

Moving Transportation Reform: An Inside Perspective from the U.K.

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The next iteration of federal transportation policy in the United States should include mechanisms to make decisions based on economic goals rather than political horse trading. The U.K. experience provides valuable lessons for the ongoing debate about the future of transportation policy in the United States, given that the U.K. has started its own transportation reform during the last decade. This policy brief discusses the new transportation strategy recently adopted in the U.K. and the possible lessons for the United States. While facing its own political hurdles, the U.K. is on the path of implementing a policy process focused on the prioritization of transportation projects with highest social return, based on economic appraisal. Learning from this process, American transportation stakeholders could move the reform discussion forward in a substantive way.

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I. Introduction

The year 2007 marked a major change in transportation strategy for the United Kingdom. A new national government policy document set out a new and different way of approaching transportation policy: one which is objective-focused and evidence-based. Perhaps the best summary of this strategy comes from *The Economist* magazine. The magazine's headline for the article assessing the merits of the policy was: “The government has decided what its transport policy is for.”²

This new approach toward transportation is notable for its radical departures from traditional approaches to transportation policy so prevalent today in many countries. Most notably, it starts with a very clear focus on non-transportation objectives for the transportation system. This means supporting economic growth and meeting emission reduction targets as opposed to a focus on transportation outcomes as worthy goals in their own right.

The new policy also suggests a new and rigorous process of strategy and policy development to address those objectives. The process emphasizes the assessment of a range of transportation options to meet an objective while remaining agnostic toward the particular mode (e.g., roads, rails, transit) or the particular type of intervention (e.g. large capital projects, pricing, or small strategic investments).

In essence, the new process is a merit-based approach to decisionmaking. Such discipline would allow the government to identify and select priorities amongst these options on the basis of hard-edged and comprehensive economic appraisal of the costs and benefits of policies and projects. In short, it selects the solution that best meets the range of policy objectives.

The origins of this strategy are in a report released in December 2006: the Eddington Transport Study.³ Departing from a transportation-centric thinking, the study treated transportation as an arm

of economics, environmental, and social policy, not a goal in its own right. To reinforce the point, the Eddington report was jointly commissioned by the transportation and economics ministries. This also demonstrated that successful transportation policy matters a great deal to a constituency beyond the transportation sector.

The U.K. experience provides valuable lessons for the ongoing debate about the future of transportation policy in the United States, as it faces similar transportation challenges. Both countries suffer from crowded urban networks, constraints in import and export corridors, rising carbon emissions, and funding limitations. Of course, differences abound, such as the U.S. federal system and the central government's relationship with individual states, metropolitan areas, and localities.

Nevertheless, with the next round of federal transportation policy very much on the mind of policymakers in the United States, lessons on how to make decisions based on economic goals rather than political horse trading are especially timely today. The reorganization of the U.K. Department for Transport to better address the identified priorities is a lesson in breaking down barriers, particularly modal silos. Following the U.K. example, the implementation of a policy process focused on the prioritization of transportation projects with highest social return, based on economic appraisal, would be a major step forward for the United States.

This policy brief discusses the new transportation strategy recently adopted in the U.K. and the possible lessons for the United States. It starts with an examination of the U.K. transportation sector and policy before the Eddington Study. Next, the paper details the plan offered by Eddington followed by the reactions to that report. The paper then analyzes the resulting U.K. government's transportation strategy and implementation. The last sections offer potential lessons and future directions for the United States based on the U.K. experience.

In the end, the challenges of implementation of the recommendations may be the most important lesson of all. One thing the Eddington Study shows us is that despite excellent analysis, proper framing, and a solid and timely case for fundamental reform, politics and transportation decisionmaking go hand-in-hand.

II. U.K. Transportation Policy Pre-Eddington

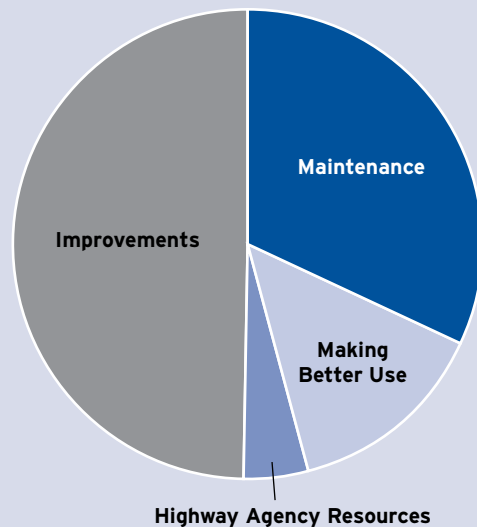
Similar to the U.S. today, the U.K.'s approach to transportation before the Eddington study was outdated. There were several problems:

For one, the underlying goals for transportation policy were unclear. Instead, policy was focused on achieving detailed transportation targets, which are often poor proxies for broad national, or economic, goals. For example, the Department for Transport's (DfT) priorities included increasing bus patronage; encouraging mode-switching away from cars; on-time performance of the railways; and reducing road congestion.⁴ The problem with such proxy targets is that they could result in the adoption of inefficient solutions to the underlying policy goal or were often impossible to deliver in practice.

One example is the goal of switching passengers from one mode of travel (single occupant vehicles) to another (mass transit), which arose largely from a worthy underlying policy goal to reduce carbon emissions. This "mode switch" target is not always the best solution to the carbon problem when mass transit options do not exist (such as in exurban areas) or when their provision would wind up being a very expensive and inefficient way to reduce carbon emissions. Instead, new land use patterns, energy efficient transportation technologies, and demand management may in fact be much better alternatives from an economic and social perspective—and more achievable.

Second, U.K. transportation policy was focused heavily on modes that tended to present compartmentalized policy approaches. For example, the future of the railways was decided with little coordination with the road network or bus services, despite the frequent overlap in users of these services. Decisions on the railways were taken every five years, while investments in the strategic road network were made on a rolling basis with a list of priority investments agreed to over ten years previously, thus all but guaranteeing a lack of coordination.⁵ The bus network was managed by local governments on yet another policy timetable. As a result, not only was coordination rare, but it was very difficult to examine the impact of rail or road investments on a comparable set of policy goals and outcomes.

Figure 1. The Highway Spending Priorities in the U.K. Government's 10 Year Transportation Plan, 2000



Note: "Making Better Use" projects refer to demand management measures. "Improvements" refer mainly to modernization and new capacity projects. The Highway Agency resources comprise the spending by the DfT to implement the long term plan for highways.

Source: The U.K. Department for Transport, Transport 2010: the 10 Year Plan (U.K. Department for Transport, 2000).

Third, the U.K.'s transportation policy did not incentivize policy makers to consider a range of solutions to existing problems. Thus, investment in new capacity tended to dominate policy, as the government's 10 year transportation plan, published in 2000, showed (Figure 1). Other measures with better economic and social outcomes, such as ramp metering or road pricing, were only considered on an "ad hoc" basis, not as a matter of course in the policy process.

Fourth, while the U.K. had a tradition of rigorous economic appraisal of projects, the results of these analyses did not always influence policy decisions. This is partly because there were no intermodal comparisons, given the modal focus of the transportation policy discussed above. However, it was also because of pressures on decision makers. Public or media attitudes often meant that large rail investments were considered vital, even if the analysis suggested the social returns to public investment were likely to be low.⁶ Further, economic analysis was sometimes used to justify decisions already taken, rather than employed to drive strategy and option development.

While these shortcomings certainly contributed to deterioration in the performance of the U.K. system, it would be an oversimplification to argue that the policy making process was the only driver of problems.

