land use planning and assures compliance of all projects with environmental laws.

a vehicle tax—accrue to general national coffers (MFAP, 2010a). A portion of national excise taxes on gasoline (11%) and diesel (24%) are dedicated to *Estradas de Portugal* (EP), the quasi-privatized national highway agency. These funds can be used for capital or operating costs (Assembleia da República, 2007; OECD & European Environmental Agency, 2008). Thus, fuel taxes partly link vehicle use to highway expenditures. In 2009, the Portuguese state collected just under €3 billion in revenues from petroleum products and another €820 million in vehicle taxes. Approximately €555 million of fuel taxes were dedicated to EP. On a discretionary basis, the Portuguese government spent €107 million (out of €2.1 billion) on PIDDAC projects for “transportation and communications” (of which €14 million consisted of local co-financing). Through the SEE, the government spent €260 million on subsidies for transportation state-owned enterprises (SOEs) and private-sector concessionaires. Nearly €180 million of SEE subsidies went to public transportation operations in the Lisbon and Porto metropolitan areas in 2010 (Table 3).

Recent reforms of the SEE have focused on greater administrative independence, transferring sector debts off the central government’s balance sheet, and securing private finance. The transportation sector’s fiscal situation has not improved. Over the period 2005-2010, public sector income (from all sources, including social security) increased by 3.9% annually (MFAP, 2005; 2007; 2010); total SEE subsidies increased by 5.9% annually; while total subsidies to metropolitan transportation operations (both SOEs and private operators) in Lisbon and Porto increased by 12% annually (Table 3).

An urban light rail system which opened in 2007 in several municipalities in Greater Lisbon’s south bank is illustrative. Originally conceived of by a group of municipal governments and envisioned to be financed exclusively via user fees and delivered via a public-private

concession (Governo da República Portuguesa, 1999), the Metro Transportes do Sul (MTS) project was eventually taken over by the central government (delivered and operated by private concession). Delayed by conflicts with affected local governments, the project suffered from overly-optimistic cost estimates and ridership projections.¹⁰ Over 63% of the estimated €393 million in capital costs were financed by the central government, which also offered minimum revenue guarantees to the concessionaire (Câmara Municipal de Almada, 2008; Monteiro, 2007); the EU provided 19% of the investment costs, the concessionaire 14%, and municipalities 4% (Gouveia, 2008; Lino, 2007). In 2010, the 15-km, 19 station MTS system incurred central government operating subsidies estimated at €8 million (MF, 2011), implying a subsidy of €0.27 per passenger kilometer transported (PKT) – more than 16 times higher than the per PKT operating subsidy provided to the Lisbon Metro.¹¹

3.3. Transport Finance and Metropolitanism: Analysis

Portugal's metropolitan transportation poses a fiscal federalist challenge. Much of the central government-controlled and financed transportation system serves largely regionalized economic and functional purposes (at least with respect to passenger transport). This includes urban public transit (urban rail, bus, and ferry), regional and commuter rail and ferry services, and roadways serving mostly urban commuter traffic. Although the highway public-private partnerships (PPPs) have introduced tolling, in-line with fiscal federalist principles, tolled facilities remain limited in the metropolitan areas themselves. In any case, the central government retains policy control over the highway PPPs.

¹⁰ In 2010, the system recorded 23.9 million PKT, 33% of the forecast (Tribunal de Contas, 2011).

¹¹ In 2009, the last year for which data are publicly available, the Lisbon Metro carried 829.1 million PKT (Metropolitano de Lisboa, 2010) with €13.9 million in subsidy, or approximately €0.02 per PKT.

The situation hampers fulfillment of fiscal federalism's principles. Subsidizing public transportation operations (and, arguably, investments) can be justified on intra-system *externalities* grounds, since auto use is under-priced in congested metropolitan areas. But, Portugal's current metropolitan subsidy structure – directly resulting from SEE negotiations with the SOEs and from national government contracts with private companies – pays little heed to intra-system externalities, as evidenced by the recent rapid increase in operating subsidies (Table 3). System *efficiency* likely suffers. These subsidies may serve socioeconomic *equity* goals, although their effectiveness would require detailed analysis (e.g., Serebrisky et al., 2009).

