Amenity and Severance

Susan Handy
Department of Environmental Science and Policy
University of California at Davis
Davis, CA  95616-8576
slhandy@ucdavis.edu


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Introduction

In 1998, the Department of Transportation for the State of Texas, better known as TxDOT, won a court case that allowed the department to move forward with plans for an extension to State Highway 161 through Grand Prairie, a small city located about halfway between Dallas and Fort Worth and just south of the Dallas-Fort Worth International Airport. A neighborhood group had been battling this freeway in the courts for more than a decade. At the core of the battle was the Environmental Impact Statement (EIS), required for this project under the National Environmental Policy Act of 1969, and the adequacy of its assessment of the impacts of the proposed freeway on the surrounding community. The preferred alignment for the freeway as recommended by the EIS would take 9.9 acres from a well-used, 24.7-acre city park. The freeway structure, elevated as it passed next to the neighborhood and through the park, would project noise and shadows into the adjacent areas and create a barrier between the neighborhood and the park. Although it was clear that the proposal would reduce amenity in the community and increase severance between different parts of the community, the EIS provided little in the way of analysis of these issues. Nevertheless, the judge in the case concluded that the EIS reflected standard practice in transportation planning.

Techniques for assessing the impacts of transportation projects on amenity and severance in a community are neither well developed nor widely used. Interest in developing such techniques first emerged in the 1960s and 1970s in the wake of concerns over the impacts of freeway building on existing communities, but the challenge of defining these concepts, let alone measuring them, contributed to a lack of progress. In the absence of standardized techniques, amenity and severance are often ignored or at least underplayed in environmental impact assessments and transportation planning processes. As an appreciation of the importance of these concepts grows, however, the tools available for measuring and evaluating them have improved and examples of efforts to enhance amenity and reduce severance have proliferated. Although more basic research on the concepts of amenity and severance is needed, planners can find effective ways to address these concerns. This chapter defines amenity and severance, reviews the tools available to planners for assessing these characteristics, and presents examples of policies and projects designed to enhance amenity and reduce severance.
Defining the Concepts

Both amenity and severance are characteristics of a community that are determined by the physical environment yet depend on the human response to that environment. Most people can tell you to what degree a community has amenity or whether it has experienced severance, but the assessments of degree and explanations of why will vary from person to person. Amenity is perhaps the more subjective of the two characteristics, but severance involves a significant perceptual component as well.

*Amenity*

Amenity refers to the quality of a place, the way it looks, sounds, smells, and feels, and it affects the way people experience a place. The aesthetic qualities of a place are an important part of amenity, but amenity is broader concept. Amenity is determined both by the physical design of a place and the human activity that takes place there. A place that has amenity is pleasant, attractive, and agreeable, as well as convenient and comfortable. Transportation amenity comes in three forms: the amenity of the transportation system for its users, the impact of the community on the amenity of the transportation system, and the impact of the transportation system on the amenity of a community. In addition, amenity will vary for each transportation mode within the same community.

The amenity of the transportation system for its users depends on the qualities of vehicle interiors, stopping places, and pathways. For automobile users, the shape and upholstery of seats, the quality of the sound system, the smoothness of the ride, the lack of noise from the road, and the aesthetics of the car interior all contribute to the amenity of the experience. The design of the road also affects amenity, as does the availability of rest stops, gas stations, and other needed services along the way, and the design of parking facilities at the destination. For transit users, the qualities of the bus or rail car and the design of bus stops or rail stations contribute to the amenity of the experience. For bicyclists and pedestrians, the design of the pathway, including pathway widths, separation from vehicle traffic, the availability of shade, and the adequacy of lighting, is most important to amenity. In all cases, other users may also impact amenity. Drivers who cut in and out of traffic, bus riders who talk loudly, bicyclists or pedestrians who hog the path all reduce the amenity of the experience for others, for example.

The design of the community also affects the amenity of the transportation system by influencing the view from the road, bus, train, bikeway, or walkway. The size, design, and placement of buildings, signs, and other structures relative to the pathway and the amount and type of landscaping found alongside the pathway contribute to a more or less pleasant experience. A train ride through an industrial area of a city does not offer the same amenity as a train ride through a forest, and a ride on a subway offers little in the way of a view of any sort at all. Human activity within view of the road may make the
experience more interesting, though the refuse of human activity – graffiti, garbage, vandalism – tends to reduce amenity. These two forms of transportation amenity – the amenity of the transportation system as shaped by the design of the system and the design of the community – are of interest to planners because of their impact on travel behavior.

