A justice-theoretic approach to the distribution of transportation benefits: Implications for transportation planning practice in the United States

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ABSTRACT
Transportation improvements inevitably lead to an uneven distribution of user benefits, in space and by network type (private and public transport). This paper makes a moral argument for what would be a fair distribution of these benefits. The argument follows Walzer's "Spheres of Justice" approach to define the benefits of transportation, access, as a sphere deserving a separate, non-market driven, distribution. That distribution, we propose, is one where the maximum gap between the lowest and highest accessibility, both by mode and in space, should be limited, while attempting to maximize average access. We then review transportation planning practice for a-priori distributional goals and find little explicit guidance in conventional and even justice-oriented transportation planning and analyses. We end with a discussion of the implications for practice.

KEYWORDS: justice, equity, access, accessibility, Walzer, Rawls

1. INTRODUCTION

Transportation planning decisions inevitably yield benefits which vary across different communities within an urban area. Much thought and effort has gone into understanding and addressing these differences (see: Beatley, 1988, Forkenbrock and Schweitzer, 1999, Hine, 2008, Hodge, 1995, Schweitzer and Valenzuela, 2004, Sanchez, Stolz et al., 2003; Taylor and Norton, 2009, and Taylor, 2004 for great syntheses of the issues along a variety of dimensions). The starting point for this paper is the observation that: (1) there is no clear definition, in practice or theory, of what constitutes a fair distribution of benefits from transportation investments; and (2) no standards, goals or performance measures exist, against which agencies can measure progress or success in the distribution of transportation benefits.

As we will show, in current transportation planning practice, distributional goals are either not stated at all, are implied but unclear, or, when stated explicitly, are not based on a well-developed moral argument. The aim of the paper is to develop such an argument, i.e. to develop a well-founded justice approach to the distribution of transport-related benefits. To the best of our knowledge, such an attempt has not yet been made in the literature. Because of its normative character, defining such a justice approach is inevitably controversial and is likely spark debate, in both academia and practice. While we understand the difficulty in implementing a strong normative vision in policy and practice, we still feel an adequate theoretical exploration of such a vision is needed. This is the aim of this paper; to begin an explicit and, we hope, fruitful discussion on transport and justice. From here, perhaps the community of planners and other stakeholders can engage in a more concrete and explicit resolution of exactly what is a just outcome for transportation investments.

The theoretical framework developed in the paper builds on Walzer's 'Spheres of justice' (Walzer, 1983) and Rawls' 'A theory of justice' (Rawls, 1971). Following

Walzer's argument, we focus on access as the prime benefit distributed through transport projects. Taking inspiration from Rawls, we claim that a justice approach to transport implies a maximum gap in access level between the best-off and worst-off group in society. Using this justice framework, we then evaluate the current state of transportation practice for its implicit (or sometimes explicit) distributional aims – including both conventional approaches and those specifically addressing justice issues within the framework of the Civil Rights Act of 1964 and the subsequent rulings incorporating "environmental justice" considerations in transportation planning. We look more specifically at the equity analysis performed by the Metropolitan Transportation Commission (San Francisco Bay Area) for its implicit and explicit justice norms. We conclude with some broad comments on practice and posit changes required to reduce discrepancies found between the proposed theory and practice.

As mentioned, note that the paper focuses on the distribution of the benefits generated by transportation (investment) projects. The equally important issues of the distribution of transport-related burdens and transport-related costs, as well as fair participation in decision-making, can be subject to a similar treatment perhaps in a later discussion (see Martens (in press) for some observations regarding the distribution of transport-related burdens, and Robinson (2008)).

2. WALZER'S SPHERES OF JUSTICE

Scholars of social justice have traditionally hardly paid any attention to the field of transport. At best, scholars have dealt with it in the sidelines of their argument (e.g., Michelman, 1973, p. 980; Walzer, 1983, p. 115; Sadurski, 1985, p. 161). Scholars in the field of transport, in turn, have explored some of the implications of the major theories of social justice, such as Rawls' theory of justice (e.g. Beatley, 1988) or utilitarianism (Khisty, 1996). While we feel that the application of existing social justice approaches to transport is a good starting point, it does not provide an answer to the key question of why a distributive approach is called for in transportation in the first place. To begin such an inquiry, we rely on Walzer's 'Spheres of justice' to provide such a theoretical foundation for a distributive approach to transport. Walzer's approach starts from the conceptualization of society as a distributive community, in which people produce a variety of goods that are subsequently shared, divided and exchanged in specific ways (Walzer, 1983). Walzer claims that goods differ in terms of the social meaning members of society attach to them. Given these differing meanings, there can be no single distribution criterion by which all goods are to be made available to members of society. Rather, each good should be distributed in a way corresponding to the social meaning of that good.

Walzer then develops the concept of 'distributive spheres' (not to be confused with the "public sphere" or "private sphere"). Regular goods can be distributed through the market, where the distribution is determined by the principle of free exchange in combination with individuals' ability and willingness to pay for a particular good. In contrast, goods to which a particular society ascribes a distinct social meaning, are to be taken out of the sphere of free exchange. Such goods 'deserve' their own distributive sphere, which is characterized by two basic features. First, it would require a distributive principle different from market exchange, ranging, for example, from equality to distribution based on need (Trappenburg, 2000). Second, a distributive sphere should be

autonomous from other goods' spheres. According to Walzer, injustice occurs if spheres are not autonomous. The distribution should be based on "internal reasons" only, i.e. linked only to the social meaning of that particular good.

If these principals are not followed, one good or set of goods can become dominant and determine the distributions in all, or many, spheres of distribution. Typically, in the USA and elsewhere, money and power are the goods to claim dominance, and much of the policy debates, e.g. in the field of basic education or health services, are about limiting their domination. For instance, struggles over access to education can be viewed as a result of the struggle against the dominance of money and power in this dimension of social life. Ultimately, autonomy guarantees what Walzer terms 'complex equality': a situation in which inequalities within spheres may exist, but in which the autonomy of distributive spheres will guarantee that inequalities will not compound across several goods.

Though Walzer's approach is certainly not without critics (see e.g., Dworkin, 1983; Teuber, 1984; Fabre, 2007), its strength lies in the theoretical foundation it provides for political reality in modern societies. His theory of justice provides a theoretical foundation for a just distribution of a wide variety of goods: 'When meanings are distinct, distributions must be autonomous' (Walzer, 1983, p. 10). If this condition holds for the transport good, then a distributive approach to transport can be justified. Below, we explore these for transportation justice.