Regarding geographic equity, or *fiscal equivalency*, available information precludes a detailed analysis, due to the lack of geographic granularity regarding origins of relevant revenues and destinations of expenditures. The modest sectoral investments via PIDDAC funds are distributed relatively broadly throughout the country. The SEE expenditures for transportation, more than double the PIDDAC funds, may indicate the general tendency in light of Portugal's demographic and economic geography. Greater Lisbon, including the south bank peninsula, accounts for 26% of the nation's population and 37% of Gross Domestic Product (GDP) (INE, 2008) and receives approximately 26% of total SEE subsidies specifically for its public transportation operations. Greater Porto accounts for 12% of the nation's population and 12% of GDP and receives approximately 9% of total SEE subsidies for its public transportation services (INE, 2008). In addition, substantial percentages of metropolitan transportation operating revenues are derived from user fees and local sources (Figure 3). Thus, the large metropolitan areas are not necessarily getting "more than they should" in terms of central government public transport support. Rather, the concerns are poor explicit *fiscal equivalency* and subsequent lack of transparency and local accountability and the potential appearance of regional inequities. This

may also be contributing to the rapid growth in operating subsidies to state-owned and private public transit operators in the metropolitan areas, epitomized most recently by the newly opened MTS on Lisbon's south bank. This trend clearly violates fiscal federalism's *hard budget constraint* principle, countering any incentive to reform pricing, investment, and management while also not helping to stabilize Portugal's macroeconomic picture.

In summary, metropolitan transportation in Portugal suffers from various inconsistencies regarding efficiency, financial stability, and equitable service and infrastructure delivery (see Table 4). Fiscal federalism suggests that transportation expenditures should be derived primarily from metropolitan sources. More clearly aligning these expenditures with direct revenue sources would make the costs and benefits recognizable to the relevant stakeholders. Public transportation fares partly achieve this, but the increasing SEE subsidies to operators (public and private) suggest beneficiaries are not facing the costs implied. The move towards tolled highway PPPs might increase efficiency and fiscal equivalence, but widespread adoption of tolling, especially congestion-pricing, in the metropolitan areas seems unlikely in the short-term. Furthermore, the PPP contracts and regulatory structure may impede efficient system-wide pricing and management relating to congestion pricing and inter-modality. In the meantime, the reliance on partial earmarking of national fuel taxes, themselves imperfect roadway user fees, mixed with general taxes and unclear criteria for spatial redistribution of the funds blurs the picture. Metropolitan areas, thus, depend highly on central government for transportation investment and operating resources and have little direct control over metropolitan-scale transportation policies.

In this case, a regional government enjoying administrative autonomy, consent from the governed, sufficient fiscal autonomy, and hard-budget constraints has a higher likelihood of

arriving at a socially optimal outcome by aligning supply and demand via prices. Even where direct user fees are inefficient or impractical, an empowered metropolitan transportation authority would, at least in theory, more closely align costs to beneficiaries through indirect user fees and taxes. Do the newly created AMTs hold promise towards this end?

4. Fiscal Federalism and the Portuguese AMT Law

A 2009 Law gives the AMTs responsibility for *public* transportation, including planning, coordination and regulation, financing and pricing, service promotion and development, integration with local land use plans, operational planning, and strategic planning specifically to “promote” the development of urban mobility plans (*plano de deslocações urbanas* or PDU), in technical collaboration with the IMTT, the national land transportation regulatory body (Table 5). AMTs are also responsible for promoting the development of operational programs for transportation (*Programa Operacional de Transportes* or POT), a legal instrument defining, for a four-year period, necessary aspects of passenger transport in metropolitan areas, including: public transport itineraries, service levels, fares, traffic, parking, costs, and financing. As described above, the AMTs function as institutions legally separate from the metropolitan areas (AMP and AML), although the latter do have responsibility for appointing some members of the AMTs’ General Councils.¹²

The AMT law offers a reasonable institutional framework for applying fiscal federalist principles to regional transportation in the Lisbon and Porto metropolitan areas. Nonetheless, unclear language about real fiscal power and tools suggests that the AMTs may be unable to implement metropolitan transportation policies in the spirit of fiscal federalism. Furthermore, the

¹² This provides evidence of some effort to coordinate between the metropolitan areas (AMP and AML) and their respective AMTs.

dominance of central government appointees on the various AMT councils perpetuates the heavy national influence in metropolitan transportation.¹³

As of late 2011, the AMTs have been “legally” implemented, but remain functioning at a very low level of activity, currently examining the possibilities to reform public transport operations through mergers (suggesting the government may be using the AMTs as a “scapegoat” for any negative effects of pushing through institutional reform). With the nation’s ongoing financial crisis, no budget has been allocated to finance AMT activities. While council members and some administrative employees have been appointed, most are still waiting for orders and budget and remain employed by other agencies. Without a specific budget allocation, the AMTs will not likely initiate any of the substantive activities prescribed in law. In theory, the AMTs reflect modest steps in the “right” direction. Still they focus primarily on public transportation, have little actual recourse to financial instruments, and remain dominated by central government. In practice, the lack of any movement on AMT formation two years after the law passed signals uncertainty regarding any power eventually accruing to them.