In the early 2000s congestion and reliability on the U.K. road network was worsening (Table 1). The operational efficiency and capacity of the system was not keeping up with surging demand caused by economic growth and increased mobility. Congestion in cities was rapidly growing, causing long delays on the roads and leading to severe overcrowding on the commuter rail networks. The links to the U.K.'s international gateways for both freight and passengers, were under increasing pressure. Rail freight lines and strategic road links to ports and airports were heavily congested and often beyond capacity in peak times.

On the roads, the traditional approach of increasing capacity through new links or new lanes was not sufficiently counteracted by a demand management approach.⁷ While the government's 1998 *Transport White Paper* appeared to abandon the traditional "predict and provide" strategy, measures to make better use of existing capacity by regulating flow through pricing strategies and demand management were rare.⁸ The London Congestion Charge, a recent but significant exception, was developed by local

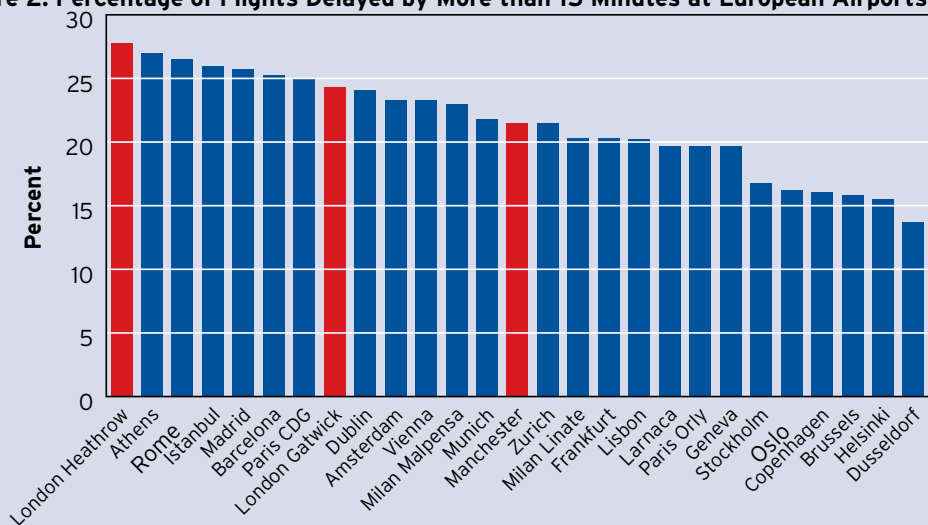
Table 1. Congestion Levels on the U.K. Road Network, 2003

Area Type	Share of traffic in very congested conditions
London	24%
Major urban areas/ conurbations	15%
Other urban areas	9%
Strategic roads- M roads and A roads	7%
Rural	2%
Whole Network	8%

Note: "Very congested conditions" are traffic cases in which the ratio of the volume of traffic relative to road capacity is above 0.8. The "strategic roads" are for long distance traffic, considered of national importance. They are comprised of motorways (M roads) and all-purpose (A roads). These roads are managed by different agencies, depending on the region. The strategic roads in England are the responsibility of the U.K. Highway Agency, those in Scotland are managed by the transportation agency of Scotland, and those in Wales by the Welsh government.

Source: The Eddington Study, volume 2, p.79, figure 2.6.

Figure 2. Percentage of Flights Delayed by More than 15 Minutes at European Airports, 2005



Source: The Eddington Study, volume 2, p. 86, figure 2.11.

not national government.⁹

On the railways, operational inefficiency and higher safety standards were crucial to the rapid deterioration of punctuality.¹⁰ However, higher overcrowding levels reflected poor decisions in terms of project investments, notably a preference for expensive intercity links when the growth in demand was primarily on suburban routes—a reflection of external pressures overriding the thrust of the economic analysis.

Congestion extended to the U.K.'s international gateways as the nation's main deep sea container ports operated beyond capacity during peak times. The U.K.'s main global aviation hub—London Heathrow Airport—was operating at capacity for almost the entire day, leading to delays and congestion (Figure 2).

Greenhouse gas emissions from the transportation sector were also rising fast, driven by the growth in both private vehicle usage and aviation. When international aviation and shipping are included in

the U.K.'s figures, transportation's share of U.K. carbon emissions is 28 percent of the total.¹¹ The lack of a successful policy response to directly curb emissions made a difficult situation worse. The prevalent targets, such as bus patronage and mode switching, were not effective in areas outside London.¹² Demand management and fuel efficient technologies were not sufficient priorities in the policy development process.

The safety performance on the roads was a success story, driven by the alignment of targets with the underlying goal. Road safety had improved significantly following related policy responses and information campaigns.¹³ On the railways, a series of major accidents had raised concerns about safety performance.¹⁴ The structure and incentives of the privatized rail industry came under intense scrutiny in the debate about the causes of these accidents.

Sustained years of economic growth, surging demand across the modes, and belated or ineffective policies led to growing problems with congestion, reliability, overcrowding and lack of capacity by 2005. As a result, the quality of life for many users was deteriorating, the economic costs were becoming significant, and emissions from the transportation sector were rising.

III. The Eddington Transport Study

The wider economic and social impacts of the performance of the U.K. transportation network, coupled with the pressure from the public and the business community, meant that by 2005 the government sought radical action to reform its approach to transportation. To do this, it decided to break from traditional DfT-driven policy reform. In addition, the long term planning necessary for the transportation sector and the controversy around some of the potential reforms (e.g. road pricing) caused the government to attempt to forge a consensus across the political spectrum on the right course of action.

The government therefore turned to a model it had pioneered in the health sector: the use of a high profile expert, "independent review" to break with traditional departmental thinking, provide independence, identify innovative solutions, and help to create cross-party support for action. These reviews have usually been in step with the latest thinking and have been a useful way of accelerating policy development. They have been led by respected business leaders, academics, or other high-profile public figures, giving them focus and momentum. They have also been staffed by cross-departmental teams of civil servants and experts, usually based inside the Treasury department, helping them to avoid getting bogged down in inter-departmental inertia.¹⁵

Sir Rod Eddington, then chief executive of British Airways (a role he occupied from 2000 to 2005) was invited to lead the work. Eddington, a veteran of the transportation industry, had made a number of public speeches regarding the state of the U.K. transportation sector in the preceding years. In his speeches, Eddington warned of the danger to the U.K.'s economic growth if the performance of the transportation system continued to deteriorate. This, combined with his high professional standing, made him an appropriate choice to lead the study.

The general crux of the Eddington Study was to push transportation as a means to improve general economic performance, and to do so in a method that also promotes environmental and societal goals. The report is split into four sections:

The first considers the relationship between transportation and economic growth in detail. In section two, this in-depth understanding is combined with a data-rich analysis of the U.K. transportation network to identify the key areas where the performance of the transportation networks negatively affects economic growth and environmental sustainability. Based on the evaluation of 170 government investment cases, section three provides a series of policy options that would address the U.K. transportation challenges in a cost-effective manner. Finally, section four considers "delivery" issues, including reform to the development consent process, to improve the deliverability of interventions and investments. Each section is described below.

1. Understanding the links between transportation and economic growth

This section examines the fundamental links between the transportation system and economic growth, relying on previously published and newly commissioned academic and private sector research. The

Eddington Study found that there is a positive link between investment in transportation and economic growth. However, it could not determine the magnitude of this relationship and the direction of causality between transportation and economic growth.¹⁶

At certain times, investments in the transportation system, such as the rapid creation of passenger rail networks in Europe in the late 19th century and the completion of the U.S. interstate highway network in the 1950s, are associated with major increases in productivity. However, this only occurs when the improvements are genuinely transformative, which, by nature, are rare in advanced economies. Instead, most transportation improvements will have an incremental (but not insignificant) impact on productivity and growth. Therefore the detailed linkages between transportation and other sectors should be the focus of attention for policy makers in advanced economies, as they will guide policy toward making the most effective improvements.