The transportation system also affects the amenity of a community in many ways. Transportation facilities represent a significant element of the built environment, accounting for a substantial share of land in urban areas, especially where abundant surface parking is provided. The pavement associated with these facilities impacts the appearance of the community and may help to increase ambient temperatures. Elevated structures, whether for roads or rail, also impact the appearance of the community and may cast shadows on surrounding areas and increase noise levels. When designed solely from the standpoint of function, these facilities tend to detract from the amenity of a community. When attention is paid to aesthetics in design, these facilities may add to the amenity of a community. The use of these facilities also affects the amenity of a community. Vehicle traffic, including cars, buses, and trains, adds to noise levels, reduces air quality, and threatens safety for the surrounding community, thereby reducing amenity. Pedestrian and bicycle traffic can increase the appeal of a place, thereby increasing amenity, or, depending on the nature of that traffic, decrease the appeal of a place, thereby decreasing amenity. This form of transportation amenity – the impact of the transportation system on the amenity of the community – should be a part of community impact assessments for proposed transportation projects and policies.

These connections between transportation and amenity are, of course, highly subjective. What for one person adds to amenity may for another person detract from amenity. Finding lots of other people out walking, for example, may add to the enjoyment of a walk for some but detract from the enjoyment for others by increasing the opportunity for or necessity of social interaction, respectively. What adds to amenity in one place may detract from amenity in another. An elevated train in downtown Chicago has a certain charm, for example, but would seem a noisy intrusion through an otherwise quiet park. This subjectivity makes an assessment of amenity challenging but no less important than the assessment of more objective characteristics of a community.

**Severance**

Severance refers to separation or partitions between people, between people and places, or between two places. The purpose of the transportation system is the opposite of severance: its purpose is to join, link, or connect one place to another, people to places, and people to each other. But sometimes the transportation system serves to sever rather than connect. Human communities are severed when a new facility, such as a freeway or a rail system, is built through an existing community and local streets are closed to accommodate the new facility. Natural communities may be severed when a new
highway is built along a new alignment through an undeveloped area. Such impacts are often referred to as the "barrier effect," and may be as much psychological as physical, as much perceived as real. However, the barrier effect and severance are not quite the same thing. In a community that grows up around an existing highway or rail line, the transportation facility may serve as a barrier that impedes the creation of connections between people and places but it did not sever connections because none existed at the time it was built. Transportation projects can also contribute to severance by displacing residents and businesses, thus eliminating connections without necessarily creating a barrier.

Severance can also be understood through its converse, at both a physical and a social level. Connectivity is a physical quality of transportation networks that takes into account the number and directness of the connections between places served by a network. Good connectivity means that travelers have multiple, relatively direct routes to their destinations (Figure 1). Poor connectivity means few, relatively indirect routes to their destinations (Figure 2). Drivers have some level of connectivity via the road system to practically all destinations, at least within metropolitan areas. Transit riders, on the other hand, might find significant gaps in connectivity to parts of the region that are not served by the transit system. Pedestrians and bicyclists may also have connectivity to practically all destinations via the road system, though the poor quality of travel on the road system for these users often creates an effective barrier. As a physical concept, connectivity reflects the potential for movement through the transportation system but does not describe the way that residents actually choose to move through that system.

Community cohesion also represents the converse of severance but takes into account the social implications of physical changes. This concept is often defined as comprising the broader notions of shared values and common goals among members of a community. In a cohesive community, residents have a sense of belonging and feel a strong attachment to the community and their neighbors, and they make use of local facilities and engage in community activities. Although usually defined in social and economic terms, the physical environment plays a role in either fostering or hindering community cohesion in three important ways: by creating borders that help to define the community, by creating barriers that divide a community, and by creating gathering spots that foster community interaction. In these ways, transportation facilities affect the network of social interactions within the community. Roadways can serve as borders or barriers. Major arterials often help to define the boundaries of a neighborhood, for example, but projects to widen a road through an existing community or upgrade a surface street to a controlled-access freeway can create a barrier between two halves of a previously cohesive community. Streets within the community are also an important public space and can provide a place for residents to gather and interact. Boulevards and traditional Main Streets, for example, have long played this role in urban settings. Rail lines also can serve as borders or barriers, and rail stations as well as bus stops may serve to foster interaction in the community. Bicycle and pedestrian facilities also tend to foster
interaction and by doing so are less likely to create a barrier in the community. Whether transportation facilities will serve as borders, barriers, or gathering spots depends in part on how residents perceive and react to these facilities.