2.1 THE SOCIAL MEANING OF THE TRANSPORT GOOD

In the literature on transport and justice the distribution of a wide diversity of transport-related goods is addressed. This includes the distribution of road and gasoline taxes (Altshuler, 1979); transit investments and subsidies (Cervero, 1981; Hodge, 1988; Garrett and Taylor, 1999); road user charges (Richardson and Bae, 1999; Eliasson and Mattsson, 2006; Ecola and Light, 2009); transportation decision-making (Nelson et al., 2006); transit service (Rucker, 1984; Murray and Davis, 2001; Wu and Hine, 2003); transport-related noise and air pollution (Bae, 1996; Forkenbrock and Schweitzer, 1999); transport-related risk (Current and Ratick, 1995; Mills and Neuhauser, 2000); and accessibility (Purvis, 2000). This diversity underlines the critique of Dworkin (1983): the demarcation of the social meaning of the transport good is not a straightforward issue. The discussion below is an attempt to demarcate a social meaning that might be widely shared in modern, industrialized, societies.

First, it can be argued that the social meaning of the transport good lies in the benefits it generates and not in the burdens it causes. Both government bodies and citizens relate to transport first and foremost in terms of the possibilities it offers to connect places. In contrast, the burdens related to transport, such as pollution emissions, are perceived – both in academic and popular discourse – as negative externalities. Hence, they are not perceived as an element of the transport good itself. This is a fundamental point, as much of the debate on transport and equity has focused precisely on the distribution of transport-related burdens (e.g., Feitelson, 2002; Forkenbrock and Schweitzer, 1999; Schweitzer and Valenzuela, 2004).[1]

[1] Walzer's approach does not suggest that the distribution of transport-related burdens is not a matter of justice. Following Walzer, one could argue that in current Western societies, a healthy environment is a

Second, the literature suggests that two overarching conceptualizations of the transport good can be distinguished: potential mobility and access (e.g., Garb and Levine, 2002; Vigar, 1999). Potential mobility, often simply referred to as mobility, refers to the ease with which a person can move through space (e.g., Sager, 2005). Access, in turn, refers to the ease with which a person can reach destinations from a given location in space (see e.g., Farrington and Farrington, 2005; Dong, Ben-Akiva et al., 2006; Niemeier, 1997).

While it has been argued that potential mobility is more strongly rooted in Western culture than access (e.g. Zeitler, 1999), we contend that ultimately access best reflects the social meaning of the transport good in Western societies. Defending potential mobility as a proper conceptualization of the social meaning of transport seems problematic, as its distribution does not necessarily correlate with the distribution of those goods for which we are transporting ourselves in the first place. Ultimately, transport is first and foremost a 'need' or a want (e.g., Rimmer, 1985) derived from those other, higher valued, goods. The social meaning of the good should therefore also be derived from those underlying wants and needs. Since access, in contrast to potential mobility, does link transport to satisfying these underling needs, we argue that access rather than potential mobility best captures the social meaning of transport in current Western societies.

The social meaning of the transport good, defined as access, has changed tremendously since the industrial revolution. Before the advent of motorized transport, walking was the dominant means of access and the near-universal ability to walk implied that transport was not an issue of distribution. The situation changed fundamentally with the ascent of private, individualized, motorized transport. The widespread availability of the motorcar, triggered by vast investments in the road system, implied a fundamental shift in the meaning of transport. The dominance of the motorcar resulted in a vast dispersal of urban functions over space, eliminating walking as a feasible alternative for most trips. Because of the motorcar the 'urban environment has 'unbundled' territorialities of home, work, business and leisure that historically where closely integrated, and fragmented social practices …' (Urry, 2004, p. 28).

The rise of motorized transport has thus re-shaped the social meaning of the transport good. Once, transport was hardly perceived as a good, but rather taken-for-granted, as a natural extension of life itself. Now, transport is a prime good that is of key importance for fulfilling one's needs and desires. The availability or un-availability of access shapes people's life opportunities (Lucas, 2006) – it determines whether a person can take advantage of education and health services, can access job markets (Ihlanfeldt and Sjoquist, 1998; Ong and Blumenberg, 1998) and thus advance economically, can keep in contact with friends or family, or whether she/he can enjoy leisure and recreational facilities (Frank, Sallis et al., 2006).

It is this strong interrelationship between access and people's life opportunities that suggests that transport has a distinct social meaning in current societies. Following Walzer, this then implies that the transport good – defined as access – should be set apart from regular goods and distributed in a separate sphere according to distributive

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good with a distinct social meaning that deserves to be set apart from other goods. However, we have decided in this piece to only focus on the transport good which should be discussed in its own context.

principles that are derived from the social meaning of the good. In the next section, we discuss these possible distributive principles.

2.2 A MOST JUST DISTRIBUTION: THE MAXIMAX GUIDING PRINCIPLE

Let us commence this exploration with the observation that most scholars of justice agree, at least since Aristotle, that the distributive principle of equality can be perceived as the 'default' criterion for the distribution of goods over members of society (e.g., Kolm, 1996). Smith (1994), for instance, argues that the challenge for scholars of social justice is to provide convincing justifications for a deviation from the criterion of equality. Lacking such arguments, Smith upholds, equality remains as the only correct way to distribute a good. Shrader-Frechette (2005) refers to this as the principle of prima facie political equality. Indeed, many transport scholars agree with the notion that social justice pertains to some aspect of equality (Banister, 1994; Hine, 2008). Following this line of argument, we posit that access should be distributed equally – that is, distributed evenly over people irrespective of the differences between those people – unless convincing arguments can be provided for another way of distribution.

Walzer explicitly states that the distribution of a good with a socially distinct meaning should be guided solely by internal reasons only, i.e. be derived from its social meaning. Therefore, the explorations below start from the delineation of the transport good as access and the intrinsic interrelationship between access and people's life opportunities. Furthermore, the argument builds on the particularities of the transport good, specifically on the dynamic interplay between transport and land use, as these particularities also provide crucial demarcation points in search for an adequate principle for the distribution of the transport good.

