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Swedish and Scottish National Transport Policy and Spend: A Social Equity Analysis

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Abstract: The topic of social equity in transport planning has been dealt with, in particular, by authors such as Martens (2012) and Martens and Golob (2012) using a social justice based-approach. However, such an approach, whilst valuable and analytically rigorous (based as it is on accessibility modelling), does not consider a wide range of possible other social impacts of transport, as set out in a framework first put forward by Geurs et al. (2009). This paper uses Geurs' analytical framework to consider two empirical case studies: The National Transport Strategy for Scotland, adopted in January 2016, together with associated national level spending plans; and Sweden's 2014–2025 National Transport Plan. The paper will first summarise the contents of each document before analysing them in relation to the categories of social impact that Geurs (2009) identifies, and assess how, in relation to each category of impact, various social groups will benefit or disbenefit. A range of projects (planned) to be delivered by the two national strategies is then analysed in relation to the criteria. This analysis shows that the two national strategies/plans are in their distribution of spending, and the projects funded are generally working away from greater social equity in their distributional impacts.

Keywords: social; equity; national; transport policy; funding

1. Introduction

Transport has economic, environmental, but also social impacts. Geurs et al. [1] define these social impacts as:

> "...changes in transport sources that (might) positively or negatively influence the preferences, well-being, behaviour or perception of individuals, groups, social categories and society in general (in the future)".

This definition is generally accepted as both robust and comprehensive, being used by a number of others investigating the social aspects of transport, including Anciaes, Metcalfe, and Heywood [2], and Lowe, Stanley, and Stanley [3].

Public investment in and spending on transport produces these social impacts and it is clear that they are not distributed equally in time, space, or socio-economically: There is a clear social equity dimension to the social impacts of transport. This is because that spending is focused on certain types of investment and services that may be used by or useful to certain socio-economic groups more than others (for example, in many countries, national roads and rail receive a high proportion of the public funds spent on transport—see UK Department for Transport [4] for a breakdown of English transport spending across these headings); and because spending is unevenly distributed in space, since transport infrastructure investments, in particular by their nature, are made in one place or along

one corridor. In another example, Chatterton et al. [5] have recently demonstrated that those social groups who contribute least to local air pollution suffer most from the health effects of that pollution, and it has long been known that poorer people are more likely to be victims of collisions on the road (see for example, Naci, Chisholm, and Baker [6]).

At the same time, governments have stated objectives to make their transport systems more socially inclusive and equitable. For example, Sweden's government states in its overarching objectives for the transport system that "ways of working, the implementation and impacts of transport policy should lead to a more equitable society" (Swedish Government Environment Department [7]). The Scottish Government [8] published an updated National Transport Strategy in 2016 in which "social inclusion" is a strategic objective and where the vision for transport in Scotland states explicitly that the government seeks ... "an accessible Scotland with safe, integrated and reliable transport that ... provides opportunities for all".

The objective of this paper is to use a theoretical framework as the basis for a comparative review of national transport policy and spending in Sweden and Scotland, two relatively small northern European countries, to assess how far their respective national transport policies support the stated objective of increasing social equity by reducing transport's negative social impacts. These two countries have been selected because of their size, distribution of population between urban and rural areas, age profile, and relatively similar governance structures for transport at the national level. Relatively good data availability is also a motivation for the selection of these two countries (note that although Scotland is not a state in its own right, almost all decisions about surface transport policy and spend are made at the Scottish government level, not the UK government level).

An important issue with regard to an analysis of the social impacts of transport policy and spend in different countries is how governments and politicians in those two countries have viewed social justice. Social justice is a concept (much challenged by some economists and philosophers) of a basic level of "fair play" in the individual's relationship to society. This relationship is seen to result from factors such as distribution of wealth and access to opportunity. However, different countries are known to view social justice differently. Sweden's view of social justice has historically been that it should be redistributive, as well as ensuring equality of access to opportunity, whereas in the UK, there is more emphasis only on the latter. This is seen in the quotes from transport policy documents in the two countries in the paragraph before last. It is possible that these different views of social justice will feed through to differences in transport policy and spending and thus in the equity with which social impacts of transport are distributed—the empirical evidence for or against this will be considered later in the paper.

It is important at this point to have clarity on the terms used in this paper. To do this, the following definitions are helpful:

- **Social impacts** of transport are as defined by Geurs et al. [1].
- **Social equity** in transport is the equality, or otherwise, with which transport's social impacts are distributed.
- **Social justice** refers to the "fairness" in the relationship between the individual and society.
- **Equality of opportunity** in this paper refers to a political objective, to ensure that individuals have equal access to the activities and services (e.g., jobs, education, healthcare) that they need in order to prosper. It is not something that this paper attempts to measure quantitatively.