The Eddington Study identified seven micro-economic drivers that may serve as gateways for transportation's impact on productivity. A well performing transportation network would:

- **Increase business efficiency**, through time savings and improved reliability for business travelers, freight and logistics operations.
- **Increase business investment and innovation** by supporting economies of scale or new ways of working.
- **Support clusters and agglomerations of economic activity**. Transportation improvements can expand labor market areas, improve job matching, and facilitate business to business interactions.
- **Improve the efficient functioning of labor markets, increase labor market flexibility, and the accessibility of jobs**.
- **Increase competition** by opening up access to new markets.
- **Increase domestic and international trade** by reducing the costs of trading for services and freight.
- **Attract globally mobile activity to the U.K.** by providing an attractive business environment and good quality of life.

The focus on the seven micro-drivers suggests that only well targeted transportation investments would have the expected results. In other words, the right level of investment is less important than where transportation projects are funded and how they are chosen. The Eddington Study recommended that investments in the most congested or growing areas, chosen in a transparent, prioritized manner, based on a full appraisal of their benefits and costs, should be the mainstay of the U.K.'s transportation policy.

2. Defining the challenge in the U.K.

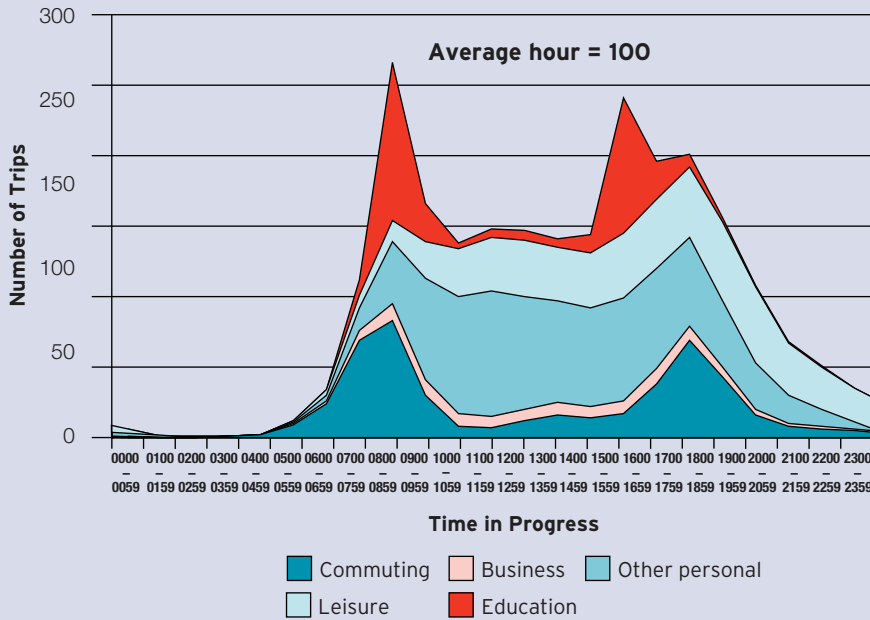
Based on the results of the first part, the second section of the Eddington Study sought to identify the strategic economic priorities for the U.K. transportation system. The report noted that the U.K. had a unique economic geography, with a territory relatively small and densely populated. The data showed that most journeys were short distance and local. Demand was concentrated onto certain parts of the network and at certain times of day (or year) (Figure 3).

Therefore, the transportation problems were mainly due to the high density of demand rather than the need to shrink long distances.¹⁷ Capacity and reliability, not speed, were therefore the more pressing problems, a view confirmed by stakeholder engagement. For example, a 2005 survey for the Confederation of British Industry (the U.K.'s top industry body) found that 62 percent of businesses surveyed believed unreliable delivery times for supplies had an impact on their business.¹⁸ This conclusion was in contradiction with the view of many transportation sector lobbyists and commentators who favored, with little supporting data, the creation of new high speed road and rail networks across the country on the basis that increased speed was the key problem affecting the U.K.

The Eddington Study noted that the major pillars of the U.K. economy are services in its major metropolitan areas and international trade in goods and services. As a very open economy, the U.K. would therefore have much to lose if international trade routes malfunctioned. Similarly, as a highly urbanized economy, the U.K. would be significantly affected if urban networks were to become significantly congested.

Further, the detailed performance data analyzed in the report showed that the U.K.'s transportation system was under the most pressure in both these places: the key metros and along key international

Figure 3. Trips in Progress by Hour of Day and Purpose, Great Britain, 2002-2004



Source: *The Eddington Study, volume 2, p.50, figure 5.*

trading corridors. All the modeling suggested these trends would worsen through to 2030.⁹ Consequently, at a strategic level, the report concluded that improvements in city networks, international corridors, and selected corridors between cities and international trading corridors are likely to offer the highest returns in the U.K.

In light of the findings in the first 2 chapters, the Eddington Study recommended that to meet the changing needs of the U.K. economy the government should focus policy and sustained investment on improving the performance of existing transportation networks in those places that are important for the U.K.'s economic success. Specifically, the three strategic economic priorities for transportation policy should be: congested and growing commuter cities, the key interurban corridors, and the key international gateways that are showing signs of increasing congestion and unreliability.

3. Meeting the challenge

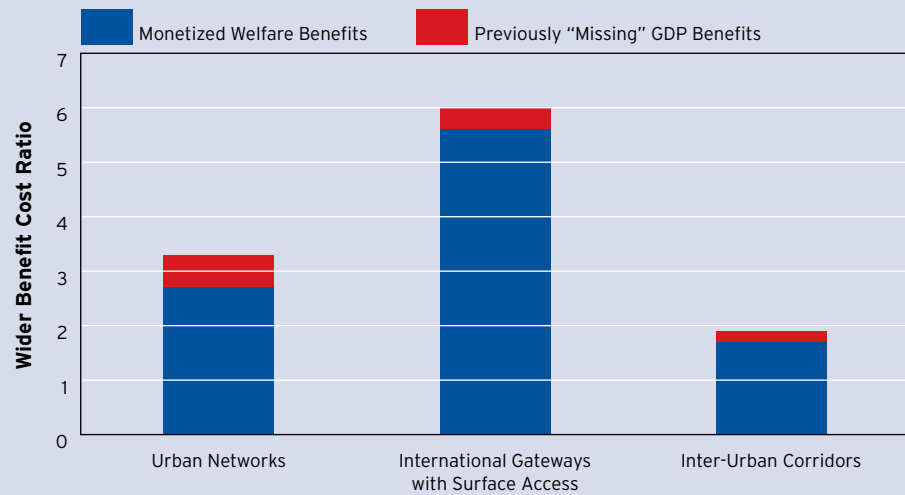
This section examined the best course of action to respond to the challenges identified in the first and second sections. The Eddington Study collated the detailed cost-benefit information for over 170 different projects (past, current, and future) considered (but not necessarily funded) by the government into a single database. The key conclusions were striking:

Certain transportation projects, such as those in international gateways areas, offer a very good return on investment. In fact, many offer economic returns of over £3 or £4 (about \$4.50 or \$6.25 in U.S. dollars) per pound of public investment when the benefits to the wider economy are added (Figure 4).

Ensuring that prices reflect the true benefit and impact of journeys was a “fundamental economic principle.” In other words, proper pricing was important for economic reasons, as well as critical for combating emissions by making users pay the economic costs of their emissions.

No one type of intervention (e.g. pricing vs. new capacity) or one mode had the monopoly on high returns—suggesting that transportation policy should be a mixture of different interventions (a “sophisticated policy mix”).