It may be obvious that in nowadays society, the distribution of access is far from equal. Access levels between individuals differ substantially, whether in terms of space, mode availability or income. The level of access a person may experience is strongly related to three characteristics. First, space is an important determinant, as the location of a person's residence has a strong impact on access to various opportunities (Naess, 2006). Second, mode availability, and especially car ownership or, more broadly, availability, strongly shapes a person's level of access (e.g., Benenson, Martens et al., in press). Third, and interrelated, income has a substantial influence on level of access, given the cost related to every trip (e.g. Levinson, 2010). Following the 'default' status of the principle of equality, the question is whether people should have equal level of access, irrespective of space, mode or income considerations? Below, we turn to this question for space and mode availability. We leave the treatment of justice in access in relation to income differences to a later discussion, as it concerns issues of transport pricing rather than investments in transportation infrastructure and services.

2.3 THE DISTRIBUTION OF ACCESS IN SPACE

Let us first consider equal distribution of access in relation to space. While philosophical arguments may suggest that equality is called for, insights from research into the dynamics of space suggest that equal distribution in this respect is impossible to achieve. Theoretical modeling studies have shown that, even if starting from an even distribution of opportunities over space, and hence equality of access, centers will rapidly develop over time as a consequence of the advantages connected to spatial proximity (e.g., Puu,

2005). In other words, space by its very nature is divided into center and periphery and not every point on a plane can be equidistant from the important centers of opportunities. As a result, inequality in access to life opportunities is inevitable. Transport policies cannot correct the differences between center and periphery; they would at best redefine or reinforce the relationship between them. While this is not a normative argument against distribution according to equality, it does underscore that the principle of equality is hardly suited to guide the distribution of access in real-life situations. More precisely, this observation suggests that equality of access cannot be achieved across-the-board and that a non-equal distribution must be proposed explicitly.

Rawls' work suggests that at least four distributive principles should be discussed between the individuals placed behind his famous veil of ignorance as an alternative for the principle of equality. These principles are (Rawls, 1971; see also Frohlich and Oppenheimer, 1992): maximizing the average access level; maximizing the average access level with a floor constraint for the minimum; maximizing the average access level with a range constraint; and maximizing the lowest level of access (Rawls' "difference principle"). Could any of these serve as a guiding principle for the distribution of access? When looking at the options, the first of these criteria (maximizing the average level of access) seems to be of little relevance, as it hardly guides the actual distribution of the transport good over population groups – the principal issue of justice with which we are concerned. Rawls' difference principle (maximizing the lowest level of access), in turn, also has its problems when applied to the transport good. Rawls developed this criterion for income, based on the understanding that differences in income might result in a better working economy because of motivational factors, which would then, in turn, generate a higher level of income for the worst-off. It seems unlikely that a comparable mechanism could be at work in the transport system.

This brief analysis of possible distributive criteria suggests that two principles remain as possibly relevant for the distribution of space-related access: (1) maximizing the average level of access with a floor constraint for the minimum; and (2) maximizing the average level of access within a defined maximum range constraint. The difference between these two principles is significant. The second criterion (called "maximax," referring to maximizing the average while observing a maximum gap) defines the height of the floor constraint in relation to the maximal level of access experienced by the most accessible community. This criterion is thus 'inflation' robust – the floor constraint will be automatically adjusted in accordance with changing levels of access. The first criterion lacks such an adaptive mechanism, implying that the floor constraint will have to be re-assessed whenever substantial changes in access levels occur across-the-board.

Concluding, the maximax principle would guarantee that access is maximized, while ensuring that an acceptable level of access is ensured for all population groups, irrespective of location. In this way, the transport system can be continuously improved while no area or neighborhood will be left behind. In comparison to the equality principle, the maximax criterion does not demand uniformity and is thus in line with the inevitable differences in access created by space. Given this feature, the maximax principle seems to be a practically applicable principle to guide the distribution of space-related access levels within a separate distributive sphere.

2.4 DISTRIBUTION OF ACCESS BY MODE AVAILABILITY

Mode availability is a second key characteristic that will shape an individual's access level. Hence, the question is whether equality of access should be guaranteed irrespective of people's mode availability? Starting from the social meaning of the transport good – access as a necessary prerequisite to fully participate in society and to fulfill life opportunities – there seem to be few reasons to deviate from the default principle. However, it could be argued that not every person requires the same level of access to achieve both, i.e. to participate fully in society or to fulfill life opportunities. For some, full participation in society may require a high level of mobility and hence access (e.g. a doctor making house calls), while others may be able to achieve their life opportunities with relatively low levels of access (e.g. a writer working from home). Whether they have access to an automobile or not, large differences in access levels would be acceptable from this perspective.

This suggests that a need-based approach would be appropriate for the distribution of access by mode availability. According to this principle, it is fair that different persons experience different levels of access, as long as these disparities match the differentiation in social needs (e.g. Sen, 1973). While the need criterion may appeal to some, its application to the field of transport is extremely problematic. On top of the general objections against a need-based approach to distribution (e.g. Kolm, 1996), Cass et al. (2005) argue that the increasing importance of social networks in current lifestyles challenges the assumption that needs can be easily translated into well-defined travel needs. Rather, the need to physically access social networks results in a dispersed pattern of travel needs that can hardly be captured through regular transport analysis. Furthermore, it should be noted that one of the key tools to improve people's access levels – transport infrastructure projects – are provided to collectives rather than individuals, and for the long-term rather than the short-term. As a result, the current needs of individuals are of little relevance in the distribution of access through transport infrastructure. The needs of collectives, such as neighborhoods and entire commute sheds, now and in the future, are what counts. Since population structures of urban areas can and will change over time, the consequence would be that near identical levels of transport service would have to be provided to each and every neighborhood. Hence, our conclusion is that the criterion of need lacks distinctive force to guide the distribution of access in relation to mode availability (see also Apparicio and Seguin, 2006).