5. Discussion

Similar to many other countries, metropolitan governance in Portugal remains a challenge. In Lisbon and Porto, metropolitan governance is a mix of occasional, ad-hoc, and limited voluntary cooperation among municipalities and a few special-purpose bodies. In this respect the

¹³ The Central Government appoints the president and two vice presidents of the AMT Executive Council and over 50% of the members of the General Council (which serves as a supervisory role over the Executive Council). The law does provide for more prominent representation by the center cities of Lisbon and Porto in their respective AMT General Councils, in some attempt to reflect these cities dominance in terms of metropolitan travel demand.

country shares characteristics with, for example, Brazil and Argentina (Bird and Slack, 2007). General metropolitan authority legislation, and transportation-specific legislation have attempted to create a new tier of governance, but with little impact to date. As Bird and Slack (2007) suggest for Latin America, effective metropolitan governance requires an appropriate fiscal structure.

Our analysis shows that such a structure does not yet exist in Portugal. Metropolitan public transportation planning, investment, and regulation in the country are challenged by issues of efficiency, fiscal stability, and equity. Existing incentives promote the delivery of *quantities* (of infrastructure, services) without adequately controlling quality or need, resulting in inefficient resource allocation. Some of these issues require modest institutional change, such as establishment and use of formal project evaluation procedures as a requirement for public investments. However, the lack of a direct link between costs and benefits is increasing debt and subsidy requirements for metropolitan transportation entities. Local instability arises from *de facto* dependence on the central government. The central government, in turn, runs the risk of having to unexpectedly assign additional resources, with little consideration for horizontal or vertical equity. This situation could further imperil the nation's financial stability and its compliance with the EU's macro-economic requirements (to be fair, estimated metropolitan-level transportation subsidies make up a minor share of annual government expenditures; an estimated 0.2%). Regarding the hypothesis that decentralization might increase the risk of lower-level government bailouts, metropolitan public transportation in Portugal offers no support – increasing subsidy levels persist even with central government financial responsibility.

Current institutional arrangements could adversely affect inter-regional equity and intra-regional efficiency, especially for metropolitan public transportation. Lisbon's and Porto's public

transportation services are provided primarily by companies that depend substantially on central government subsidies, violating fiscal equivalency. In other Portuguese cities, such responsibility rests solely with municipalities and local users and taxpayers, more closely adhering to fiscal equivalency. As such, the system manifests a “partial” fiscal equivalency for public transportation operations, but potential, or at least perceived, inequity in favor of residents in the nation’s largest metropolitan areas.

The evidence indicates the difficulty with “metropolitanizing” transportation in Portugal, with the AMTs apparently lacking the requisite administrative and fiscal powers to advance this objective. By targeting specifically Lisbon and Porto, the law may further exacerbate the perceptions of bias towards these metropolitan areas. By focusing primarily on public transportation, the law does not enable broader intermodal, intra-system management and financing of the overall mobility system. The AMTs remain a heavily top-down solution, evidenced by the Portuguese Government’s control over the majority of appointments for both the General and Executive Councils. The AMTs have been given some paper responsibility for planning, but with no link to funding instruments. The AMTs also have no direct access to investment sources such as PIDDAC funds. According to the law, the AMTs should predict/anticipate the need for subsidies in transport operations and the respective resources for funding them. However, the ability of the AMTs to mediate between the SEE and Finance Ministry remains to be seen. The AMTs will not likely be able to move towards enforceable fiscal discipline of sub-national governments. Finally, regulatory responsibilities remain somewhat murky, in the unclear relationship between the AMTs and IMTT.

For effective sub-national transportation administration and finance in Portugal, AMTs need greater independence from the central government and fuller representation from citizens

within the corresponding geographic boundaries. Institutionally, the AMTs could take a first step in the right direction by undertaking a detailed assessment of the nation's transportation finance system, making the system explicit and transparent, following the fiscal federalist principles outlined in this paper. Such an activity appears to fall within the AMTs' legal purview and, presumably, the AMTs would have access to key budgetary details unavailable to us. The central government could also test the effectiveness of, and build the capacity of, the AMTs by endowing them with some grant-making capabilities. For example, Rayle and Zegras (2012), in an analysis of inter-municipal collaboration in Portugal, find evidence supporting the role of financial incentives in inducing such collaboration. Perhaps the AMTs could be enabled to deploy modest sums for projects of inter-municipal interest, which also seems consistent with the AMT Law. In the end, however, the current law suggests the AMTs may simply represent another organization overlaid on a complex institutional architecture, adding yet one more player to the fight for limited resources.

6. Conclusion

Fiscal federalism refers to the attribution of administrative, taxing, and spending powers among the different levels of government in a decentralized system. Within fiscal federalism, the metropolitan transportation sector is relevant due to its importance to economic and social development, the multiple layers of government involved, and the key role the public sector plays in service provision, operation, investment, and regulation. Numerous countries around the world are struggling with creating better institutions for metropolitan transportation management.