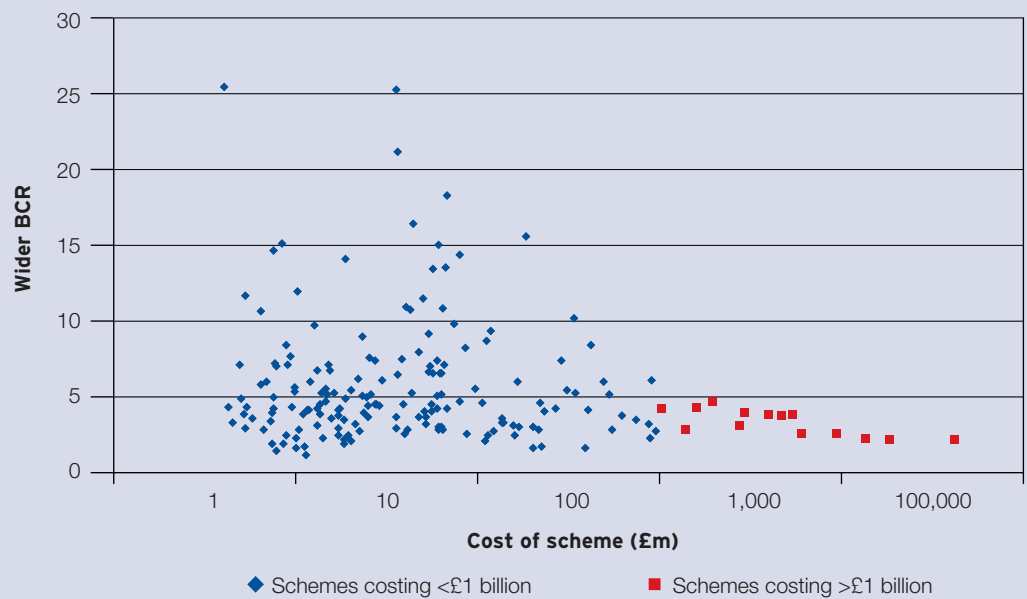
Figure 4. Average Economic Returns from Government Expenditure with GDP Impacts Added In: Wider Benefit Cost Ratios



Note: The wider benefit-cost ratio adds missing GDP effects to the benefit-cost ratio resulting from the DfT benefit-cost analysis. The latter monetizes changes to the overall costs of travel, the value of changes to travel times, safety benefits, and the economic costs of doing the project.

Source: The Eddington Study, volume 3, p. 129, figure 1.5.

Figure 5. Economic Returns of Smaller schemes Relative to Larger Schemes



^aCosts are in a log scale.

Source: The Eddington Study, volume 3, p. 132, figure 1.8.

Measures that allowed operators to make better use of existing assets often offered higher returns than investment in capacity. Some measures like longer trains, junction improvements on the roads, bus priority measures, and rail flyovers offered returns in excess of over ten to one.

Smaller scale schemes seemed to offer much better returns than large scale projects, on average (Figure 6). However, this did not mean large scale projects should be ruled out—sometimes surging demand or emission reductions will merit significant new capacity.

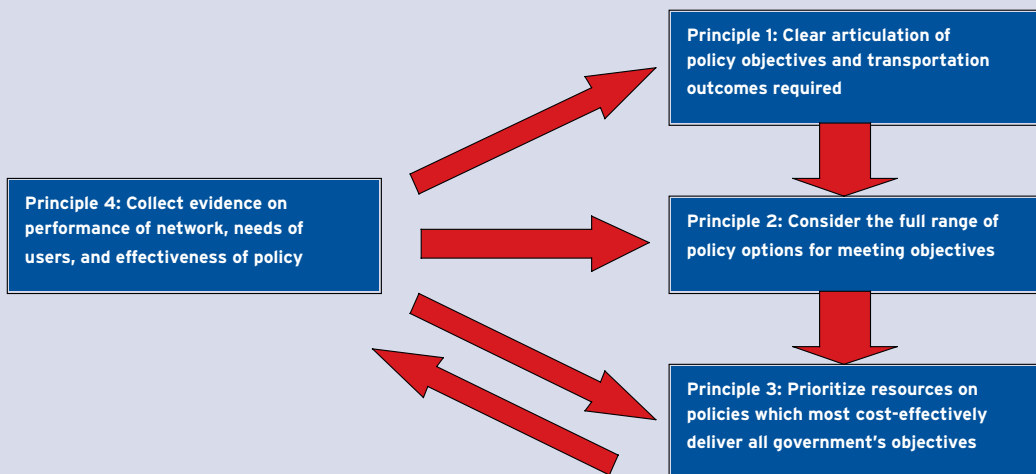
A nationwide congestion targeted road pricing scheme, in which drivers pay for the economic cost of the congestion they cause as well as environment costs, offers huge potential economic benefits. The Eddington Study team modeled a complex place- and time of day- specific congestion scheme, with up to 75 different price levels depending on the external congestion and environmental costs. The model capped the maximum price at eighty pence per kilometer (\$1.25 per mile). The Eddington Study quoted economic benefits of £28 billion (\$43.8 billion) each year by 2025, including a 50 percent reduction in congestion. In addition, an often overlooked benefit of the scheme was that the model found that 80 percent fewer new roads would need to be built, thus requiring significantly reduced public investment that could be spent elsewhere in the sector—e.g. mass transit—on other policy areas, or returned to taxpayers.

The “user-pays” principle emerged at the center of the Eddington Study’s recommendations. Paying the full costs of using the transportation network, across all modes, would eliminate the modal distortions in the government funding policy. In addition, it would help reduce congestion, greenhouse emissions, and the need of additional investment in new capacity. Users and transportation operators would use the current facilities in a more efficient way. As in any other economic sector, pricing is essential for an efficient allocation of resources in transportation.

4. Enabling the system to deliver

The Eddington Study concluded by proposing the reforms to the policy process required to deliver the new policy prescription in practice. In particular, it noted that it is crucial to identify the best solutions to the most pressing problems. This perspective is a radical change from the past.

Figure 6. Principles to Guide Transportation Decisionmaking



Source: *The Eddington Study*, volume 4, p.225, figure 1.1.

The report found that existing goals were not clear or were input driven. No objective assessment was made to determine which transportation problems were most economically or environmentally damaging. Instead, ‘solutions’ in the form of ideas or schemes bubbled up organically, driven by technologies or interest groups. However, it was not clear that these were solutions to the right problems, or even that they were the best solution to the problem. They were too often solutions looking for problems.

The Eddington Study urged policy makers to start with clear stated outcomes, and then consider a full range of options to deliver those outcomes (See Figure 6). The government should prioritize the projects that tackle all the set out objectives in the most cost effective manner. Data and modeling on both current and anticipated use and performance of the transportation network should inform all three steps of the process.

This three step process can be expanded into five key elements:

- **Define the outcomes that society seeks.** In other words, what are the true fundamental economic, environmental and social goals? This is distinguished from transportation outcomes or inputs and is based on the principle that transportation is a means to an end, not an end in itself.
- **Quantify the transportation issues that are hindering achievement of those economic, environmental, and social goals.** Strategic priorities for action should be identified given the likely direction of the relevant local or national economy. Then quantify the economic or environmental impact of specific problems, with a location specific, data-rich, definition of the issues (congestion, reliability, safety, etc.) and, importantly, focus efforts onto the most pressing problems or those that most hinder achievement of the goals.
- **Consider the full range of solutions.** The full range of interventions that might address the issue—e.g. pricing, regulatory, better use, capacity increases—should be examined and narrowed down on an objective basis.
- **Assess all impacts.** The cost-benefit analysis of projects should consider the full range of economic, environmental, and social impacts, including business innovation, labor market and trade impacts, carbon impacts, noise, and landscape impacts.
- **Make the Benefit-Cost Ratio (BCR) the primary driver of decisions.** Cost-benefit assessment should be used to prioritize those interventions that offer the highest return to society. They should not be used to justify existing decisions.