In addition, accessibility in this paper is defined in social terms, using the question-as-definition first provided by the UK Government's Social Exclusion Unit (SEU) [9]:

> " ... can people get to key services at reasonable cost, in reasonable time and with reasonable ease? Accessibility depends on several things: does transport exist between the people and the service? Do people know about the transport, trust its reliability and feel safe using it? Are people physically and financially able to access transport? Are the services and activities within a reasonable distance?"

The paper will first review relevant literature and develop, based on earlier work, an analytical framework that supports the type of analysis that we seek to carry out here. The paper then describes each country's national transport strategy and the spending patterns that proceed in parallel with the strategy. It then assesses the degree to which the strategy and spend support increased reduced social impacts and increased social equity as the strategic objectives suggest that it should, by considering the impacts in relation to their effects on a subset of social groups.

2. Previous Literature and Analysis of Social Impacts

The topic of social equity in transport planning has been dealt with in particular by authors such as Martens [10] and Martens and Golub [11] using a social justice-based approach. It has much been informed by the US Federal definition of social justice, and empirically based on accessibility analysis, to demonstrate how new transport infrastructure investments benefit and disbenefit different social groups in terms of the distribution of resulting accessibility improvements. Martens [10] convincingly demonstrates that traditional planning approaches may result in inequalities in speed, and potential mobility, as well as accessibility.

However, this is very much a distributional analysis—looking at how impacts are distributed across different social groups, in time, and space—and such an analysis may, as argued by Jones and Lucas [12] omit certain types of social impact which may, nonetheless, have social equity implications. In addition, as they point out, changes in accessibility are but one possible form of social impact. This paper therefore adopts Jones' and Lucas' viewpoint that transport policy decisions (resulting in specific forms of investment as well as services) lead to impacts that can be environmental, economic, and/or social; and that these impacts then have distributional effects in terms of who benefits and disbenefits from them, where, and when.

The points that Jones and Lucas [12] make also sit reasonably with a framework first put forward by Geurs et al. [1], who categorised the social impacts of transport in terms of the presence of infrastructure; presence of (parked) vehicles; presence of transport facilities; movement of vehicles (traffic); travel; and land use. This obviously covers a much wider range of impacts than only changes in accessibility. Jones and Lucas provide a list of impacts including accessibility (micro, meso, and macro); actual patterns of use of the transport system; road casualties and injuries, air quality, noise, physical activity, and intrinsic value; and community impacts, before considering how these are distributed across time, space, and social group. These various impacts were categorised and listed as follows by Lucas and Markovich [13].

These social impacts are not, as many authors have commented previously, distributed equally across socio-demographic groups. Many authors and policymakers also have noted that people in certain socio-demographic groups are at risk of social exclusion, that is, being unable to participate fully in society due to a range of barriers. Studies also show general trends of increased social exclusion (van Wee [14]). If social exclusion is to be reduced and equality (of opportunity) maintained or enhanced then at the very least the barriers to inclusion caused by the social impacts of transport should be distributed equally across groups, and transport policies and should seek to change any unequal distribution of impacts in a direction that reduces these barriers.

In practice, a major issue that influences how different people experience the social impacts of transport is how they travel. Travel survey data shows very clearly that people in different socio-demographic groups travel differently, and have differing levels of mobility. Table 1 presents data from the English National Travel Survey.

Table 1. Trips per year by different socio-demographic groups, England, 2016 (source: English National Travel Survey, [15]). Percentages show proportion of trips in each column made by each mode.

	Percentage of Trips Made by Each Mode						
	Lowest Real Income Level	**Second Level**	**Third Level**	**Fourth Level**	**Highest Real Income Level**	**All People**	**People Aged 70 or Over**
Walk	29	23	20	19	19	25	23
Bicycle	3	2	2	2	2	2	1
Car/van driver	28	37	44	48	47	41	43
Car/van passenger	23	25	23	22	20	21	21
Other private tspt	1	1	1	1	1	1	1
Bus and coach	12	8	6	4	3	6	9
Rail	2	2	3	3	6	2	1
Other public tspt	2	2	1	1	1	1	0
Total trips all modes (count)	791	867	947	991	1014	954	777

It is clear from Table 1 that poorer groups and the elderly travel less in terms of number of trips (the difference in terms of km travelled is much more marked but is not shown in this table) and are far more dependent on walking and buses, and less dependent on cars and rail, than wealthier people. This is driven, in part, by much lower car ownership in poorer groups and amongst the elderly.

Precisely equivalent data are not currently publicly available for Sweden but Table 2, below, based on the Swedish National Travel Survey (Transport Analysis, [16]) provides some indications that similar patterns can be observed there. In particular, the number of trips made per person per day is 20% fewer than the average in the 65–74 age group and 35% fewer in the 75–84 age group. In addition, in 2005, 70% of people in the wealthiest 25% of households had access to a car, whilst this figure was 22% amongst the poorest 25% (Pyddoke, [17]).