We examined metropolitan transportation through the lens of fiscal federalism in a (slowly) decentralizing country, Portugal, within the quasi-federalist EU system. Our analysis revealed Portugal's ongoing challenges in financing metropolitan transportation systems.

Fundamentally, Portuguese surface transportation lacks an explicit finance system. The nation's highway PPP system is partly changing this picture via direct tolling, although PPP tolling in metropolitan areas remains limited. Generally, the existing incentives promote the delivery of *quantities*, with little emphasis on evaluation, heavy dependence on the central government, and risks of financial instability. The lack of a meaningfully direct and transparent connection between the benefits and costs accruing to users reduces the efficiency of both output and the collection and use of nearly all revenue sources. In terms of fiscal equivalency, the system plays out unevenly across Portuguese urban areas – the two largest metropolitan areas depend largely on the central government for public transport operations, while other municipalities mostly fend for themselves. This “partial” fiscal equivalency may favor the largest metropolitan areas, although we cannot be sure due to data limitations. Public transportation finance violates fiscal equivalency, with few incentives to match benefits with expenditures. Risks to the sustainability of the subsidized services and to greater macroeconomic stability exist.

A new law creating metropolitan transportation authorities (AMTs) in Lisbon and Porto will not likely ameliorate the fundamental challenges, offering little detail on financial instruments and responsibilities and project evaluation requirements. Ultimately, reform must assign responsibility for transportation administration and finance to sub-national governments and create explicit metropolitan transportation finance systems. Such reform may require changes in the governance system to allow for financially and politically autonomous metropolitan areas. In the short term, infrastructure investment projects require application of transparent and rigorous project evaluation procedures and the creation of stronger co-financing requirements by local governments. Increased private-sector participation (via, e.g., infrastructure concessions) could move in that direction. The AMTs could also theoretically

move in this direction, including by conducting an explicit transport system finance analysis through the fiscal federalist lens and serving as an institution for deploying grants for inter-municipal cooperation. Reform of Portugal's transportation finance system remains a question of "when?" The government must minimize inefficiencies and inequities in the public finance system; transportation offers an opportunity towards that end.

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Table 1
Principal Institutional Acronyms

Acronym	Portuguese Name	English Translation
AML	<i>Área Metropolitana de Lisboa</i>	Metropolitan Area of Lisbon
AMP	<i>Área Metropolitan do Porto</i>	Metropolitan Area of Porto
AMT	<i>Autoridad Metropolitana de Transportes</i>	Metropolitan Transportation Authority
CCDR	<i>Comissões de Coordenação e Desenvolvimento Regional - CCDR</i>	Regional Development and Coordination Commission
EP	<i>Estradas de Portugal</i>	
IMTT	<i>Instituto da Mobilidade e dos Transportes Terrestres</i>	Mobility and Land Transport Institute
InIR	<i>Instituto de Infra-Estruturas Rodoviárias</i>	Roadway Infrastructures Institute
MF	<i>Ministerio das Finanças</i>	Ministry of Finance
MTS	<i>Metro Transportes do Sul</i>	Metro Transport of the South (light rail line on south bank of Lisbon's Tagus River)
PIDDAC	<i>Programa de Investimentos e Despesas de Desenvolvimento da Administração Central</i>	Central Administration Program of Development Investments and Expenditures
SEE	<i>Sector Empresarial do Estado</i>	State-owned Enterprise Sector
SEOPTC	<i>Secretário de Estado das Obras Públicas, Transportes e Comunicações</i>	Secretary of State for Public Works, Transportation and Communication

Table 2

Fiscal Federalism and Sub-national Governance in Portugal.

Concept	Consistencies	Inconsistencies
<i>Decentralization and fiscal equivalence</i>	<ul style="list-style-type: none"> • Allocation of powers for most local services to municipalities • Municipal discretion to set local tax levies (e.g., property taxes) and portions of income taxes 	<ul style="list-style-type: none"> • CCDR boundaries inconsistent with metropolitan areas • Central government controls some municipal services and retains great share of revenue-raising and expenditure powers
<i>Legitimacy of authority & accountability</i>	<ul style="list-style-type: none"> • Local governments directly elected by voters 	<ul style="list-style-type: none"> • District governments, and CCDRs are deconcentrated arms of central government, not directly elected and independent • Central government appointment of AMT leadership
<i>Efficient levying & collecting of taxes</i>	<ul style="list-style-type: none"> • Central government collects highly mobile taxes • Municipalities collect local property taxes, some local user fees, and some corporate income taxes 	<ul style="list-style-type: none"> • Central government collects and remits local taxes (e.g. property taxes), but local governments cannot audit • Regional government entities cannot generate own revenues
<i>Internalizing spatial spillovers & externalities</i>	<ul style="list-style-type: none"> • Administrative districts, CCDRs, AMTs, and voluntary municipal coalitions, in theory • SEE administers and raises funds for many national services and infrastructures 	<ul style="list-style-type: none"> • SEE administers many services and infrastructures with sub-national impacts • Municipal coalitions not empowered with sufficient authority or budget
<i>Equity (vertical and horizontal)</i>	<ul style="list-style-type: none"> • EU cohesion and domestic equalization funds 	<ul style="list-style-type: none"> • Questionable equity of SEE's distribution of subsidies • PIDDAC funds are discretionary and unpredictable

Notes: CCDR – regional development and coordination commissions; AMT – metropolitan transport authorities; SEE – state-owned enterprise sector; EU – European Union; PIDDAC – investment and expenditure program of central administration.