The Connection Between Amenity and Severance

Amenity and severance are relatively distinct characteristics of a community, yet one influences the other in important ways. First, a lack of amenity can help to sever a community. A six-lane arterial street with no landscaping and poorly designed pedestrian crossings, for example, might serve as an effective barrier between two sides of a community, while a four-lane arterial street with mature landscaping, wide sidewalks, and pedestrian signals might help to link the two sides. Second, a project that increases severance often reduces amenity in a community. An elevated freeway that creates a barrier through a community, for example, increases noise levels, creates visual blight, and may make it harder for residents to get to community facilities, thereby reducing amenity from the standpoint of both aesthetics and convenience. In addition, both amenity and severance are closely tied to levels of traffic. High levels of traffic, for example, both reduce the amenity of a place and create an effective barrier. Appleyard’s classic study of patterns of social interaction on three streets in San Francisco carrying low, medium, and high levels of traffic elegantly documents this effect (Appleyard 1981). At the same time, amenity and severance both influence the travel experience and thus the choices that individuals make about travel and the traffic they generate. Amenity and severance thus shape the quality of life in a community both directly and indirectly through their impact on traffic (Figure 3). Although assessments of transportation projects are generally limited to the direct impacts of the projects on amenity and severance, a more thorough approach would trace these interdependencies to evaluate the overall implications for quality of life in the community.

Techniques for Assessing Amenity and Severance

In order to consider amenity and severance within the transportation planning process, techniques for assessing these rather abstract concepts must be available to planners. The assessment of amenity and severance as a part of the transportation planning process generally involves three steps. First, the current level of amenity or severance must be determined. Second, the impact of a proposed project or policy on amenity or severance must be estimated. Third, the value of that impact to the community must be calculated, particularly if amenity and severance are to be incorporated into traditional cost-benefit analyses. All three steps can be challenging, although the third step is generally the most controversial. Some techniques skip right to the third step, making the first two steps implicit to the analysis.
Three important considerations guide the development of techniques for assessing amenity and severance: validity, practicality, and understandability. First, the measures used to represent amenity and severance must accurately reflect the concepts of amenity and severance. When the concepts themselves are vague, as is the case for amenity and severance, establishing validity is especially challenging. Second, the measures must be relatively easy to calculate with available data or data that are easy to obtain. Otherwise, the measures will not be practical for use in the transportation planning process. Finally, the measures must be relatively easy for the general public to understand, given the importance of public involvement in the planning process. Although most measures rate well on practicality and understandability, the validity of these measures rests more on intuition than on empirical testing. Publications on community impact assessment (e.g. FDOT 2000) and social impact assessment (e.g. U.S. Department of Commerce, et al. 1994) provide important guidance on techniques for evaluating impacts on characteristics like amenity and severance.

Assessing Amenity

Determining the level of amenity in a particular community is not a straightforward task. Amenity is an inherently subjective and multidimensional concept, and standard measures of amenity simply do not exist. The most obvious approach is to ask residents what they think of a place, how they would rate its amenity – a stated preference approach. Another approach is to observe the choices that residents make and infer from their choices their evaluations of amenity – a revealed preference approach. Both approaches offer the potential for determining the level of amenity and valuing a change in amenity in a particular community, but neither necessarily provides an accurate picture of actual preferences. In general, the techniques for valuing amenity are better developed than techniques for measuring amenity but they are also more complex.

A simple measure of amenity might take the form:

\[ A = w_1C_1 + w_2C_2 + w_3C_3 + \ldots \]

Where:
- \( A \) = overall amenity
- \( C_i \) = a characteristic of a place that contributes to amenity
- \( w_i \) = a weight representing the relative importance of that characteristic

Planners must first calibrate this measure by determining what characteristics to include and what weights to assign them. A list of characteristics that may contribute to the amenity of a place is relatively easy to generate. The relative importance of these characteristics is not so easy to determine, however, and may vary significantly from person to person. One way to tackle this problem is to survey residents of the community
or communities where amenity is to be evaluated. In the survey, residents can be asked to rate the importance of each characteristic, for example, on a scale from 1 (not important) to 5 (very important). The average ratings can then be used as weights for the characteristics in a simple model for determining the overall amenity of a place based on its characteristics. A more sophisticated approach is to have residents rate the amenity of a sample of places representing a wide range of characteristics. These ratings are then used as dependent variables in a regression model, with various characteristics of each place as the independent, or explanatory, variables. The regression analysis indicates which characteristics are significantly correlated with amenity, and the coefficients estimated in the analysis indicate their relative importance. Factor analysis can be used to condense a long list of characteristics that potentially influence amenity into a smaller set of composite factors. This approach often improves the efficiency of the analysis when a large number of interrelated variables are involved. The model that results from the regression analysis can be used to generate measures of amenity in different places, at different times, under different conditions. In addition, the coefficients of the model can be transformed into elasticities that show the change in amenity that results from a given change in one characteristic or factor.