Given the scale of the transportation challenge in terms of future investment needs, this section of the Eddington report also called on the U.K. government to continue to work closely with the private sector to improve the operation of existing infrastructure and to deliver new infrastructure investment. The report noted the appetite in the private sector for long-term, stable assets, and recommended the government to take advantage of this trend.²⁰

IV. Reactions to the Eddington Transport Study

After it was published in December 2006, the Eddington Study was generally received positively by the stakeholders in the transportation policy process in the U.K. In particular was the appreciation and understanding that the report had put transportation firmly in the public spotlight as a critical input not just for economic growth, but also the quality of life and environmental issues. As a result, there was considerable goodwill and enthusiasm for the report’s recommendations, albeit accompanied by the usual skepticism about government’s ability to deliver change.²¹

However, there were exceptions. Some modal providers and representatives perceived themselves as “losers” in view of the proposals of the Eddington Study. The lack of specific recommendations with regard to modes, reinforced by the lack of modally-specific chapters (possibly a first for a transportation report), caused concern from those backing a specific mode.²² In part, this reflected a misunderstanding of the new approach in that the lack of modal conclusions was a very deliberate departure. The Eddington approach leaves room for all modes, but seeks not to favor any one.

Also contentious was the Eddington Study’s support for congested targeted road pricing. Indeed, this recommendation was highlighted in many of the newspaper headlines. Some motoring and small

government groups, including small trucking companies, were hostile to the move. Others expressed cautious support, including official motoring groups who could see the benefit to the motorists of less congested roads, as long as the overall tax burden on the motorists was balanced.²³

Perhaps the most enduring negative response came from those commentators and producer-backed lobbyists seeking a more “visionary” report: namely, one recommending a much bigger increase in capacity on the road and rail systems.²⁴ This argument interpreted the Eddington Study as rejecting large projects, and so questioned if the vision was enough to cope with surging transportation demand. However, this is another misunderstanding of the Eddington report. The study did not exclude big projects; it cautioned against large speculative projects and noted that smaller projects were often the *first* and *most effective* interventions to address a problem.

The business community gave vocal backing to the Eddington report. This reflected their satisfaction that their long standing position had been vindicated in a major independent review. Business owners in the U.K. have claimed for a long time that transportation network was restricting economic growth and driving up business costs.²⁵ Further, it reflected a strong welcome for the thrust toward better investment decisions, and therefore higher returns from their tax contributions. It reflected their strong backing for the focus on highly effective and quick-to-implement measures to increase the efficiency of use of the existing infrastructure, a typically business-like approach.

The environmental community gave a qualified response. They welcomed the focus on proper infrastructure pricing and the rejection of a simple “predict and provide” approach.²⁶ Likewise, the very strong messages that transportation should face its external costs and that project analysis should quantify the cost of carbon were positively received. However, the report’s finding that the provision of extra runway capacity in the U.K. was still justified, even with the inclusion of environmental and social costs into calculation, was less welcome.²⁷ This is an on-going debate in the U.K., which at the analytical level is a dispute about the true price of carbon. It is also a dispute about behavioral responses, and in particular whether an emissions trading scheme will drive emissions down to the extent desired or if more immediate barriers to further travel demand should be put in place.

V. The U.K.’s New Transportation Strategy in Practice

The U.K. government gave the Eddington Study a warm welcome and committed to the execution of the report’s recommendations. The implementation, however, was far from straightforward. The new approach makes very significant demands in terms of resources, data, modeling, and time, and the U.K. government required a considerable period of time to ensure all proposals of the Eddington Study were implemented with the necessary resources in place.

The U.K. government formally responded to the Eddington report in October 2007, by publishing a strategy document entitled: *Towards a Sustainable Transport System: Supporting Economic Growth in a Low Carbon World*.²⁸ The document was the culmination of ten months’ of activity to design the nuts and bolts of the government’s new approach. The design phase was led by an enhanced strategy team within the DfT, working closely with the Treasury (ultimately the implementation was agreed by the Cabinet). It also reflected a period of stakeholder consultation.

The government’s new approach represented a series of far-reaching policy, administrative and procedural changes. However, the goal was not simply a new process. Ultimately, the success of the reforms would be seen in a new portfolio of interventions that made a more effective impact on achieving the U.K.’s economic, social, and environmental goals. This section outlines the reforms but also explains how the intervention portfolio changed in light of the new process. It is important to note that these reforms reflect varying degrees of implementation.

A. A New Policy Process

The centerpiece of the government’s plan will be a new, evidence-based, cross-modal transportation planning and decisionmaking process, or “cycle,” modeled on the rigorous process recommended by the Eddington Study. Each cycle will identify, develop, and prioritize intervention and investment decisions for a future five-year period, reflecting the long term nature of the transportation sector. The

government announced that the first five-year period to be approached in this way would be 2014–2019. However, the planning would start immediately, to ensure that investment and reforms could be implemented immediately in 2014.²⁹

The key elements of this new cycle are as follows.

First, to deliver Eddington’s focus on societal goals not transportation outcomes, the cycle has a new set of formal targets for the DfT replacing the old, modal, and transportation outcome driven targets. In particular, this was reflected in a target to increase the “value for money” (VFM) of investment decisions annually. The focus will be on prioritizing those interventions which offer the highest benefit-cost ratio. The indicator used to measure the achievement of this target is the annual change in the average return on investment across the DfT portfolio. This target is a fundamental switch away from expressing targets by mode (e.g. road congestion) or types of intervention (e.g. levels of investment). Instead, what matters is the economic and social return on interventions, blind to the nature of the intervention, thus incentivizing the prioritization of the most effective solutions to support the economy and avoiding the false incentives inherent in proxy measures.

In addition, the DfT adopted a target to reduce carbon emissions, including the adoption of a year on year target for the reduction of carbon emissions from the sector. This represents the first ever carbon reduction pathway for the transportation sector in the U.K. Again, this replaced the use of transportation outcome targets (e.g. bus patronage or mode switching) as a proxy for carbon emissions. Instead, policymakers are now incentivized to prioritize the solutions which most impact on the true goal: reduced emissions.

Second, to identify the best interventions, the first stage of the new cycle will analyze the key problems facing the U.K. system in the three strategic priority areas: congested and growing cities and metros, the key interurban corridors, and the key international gateways. Following this step, the U.K. government plans to develop a series of potential interventions for each problem in consultation with delivery partners and other stakeholders. The goal is to prioritize pricing and other better use measures before investment in new capacity.

Third, to ensure that the best interventions are identified and all impacts are assessed in accordance with Eddington’s comprehensive approach, all options will be subject to comprehensive economic appraisal in accordance with new appraisal guidance. The new guidelines incorporate Wider Economic Benefits (WEBs) identified by the Eddington Study, such as labor market, international trade, and competition impacts. In addition, they incorporate wider environmental and social impacts, including the costs of carbon emissions. As result, appraisal will assess and present the impact of policies and projects on all of society’s goals, allowing policymakers to identify which intervention makes the most positive impact.

Fourth, to help prioritize interventions across modes and to focus on high VFM interventions, wherever possible, decisionmaking for all modes will be aligned to the five year cycle. Once a short list of possible interventions covering different networks and modes has been identified, all those interventions will be considered at the same time, so that comparisons can be made. Those interventions which will make the biggest impact—measured by the BCR—will be prioritized.

This process is fundamental in order to shift strategy and decisionmaking onto a cross-modal, goal-based footing. To deliver this new cross-modal strategy and planning, the DfT undertook a radical reorganization of responsibilities within the Department, centered on the new economic priorities.

Before Eddington, the Department was organized largely upon modal lines, reflecting the delivery structures. Thus there was a “director general” for each mode: roads; rail; buses and local transportation; and aviation and maritime. Strategy, planning, and delivery were organized along these lines, making cross-modal planning very difficult. These modal silos were replaced with structures based around the three strategic economic priority areas and the multimodal realities of users.