Table 3

Operating Subsidies to Surface Transportation Companies in Lisbon and Porto.

Item	€ Millions						AAGR (05-10)
	2005	2006	2007	2008	2009	2010	
<i>State-owned Enterprises</i>							
Carris (bus/tram in Greater Lisbon)	42.5	45.5	48.6	52.1	56.5	58.7	6.7%
Metropolitano de Lisboa (ML)	21.2	22.7	24.3	26.1	29.0	31.1	8.0%
STCP (bus services for Greater Porto)	15.3	16.3	17.5	19.4	21.5	20.7	6.2%
Metro do Porto (MP) ^a	2.4	2.5	10.9	13.0	13.9	13.2	40.6%
Transtejo (water ferry in Greater Lisbon)	5.3	5.6	6.0	6.4	7.0	7.2	6.3%
Soflusa (water ferry in Greater Lisbon)	3.7	3.9	4.2	4.5	4.9	5.1	6.6%
CP Lisbon ^b	5.4	4.6	n.i.	14	9	15.2	23.0%
CP Porto ^b	6.3	4.8	n.i.	13.9	15.3	16.5	21.2%
<u>Total SOE subsidies</u>	102.1	105.9	111.5	149.4	157.1	167.7	10.4%
<i>Private Companies</i>							
Fertagus (rail in Greater Lisbon)	5.2	10.4	12.6	11.6	11.3	11.3	16.8%
Rodaviaria Lisboa (bus in Greater Lisbon)	2.4	4.3	2.1	4.2	2.5	6.2	20.9%
Scotturb (bus in Greater Lisbon)	0.05	0.05	0.03	0.06	0.04	0.09	11.9%
TST (bus in Greater Lisbon)	1.8	2.7	1.4	2.8	1.7	4.4	19.2%
Vimeca (bus in Greater Lisbon)	2.0	2.9	1.4	2.8	1.8	4.4	17%
MTS (south bank light rail service)					0.07	8.0	n.a.
<u>Total Private Subsidies</u>	11.5	20.3	17.5	21.5	17.4	34.4	24.5%
<u>Total Lisbon</u>	89.6	102.6	100.6	124.6	123.7	143.7	9.9%
<u>Total Porto</u>	24	23.6	28.4	46.3	50.7	50.4	16.0%
<u>Total Metropolitan Transport Subsidies</u>	101.1	122.9	118.2	146.0	141.1	178.1	12.0%
Total SEE Subsidies (all Sectors)	371.3	399.5	413.5	410.8	456.2	494.5	5.9%

Sources: CP, 2006, 2009, 2010; MFAP, 2007, 2008, 2009, 2010b; MF, 2011. Notes: ^a Increased expenditures in 2007 reflect system expansions completed in 2006 (MP, 2008a,b); ^b CP figures are indicative, not necessarily exactly comparable to the other subsidies reported; these are the operating losses reported by CP, which are roughly consistent with the total CP subsidies reported by MFAP (which does not disaggregate CP subsidies by service area). n.i.- no information (losses not reported for 2007); n.a. – not applicable.

Table 4

Fiscal Federalism and Metropolitan Transportation in Portugal

Ideal	Consistencies	Inconsistencies
<i>Decentralization and fiscal equivalence</i>	<ul style="list-style-type: none"> • Municipal governments control local roads, parking, and most local transit systems • Dedicated local public transport funding in a few small cities 	<ul style="list-style-type: none"> • Central government authority and subsidy (via SEE) of sub-national transport infrastructure and services • Pricing of metropolitan transport not consistent with costs
<i>Legitimacy of authority & accountability</i>	<ul style="list-style-type: none"> • Local transport infrastructure is generally controlled by locally-elected officials in smaller municipalities 	<ul style="list-style-type: none"> • Central government controls many transportation assets and services with regional and/or local impacts
<i>Efficient levying and collecting of taxes</i>	<ul style="list-style-type: none"> • Municipalities collect locally derived transport-related taxes and local bus fares (except in Lisbon and Porto) • Central government collects fuel excise taxes 	<ul style="list-style-type: none"> • Regional transport infrastructure and services highly dependent on discretionary central government transfers
<i>Internalizing spatial spillovers & externalities</i>	<ul style="list-style-type: none"> • Government-granted monopolies over transit in Lisbon and Porto metropolitan areas helps internalize regional decision-making 	<ul style="list-style-type: none"> • Voluntary program for the creation of regional partnerships has failed to produce much progress in regional transit planning and administration
<i>Equity (vertical and horizontal)</i>	<ul style="list-style-type: none"> • EU Cohesion, PIDDAC, and central formula funds help promote horizontal equity in transportation 	<ul style="list-style-type: none"> • Bias of national transportation investment to roadways • Nearly all public transit capital support goes to two metropolitan areas