Does this imply that the principle of equality should guide the distribution of access by mode availability? It could be argued that perfect equality in access levels is not a necessary condition to guarantee that a person has an acceptable range of life opportunities (see Daniels' (1985) "normal opportunities range"). In other words, certain differences in access levels could be deemed acceptable, as long as a certain 'basic' level of access is guaranteed. This basic level should guarantee sufficient access to destinations that are of key importance for people's life opportunities: employment centers, health services, education, recreational facilities, as well as family and friends. However, in line with the critique on the principle of need, it will be extremely difficult to determine what constitutes a sufficient level of access for the low-mobile groups that avoids a reduction in life opportunities. This implies that the distributive principle 'maximizing the average level of access within a floor constraint' is difficult to apply, without making extremely

precarious normative judgments. In contrast, the maximax principle introduced before ('maximizing the average level of access within a defined maximum range constraint') may avoid detailed normative judgments about what constitutes a sufficient level of access. While it will be difficult to determine an acceptable range, the principle at least provides a clear, empirical, anchor point as the basis for political debate (i.e. the highest level of access). This suggests that, as in the case of space-related access, the most defensible principle to guide the distribution of mode-related access links the lowest to the highest access level.

Before concluding, another issue regarding mode-related access has to be addressed in relation to the particularities of the transport system. Unlike e.g. education or health services, which are provided both by the government and through the market, virtually all forms are access require some form of government intervention and investment. That is, while households may invest in a higher level of access through the purchase of an automobile, this higher level of access ultimately depends on government investments in car-related infrastructures and services. The question can then be raised what the moral basis is for investment in government funds in a higher level of access for a certain group only? The answer would be that such a higher level of provision through the government is only acceptable if the car-owners fully cover the expenses for this higher level of access. It is questionable whether this is currently the case for car owners, certainly if one includes the external costs related to car infrastructure and use (see Jakob, Craig et al., 2006). Whatever the current situation in this respect, this brief argument suggests that some inequality in the distribution of access by mode availability is acceptable if two conditions apply: (1) if the minimum level of access is sufficient to guarantee that a person has an acceptable range of life opportunities; and (2) if access levels above the minimum level are financed by the recipients of that higher level.

Based on these conditions, again a maximax principle is outlined for the distribution of mode-related access levels. The maximax criterion combines the goal of maximum average access across modes, with a limit on the maximal gap between the worst-off and the best-off in terms of access levels. In this way, an acceptable level of access is ensured for all population groups, irrespective of mode availability. Figure 1 summarizes the argument. Following the discussion outlined above, for both space and mode availability the maximax principle applies. Ideally, transport investment programs should guarantee that: (1) the gap between the areas or neighborhoods with the lowest and the highest level of access should remain within a predefined range (space-related or inter-neighborhood equity) (comparison 1); (2) the gap between car-owning and car-less households residing in the same area or neighborhood should remain within a predefined range (mode-related or intra-neighborhood equity) (comparison 2); while (3) aiming to achieve the highest possible average access level across all neighborhoods and mode-related groups. Given existing gaps in access levels, the application of this set of distributive principles is likely to imply in actual practice that transport investment programs should generate disproportionate benefits for the low-mobile groups in order to be considered fair transport investment programs.

In the next section, we explore the distributive principles of transportation planning practice in the United State in an effort to compare it with our theoretical approach.

-- FIGURE 1 ABOUT HERE --

3. STATE OF PRACTICE IN THE UNITED STATES

The distribution of the benefits of transportation, access, is addressed in several ways in transportation planning practice. We will first look at conventional planning approaches, and then at approaches which follow explicit distributional goals. We will then highlight one of the more advanced distributional analyses – the equity analysis of the regional transportation plan carried out by the Metropolitan Transportation Commission (MTC) of the San Francisco Bay Area.

3.1 CONVENTIONAL TRANSPORTATION PLANNING

Looking first at roadway planning, by and large the dominant approach to access distribution is through the active maintenance of levels of service (mobility). Congestion delays are reduced or stabilized through roadway investments or operations improvements in areas of the road network where demand exceeds capacity and travel speeds are degraded or are projected to degrade based on forecasted travel (Johnston, 2004; McNally, 2000). The more a traveler utilizes these improved networks, the more access benefits they reap. These approaches do vary by place, and it is well documented that access through automobile-based mobility is strongly focused on suburban to city and suburb to suburb travel (Cervero, 2004; Sanchez, Stolz et al., 2003). This means, in effect that the most mobile who make greater demands on the road network will be the beneficiaries of future investments because of the congestion they cause (Martens, 2006).

Past social processes of urban spatial containment left many low-income and minority residents concentrated in central cities. The barriers posed by the costs of automobile ownership and public transportation systems ill-equipped to service center-city to suburban trips, resulted in a well documented spatial mismatch (Ihlanfeldt and Sjoquist, 1998), sometimes dubbed "automobile mismatch" (Ong and Blumenberg, 1998). These populations who are relatively less mobile and will pose fewer demands on the road network, will therefore be the beneficiaries of fewer road investments than those most mobile. In effect, the gap between the least and most mobile will grow under this planning process (Martens, 2006). This distributional ethic is hardly ever discussed explicitly.

In keeping with its distributional obscure approach, roadway planning follows a de-facto "Kaldor-Hicks" improvement process, according to which infrastructure investment is acceptable if there are positive net benefits within a cost-benefit framework. The benefits reaped by some can in theory compensate for the losses for other groups (Rietveld, 2003). Sometimes, the stricter Pareto improvement requirements are implied instead, where transportation investment programs are justified on justice grounds because no communities are made worse off (see our discussion below of the Metropolitan Transportation Commission equity analysis). Still, this approach leaves distributional issues unclear, as most of the access gains may fall to those with already high levels of access or to only those with access to vehicles.

Considering public transportation, there are two logics of benefit distribution at work – one catering to the least mobile, and one attempting to solve regional congestion problems typically caused by the most mobile. The first is the provision of a basic (in

many places, minimal) level of system availability for low-income and minority populations (Polzin, Pendyala et al., 2002; Sanchez, 2008). Availability refers to the ability of a person to use the system spatially, through physical proximity to the transport network and stops and stations, or temporally, in that the service is provided at the right frequencies or times of day. Note that system availability does not guarantee access to (desired) destinations. Part of the effort to provide this minimal service, is focused on "gap closure" by attempting to add transit investments at the margin which serve the most pressing access needs, such as reverse commuting through the federally supported Job Access and Reverse Commute (JARC) program and other welfare to work programs, paratransit, schedule extensions or owl services (Cervero, 2004).

The other logic for transit investments is to use higher performance systems to address regional congestion issues. Services, such as express bus, regional rail and commuter rail systems, are developed for commuters and higher income populations for peak-hour, mostly work trip, accessibility needs. Here, access levels by car and public transport are somewhat related to each other: when the access level of the most mobile is threatened (due to congestion, etc), the access level of the least mobile (those without a car) may be improved by the new transit investments. Sometimes however, the transit investments made to serve the most mobile hardly benefit the least mobile (Mann, 2004).