Two approaches to surveying residents about their ratings of amenity are now frequently used. In walk-around surveys, residents walk through the community, rating the amenity of different places within the community and identifying positive and negative characteristics. Community image surveys are an increasingly popular technique for eliciting preferences for different types of development from residents of a community using a slide show of images of different places. Although both approaches are often used as a public involvement tool rather than a measurement tool, they provide a way of systematically evaluating amenity. The version of the community image survey developed by the Local Government Commission involves a slide show of 40 different images (LGC 2002). Survey participants are asked to rate each image on a scale of −10 to +10 depending on how much they like or dislike each image (such as those in Figures 4 and 5). The scores are then averaged for each image to represent the collective evaluation of that image. The images are shown again along with the average scores and participants are given a chance to discuss their responses. Both the community image survey and the walk-around survey approaches can be used to identify characteristics of places that contribute in positive or negative ways to amenity and for evaluating the overall level of amenity in a community.

A more rigorous form of stated preference survey is increasingly used in transportation planning to assess the probable response to proposed policies or projects. In this technique, a series of scenarios are defined that vary with respect to a few key variables. Participants are given two scenarios and asked how they would respond. By systematically structuring the scenarios and the comparisons offered, researchers can determine the relative value participants place on different variables and the trade-offs they are willing to make between different variables. This technique can be used both to
develop a model for measuring amenity and to assess the response to changes in amenity. In the first application, participants might be shown two images of places and asked which has higher amenity. Visual simulation can be used to create a series of images for use in the survey that vary systematically on only one or two characteristics at a time so that the effect of different characteristics on amenity can be isolated. In the second application, participants might be given descriptions that include amenity characteristics of two mode or route options, for example, and asked which one they would pick. Again, the descriptions would vary systematically on only one or two characteristics at a time. In both applications, statistical analysis techniques are used to determine the relative importance of different characteristics in explaining amenity or responses to amenity.

In the planning process, it is often necessary to put a value on amenity, to measure the benefit of an improvement in amenity or the cost of a decline in amenity. Contingent valuation is another sophisticated stated-preference technique useful in estimating the value of amenity and is described in more detail in Chapter ?? of this Handbook. This technique, which ascribes a monetary value to a public asset that is not sold on the market, is frequently used in environmental planning, though rarely in transportation planning. Although many different versions of contingent valuation have been developed, it commonly involves questionnaires that ask participants about their willingness to pay for a public asset, such as a healthy wetland, a beautifully designed bridge, or a traffic-free park. In this way, the cost of providing the asset can be weighed against the estimated monetary benefit to the community. The methodological issues associated with contingent valuation are complex, however, and the validity of the results is often questionable.

In revealed-preference approaches, the value of amenity is inferred from observed or reported behavior. Mode choice models used in transportation planning are one form of this approach. These models, using data from travel surveys, estimate the probability of choosing one mode over others based on the characteristics of the different modes. Amenity is rarely incorporated into these models because data on characteristics that influence amenity are not generally available. If such data were available, mode choice models could provide an important tool for assessing the relative importance of amenity. Hedonic pricing models are another important form of the revealed-preference approach. These models estimate housing prices based on the characteristics of the housing unit and its location and have been used to estimate the value of proximity to a transit station or to a freeway, variables that represent access to transportation but also the impact of transportation on amenity. The development of both mode choice models and hedonic pricing models requires a level of statistical expertise beyond that found in many planning agencies, however.
Measuring Severance

Severance can be measured at two levels: the physical environment, and the social response to the physical environment. Measures at the level of the physical environment are considerably more straightforward and objective than measures at the level of the social response to that physical environment. Measures of the converse of severance are more common than measures of severance itself.