Table 5

Metropolitan Transport Authority Responsibilities According to Portuguese AMT Law

Responsibility	Specific Attributes
<i>Strategic Planning</i>	<ul style="list-style-type: none"> - promote the development of urban mobility plans (PDUs) and operational programs for transport (POTs) - develop mobility surveys - promote preparation of public accounts of passenger mobility on public transportation - provide opinions on/analysis of municipal land use plans - assure integration between public transport modes and coordination with traffic and parking policies - promote alternative traffic and parking policies to increase public transportation attractiveness
<i>Coordination and Regulation</i>	<ul style="list-style-type: none"> - promote mechanisms to increase inter-operability and inter-modality among the various public transport operators - define metropolitan traffic and parking policies to promote public transport attractiveness - define the guiding principles and approaches for metropolitan service integration, via delegation to municipal associations or concessions to third parties - develop coordinated actions to improve quality, safety and environmental protection in public transport operations - assure gradual and progressive contracting of public transport services, without violating the responsibilities of IMTT - assure the public service contracts with private operators of road-based public transportation - monitor and evaluate the quality and efficiency of public transportation services - enforce relevant laws and regulations (contracts, concessions) in cooperation with IMTT - apply sanctions and penalties according to the law or operating contracts
<i>Financing and Pricing</i>	<ul style="list-style-type: none"> - anticipate the inherent public service obligations of transportation and the respective financial compensation required - promote the establishment mechanisms to regulate, program, incent, and financially support fleet purchase/renewal, information systems, and new technologies for urban transport, in cooperation with IMTT - establish rules, within the terms of the law, regarding coordinating mobility taxes for the metropolitan areas and their corresponding municipalities. - consider and apply principles and fares for the transport system, its integration, and parking of metropolitan interest - consider, implement and coordinate a metropolitan ticketing system - regulate the commercialization of multimodal transport services and the redistribution of revenues in function of services provided by each operator
<i>Dissemination and Development</i>	<ul style="list-style-type: none"> - develop and promote the urban transport image and promote public transport use - disseminate service information, creating and managing information and communication services with the operators - promote innovative technology initiatives and services to improve quality, service and mobility - support, participate and finance research in urban transport and mobility - promote and implement innovative projects and pilot programs

Source: Assembleia da República, 2009.