In the new structure, one director general oversees *City and Regional Networks*, including strategy and planning for roads, rail, and buses in cities; another director general oversees *International Networks and Environment* including aviation, maritime, and the surface access links to ports and airports; and another oversees *National Networks* including the key intercity and interregional road, rail, and air links.³⁰ To ensure coordination where these networks overlap—e.g. where surface access to airports was also a city network issue—these three units are coordinated by a central strategy and planning team.

B. A New Portfolio of Interventions

The government started to implement the new strategy in 2007 and 2008. A number of major decisions were either required for legal reasons (for instance, a statement on the future of the railways to provide guidance for private operators) or for urgent policy reasons, such as the policy toward a third runway at London's heavily congested Heathrow airport. It is already clear that the new approach, even though the first formal five year cycle will only affect interventions in 2014-2019, is having a significant effect on transportation policy decisions. A number of examples illustrate this.

In July 2007 the government published its *Railways White Paper*, as it is obliged to do every five years by law in order to give the private rail operators a firm picture of the future.³¹ The White Paper committed to major investment in increased capacity in the cities (one of Eddington's strategic priorities), but also contained, following Eddington, a strong focus on smaller schemes and better use measures aimed at congested pinch-points in the network. For example, the Paper announced the purchase of over 1,200 new commuter rail cars in order to rapidly deliver greater capacity without major capital works, platform improvements to reduce congestion and shorten dwell times, and junction improvements to unlock capacity by releasing pinch-points caused by same-level junctions.³²

On the roads, the government heralded the greater use of pricing and demand management measures to alleviate congestion, rather than new capacity. For example, it confirmed its commitment to the introduction of congestion targeted road pricing in three more U.K. cities before 2012. This was to be accompanied by significant associated mass transit improvements funded by the Transport Innovation Fund (TIF).

This new transportation fund provides financing to local governments to develop innovative local and regional transportation strategies.³³ The TIF supports the costs of demand management measures such as congestion pricing schemes, provides incentives to local governments to use new funding sources, and to create projects of regional and national importance. While the idea was proposed in 2004, the TIF money (up to £200 million annually—about \$305 million) became available to local government projects in the fiscal year 2008.³⁴ In 2008, the government extended the funding horizon for TIF from fiscal year 2014 to 2018, in order to maintain funding for long term planning.³⁵

The government introduced *Active Traffic Management (ATM)* as a pilot roads program in the Birmingham area in 2006. ATM is an integrated system that uses strategies like remotely controlled variable speed limits to ease traffic congestion and to maintain flow, as well as opening up the hard shoulder as an additional lane during busy times. The two stages of the Birmingham pilot (a six month and a twelve month trials) suggested that relatively low levels of investment in things like gantries, electronic signs, cameras, and remote operators could result in significant improvements in average speeds, journey time reliability, safety, and environmental performance.³⁶ This could be possible while accommodating the same level of demand.

The government has also shown that it understands Eddington's message that small steps are not always sufficient. In October 2007 the government announced the go ahead for London's Crossrail project, an almost £16 billion (\$24.76 billion) new underground rail line across London, extending from Heathrow airport, through the City of London and out to Canary Wharf, London's fast growing new financial district.³⁷ In addition, despite environmental groups' opposition and the long consultation process, the Secretary of Transportation declared the government's support for the creation of a third runway at London's Heathrow airport in January 2009.³⁸

C. An Enduring Legacy, but not Without Challenges

Confirming the enduring legacy of the Eddington Study, the government's transportation plan, *Delivering a Sustainable Transport System*, published in November 2008, set out the government's plans to 2014.³⁹ The plan strongly reflects the new, Eddington-inspired approach.

The document focuses on the challenge of delivering strong economic growth while at the same time reducing greenhouse gas emissions. It identifies the U.K.'s "strategic infrastructure," which is a network based on Eddington's original three strategic priorities: 14 national transportation corridors connecting the U.K.'s 10 largest metropolitan areas and 17 key international gateways.

The plan commits to concrete investment and policy plans to 2014. Reflecting the Eddington Study, it focuses on making better use of the existing network, combined with a targeted program to improve capacity, reliability, and safety in the most congested areas. In addition, the strategy paper includes

a detailed case study of analysis of the London to Manchester corridor. The case study is included to specifically demonstrate how the new approach works in practice. A careful, objective-focused, and modally-agnostic policy process leads to the identification of high return multimodal policies, similar to Eddington's "sophisticated policy mix."

That said, applying Eddington's transformational approach has not been without its challenges.

For example, the government's "pathway" to road pricing was based around a phased roll out of charging schemes in large metropolitan areas.⁴⁰ However, in both Manchester and Edinburgh progress toward congestion charging schemes has been very difficult, not least due to public opposition to the specific plans. Greater Manchester voters roundly rejected the pricing scheme there in a regional referendum in December 2008.⁴¹

Another potential challenge exists concerning high speed rail. All three political parties publically support such investments, and top officials at the DfT have called for analytical work in the case for a second new high speed rail line in the U.K.⁴² At first sight, such enthusiasm for a particular mode may seem to be a challenge to the "modally agnostic" approach advocated both by the Eddington Study and the government's own policy plans. However, this enthusiasm may not necessarily challenge the integrity of the new transportation strategy if the investigation finds a strong economic and environmental case for high speed rail and assesses it to be a better investment than other available options. If politically-motivated decisions overrule the evidence in regard to impacts, this would be poor policy and the bad old days of modal prejudices would have returned.

Last is the challenge of ensuring the Eddington Study's legacy endures beyond the walls of the DfT. There have been three transportation ministers since the report's publication in December 2006 and a change of government, so continuity is a potential problem. But perhaps looming larger are the complexities inherent in persuading politicians to rely entirely on quantified economic appraisals to determine how these infrastructure investments are made.

VI. Eddington's Lessons for the United States

There are important lessons from the U.K. experience in transportation policy reform for the United States. The lessons are not perfect matches, however, since the systems of government in the two nations differ substantially. In the U.K., the central government collects and distributes almost all public funds and takes the lead on all major policies, including health, education, crime, economic development, as well as transportation. In fact, the U.K. is one of the most highly centralized countries in the industrialized world, operating under a parliamentary system of government.⁴³

In contrast, the U.S. system is far more disaggregated. This pertains both to how Washington operates and the relationship between the executive and legislative branches, as well as the federalist system and the relationship between the federal government and the states, not to mention local governments and over 300 metropolitan areas. This means the federal government has a difficult time developing broad-based policies that truly meet national interests, as opposed to those of individual states.⁴⁴

However, like the U.K., the future performance and sustainability of the U.S. transportation network is a cause for real concern. The quality of the policy development process is under scrutiny, with modal thinking in the ascendancy and economic analysis playing only a minor role in decisionmaking. Transportation is seen as end in itself, rather than in service to economy and other national priorities.

Fortunately, a recent flurry of reports and legislation has amplified the need for an Eddington-like approach for the U.S., though not always referred to as such.⁴⁵ Notably, the National Surface Transportation Policy and Revenue Study Commission's 2008 report *Transportation for Tomorrow* stated that "in addition to putting more money into the system, we also must create a system where investment is subject to benefit-cost analysis and performance-based outcomes."⁴⁶ The U.S. House Transportation and Infrastructure Committee's draft proposal for reauthorization of the federal transportation law aspires to "transform Federal surface transportation to a performance-based framework."⁴⁷

The reason for this receptivity is the recognition that U.S. institutions, methods, and programs for

transportation are in many ways a half century old and are tailored to the challenges of a bygone era. There are three major problems:

In transportation policy, the federal government is often **absent** when it should be present, lacking any overarching vision, goals, or guidance. Put another way, the program does not recognize that there is a role for the federal government in areas inherently national in scope. Clearly this is partially due to the fact that, unlike the U.K., the U.S. system has long been considered to be a federal-aid program with the states assigned the primary role in transportation planning and programming.