Physical barriers such as freeways or rivers that create discontinuities in the transportation network are easy to identify. Barriers created by high levels of traffic or by low amenity or other perceptual factors can be more subtle. One indication of such barriers is relatively low volumes of traffic – pedestrian, bicycle, or vehicular – crossing a particular street or passing through a certain area. The key to this approach is to find a suitable benchmark against which to compare the volume of crossing traffic, such as the volume of traffic within the areas on either side of the suspected barrier. Another approach is to survey residents about their usual destinations and travel routes. By mapping their responses, it may be possible to identify streets that effectively serve as barriers. These techniques work well for before-and-after studies of the impact of a transportation project, but are not easily used to predict the impact of a project.

Several different approaches have been used to measure the connectivity of the street network (Handy, et al., in preparation). Simple ratios of the number of intersections per mile of street in the network or of streets per square mile of area can give a basic indication of the connectivity of the network. The ratio of the distance between two points via the street network to the straight-line distance between the two points is perhaps a more valid measure of connectivity but also one that is hard to implement in practice. Geographic information systems can facilitate the calculation of both network and straight-line distances, but a rationale for the selection of a sample of points in the network must be devised. In the U.S., two other measures of connectivity have been used by cities to establish connectivity requirements for new development. The first is simply the average block length (or the distance between streets): shorter block lengths are correlated with a greater number of intersections, which generally leads to greater connectivity. The second is a “connectivity index,” calculated as the ratio between “links” (street sections between intersections) and “nodes” (intersections and cul-de-sacs). The higher the index, the higher the assumed connectivity. Using any one of these connectivity measures, the impact of a transportation project on severance can be calculated as the difference in connectivity with and without the project.

The value of connectivity for drivers can be estimated in a variety of ways. One approach is to estimate the change in average travel distance that the change in connectivity will produce. For a small area, the change in travel distance can be estimated manually or using the network analysis capabilities of a Geographic Information System for a sample of points in the network. The sample must be carefully
selected, however, so as to accurately represent the range of impacts on travel distance. The overall estimated change in travel distance can then be converted to a monetary value using standard cost-per-distance assumptions. For large-scale changes in connectivity, such as the construction of a freeway, the impact on travel distances for freeway users and for local traffic can be estimated directly using a regional travel demand forecasting model. However, the model must reflect enough detail in the local street network that increases in travel distances for local traffic are accurately estimated. Again, the changes in distance can be converted into monetary values using standard cost-per-distance assumptions. The impact of connectivity on travel time rather than distance can also be used in these calculations, although assumptions about the value of time can be problematic. The value of connectivity for bicyclists and pedestrians is less easily measured, not only because the cost-per-mile is not readily quantifiable but also because decreased connectivity may lead bicyclists and pedestrians to forego trips altogether. For these users, willingness-to-pay approaches, described above, may prove more useful.

Community cohesion has been measured in a wide variety of ways by researchers, but not all of these measures are useful for planning practice. Data on the use of community facilities, membership in local organizations, the tenure of community residents, the homogeneity of the population, the share of households that are families, and residential and commercial vacancy rates can be used as indicators of community cohesion. Surveys of community residents can be used to determine the degree of identity with the community, desire to stay in the community, and satisfaction with the community. Observations of activity within the community can also be used to assess community cohesion. None of these indicators on its own is likely to produce a complete assessment of community cohesion, so a multi-faceted approach must be used. Estimates of the impact of a project or a policy on community cohesion are trickier than estimates of the impact on connectivity, as they require a prediction of how these social indicators will change in response to the project or policy. Surveys or focus groups with residents and interviews with community leaders can serve this purpose, but residents and leaders may find it hard to say how they will respond to the project in terms of these indicators.

Placing a value on community cohesion is even trickier. Contingent valuation techniques, such as the willingness-to-pay approach, described earlier, are hard to apply to community cohesion. According to some researchers, community cohesion fosters economic opportunity and may thus have measurable economic value. Still, determining just what share of the local economy can be attributed to community cohesion is not easy.

Incorporating Amenity and Severance into Composite Measures

Planners often use what might be called composite measures that reflect a variety of characteristics of a place. Aspects of amenity and severance are not always included in these measures but they often could be. Two types of composite measures in particular
offer a promising opportunity to bring concerns about amenity and severance into the planning process: accessibility measures and measures of the pedestrian or bicycle environment.