Figure 1

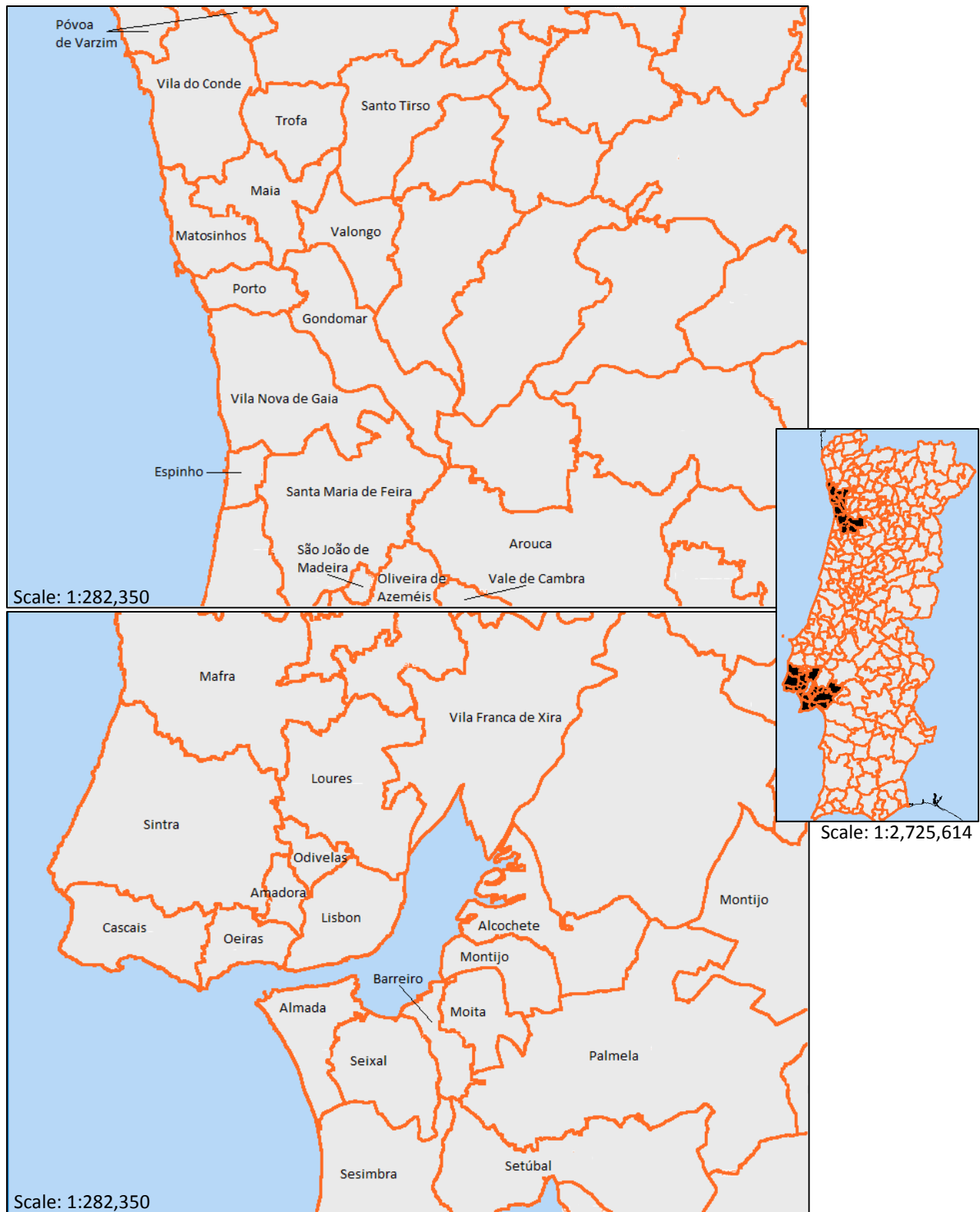


Fig. 1. Municipalities in the Porto Metropolitan Area (AMP) (top) and Lisbon Metropolitan Area (AML) (bottom). (Instituto Geográfico Português (<http://mapas.igeo.pt>), Assembleia da República, 2008). *Notes:* Inset shows (in dark) the AMP and AML within continental Portugal (Municipal borders shown); Municipalities named are those legally included in the respective metropolitan areas.