This bifurcation in public transport planning can lead to tensions when funding gets shuffled between services for low income groups and for commuters (Mann, 2004), but in most places, this dual system survives because of the overarching goals of both minimal welfare for the poor and car-less, and regional congestion and air quality management. The main conclusion from practice is that the distribution of access benefits between places and between modes is not considered explicitly, but results from ad-hoc system improvements which tend to favor, over time, improving services for the most mobile. While average access levels grow, so does the gap in access levels between the most and least mobile.

3.2 EXPLICIT JUSTICE-ORIENTED TRANSPORTATION PLANNING

Following the passage of the Civil Rights Act in 1964 and subsequent documents relating to environmental quality or to transport directly (see below), the distribution of access has received more explicit attention in (metropolitan) transportation planning practice. In line with the underlying environmental justice (EJ) considerations laid down in the various documents, transportation planning most often invokes either: fostering participation of groups traditionally marginalized in the transportation planning process, preventing undue burdens from exposure to the externalities of transportation systems, or insuring the distribution of benefits among various communities. For a more complete discussion, see Cairns, Greig et al. (2003), Cambridge Systematics (2002), Forkenbrock and Sheeley (2004), and AASHTO (2009). Given our focus on access, we limit the discussion below to ways in which the distribution of transport benefits is addressed in practice.

Civil rights and EJ legislation related to transportation make justice considerations from the standpoint of "protected classes" – those populations, low-income and minority, who are legally protected under the several overarching legislations. Title VI of the Civil Rights Act states that: "No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial

assistance." The National Environmental Protection Act codified procedures for the exploration of impacts from transportation projects and public involvement in project planning. Executive Order 12898 (1994), entitled "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," effectively expanded the definition of "protected classes" to include low-income populations, which would be significant for transportation equity issues (42 U.S.C. §4321). Following this order, both DOT and Federal Highway Administration (FHWA) adopted Environmental Justice directives to clarify the importance of recognizing disproportionate impacts (Department of Transportation USA (DOT), 1997; FHWA, 1998) and how these directives impact Metropolitan Planning Procedures (FHWA and FTA, 1999).

Since we are interested in the benefits of transportation, access, we will focus on the treatment of benefits in these directives. Unfortunately, we find little clear guidance on these issues. The DOT directives explain that environmental justice in transportation incorporates three principles: 1. avoid, minimize, or mitigate disproportionate burdens of transportation; 2. ensure the full and fair participation by all stakeholders; and 3. prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations (FHWA, 2009 – authors' emphasis). Additional mentions are made of distributions of benefits in other parts of the FHWA guidance. While clearly, there is an interest in understanding how benefits from transportation investments are distributed, no explanation is made of what acceptable distributions would be, and a particular distribution is not required to comply with EJ rules. Again, from FHWA, here referring to the distribution of funding for transportation projects: "Consistent with the U.S. DOT Order on Environmental Justice… adverse impacts should be mitigated…. Beyond this mitigation requirement, there is no presumed distribution of resources to sustain compliance with the Environmental Justice provisions." (FHWA, 2009). Paraphrasing from Forkenbrock and Sheeley (2004, pp. 312-313), the EJ directives leave several questions unanswered, including how to measure "proportionate." There are no established standards for deciding how to measure the proportionality of the distribution of access for a plan or project.

The NCHRP Project 8-36 (11) report, "Technical Methods to Support Analysis of Environmental Justice Issues" reviewed the state of practice of how MPOs measure and mitigate any disproportionate benefits or impacts (Cambridge Systematics, 2002). The study surveyed 15 state DOTs, 22 MPOs and three transit agencies about their efforts to measure and mitigate environmental justice issues in their activities. While most agencies incorporate educational and public involvement activities, few attempt to define what it would mean to 'prevent the denial of, reduction in, or significant delay in the receipt of benefits' in terms of access. However, "some" MPOs attempt to develop measures of access benefits.

The Florida DOT's community impact assessment handbook outlines what is probably a typical approach to evaluating disproportionate impacts in project planning. The handbook states that disproportionate impacts should be dealt with, by identifying the potential population that might be affected by the transportation project, comparing the distribution of potential impacts on different populations, and reviewing results with members of the potentially impacted population. The handbook, however, does not identify a specific means of testing disproportionality, aside from the use of judgment by

the analyst in consultation with the community (Cambridge Systematics, 2002, pp. 4-32). With no standard for comparison, a growing gap would probably be deemed acceptable, so long as, like in a Pareto-type approach, most groups receive some share of the benefits and no group experiences a decrease in access levels.

Two of the MPOs in the Cambridge Systematics survey (Cambridge Systematics, 2002) indicated that they have taken steps toward defining disproportionate differences in benefits from a quantitative standpoint: the Metropolitan Transportation Commission (MTC) in the San Francisco Bay Area (discussed below) and Sound Transit in Seattle. Sound Transit in Seattle, calculated the percentage of total project benefits and impacts accruing to minority (or low-income) population groups, and then compared that percentage to the total percentage of minority (or low-income) population in the study area. If the amount of benefit or impact accruing to the minority/low-income population was at least one standard deviation greater than the mean percentage of minority/ low-income population in the study area, the difference was determined to be significant. While it is understandable to measure differences in burdens in such a way to direct mitigation efforts, it was unclear how differences were used to shape policy for benefits (Cambridge Systematics, 2002, pp. 4-34 to 4-35).

When the state of practice is compared to the maximax approach, the following pictures ensue (Figure 2). On the left side of the figure, the conventional practice produces rising access for the most mobile, with a rising average, but with a likely growing gap between those with the highest and the lowest level of access. Those least mobile would likely experience declining access as land uses may reorganize around the changing mobility patterns (e.g. spatial mismatch problem). On the right, the maximax approach shows how more investments benefiting low-access populations would catch them up to the most mobile to within an acceptable gap, similarly raising the average access levels for everyone, while also benefiting those with the most access.