Accessibility can be defined as the ease of reaching needed or desired activities. Measures of accessibility generally incorporate both an “attractiveness” element and an “impedance” element. The attractiveness element reflects the qualities of the activities and the destinations where they are found and is often measured in terms of the amount of activity at a particular destination. The impedance element reflects the qualities of the transportation system that connects the traveler to potential destinations and is often measured in terms of travel cost. Amenity and severance both play an important role in determining accessibility, yet are rarely incorporated into such measures because the data needed to do so are rarely available (Handy and Clifton 2001a). Amenity affects both attractiveness and impedance, the former by influencing the appeal and convenience of potential destinations and the latter by influencing the experience of travel and thus the perceived travel cost. Severance affects impedance more directly than amenity and may work to increase impedance or to eliminate potential destinations altogether. The use of accessibility measures in transportation planning is growing.

Measures of the quality of pedestrian and bicycle environments are also increasingly used in transportation planning. These measures are generally developed using relatively simple techniques, such as professional judgment or simple stated-preference surveys, to determine what factors to include and what weights to give them in the measure. For example, the advocacy group 1000 Friends of Oregon developed a "pedestrian environment factor," or "PEF," for the Portland area that combined ratings of sidewalk continuity, topography, ease of street crossings, and the type of local street network (grid vs. cul-de-sac) using equal weights (1000 Friends 1993). The Federal Highway Administration developed a "bicycle compatibility index" by asking a sample of bicyclists to rate videotaped images of different bicycle routes. Regression analysis was used to create an equation that incorporates nine different variables, weighted by their regression coefficients, that reflect the design of the street, the nature of vehicle traffic on the street, and the type of development along the street (FHWA 1999). More recently, the U.S. DOT published a "bikeability checklist" that residents can use to assess the quality of the bicycle environment in their community. This checklist includes numerous amenity factors, including debris, lighting, and traffic, as well as severance factors, such as the abrupt ending of a bike path (US DOT 2002). Measures like these provide planners with a tool for evaluating the overall quality of a place as determined by elements of amenity and severance.
Policies to Improve Amenity and Reduce Severance

Improving Amenity

Amenity has long held an important place in transportation planning. Aesthetic concerns were given a high priority in the design of the mass transit and highway systems built in the first half of the 20th Century, and although function was often given greater weight over form in the decades following World War II, aesthetics and convenience were not ignored in the design of the new rapid transit and freeway systems. For example, in 1963, California established a scenic highway program with the goal of adding to the pleasure of the traveling experience and boosting the tourist economy (Caltrans 1996). In the same year, the state department of transportation hired the architect Mario Ciampi to design aesthetic structures for the new Junipero Serra Freeway (Interstate 280) along the San Francisco peninsula. Officially labeled by the state “the world’s most beautiful freeway,” this split-level facility was designed to follow the contours of the hills through which it winds and is often cited as a model for freeway design (Figure 6). However, such examples are more the exception than the rule, and transportation agencies have often argued that the additional cost of aesthetic features cannot be justified when transportation funding is already stretched thin. Nevertheless, in response to growing concerns over the social and environmental impacts of the transportation system, amenity has been given greater weight in official policy in the U.S. in recent years and the public has been given a greater role in defining and creating amenity. Examples at the federal, state, and local levels illustrate the broad range of policies that now support improved amenity.

The Intermodal Surface Transportation Efficiency Act, passed by the U.S. Congress in 1991, created new programs that put amenity at the forefront. The National Scenic Byways Program has designated 72 roads in the U.S. as scenic byways or “all-American roads” based on their archaeological, cultural, historic, natural, recreational, and scenic qualities. The purpose of the program is to provide resources to help local communities create “a unique travel experience and enhanced local quality of life through efforts to preserve, protect, interpret, and promote the intrinsic qualities of designated byways” (FHWA 2002a). The Transportation Enhancements program provides federal funds for projects that enhance the amenity of the transportation system, including projects to convert railroad rights-of-way to pedestrian and bicycle trails, restore historic train stations, renovate streetscapes, and build visitors centers or transportation museums. As of 2002, the program had poured $2.4 billion into over 12,000 projects (FHWA 2002b). Since the early 1990s, the Federal Highway Administration has worked with the American Association of State Highway Officials to promote “context-sensitive design,” defined as “a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic,
aesthetic, historic, and environmental resources, while maintaining safety and mobility” (FHWA 2002c). This effort has lead to changes in official guidelines for the design of highways in the U.S.