Table 2. Trips by different socio-demographic groups, Sweden, 2016 (source: Transport Analysis, [16]).

	Percentage of Trips Made by Each Mode							
	Lowest Real Income Level	**Second Level**	**Third Level**	**Fourth Level**	**Highest Real Income Level**	**All Men**	**All Women**	**People Aged 65–84**
Walk	21	22	11	8	6	9	14	15
Bicycle	28	16	14	14	17	14	15	11
Car	23	39	61	68	61	62	55	61
Bus and coach	18	17	8	7	6	8	10	11
Rail	9	5	5	3	6	4	5	1
Other	1	1	1	1	4	3	1	1

The literature gives some important pointers as to how the impacts listed in Table 3 are in fact inequitably distributed in relation to older people (those aged 65 or over (Sweden) or 70 and over (Scotland)) and people in the lowest income quintile (Scotland) or quartile (Sweden). There are, of course, other socio-demographic groups across which the distribution of social impacts of transport could be analysed: For example, women, children, or disabled people. Many of these characteristics interplay with each other; for example, older people have a higher prevalence of disability; or older single women tend to be on low incomes. Thus, for simplicity, the impacts on all these groups have not been analysed here, but if they were, then many of the same patterns would be observed. This is summarised in Table 4, below, but the table also shows how the impact affects these people and therefore the direction in which policy should work if the impact is to be reduced. The table shows the sources of these assessments. In some cases, however, it has not been possible to make an assessment due to absence of relevant literature, and so these impacts have been omitted from the table. It is also important to bear in mind that the impacts of transport policies will be greatly dependent on where poorer people live. For example, in Sweden there is a greater tendency than in Scotland for poorer people to live in outer suburban areas, meaning that bypasses may increase severance for them and

that, conversely, managing parking to free up road space for walking is less of an issue as there is more off-street parking available.

Table 3. Social impacts by type, source, and levels of human need (adapted from Lucas and Markovich, [13]).

Theme	Sub-Theme	Impact
Presence of infrastructure	Structurally	Visual quality Historical/cultural resources Severance/social cohesion
Presence of parked vehicles	Structurally	Visual quality Use of space Safety
Presence of transport facilities, services, and activities (accessibility)	Transport facilities	Availability and physical access to services (walk, bus, rail, cycle, car, coach, taxi) Level of service provided Transport choice Cost of transport
	Land use delivery and opportunity	Access to spatially distributed services and activities
Traffic (movement of vehicles)	Safety	Accidents Averting behaviour Safety perceptions
	Environment	Noise and nuisance Soil, air, and water quality
Travel (movement of people)		Physical fitness (active travel) Security

Table 4. How different impacts may affect poorer demographics in society and policy direction required to reduce impact.

Impact	Impact on Poorest Income Quartile/Quintile	Impact on Older People Aged 65 (Sweden) or 70 (Scotland) or Over	Policy Direction to Reduce Impact	Source (Studies on Distributional Effects of Impact)
Severance/social cohesion	More likely to live in places that are severed by major transport infrastructure. More dependent on modes (walk, bus) that are affected by severance.	More dependent on modes (walk, bus) that are affected by severance.	Policy and measures should seek to reduce severance caused by new and existing transport infrastructure.	James et al. [18]
Use of space	More likely to live in areas where space is dominated by parking and traffic (inner cities). Less likely to have private green space.	Older people more likely to have disabilities and be more dependent on walking thus disproportionately impacted	Manage parking. Reduce road space for moving and parked vehicles especially in inner urban areas.	No literature found

Table 4. *Cont.*

Safety	More dependent on more vulnerable modes (walk). Poor people known to be disproportionately victims of road safety problems Poor people known to be disproportionately victims of street crime	More dependent on more vulnerable modes (walk) which have worse safety record in terms of exposure than do motorised modes.	Improve road safety (in exposure related terms) for walk and to lesser extent cycle. Improve security of walking routes and public transport, especially buses	Short and Pinet-Peralta, [19]
Availability and physical access to services (walk, bus, rail, cycle, car, coach, taxi)	For those living in rural and peripheral urban areas without a car, accessibility severely constrained compared to those with a car especially off-peak	As left	Improve level of public transport service to increase access to jobs and services	Dwyer and Hardill, [20]
Level of service provided	More people in these social groups are disabled and therefore suffer if walking infrastructure not accessible.	Older people more likely to have disabilities and be more dependent on walking thus disproportionately impacted	Land use planning to focus housing and services in areas served by PT Ensure micro-accessibility of walking and bus stop infrastructure	Rye and Carreno [21]
Cost of transport	Problematic if cost of public transport use rising faster than cost of car use	Older people on lower than average incomes and more dependent on public transport than average	Ensure affordability of public transport fares in absolute terms and in relation to car use	Rye and Carreno [22]
Access in space to services and activities	See above	See above	See above	
Noise and nuisance Soil, air and water quality	Because of where poorer people live, they are disproportionately exposed to these problems whilst producing fewer of them	Highly dependent on residential location	Policy should focus on pollution reduction in most polluted areas	Dinno et al., [23] Schweitzer and Zhou [24]