In addition, as a program with its roots in the 1950s, the U.S. surface transportation program is woefully **outdated**. U.S. transportation policy has only haltingly recognized metropolitan areas' centrality to transportation outcomes, continues to emphasize the individual modes while at the same time compartmentalizing the federal highway, transit, railroad, and aviation programs. Like the U.K. in pre-Eddington days, the United States has not embraced market mechanisms or a range of pricing schemes to better operate and manage the system. A recent report shows that highway funding in the United States is shifting markedly away from user fees.⁴⁸

The third problem is that the lack of a 21st century approach to government means the U.S. program is **underperforming** and failing to maximize efficiencies. Formal benefit/cost analyses are not used and regular evaluations of outcomes are typically not conducted.⁴⁹ On the whole, transportation, almost uniquely among federal programs, has failed to adopt the past half century's advances in economic analysis, evidence-based evaluation, and data that support those decision tools.

There is no doubt that an Eddington-style approach to transportation policy represents a radical reform for the United States. Given the different systems of government, the complex relationships between the federal, state, local, and metropolitan actors, and growing disconnection between funding and revenues, the wholesale adoption of an Eddington approach is unlikely. However, there are several key considerations wrought by Eddington that have direct applicability to the ongoing transportation policy problems in the United States.

To address the absentee nature of the program, the U.S. government could establish and prioritize a set of national objectives that articulate what the nation wants the federal transportation investments to achieve. To truly produce real prosperity, federal leadership, as with the interstates in the 1950s, is more necessary than ever and should advance an updated vision identifying strategic, transformative infrastructure investments of critical importance to support the competitiveness and environmental sustainability of the nation.⁵⁰

To update the program to meet the realities of today, policy should get the prices right (especially congestion pricing on the roads and environmental pricing across all modes) to allow for better management of the metropolitan network. At the same time, a modally neutral approach would help advance the broad national goals: in other words, examining particular policy areas through the broad lens of the policy outcomes (e.g. economy, environment, equity) rather than that of a particular mode (e.g., highway, transit, bike/pedestrian, and air). Without a doubt, specific and different modes are critical to delivery, but that should not be the starting point.

To optimize Washington's own performance and that of its partners the United States needs to make great strides and objectively measure progress toward the national goals and implementation of the program.⁵¹ While no simple analytical tool can provide all the answers, in this era of fiscal austerity the federal government should take steps to ensure that grantees apply rigorous benefit/cost analyses to any project that uses federal funds. In this way, there can be some assurances that high returns are being generated and that investments are properly evaluated.

In this regard, two important efforts initiated in 2009's American Recovery and Reinvestment Act (ARRA) should be monitored closely. One is the \$8 billion intended to jump start an American high speed rail network. The other is \$1.5 billion in so-called TIGER (Transportation Investment Generating Economic Recovery) grants. Both of these new federal initiatives are competitively-driven with selection criteria based on key indicators of economic return, energy independence, environmental quality, and others.⁵² Both were oversubscribed with applications for far more funding than available. In TIGER's case it was 38 times greater. While initial examinations of the project decisionmaking look positive, detailed evaluations should be conducted to determine the extent the awards were made based on merit and the efficacy of those projects. Proven success with respect to the programs may help alleviate the pressure to allocate funds in other areas based on political considerations, rather

than the kind of quantitative evidence endorsed by Eddington.

Yet, perhaps the most important lesson the United States can learn from the U.K. experience is that the British team was not worried about transportation when they began the work. They were concerned about the economy. In other words, they did not set out to address problems like congestion in and of itself: but, for example, worried about the effect of congestion on users, its critical metropolitan areas, and goods movement. With the United States facing crushing fiscal challenges today, examining the economy through a transportation lens—with recognition of environmental and social factors—is something policymakers in this country should deliberate.

VII. Conclusion

The performance of a nation's transportation system matters to its economic, social, and environmental success. In response to widespread concerns about the performance of its own system, and following the recommendations of Sir Rod Eddington's independent review, the U.K. Government is reforming its approach to transportation policy. Moreover, the reforms have begun to bite: leading to a sea-change in the direction of policy with interventions carefully targeted on key priorities such as cities and international gateways, and the adoption of a mixture of the most promising interventions, including a far greater use of intelligent better use and demand management measures.

The transportation reforms of the late 2000s provided the U.K. with a new start. It has adopted a policy process which is able to identify the best solutions to its challenges. It has already started to implement promising interventions that will make an immediate impact on its economic and environmental goals, such as active management of highways and junction improvements on commuter rail lines.

It is important for U.S. policymakers to understand that implementation is not straightforward. It requires political and bureaucratic support and patience. It also requires significant new data and modeling capabilities, a stronger strategy and problem definition capability, and a wholly new long-term administrative process. Such changes take time and resources, and need careful explanation to internal and external stakeholders.

Yet, given the challenges the United States is facing today, there may be no better time to start.

Endnotes

1. Oliver Jones is a former U.K. senior civil servant. He led the team which produced Sir Rod Eddington's study of the future of transportation policy in the U.K. Following the publication of the Eddington report, Jones moved to the U.K. Department for Transport (DfT) as head of the Board Support Division, where he had responsibility for the implementation of the Eddington report's recommendations. Jones is currently a Director in the Economics practice at PricewaterhouseCoopers Australia. The views expressed in this paper are his own and do not necessarily reflect those of PricewaterhouseCoopers Australia.
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3. Rod Eddington, "Main Report: Transport's Role in Sustaining the UK's Productivity and Competitiveness," HM Treasury, UK, 2006. The paper will refer to it as the "Eddington Study" or "the report."
4. U.K. DfT, "Spending Review 2002 PSA Targets," April 12, 2005. Available at <http://www.dft.gov.U.K./about/howthedftworks/psa/spendingreview2002psatargets>.
5. Network Rail, the company that has managed the U.K.'s rail system since 2002, released its 5 year strategic plan (2009-2014) in 2006. The U.K. Highway Agency in charge of the major roads in England released its ten year plan in 2001. The Highway Agency's "targeted program of improvements" was reorganized into the "program of major schemes" after the 2007 review of the program. See: Network Rail, "Initial Strategic Business Plan," 2006; U.K. Highway Agency, *A Targeted Programme of Improvements: Highways Agency Strategic Plan for Improving the Network*, 2001; Nichols Group, "Review of Highways Agency's Major Roads Programme," London, 2007.
6. Analysis done in the Eddington Study shows that many large rail intercity projects constructed or proposed up to 2005 by the U.K. the national government have low economic benefits. The average return from the intercity