-- FIGURE 2 ABOUT HERE --

3.3 THE EQUITY ANALYSIS OF THE METROPOLITAN TRANSPORTATION COMMISSION (MTC)

The Metropolitan Transportation Commission (MTC) serving as the MPO in the San Francisco Bay Area has carried out one of the more advanced environmental justice analyses in the country (see Cambridge Systematics, 2002). Using its main regional travel model, MTC attempts to measure access impacts for "communities of concern" (so-defined as minority and low-income neighborhoods) resulting from their 25-year investment plan and compare that to a "no-plan" scenario, along with other variations on the plan (Purvis, 2000; MTC, 2004). The overall conclusion was that communities of concern benefited from the investment plan. Specifically, the analysis found that after the project investment, communities of concern were "more accessible" to jobs by both transit and automobile than without the project. It also claimed that, separately by automobile and transit, the urban communities of concern had higher levels of access to jobs than other communities. Moreover, they concluded that all communities benefit in some way from the proposed plan and hence the plan is "fair." The report concludes: "When looking at the aggregate level across the Transportation 2030 alternatives,

communities of concern appear to share in the benefits of the transportation investments without bearing a disproportionate share of the burdens compared to the remainder of the Bay Area" (MTC, 2004, p. ES2). This conclusion is adopting a de facto Pareto Improvement approach: as long as there are positive and non-zero benefits for all stakeholders, the actual distribution of benefits is unimportant. This implies that the MPO basically accepts existing differences in access, whether between neighborhoods or mode-related groups, and focuses on increments from the status quo as tests of fairness without a specific distributional goal or requirement.

There are three main problems with this conclusion. First, while the analysis does an excellent job of comparing neighborhoods, in this case grouped by demographics, it avoids the inter-modal comparisons. The intermodal disparity in access is quite profound and reported directly in the analysis. For example, with the Regional Transportation Plan investment, communities of concern in urban areas have access to roughly 140,000 jobs within 30 minutes by public transit, and 800,000 jobs within 30 minutes by automobile (MTC, 2004, pp. 5-3). Similar results are found for other destinations and for comparisons of communities in suburban locations. No mention is made of the likelihood of car ownership of different communities. So, while drivers from communities of concern and other neighborhoods have similar accessibilities in theory, and may, in theory, benefit from investments, this approach fails to point out the significant difference between access to automobiles in communities of concern and wealthier communities. This means that even if communities of concern have more jobs accessible by automobile, we cannot conclude that they actually have access to these jobs as we do not know whether they own an automobile to use the improved road network. Without a clear measure of the actual automobile access in the community, their actual access to jobs is still unknown. It is implied in this approach that so long as communities could access the higher-performance road network, the result is fair. Second, it has no stated goal for any of the comparisons – what differences between the accessibility of communities are acceptable, and why? There is no goal or standard by which MTC determines a plan is equitable, so any improvements seem acceptable. Third, the analysis focuses on increments: the communities are more accessible to jobs than before. The natural increase in job density would likely increase a community's access to jobs, even without any investments. Without a clear goal, focusing on increments assumes the existing distributions are ok and just need some slight modifications, while again, a standard for success is not clear. A similar focus on increments in accessibility benefits is made in the South Coast Association of Governments' equity analysis (Pfeffer, Wen et al., 2002).

4. CONCLUSIONS: IMPLICATIONS FOR PLANNING PRACTICE IN THE UNITED STATES

The literature and practice on environmental justice and transport has traditionally focused on transport-related burdens and participation in decision-making processes. In this paper, we have taken up another issue, by specifically addressing the distribution of access through transport investment projects. Arguably, improvement in access levels is the most important benefit conveyed through transport infrastructure and services.

We have provided a philosophical argument that has resulted in the identification of a set of principles that, in our opinion, should guide a just distribution of transport investments and services. The criterion states that, ideally, transport investment programs

should guarantee that: **(1)** the gap between the areas or neighborhoods with the lowest and the highest level of access should remain within a predefined range (space-related or inter-neighborhood equity); **(2)** the gap between car-owning and car-less households residing in the same area or neighborhood should remain within a predefined range (mode-related or intra-neighborhood equity); while **(3)** aiming to achieve the highest possible access level across neighborhoods and mode-related groups. In our opinion, the application of this double 'maximax' principle over time would result in a reduction of the existing gaps in access between various population groups, ultimately resulting in a transport system that provides a level of access that guarantees that each member of society can fulfill his or her life opportunities.

None of the typical approaches to justice taken by MPOs and states in the United States comes even close to this ideal set of principles. Most planning authorities all but ignore the distribution of transport-related benefits in the evaluation of plan alternatives. Only a few authorities actually measure or invoke the distribution of access. These authorities, however, fail to define a well-founded goal against which to assess the results of the analysis. As a result, they use the notion of 'disproportionate' as a basis for analysis, or implicitly apply a Pareto-like criterion to assess investment programs. The consequence is that even in the jurisdictions carrying out an equity analysis, transport investment programs are accepted that hardly address the existing and growing gaps in access levels in American cities.

The limited and poorly defined attention to the distribution of access can in part be related to the existing environmental justice legislation and related guidelines, as they lack clear demarcation points for carrying out such an equity analysis. Furthermore, there are virtually no examples on which MPOs or others could build. There is some previous thinking on this subject, however. For instance, Martens (2006) shows how the value of accessibility increments for low-accessible communities could be more explicitly accounted for and more highly valued within both traditional cost-benefit analysis and the four-step travel demand models, as a way of moving forward to closing accessibility gaps. Indeed, there are a range of excellent recommendations towards improving planning procedure to address equity (Sanchez, Stolz et al., 2003; Robinson, 2008). We are arguing here for some definition of vision alongside understanding strategies for achieving that vision.

While we realize that still many questions remain unanswered in the approach outlined above, we hope that the developed justice approach to access will assist MPOs in developing a more systematic and well-founded equity analysis of transport-related benefits in the future. Implementing a maximax "ethic" or "vision" in planning would be a long-term goal, like free, basic education for all was a long-term goal when it was proposed at the end of 19th century. Its radical nature at the time did not stop people from taking it as the goal – and indeed, throughout much of the developed world, it has now been achieved and is considered basic policy. Hopefully, the introduction of a social-justice approach into transportation planning will, over time, also result in a more fair distribution of such an important social good as access.