This section has attempted to summarise the literature on the social impacts of transport, how these are distributed in relation to older and poorer people, and how policy should respond if negative distributional impacts are to be reduced. The paper now goes on to summarise the national transport documents and spending plans in Sweden and Scotland before assessing them in relation to the column "Policy direction to reduce impact" in Table 2 above.

3. National Policy and Spending in the Two Countries

3.1. Introduction

Here, the relevant national policy documents and spending plans are reviewed from each country, preceded by a short description of how transport and land use planning provision is organised. To provide an overview on spend, however, Table 4 is first provided, derived from national sources in each country (this table excludes spend at local level on roads and walking and cycling facilities).

3.2. Sweden

In Sweden, there are three levels of government—local, regional, and national. All are responsible to elected politicians. Local and regional government levy an income tax on all their residents; national government levies VAT, excise duties, and a supplementary income tax on the highest earners. Local municipalities have historically been strong and independent, and they retain very strong control of land use planning (making plans and granting planning permission). They also plan, build, and operate most roads, as well as most cycling and walking infrastructure. National government owns the national road and rail network through its agency, Trafikverket; and, in addition, it sets the regulatory framework for transport, and partly funds large transport investments.

Regional and local public transport is a regional responsibility and most regions have a politically controlled body, the Public Transport Authority (PTA), that sets the policy direction for local and regional public transport, although an arm's-length public-sector company is usually responsible for the planning and franchising of urban and regional public transport, timetable and service planning, ticketing, and longer-term planning of investments and improved services. Subsidy for local and regional public transport is funded from local and regional income tax, as are local investments in and maintenance of the road, cycling, and walking network. Regional government does not provide or maintain any roads—these are a municipal or national responsibility. Long-distance national rail provision is entirely open access (an open market provided by private operators) and is not subsidized, although operators must conform to laws on accessibility.

The current national transport strategy for Sweden is set out in the document National Transport Plan for Sweden 2014–2025 produced by the national agency Trafikverket [25]. Its overarching objective is to "secure the provision of socio-economically effective and long-term sustainable transport for citizens and business across the whole country". It also includes specific objectives relating to the usability and accessibility of the transport system for disabled people and children. It is, essentially, a series of transport projects around the country that the government plans to fund, together with a budget for maintenance of the national road and rail network. Below the national plan are nested a series of regional (county (Län)-level) plans which, again, list a set of projects that the regional government wishes to deliver, although the resources for all these projects are not guaranteed and so the regional plan also acts as a form of bidding document for national resources. It is not clear to what extent the objectives of the national plan are or have to be cascaded into regional and local level transport plans; in general, in Sweden the regional and, especially, local level are independent from the centre and so it is probable that the national level objectives act only as a broad guide to lower levels of government.

The total budget in the National Transport Plan for the planning period 2014 to 2025 is 522 billion SEK (about 52 billion Euros), split as follows:

- 8.6 billion Euro for the operation maintenance and capital renewal of the railway infrastructure.
- 15.5 billion Euro for the same, but for the national road network.
- 28 billion Euro for the further development of the national transport system.

In addition, due to co-financing of elements of the county plans by the national plan, about 3.4 billion in total is set aside for investment in walking but more particularly cycling, but the projects are listed in the county plans.

The measures in the plan are appraised using Sweden's national transport appraisal framework (SEB, Samlad EffektBedömning — a combined impact assessment) and the appraisals appended to the plan. This appraisal framework considers social impacts such as health, physical activity, safety, severance, and accessibility for disabled people and for children; air pollution and noise; and access to jobs, goods, and services. However, it does not appear to consider how these impacts are distributed; nor does it show how these impacts and their distribution are weighted in relation to other appraisal criteria included in the appraisal framework such as environmental impacts, or benefit–cost ratio

(see, for example, [26]). The measures in the national plan (for new investment) can be categorised as follows:

- 55 road projects such as road widening, new bypasses, and reconstruction of major junctions.
- 39 rail projects such as double tracking, building new stations, lengthening platforms, and reopening freight lines to passenger traffic.
- 1 cycle project.

The data to calculate relative spend on road compared to rail projects are currently not readily available.