This increased attention to amenity in transportation can be found in projects throughout the U.S. In El Paso, the Texas Department of Transportation decorated existing freeways with a colorful design motif reflective of the local culture and developed through a broad public involvement program. This project also involved extensive landscaping with native species and the construction of dramatic marker at the entrance to the city along Interstate 10. Transit agencies have focused on creating amenity through the design of bus shelters, rail stations, and even vehicles as a way of promoting transit use. Art, landscaping, and architecture were used in Dallas, Texas to create a unique identity for each station in its light rail system, which opened in 1996. The Valley Transportation Authority in Santa Clara County, California, built a childcare center at its Tamien light rail station using federal transportation funding in 1994 and contracts with a national daycare operator to run the center. The goal of the project, which includes a variety of additional incentives to use transit, is to make it easier for parents of small children to use transit. At the local level, traffic calming programs have enhanced the amenity of the street environment for pedestrians and bicyclists by slowing traffic and providing attractive landscaping. Other local policies, such as sign ordinances and design guidelines, help to improve the amenity of transportation corridors.

Improved amenity is important as an end in itself but has added importance for transportation planning through its impact on travel behavior and thus levels of traffic. Choices about travel clearly depend on the experience of travel, not just how long it takes to get somewhere but also how enjoyable the experience is. The findings from studies that have looked at the experience of travel are intriguing. For example:

- Commuting increases stress levels, and unpleasant commutes increase stress even more (Novaco, et al. 1990). The kind of visual blight found along major arterials in metropolitan areas – parking lots, signs, billboards, power lines, etc. – does little to reduce stress in comparison to natural environments (Ulrich, et al. 1991). Low-amenity environments thus add to the cost of driving, although it is not clear that they discourage driving.

- Many drivers actually like driving and value the time they spend in the car, both for the things they can do while driving, including watching the scenery, and for the sake of driving itself (Mokharian et al. 2001). High-amenity environments, both internal and external to the car, may thus encourage more driving by increasing the enjoyment of driving.

- Graffiti, litter, empty lots, vacant buildings and other negative qualities around bus stops are associated with higher levels of crime and thus lower safety for bus
riders (Loukaitou-Sideris 1999). The amenity of bus stops may thus discourage transit use and undoubtedly affects the quality of the experience for those who must ride the bus.

- The quality of the pedestrian environment, as influenced by traffic levels, shade, scenery, and other characteristics, is tied to the frequency with which residents choose to stroll around the block or walk to a local store (Handy and Clifton 2001b). High-amenity environments may thus encourage walking.

Findings like these are important in understanding how amenity – or the lack thereof – impacts travel behavior. Theory suggests that travel choices depend on the relative utility, or value, of the different possible choices. In selecting a mode, travelers consider factors such as travel times in deciding which mode best suits their needs. Although amenity is not likely to be the primary factor in most mode decisions, it may have enough impact to tip the balance from one mode to another and it may be the primary factor on at least some occasions. For transit, walking, and biking to have a chance of competing with driving for those who have a choice, they must offer high levels of amenity. Of course, as the amenity within cars increases, the amenity of the alternatives may not matter, and as driving increases, the amenity of the alternatives declines.

Reducing Severance

The issue of severance came to the fore in the U.S. with the “freeway revolts” of the 1960s. At that time, the realization that freeway projects throughout the country were dividing and thus helping to destroy low-income and minority communities led to changes in the planning process and helped to shape the requirements for environmental impact assessment. The importance of avoiding severance and of reconnecting communities is increasingly recognized in official policy.

In 1994, President Clinton signed Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. This order was related to Title VI of the Civil Rights Act of 1964 and required federal agencies “to achieve environmental justice by identifying and addressing disproportionately high and adverse human health and environmental effects, including the interrelated social and economic effects of their programs, policies, and activities on minority populations and low-income populations in the United States.” As interpreted by the Federal Highway Administration, environmental justice includes not just the minimization of adverse effects but also the prevention of “the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations” (FHWA 1998). The environmental justice requirement has put new attention on the impacts of transportation projects on severance and forced transportation planning agencies to assess community
impacts in low-income and minority areas. In addition, the requirement establishes the need for efforts to remedy past impacts on these communities.

With the help of the federal Transportation Enhancements program, described above, local communities are reconnecting communities previously severed by freeways, particularly for bicyclists and pedestrians, for whom the extra travel distance can be a significant impediment. Berkeley and Davis, California have recently completed bicycle/pedestrian bridges over Interstate Highway 80 (Figure 7). San Antonio, Texas, recently renovated an abandoned rail bridge under Interstate Highway 35 for use by bicyclists and pedestrians. Up the highway in Austin, Texas, the city is working with the Texas Department of Transportation (TxDOT) to redesign the interstate through downtown to physically reconnect local streets across the freeway. The goal of the proposed design is to repair the psychological rift between the historically minority and low-income east side of Austin and downtown that was created when the freeway was built in the late 1950s (Figures 8 and 9). Even farther up the highway, the city of Dallas is working with TxDOT on a proposal to cover an existing freeway to re-establish local connections within the community. San Francisco tore down a waterfront freeway in the 1990s, and Milwaukee, Wisconsin will soon tear down an aging downtown freeway. Both removals were intended in part to reconnect severed parts of the city. A growing number of cities in the U.S., from Portland, Oregon, to Cary, North Carolina, have adopted "connectivity ordinances," designed to increase the degree of connectivity in new residential subdivisions.