Figure 2

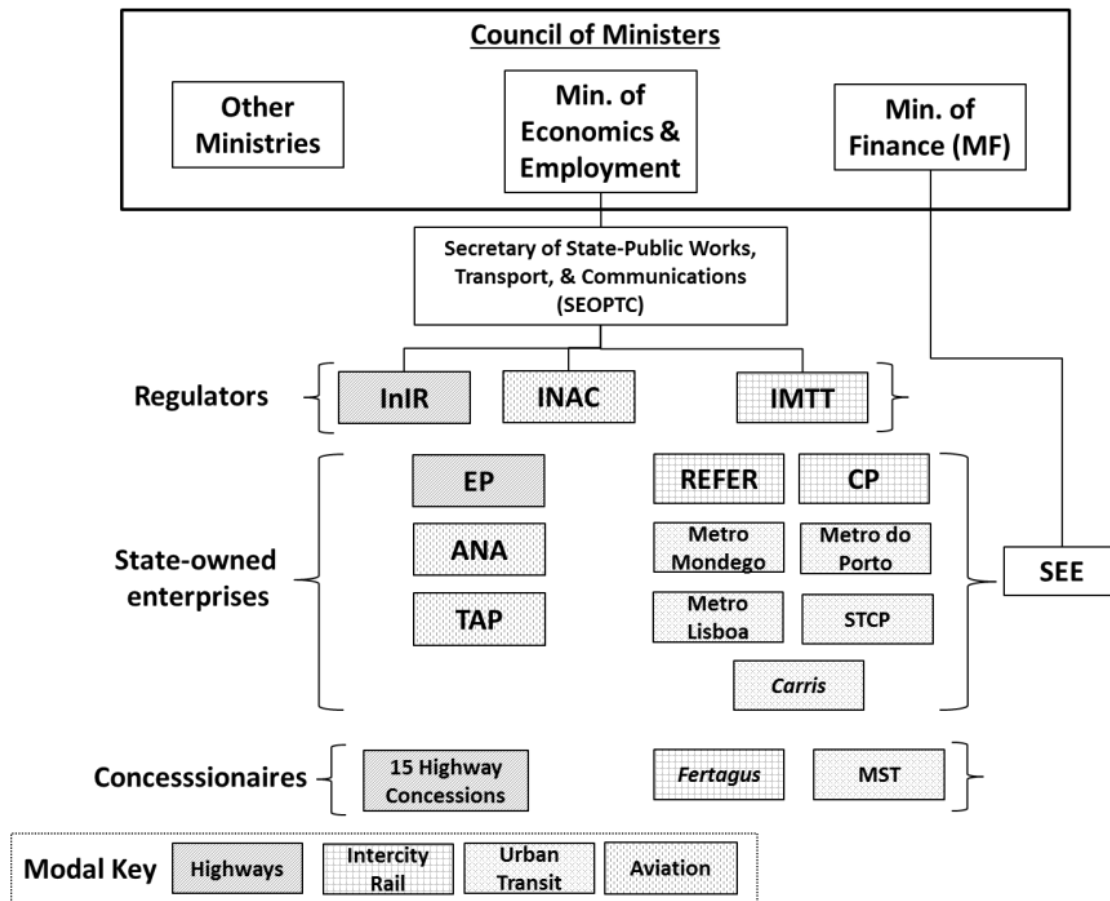


Fig. 2. Institutional Structure of Portugal's National Transportation Sector (adapted from Dunn, 2010).

Figure 3

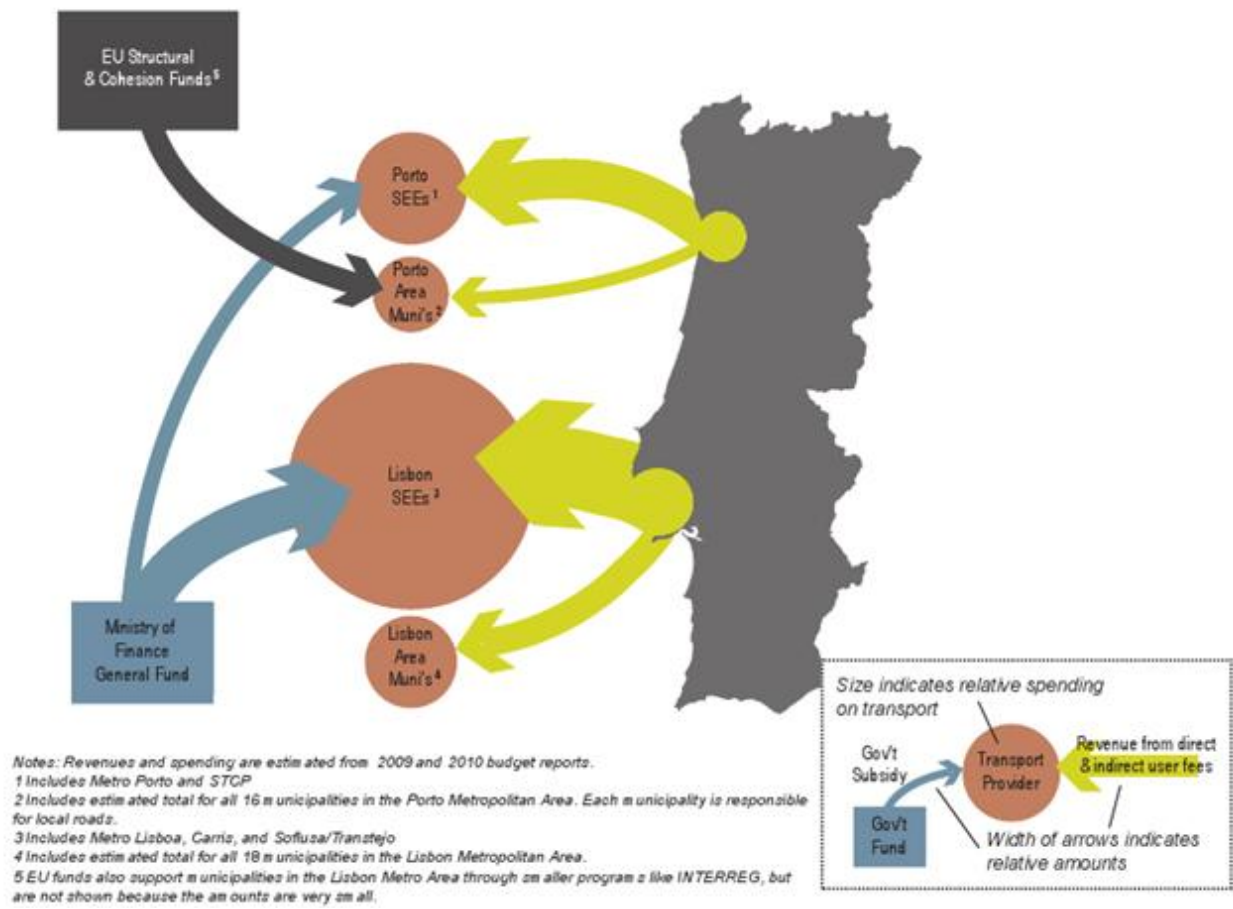


Fig. 3. Transportation Finance Geography in the Lisbon and Porto Metropolitan Areas.