Table 4, above, indicates what is spent at regional level on transport in Sweden—this is public payments to bus and rail operators, as these are funded entirely at the regional level. Without reviewing the individual budgets of each municipality in Sweden, it is not possible to report the total amount spent on local roads, cycleways, and footways. The schemes delivered at a national level over the past 15 years in Sweden have been categorised and in Table 5, below, are compared against the impacts in Table 2. Their contribution to impact reduction is assessed qualitatively by the authors on a seven-point scale of −3 (major negative) to +3 (major positive), a scale used in transport appraisal by the UK's Department for Transport (DfT) in its Transport Appraisal Guidance TAG [27]. In developing this table, it has not been possible to access specific scheme designs so it may be that there are minor inaccuracies in assessing, for example, the level of impact on severance of a particular scheme; but it can be seen that the general impact on social equity is not great and in some cases negative.

Table 5. National spend per year on transport in Scotland and Sweden, excluding new investment (Source: Trafikverket, [25]; Transport Scotland, [28]).

Country	Scotland (2014/15)	Sweden (2014)
Public payments to rail operators for operations	£676 million	£312 million
Public payments to bus operators for operations	£351 million	£939 million
Directly publicly funded rail maintenance	Funded via payment to operator	£650 million
Road maintenance including capital renewals (and in Sweden, strengthening and improving frost resistance)	£132 million	£1.3 billion
Total spend excluding roads	£1.027 billion	£1.901 billion
Total spend including roads	£1.159 billion	£3.201 billion
Population	5.3 million	9.6 million
Public spending/head excluding roads	£193	£198
Public spending/head including roads	£218	£333

3.3. Scotland

In Scotland there are effectively two levels of government for transport, the national (Scottish) government and some 32 local authorities (municipalities, LAs). A regional level does exist but has no legal powers to regulate or implement measures. Local authorities control local roads, cycling and walking infrastructure, and spatial planning, and receive around 80% of their money for so doing in the form of grants from national government (there are strict limits on what they can raise in local tax). National government has created a national agency, Transport Scotland (TS), with responsibility for the maintenance of the national road network, franchising of the main national rail operation (Scotrail), disbursement of various public monies to bus operators, and planning of and investment in the development of the national road and rail networks. However, in contrast to its Swedish counterpart, TS does not own the rail infrastructure and so must pay its owner, Network Rail (NR), for its operation, maintenance, and improvement, partly via the subsidy that it pays to the rail operator that then goes to NR as access charges, and partly as direct grant.

Local authorities are responsible to a council of politicians, each elected to represent small parts (wards) of the municipal area. TS is responsible to a board appointed by the Transport Minister. Bus services are provided by private bus operators in a deregulated market, so operators decide when and where to run buses and what fares to charge. However, around 50% of operators' income comes from public sources in the form of a reduction in fuel tax and payment for carrying people aged 60 and over at a zero fare. For some years, in most parts of Scotland, the bus network has experienced declining passenger numbers and, as a result, reducing route networks as operators cut services to maintain profitability. Municipalities are empowered to step in to procure services to fill gaps left by private operators but increasingly they do not have the budget to do so and are cutting those services that they already procure.

Transport Scotland was created in 2005 and produced its first National Transport Strategy (NTS) in 2006 [29]. This was "refreshed" in 2016 but remains broadly the same document. At about the same time as the first NTS, a separate spending plan for national projects was produced, called the STPR (Strategic Transport Projects Review). The NTS sets out the objectives for and a very broadly defined set of actions on transport, whilst the STPR lists a large number of major infrastructure projects and a summary of the appraisal of each. The objectives are related to economic growth, social inclusion, environment, and safety. TS uses an appraisal framework quite similar to that used in Sweden, but with considerably more detail and criteria related to social inclusion/exclusion. These now include community accessibility, public transport network coverage, local accessibility, comparative accessibility, equality impact assessment, and specific reference to both the social and spatial distribution of impacts (see [30]); but this methodology was not as developed as it now is at the time that STPR was produced.

The STPR included 29 schemes, of which 10 were for new road infrastructure, 13 for rail infrastructure, 2 were road safety schemes, and 4 covered other public transport including park-and-ride and integrated ticketing. Added to this were two further major road schemes that were approved subsequent to STPR. Not all STPR schemes have been built, however, and some schemes have been built that were not in the STPR such that, in 2016, Transport Scotland summarised that, since 2006 it had delivered:

- 23 new road schemes totaling £6.5 billion of investment.
- £5 billion of investment in new rail schemes including 76 new route km and 13 stations.
- £1.5 billion of mainly revenue support to the bus industry via fuel tax discounts and concessionary fares reimbursements, plus a national smartcard ticketing scheme for buses (meaning that from a technological standpoint, the same card can be used on all buses, although there is no national fare scheme).
- £1 billion on ferries.
- A consistent 1–2% of its total budget spent on cycling.