REFERENCES

AASHTO (American Association of State Highway and Transportation Officials) (2009)
The Center for Environmental Excellence by the American Association of State

Highway and Transportation Officials "Environmental Justice" Webpage. http://environment.transportation.org/environmental_issues/environmental_justice/. Last accessed 10 October 2009

Altshuler, A. (1979) The urban transportation system. Cambridge, MA, MIT Press.

Apparicio, P. and A.-M. Seguin (2006) Measuring the accessibility of services and facilities for residents of public housing in Montreal. Urban Studies, 43(1), 187-211.

Bae, C.-H.C. (1996) The equity impacts of Los Angeles' air quality policies. Environment and Planning A, 29, 1563-1584.

Banister, D. (1994) Equity and acceptability questions in internalising the social costs of transport. Internalizing the Social Costs of Transport, Paris, OECD Publications Service.

Beatley, T. (1988) Equity and distributional issues in infrastructure planning: a theoretical perspective. Public infrastructure planning and management. J. M. Stein. pp. 208-226. Newbury Park, Sage.

Benenson, I., K. Martens, et al. (in press) Public transport versus private car: GIS-based estimation of accessibility applied to the Tel Aviv metropolitan area. Transportation Research Record: Journal of the Transportation Research Board.

Cairns, S., J. Greig, et al. (2003) Envi*ronmental justice and transportation: a citizen's* handbook. Berkeley, CA, Institute of Transportation Studies, University of California Berkeley.

Cambridge Systematics (2002) NCHRP Project 8-36 (11): Technical Methods to Support Analysis of Environmental Justice Issues. Washington, DC, National Academy Press.

Cass, N., E. Shove, et al. (2005) Social exclusion, mobility and access. Sociological Review, 53(3), 539-555.

Cervero, R. (1981) Efficiency and equity impacts of current transit fare policies. Transportation Research Record: Journal of the Transportation Research Board, 799, 7-15.

Cervero, R. (2004) Job isolation in the US: narrowing the gap through job access and reverse-commute programs. Running on empty: transport, social exclusion and environmental justice. K. Lucas. Bristol, The Policy Press.

Current, J. and S. Ratick (1995) A model to assess risk, equity and efficiency in facility location and transportation of hazardous materials. Location Science, 3(3), 187-201.

Daniels, N. (1985) Just health care. Cambridge, Cambridge University Press.

Department of Transportation USA (DOT) (1997) *DOT Order 5610.2 "Department of* Transportation Actions to Address Environmental Justice in Minority Populations and Low-*Income Populations" (February 3, 1997)*.

Dong, X., M.E. Ben-Akiva, et al. (2006) Moving from trip-based to activity-based measures of accessibility. Transportation Research Part A: Policy and Practice, 40(2), 163-180.

Dworkin, R. (1983) Reply to Michael Walzer. The New York Review of Books, 30(12).

Ecola, L. and T. Light (2009) Equity and Congestion Pricing: A Review of the Evidence, Rand Corporation.

Eliasson, J. and L.-G. Mattsson (2006) Equity effects of congestion pricing: Quantitative methodology and a case study for Stockholm. Transportation Research Part A: Policy and Practice, 40(7), 602-620.

Fabre, C. (2007) Justice in a changing world. Cambridge, UK, Polity Press.

Farrington, J. and C. Farrington (2005) Rural accessibility, social inclusion and social justice: Towards conceptualisation. Journal of Transport Geography, 13(1 SPEC. ISS.), 1-12.

Feitelson, E. (2002) Introducing environmental equity dimensions into the sustainable transport discourse: issues and pitfalls. Transportation Research Part D: Transport and Environment, 7(2), 99-118.

FHWA (Federal Highway Administration) FHWA Order 6640.23 entitled "FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" (December 2, 1998). Website http://www.fhwa.dot.gov/legsregs/directives/orders/6640_23.htm. Last accessed 11 November 2009

FHWA (Federal Highway Administration) and FTA (Federal Transit Administration), 1999. Memorandum on Implementing Title VI Requirements in Metropolitan and Statewide Planning. Website http://www.fhwa.dot.gov/environment/ejustice/ej-10-7.htm. Last accessed 14 October 2009

FHWA (Federal Highway Administration), 2009. Environmental Justice web site, "The Facts – Questions and Answers on Environmental Justice". Website http://www.fhwa.dot.gov/environment/ejustice/facts/index.htm. Last accessed 12 December 2009

Forkenbrock, D.J. and L.A. Schweitzer (1999) Environmental justice in transportation planning. Journal of the American Planning Association, 65(1), 96-111.

Forkenbrock, D.J. and J. Sheeley (2004) Effective methods for environmental justice assessment, National Cooperative Highway Research Program, National Research Council/Transportation Research Board.

Frank, L.D., J.F. Sallis, et al. (2006) Many Pathways from Land Use to Health: Associations between Neighborhood Walkability and Active Transportation, Body Mass Index, and Air Quality Journal of the American Planning Association, 72(1), 75-87

Frohlich, N. and J.A. Oppenheimer (1992) Choosing justice: an experimental approach to ethical theory. Berkeley, CA/Los Angeles, CA/Oxford, University of California Press.

Garb, Y. and J. Levine (2002) Congestion pricing's conditional promise: promotion of accessibility or mobility? Transport Policy, 9(3), 179-188.

Garrett, M. and B. Taylor (1999) Reconsidering social equity in public transit. Berkeley Planning Journal, 13, 6-27.

Hine, J. (2008) Transport and social justice. Transport geographies: mobilities, flows and spaces. R. Knowles, J. Shaw and I. Docherty. Malden/Oxford, Wiley-Blackwell.

Hodge, D.C. (1988) Fiscal equity in urban mass transit systems: a geographical analysis. Annals of the Association of American Geographers, 78, 288-306.

Hodge, D.C. (1995) My fair share: equity issues in urban transportation. The geography of urban transportation. S. Hanson. New York/London, The Guilford Press.