The impact of such changes on travel behavior is largely untested. Most obviously, traffic on reconnected streets should increase, but traffic elsewhere should decrease. More uncertain is the impact on total travel – whether increased connectivity might lead to a net decrease in total travel by decreasing travel distances or to a net increase in total travel by encouraging new trips. For drivers, increased connectivity has the potential to reduce travel distances and times, but by doing so may increase the frequency of trips by drivers and may lead them to choose more distant destinations than they otherwise would. The impact on total vehicle travel is thus uncertain. For bicyclists and pedestrians, increased connectivity should reduce travel distances and may also expand the number of destinations they can reach within the limits of their own physical capabilities. Improved bicycle and pedestrian connectivity may also encourage more people to use these modes. An increase in walking and bicycling does not necessarily reduce driving, however, as bicycling and walking trips are often made in addition to rather than in place of driving trips. Clearly, the impacts of connectivity changes on travel behavior will depend on the particular context in which those changes take place and the ways in which residents choose to respond. The uncertainty of the impacts points to the need for strategic planning of projects designed to increase connectivity.

A continued demand for severance provides an interesting counter force to the trend towards increased connectivity. The most blatant example of this demand is the growth
in gated communities in the U.S. and elsewhere. In these communities, residents choose to erect barriers between themselves and others as a way of enhancing amenity as well as safety. In the typical suburban residential subdivision in the U.S., the barrier is created not through walls and gates but through the design of the street network to eliminate through streets and limit the connections between the subdivision and surrounding communities. Houses on cul-de-sacs sell for premiums, and residents vigorously fight efforts to extend dead-end streets as the surrounding area grows. Although some of the demand for severance can surely be attributed to a desire for racial and, perhaps even more so, economic segregation, concerns over traffic and its impacts on amenity and safety are most widely voiced. But local governments sometimes promote severance as well. In the 1970s, Berkeley, California became one of the first cities to implement an extensive street closure program to reduce traffic in residential areas. In the 1990s, several cities in the U.S., including Houston and Los Angeles, closed off streets in older residential areas as a way of combating crime. Traffic calming programs, now popular throughout the U.S., often include full or partial street closures.

Conclusions

Factoring the intangible concepts of amenity and severance into environmental impact assessment, cost-benefit analysis, other planning processes presents a significant challenge to planners. Without well-tested, widely-used techniques for evaluating these qualities of a place, planners tend to downplay their importance, even if unintentionally. Yet amenity and severance are important to quality of life in our communities, and the impacts of transportation projects and policies on amenity and severance and, in turn, the impacts of amenity and severance on travel need to be assessed. This need combined with the lack of proven tools creates a problem for planners, for which two approaches to a solution seem possible. One approach is to work to improve the techniques available to planners for quantifying these concepts and their value. The academic community needs to work with the planning community on the development of such techniques. The other approach is to accept that these intangible qualities of a place and their value can’t truly be quantified and so maybe planners should not try. The challenge of the latter approach is to ensure that amenity and severance are given appropriate weight in planning discussions and are not ignored because they are not quantified, as is often the case. In the immortal words of Albert Einstein,

Not everything that counts can be counted, and not everything that can be counted counts.
References:


Figure 1. High-connectivity street network:
Hyde Park neighborhood, Austin, TX
Figure 2. Low-connectivity network:
Dessau Road neighborhoods, Austin, TX
Figure 3. The Relationships Between Amenity, Severance, and Traffic
Figure 4. How would you rate the amenity of this place on a scale of –10 to +10?
Figure 5: How would you rate the amenity of this place on a scale of −10 to +10?
Figure 6. The Junipero Serra Freeway, California
Figure 7. Pedestrian/Bicycle Bridge over Interstate 80 in Berkeley, California
Figure 8. Downtown Austin, TX before construction of IH 35
Figure 9. Downtown Austin after construction of IH 35