In addition, at the time of producing the above list (2016), TS was working on delivering a £1.7 billion road bridge (opened in 2017) and a major road-widening project. Meanwhile, Scottish municipalities have a total budget for transport of around £1 billion per year, of which around 60% is spent on road maintenance and building new roads, and 11% on subsidizing buses. The schemes delivered have been categorised and in Tables 6 and 7, below, are compared against the impacts in Table 2. In developing Tables 6 and 7, it has not been possible to access specific scheme designs so it may be that there are minor inaccuracies in assessing, for example, the level of impact on severance of a particular scheme; but it can be seen that the general impact on social equity is not great and, in some cases, negative. The same qualitative seven-point scale as for Sweden has been used to assess impacts here also.

Table 6. Swedish National Transport Schemes assessed against their contribution to reducing social impacts of transport.

Scheme, % of inv. Cost	Severance/Social Cohesion—Cut Severance	Use of Space—Manage Parking, Focus Road Space on Slow Modes	Safety—Improve for Walking in Particular	Availability and Physical Access to Services—Improved Micro Accessibility, Denser Land Use	Cost of Transport—Cut Cost of PT Especially Bus	Level of Service Provided—Improve Level of PT Service Especially Buses	Noise and Nuisance—Cut in Poorest Areas	Soil, Air, and Water Quality—Focus Air Pollution Reduction in Poorest Areas
Schemes, % of inv. cost, 2011–2013 *								
Smaller rail scheme, 7%	0	0	0	1	0	1	0	1
Large railway schemes, 26%	−1	0	0	2	0	2	−1	0
Railway capacity, 14%	1	0	0	2	3	2	0	0
Accessible stations, 0.5%	3	3	3	3	0	1	0	0
Small road scheme, 19%	0	0	1	0	0	0	0	0
Mid-sized, safe road schemes, 16%	0	0	2	1	1	0	0	0
Large road scheme, 17%	−1	0	1	−2	0	0	1	1
Cycling, 1%	3	2	2	1	0	0	1	1
Finished schemes, % of inv. cost, 2015–2017 **								
Roads, nat. plans, LMR, 18%	−1	0	0	−2	0	0	0	0
Roads, nat. plans, rural, 13%	0	0	1	1	0	0	0	0
Roads, reg. plans, LMR, PT-related, 5%	2	1	1	2	3	0	0	0
Rail, nat. plans, LMR, 38%	−1	0	0	2	0	2	−1	0
Rail, nat. plans, other, 1%	−1	0	0	1	0	2	−1	0
Rail, nat. plans, commuting/freight, 19%	1	0	1	2	3	0	0	0
Rail, reg. plans, commuting/freight, 5%	1	1	1	2	3	0	0	0

* Total investment costs, 2011–2013: 7 870 M€; ** Total investment costs, projects finalized 2015–2017: 6 477 M€; LMR: Large Metropolitan Regions.

Table 7. Scottish National Transport Schemes assessed against their contribution to reducing social impacts of transport (source: Transport Scotland, [22]).

Scheme, Number of Such Schemes/Impact	Severance/Social Cohesion—Cut Severance	Use of Space—Manage Parking, Focus Road Space on Slow Modes	Safety—Improve for Walking in Particular	Availability and Physical Access to Services—Improved Micro Accessibility, Denser Land Use	Cost of Transport—Cut Cost of PT Especially Bus	Level of Service Provided—Improve Level of PT Service Especially Buses	Noise and Nuisance—Cut in Poorest Areas	Soil, Air, and Water Quality—Focus Air Pollution Reduction in Poorest Areas
Smaller rail scheme 5	0	0	0	1	0	1	0	0
Large railway schemes 7	−1	0	0	2	0	2	−1	0
Large new bridge 2	−1	0	0	−2	0	0	0	0
Bridge refurbishment 13	0	0	1	0	0	0	0	0
Small road widening/improvement 28	0	0	1	0	0	0	0	0
Large road scheme 9	−1	0	1	−2	0	0	1	1
National concessionary fares scheme (free bus travel for disabled people and those 60+)	2	0	0	0	2	1	0	0
National smartcard ticketing on bus	0	0	0	0	0	0	0	0
Subsidies for purchase of environmentally friendly buses	0	0	0	2	0	0	1	1
Cycling/active travel budget (match-funded by municipalities)	3	2	2	1	0	0	1	1

Smaller rail scheme—mainly station upgrades; large railway schemes—opening of new line, major upgrade to existing route; large new bridge—large estuary crossings; bridge refurbishment—existing bridge renovation or minor improvement; small road widening/improvement—for example, 1 km over new overtaking lane (primarily rural); large road scheme—new motorway, dual carriageway, bypass 5 km or more in length (primarily suburban or rural).