- transportation projects was estimated at around £1.8 per 1 pound invested. By removing the large intercity projects from the sample, the returns increased three fold, to almost £5 per 1 pound invested. The economic returns are defined as the result of the wider benefit-cost analysis that adds missing GDP effects to the benefit-cost ratio resulting from the DfT benefit-cost analysis. The latter monetizes changes to the overall costs of travel, the value of changes to travel times, safety benefits, and the financial costs of doing the project including impacts on taxation revenues. Source: Eddington Transport Study, p. 129, figure 1.5.
7. Geoff Vigar, *The Politics of Mobility: Transport, the Environment and Public Policy*, Routledge, 2001.
 8. U.K. DfT, "A New Deal for Transport: Better for Everyone," 1998.
 9. The London Congestion Charge was implemented with reluctant support from central government, which paid the set-up costs for the system, and increased bus subsidies to give Londoners more transportation options ahead of the charge's introduction. Chris Webber and Alan Berube, "Smarter, Stronger Cities: U.K. Urban Policy Innovations and Lessons for the U.S.," Washington: Brookings, 2008.
 10. A 2003 study suggests that the cost to businesses in the U.K. due to punctuality and reliability problems with the railways is around £400 million-£1 billion (\$625 million-\$1.56 million) per year. See Oxera, "Passenger Rail Services and Economic Performance," 2003. The exchange rate used is in purchasing power parities (PPP) for 2003-0.64 British pound per U.S. dollar. Source: Organisation for Economic Co-operation and Development (OECD), "OECD Stat Extracts," 2009, Table 4: "PPPs and Exchange Rates." Available at: http://stats.oecd.org/Index.aspx?datasetcode=SNA_TABLE4.
 11. Eddington Transport Study, volume 2, p.88, figure 2.13.
 12. U.K. Department of Trade and Industry, "The Energy Challenge - Energy Review Report," 2006.
 13. The U.K.'s annual average fatalities rate decreased significantly from the 1980s (-1.3 percent) to the 1990s (-4 percent). In comparison, in the U.S. the rate has increased from the 1980s (-1.3 percent) to the 1990s (-0.6 percent). International Road Traffic and Accident Database, "Road Safety Improved in 2008," OECD, 2009.
 14. On October 5, 1999, the U.K. witnessed one of the worst rail accidents in recent years, known as the Paddington crash. 31 people died and many others were injured when a commuter train collided with a Great Western express in the London area. A year after, an intercity train from London to Leeds derailed outside the town of Hatfield, killing four people. The evaluation of the Paddington crash recommended the creation of a rail accident investigation authority. Consequently, the Rail Accident Investigation Branch (RAIB) was established in 2003. British Broadcasting Corporation News, "London Train Crash: Special Report," January 2000. Available at http://news.bbc.co.uk/2/hi/special_report/1999/10/99/london_train_crash/465503.stm; British Broadcasting Corporation News, "Hatfield Train Crash," October 2000. Available at http://news.bbc.co.uk/1/hi/english/static/in_depth/U.K./2000/hatfield_crash/default.stm.
 15. Webber and Berube, 2008.
 16. Eddington Transport Study, volume 1.
 17. The U.K. National Travel Survey considers "long distance" trips as those over 200 miles. Long distance trips were a very small share of all trips between 2002 and 2005 in the U.K. Even in the case of business trips, long distance travelling was less than 3 percent. The reason is the small area of the U.K. relative to the United States and the high density of settlements in the U.K. and in Europe in general. For example, the driving distance between London and Edinburgh, which is the largest northern U.K. city, is only 397 miles. Brussels (227 miles) and Paris (288 miles) are even closer to London. The driving distance between New York and Los Angeles is about ten times longer (2,784 miles). U.K. DfT, "National Travel Survey," 2005.
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23. Steve Collie, the national transport chairman of the U.K. Federation of Small Businesses supported a road charging scheme only if it targets non-essential journeys. Sturcke, 2006.
24. The U.K. Road Haulage Association chief executive Roger King argued for additional investment in strategic roads, in addition to any congestion pricing scheme. Sturcke, 2006.
25. CBI, 2004.
26. Stephen Joseph, the director of Transport 2000, welcomed the recognition that the U.K. will not be able to build its way out of congestion. Sturcke, 2006.
27. Tony Bosworth, Friends of the Earth's senior transport campaigner, remarked that airport expansion will send the U.K. "in totally the wrong direction." Sturcke, 2006.
28. U.K. DfT, "Towards a Sustainable Transport System: Supporting Economic Growth in a Low Carbon World," 2007
29. The second period will run from 2019-2024, and a completely new cycle of planning and decisionmaking will inform decisions in that period.
30. Delivery expertise was kept in modal silos, to keep a critical mass of expertise and knowledge together. For example, those running the railways in an operational sense remain in one team under one director general, although the strategy and forward planning for different parts of the rail network is developed by three different, but coordinated, teams under each director general.
31. Indeed, given the statutory nature of the rail five year planning periods, the new cycle was deliberately aligned with the rail periods to ensure cross-modal planning included the future of the railways.
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33. U.K. DfT, "The Future of Transport," 2004.
34. U.K. DfT "Transport Innovation Fund," 2005.
35. U.K. DfT, "Supporting the Development of TIF Packages," 2008.
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37. U.K. DfT and Transport for London, "Head of Terms in Relation to the Crossrail Project," 2007.
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39. Note the progress from strategy to action plan: "Towards a Sustainable Transport System" becomes "Delivering a Sustainable Transport System".
40. One of Sir Rod's key recommendations was to avoid a big bang approach to road pricing and instead to take incremental steps.
41. James Sturcke, "Manchester Says No to Congestion Charging," The Guardian, December 12, 2008.
42. The first high speed rail line runs from London under the English Channel to Paris and Brussels.
43. Webber and Berube, 2008.
44. Robert Jay Dilger, "Federalism Issues in Surface Transportation Policy: Past and Present," Congressional Research Service, 2009.
45. One important report by the Bi-Partisan Policy Center does reference Eddington explicitly: The National Transportation Policy Project (NTPP), "Performance Driven: A New Vision for U.S. Transportation Policy," Washington: Bi-Partisan Policy Project, 2009. This report extensively details what a merit-based transportation program would look like in the United States.
46. National Surface Transportation Policy and Revenue Study Commission, "Transportation for Tomorrow," 2008, p. 1-2.
47. Surface Transportation Authorization Act of 2009, House Committee on Transportation and Infrastructure, 111 Cong. 1 sess, 2009.
48. The shift is toward non-user fees such as income and sales taxes. SubsidyScope, "Analysis Finds Shifting Trends in Highway Funding: User Fees Make Up Decreasing Share," Washington: The Pew Charitable Trusts, 2009.

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U. S. GAO, "Highway and Transit Investment: Options for Improving Information on Projects' Benefits and Costs and Increasing Accountability for Results," GAO-05-172, 2005.
50. See e.g., Transportation for America, "The Route to Reform: Blueprint for a 21st Century Federal Transportation Program," Washington, 2009.
51. NTPP, 2009.
52. Mark Muro and others, "Metro Potential in ARRA: An Early Assessment of the American Recovery and Reinvestment Act," Washington: Brookings, 2009.

Acknowledgements

For their substantive and thoughtful comments on earlier drafts and other elements of this paper, we wish to acknowledge: Paul Buchanan, Kenneth Button, Patrick DeCorla-Souza, Mortimer Downey, Adam Marshall, John Siraut, and Geoff Vigar. At the Metro Program: Alan Berube, David Jackson, Mark Muro, Robert Puentes, Adie Tomer, and Anne Wingate.

Emilia Istrate played the lead role in managing this report through publication.

In 2008, Brookings collaborated with partners in four metropolitan areas and held a series of events entitled, "Transportation Reform: What the UK Can Teach America," featuring Oliver Jones the author of this report. For their assistance we wish to thank the Regional Plan Association (New York), the Metropolitan Planning Council (Chicago), the Bay Area Economic Forum (San Francisco), and Metro (Portland). This study draws heavily from those events and the ideas discussed that week.

The Metropolitan Policy Program at Brookings thanks the Surdna Foundation and the Rockefeller Foundation for their support of the program's Metropolitan Infrastructure Initiative and the John D. and Catherine T. MacArthur Foundation, the George Gund Foundation, the Rockefeller Foundation, and the Heinz Endowments, for their general support of the program.

This work builds on a decade of independent and rigorous research and policy development funded through prior support from the Ford Foundation, the Joyce Foundation, MacArthur Foundation, the McKnight Foundation, Charles Stewart Mott Foundation, the William Penn Foundation, and the Rockefeller Foundation.

We also wish to thank the members of the Metropolitan Leadership Council for their support of the Blueprint Initiative, a multi-year initiative to promote an economic agenda for the nation that builds on the assets and centrality of America's metropolitan areas. Learn more about the Blueprint at www.blueprintprosperity.org.

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