Ihlanfeldt, K. and D. Sjoquist (1998) The spatial mismatch hypothesis: a review of recent studies and their implications for welfare reform. Housing Policy Debate, 9, 849-892.
Jakob, A., J.L. Craig, et al. (2006) Transport cost analysis: a case study of the total costs of private and public transport in Auckland. Environmental Science & Policy, 9(1), 55-66.
Johnston, R. (2004) The Urban Transportation Planning Process. The Geography of Urban Transportation. S. Hanson and G. Giuliano. New York/London, The Guilford Press.
Khisty, C.J. (1996) Operationalizing Concepts of Equity for Public Project Investments. Transportation Research Record: Journal of the Transportation Research Board, 1559, 94-99.
Kolm, S.-C. (1996) Modern theories of justice. Cambridge, MA, MIT Press.
Levinson, D. (2010) Equity Effects of Road Pricing: A Review. Transport Reviews: A Transnational Transdisciplinary Journal, 30(1), 33 - 57.
Lucas, K. (2006) Providing transport for social inclusion within a framework for environmental justice in the UK. Transportation Research Part A: Policy and Practice, 40(10), 801-809.
Mann, E. (2004) Los Angeles Bus Riders Derail the MTA. Highway Robbery: Transportation Racism and New Routes to Equity. R. Bullard, G. Johnson and A. Torres. Cambridge, South-End Press.
Martens, K. (2006) Basing transport planning on principles of social justice. Berkeley Planning Journal, 19, 1-17.
Martens, K. (in press) Substance preceeds methodology: on cost-benefit analysis and equity. Transportation.
McNally, M.G. (2000) The four-step model. Handbook of transport modelling. D. A. Hensher and K. J. Button. pp. 35-52. Oxford, Pergamon.
Michelman, F.I. (1973) In pursuit of constitutional welfare rights: one view of Rawls' theory of justice. University of Pennsylvania Law Review, 121, 962-1019.
Mills, G.S. and K.S. Neuhauser (2000) Quantitative methods for environmental justice assessment of transportation. Risk Analysis, 20(3), 377-384.
MTC (Metropolitan Transportation Commission) (2004) Transportation 2030 Equity Analysis, MTC.
Murray, A.T. and R. Davis (2001) Equity in regional service provision. Journal of Regional Science, 41(4), 577-600.
Naess, P. (2006) Accessibility, activity participation and location of activities: Exploring the links between residential location and travel behaviour. Urban Studies, 43(3), 627-652.
Niemeier, D.A. (1997) Accessibility: an evaluation using consumer welfare. Transportation, 24(4), 377–396.
Ong, P. and E.A. Blumenberg (1998) Job access, commute and travel burden among welfare recipients. Urban Studies, 35(1), 77-93.
Pfeffer, N., F.H. Wen, et al. (2002) Environmental justice in the transportation planning process - Southern California perspective. Transportation Research Record: Journal of the Transportation Research Board, 1792 (Sustainability and Environmental Concerns in Transportation 2002), 36-43.

Polzin, S.E., R.M. Pendyala, et al. (2002) Development of Time-of-Day–Based Transit Accessibility Analysis Tool. Transportation Research Record: Journal of the Transportation Research Board, 1799, 35-41.
Purvis, C.L. (2000) Data and Analysis Methods for Metropolitan-Level Environmental Justice Assessment. Transportation Research Record: Journal of the Transportation Research Board, 1756, 15-21.
Puu, T. (2005) On the genesis of hexagonal shapes. Networks & Spatial Economics, 5(1), 5-20.
Rawls, J. (1971) A theory of justice. Cambridge, MA, Harvard University Press.
Richardson, H.W. and C.C. Bae (1999) The equity impacts of road congestion pricing. Road pricing, traffic congestion and the environment. K. J. Button and E. T. Verhoef. Cheltenham, Edward Elgar Publishing.
Rietveld, P. (2003) Winners and Losers in Transport Policy: on Efficiency, Equity and Compensation. Handbook of Transport and the Environment. D. A. Hensher and K. J. Button. pp. 585-601. Amsterdam/San Diego, Elsevier.
Rimmer, P. (1985) Transport geography. Progress in Human Geography, 9, 271-277.
Robinson, G. (2008) Environmental Justice and Transportation Toolkit, Volume 1. Baltimore, Baltimore Region Environmental Justice in Transportation Project. Website: http://www.scribd.com/doc/9272794/Environmental-Justice-Toolkit-Volume-1, Last accessed 11 November 2009
Rucker, G. (1984) Public transportation: another gap in rural America. Transportation Quarterly, 38(3), 419-432.
Sadurski, W. (1985) Giving desert its due: social justice and legal theory. Dordrecht, D. Reidel Publishing Company.
Sager, T. (2005) Footloose and Forecast-free: Hypermobility and the Planning of Society. European Journal of Spatial Development, September 2005(17), 1-23.
Sanchez, T.W. (2008) Poverty, policy, and public transportation. Transportation Research Part A: Policy and Practice, 42(5), 833-841.
Sanchez, T.W., R. Stolz, et al. (2003) Moving to equity: addressing inequitable effects of transportation policies on minorities. Cambridge, MA, The Civil Rights Project at Harvard University.
Schweitzer, L. and A. Valenzuela (2004) Environmental injustice and transportation: the claims and the evidence. Journal of Planning Literature, 18(4), 383-398.
Sen, A.K. (1973) On economic inequality. Oxford, Clarendon Press.
Shrader-Frechette, K.S. (2005) Environmental justice: creating equality, reclaiming democracy. Oxford/New York, Oxford University Press.
Smith, D.M. (1994) Geography and social justice. Cambridge, Blackwell.
Taylor, B. (2004) The Geography of Urban Transportation finance. The Geography of Urban Transportation. S. Hanson and G. Giuliano. New York/London, The Guilford Press.
Taylor, B.D. and A.T. Norton (2009) Paying for Transportation: What's a Fair Price? Journal of Planning Literature, 24(1), 22-36.
Teuber, A. (1984) Bookreview of Spheres of Justice by Michael Walzer. Political Theory, 12(1), 118-123.
Trappenburg, M. (2000) In defence of pure pluralism: Two readings of Walzer's spheres of justice. Journal of Political Philosophy, 8(3), 343-362.

Urry, J. (2004) The 'system' of automobility. Theory, Culture & Society, 21(4-5), 25-+.
Vigar, G. (1999) Transport for people: accessibility, mobility and equity in transport planning. Social town planning. C. H. Greed. pp. 90-101. London, Routledge.
Walzer, M. (1983) Spheres of justice: a defense of pluralism and equality, Basic Books.
Wu, B.M. and J.P. Hine (2003) A PTAL approach to measuring changes in bus service accessibility. Transport Policy, 10(4), 307-320.
Zeitler, U. (1999) Grundlagen der Verkehrsethik. Berlin, Logos Verlag.