4. Assessing Performance of Swedish and Scottish Policies and Spend against Social Impacts and Their Distribution

In this section, rather than look at specific schemes, the transport policies and spend presented in the previous section are assessed in terms of their performance against social impacts and how these are distributed and a comparison between the two countries is provided. Whilst the nuances of each specific national situation should be borne in mind, it can be seen that in the majority of cases, national policy and spend is not supporting a reduction in the social impacts of transport or an improvement in their distribution.

Case Studies of Schemes

In order to put the findings of Tables 6 and 7 into context, two case studies of national government interventions are briefly analysed here in relation to the same impacts listed in that Table 8. The first case is of nationwide free bus travel for people in Scotland aged 60 and over, a measure in place since 2003. The scheme is funded by national government who pay bus operators for the revenue they lose by carrying the "concessionary" (free) bus passengers, although only those who would have travelled and paid a fare, if there had been no scheme. A key reason for funding the scheme was to reduce social exclusion of poorer older people [29]. The costs of the scheme are increasing in real terms due to rising numbers of eligible people and rising bus fares—the latter drive higher reimbursement costs. Research has shown that the biggest increase in bus use as a result of the concession has been, however, the wealthier, car-owning elderly [31]. In the context of increasing inequality (see Section 2), the free bus travel is a weak redistributive instrument and there are other reasons why the poorest people who are eligible still make fewer trips, such as having no money to spend at their destination, and their higher prevalence of disability than their wealthier counterparts. In addition, by subsidizing users rather than operators, the concessionary bus fares scheme does not directly pay to increase bus services in areas where there is currently little or no service, so its impacts on accessibility are limited by this.

Table 8. Effect of transport policy and spend on social impacts of transport in Sweden and Scotland.

Impact	Policy Direction to Reduce Impact	Effect of Scottish Policy and Measures At National Level	Effect of Swedish Policy and Measures at National Level
Severance/social cohesion	Policy and measures should seek to reduce severance caused by new and existing transport infrastructure.	Construction of large-scale road and rail infrastructure increases severance in these locations.	Construction of large-scale road and rail infrastructure increases severance in these locations, sometimes mitigated by grade separation. Bypass programme reduces severance in bypassed town centres if traffic management introduced on bypassed road but can increase it in suburbs where poorer people live
Use of space	Manage parking. Reduce road space for moving and parked vehicles especially in inner urban areas.	No national policies or measures to manage parking or reduce roadspace	No national policies or measures to manage parking or reduce roadspace (although road pricing introduced in two cities with national cooperation)

Table 8. *Cont.*

Safety	Improve road safety (in exposure related terms) for walk and to lesser extent cycle. Improve security of walking routes and public transport, especially buses	National road safety strategy focused on driver behaviour on rural roads, and on national road network, where pedestrian numbers are limited Limited grants to operators to buy new CCTV equipped buses.	Investments in regional plans to grade separate peds and cyclists from national road crossings. Local road safety—local responsibility. Very low age of bus fleet so high provision of CCTV due to franchising and financing model for public transport
Availability and physical access to services (walk, bus, rail, cycle, car, coach, taxi)	Improve level of public transport service to increase access to jobs and services Land use planning to focus housing and services in areas served by PT	No national policy to increase level of bus service. Rail service increased at public expense. Bus funding static in real terms. Continuing decrease in residential densities. Policy supports densification and orientation to PT but evidence of its implementation is patchy.	Public transport service increased in many areas due to decision to pay for more service Large urban areas development orientated to public transport but not as result of national policy.
Cost of transport	Ensure affordability of public transport fares in absolute terms and in relation to car use	Only for those aged 60 and over. Otherwise rail and bus fares increased above inflation and cost of car use	See above. Regional financing decisions keep fare increases very limited for regular travellers. Fuel tax higher than in UK.
Level of service provided	Ensure micro-accessibility of walking and bus stop infrastructure	Local responsibility although national guidance and law promotes accessible environments. National fund for municipalities to spend on this frozen in real terms. Roads for All not implemented on trunk roads.	Local responsibility although national guidance and law promotes accessible environments.
Noise and nuisance Soil, air, and water quality	Policy should focus on pollution reduction in most polluted areas	Air Quality Management Areas are in poorer areas. No effective approach to date to manage AQ in these areas, however. Split of responsibility between national and local level.	Low Emission Zones introduced in five cities but by those cities not a national initiative.

The second case is a regional bus network. In Sweden in recent decades, the challenge of supporting both economic development and sustainable transport has led to a very strong demand for regional rail investments. However, new rail transport systems are costly, and the payback on the money invested is consequently extremely low in sparsely populated areas. Faced with these challenges, in the South Swedish region of Scania, the National Infrastructure Plan allocated over £80 million to implement a "regional superbus concept". It could be described as a transport policy innovation, attempting to upgrade a number of existing regional express bus services so that they can function as an alternative to investing in light or heavy regional rail. The regional superbus concept has gained attention as a low-cost, high-capacity public transport system, providing good access in areas too sparsely populated for justifying light or heavy rail. Essentially, it is an attempt to adapt the BRT principles to the regional scale. The planning principles, the core values, are speed, efficiency, long-term stability, convenience, safety, and image etc., all in order to upgrade regional express bus services to resemble railway standards. This affects, for example, the bus stop spacing criteria: Only one bus station per town, except for in larger towns (>30,000 inh.) where a minimum of 500 m between bus stops is required.

While the regional superbus is still in the implementation phase, a few significant observations in terms of equity could be made. The rather closed concept-development phase, where only a limited number of persons at the regional level were involved, was an important factor for reaching consensus in the concept development group. However, this caused conflicts when engaging in discussions with local authorities and citizens, challenging previous democratic processes and collaboration between different governance levels. Local authorities (municipalities) were asked to co-finance bus priority measures, without being able to influence concept details or take part in the planning process [32]. Bus stops on the countryside along the existing express bus lines were to be removed, reducing access for populations already with a relatively low level of public transport accessibility. The national and regional perspective of efficiency and travel time savings collided with the justice perspective—the local need of acceptable accessibility [7].

Although co-financed through the National Plan and the Swedish transport Administration, the same organisation on the regional level raised clear objections about the traffic safety effects of bus priority measures. "In principle", the main road network is intended for cars and freight vehicles. Apart from resulting in reduced levels of service for these modes, interchanges and junctions with innovative design for bus priorities would, according to authority experts, jeopardize level of safety as well. Hence, the regional superbus concept reveals different layers of social impact conflicts [33]. Firstly, it seems, that the concept-related travel time savings of existing and new passengers' savings do not outweigh the losses car users would incur. Second, the efficiency increase comes at a social cost: The reduced accessibility of groups already marginalised and highly dependent on private cars. Thus, the overarching principles of public transport planning still seems to rely on traditional efficiency policies rather than equity, and even a novel concept as the regional superbus fails to address issues of social and ecologic sustainability.

5. Conclusions

Although this paper is, of necessity, quite brief, it has carried out a useful analysis of transport policy, measures, and spend at the national level in two small European countries in relation to their social impact and the distribution of that impact. It is always helpful to compare actual practice and the impacts of the measures that stem from that practice with the stated aims of policy. The two countries have somewhat differing definitions of the concept of social justice, but policy documents in both stress, at least, that transport investment and spend should enhance equality of opportunity, and, in Sweden, that they should improve social equity.

The particular value and novelty of this paper is that, rather than considering the social impacts of a particular project, or a small number of projects and how these impacts affect social equity by virtue of their distribution, it looks at policy and spend in its entirety at a national level and compares this in two countries. To the authors' knowledge, this has not been done before. The analysis in this paper has shown that, in both Sweden and Scotland, both national measures and spend fail to support increased equity in terms of reducing the inequitable distribution of the social impacts of transport; on the contrary, in several ways it appears that national policy and spend are working in a contrary direction. In spite of stated policy objectives (and in the case of Scotland, an appraisal framework that considers distributional impacts of individual projects), the bias of spend towards large scale rail and road projects (both in terms of operating cost and new investment) and, in Scotland, the low level of spend on buses, tends to be moving both countries towards transport systems that are less equitable in terms of the distribution of their positive and negative social impacts. When this spend is broken down to the level of projects funded and their social impacts, this conclusion is strengthened. In the context of societies where inequality is currently increasing, transport policy and accompanying spend at the national level at least is also exacerbating this trend.

There are two caveats to this general conclusion, although both these caveats point mainly to a need to carry out further work. First of all, it is very difficult in either country to work out what is being spent at local level on improved environments for walking, urban road safety, and local bus

travel which have a great potential to reduce the negative impacts of transport on poorer people and older people (because of their reliance on these modes). Some data are available in in Scotland on local level spend, which seem to indicate that a small proportion of overall funding is going to these budget areas, but further work is required. Secondly, there is a need to carry out a deeper analysis of the severance impacts of major schemes (since, if well-designed safe and secure crossing points are built in, then they have the potential in certain locations to reduce severance). Notwithstanding these caveats, overall the analysis indicates that development and maintenance of the existing long-distance higher-speed transport network is the priority of these two governments and because of this the social impacts will continue to be as or more unequally distributed as they are today.

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