The HEALTH AND PLACE INITIATIVE (HAPI) investigates how to create healthier cities in the future, with a specific emphasis on China. Bringing together experts from the Harvard Graduate School of Design (HGSD) and the Harvard School of Public Health (HSPH), it creates a forum for understanding the multiple issues that face cities in light of rapid urbanization and an aging population worldwide.
The Research Briefs series summarizes recent research on links between human health and places at the neighborhood or district scale and provides background for a number of other forthcoming products—a set of health assessment tools, planning and urban design guidelines, urban design prototypes, and neighborhood cases. While the Research Briefs draw out implications for practice, it is these other tools that really provide specific, real-world guidance for how to create healthy places.

© 2015 President and Fellows of Harvard College

As is typical practice feel free to use and cite small parts of this work, with attribution. If you want to use substantial parts, or even this entire document, the following applies. Permission is granted for use for nonprofit education purposes for all of the work except third party materials incorporated in the work, which may require permission from the authors of such material. For permission to use this work in other circumstances, contact the Harvard Graduate School of Design: hapi@gsd.harvard.edu.

The following people were involved in the Research Brief Series:

Series Editors: Ann Forsyth and Laura Smead
Contributors: Laura Smead, with Yannis Orfanos, Joyce Lee, and Chuan Hao (Alex) Chen
Copy Editor: Tim Czerwienski
Layout Designers: Yannis Orfanos, with Laura Smead and Weishun Xu
Thanks to Heidi Cho, Lydia Gaby, Andreas Georgoulis, Joy Jing, Emily Salomon, and Dingliang Yang for assistance and to Kevin Krizek for helpful comments.

Suggested Citation:
Big Ideas

- Two main issues relate to safety and health—safety from vehicular traffic accidents and safety from crime victimization.
- Violent crime directly affects health through injury and death, but the numbers are much lower than rates of injury and death from traffic accidents. Half of all road traffic deaths are among pedestrians, cyclists, and motorcyclists.
- How roadways and their surroundings are designed affects drivers’ speed, but there are debates about specific interventions.
- Lower speeds are better for everyone’s safety—but especially walking and cycling—and higher speeds are worse for walkability and cycling.
- Fear of crime is more pervasive and reduces physical activity outdoors for older persons, but not necessarily younger persons. Fear of crime is not necessarily connected to actual crime rates.
- For both traffic and crime safety, perceptions of safety are very important for health (e.g. willingness to walk outdoors, mental health). However, the reality is still quite dangerous, especially in some low-income countries.
- To improve traffic safety, interventions might include traffic calming and speed control measures, pedestrian and cyclist infrastructure and amenities, and mixed use or smart growth land use policies.
- To improve safety from crime, interventions might include street lighting, closed-circuit television use, maintenance and upkeep of public properties, and promoting natural surveillance.

What the Research Says

Health Issues

Safety means lots of things to different people. In this brief we focus on two key aspects of safety relevant to the connection of health and places: traffic safety, including pedestrian safety and cycling safety, and safety from crime (or perception of crime). Ultimately, there are two main safety goals of well-designed streets and public spaces: to reduce physical harm (injuries and deaths) and psychological harm from traffic accidents or violent crime, and secondly, to enable safe walking and cycling for transportation or recreation for all age groups.

Rates of violent crime vary widely. Generally, however, rates of injury and death from traffic accidents are much greater than deaths from violent crime (e.g. homicide).

Example: According to a global study on homicide conducted by the United Nations Office on Drugs and Crime (UNODC 2011), “Globally the total number of annual deaths estimated by UNODC to be homicides in 2010 was 468,000.”

Example: As opposed to the number of global road traffic deaths, which the according to the World Health Organization totaled approximately 1.24 million in 2010 (WHO 2014). Half of all road deaths are among pedestrians, cyclists, and motorcyclists (WHO 2013, 6).

Exposure to neighborhood crime can have negative mental health and long-term physical effects.

Example: Wilson-Genderson and Pruchno (2013) examined the effects of neighborhood violence and perceptions of neighborhood safety on depressive symptoms of older adults through a random sample survey of 5,688 persons aged 50–74 living in New Jersey (USA). They found, “Higher levels of neighborhood violent crime and poorer perceptions of neighborhood safety are associated with higher levels of depressive symptoms, controlling for age, sex, and household income” (Wilson-Genderson and Pruchno 2013, 43).

Example: Ellen et al. (2001) reviewed over 70 international articles in order to explore the links and assess evidence on neighborhood effects on health. The authors “hypothesize that a longer-term process
of ‘weathering,’ whereby accumulated stress, lower environmental quality, and limited resources of poorer communities, experienced over many years, erodes the health of residents in ways that make them more vulnerable to mortality from any given disease” (Ellen et al. 2001, 391). They discuss how research suggests that in poorer neighborhoods children are more likely to be victims of violence and experience lasting trauma from witnessing crime first-hand (Ellen et al. 2001, 391, 394, 397). Neighborhood violence also increases stress, and exacerbates stress-related disorders (Ellen et al. 2001 391, 394, 397).

This paper does not address traditional approaches to safety such as fire protection, emergency medical services, police services, or building codes. Safety from environmental pollutants is dealt with in the briefs on Air Quality, Water Quality, Housing, and Toxics; mental health safety in briefs on Disasters and Mental Health; household accidents in Housing. The synthesis on Physical Activity describes other policy and planning interventions to enable walking and cycling for transportation or recreation for all age groups.

Place issues

Traffic Safety
There is a great deal of research on traffic accidents involving motorists, cyclists, and pedestrians. Surprisingly, there are few holistic reviews. Traffic accidents are often caused by the behaviors of people e.g. speeding, distraction. However, environments can help support better behavior in some instances. A few key issues frame the relationship between traffic safety, health, and places: speed and traffic volume, safety measures for non-motorized modes of transport (traffic calming, development patterns, roadway designs), and designing streets for the safety of diverse users (ages, modes, abilities).

Increased vehicle miles traveled (traffic volume) is related to increased traffic deaths.

Example: In a report to the Victoria Transport Policy Institute, Litman and Fitzroy (2014, 11–21) reviewed nearly 200 sources to evaluate mobility management and traffic safety impacts. The authors determined that existing international data consistently indicates increases in per capita vehicle mileage is correlated with increased traffic fatalities.

As vehicular speeds increase, so do death rates.

Example: Rosen and Sander (2009) used German In-Depth Accident Study data for pedestrian accidents from 1999–2007 (n=2127 pedestrians) to create an improved risk function for adult pedestrians hit by the front of passenger cars. Consistent with other studies, the authors found, “A strong dependence on impact speed is found, with the fatality risk at 50 km/h being more than twice as high as the risk at 40 km/h and more than five times higher than the risk at 30 km/h” (Rosen and Sander 2009, 536, citations removed).

Driving environments can be designed to foster slower speeds, for example tree planting, roadway narrowing, and traffic calming.

Example: Ewing and Dumbaugh (2009) reviewed over 100 articles on the built environment and traffic safety, mostly from the 1990s and 2000s. The review was of international literature, but most focused on the United States. The authors describe their conclusions as follows, “First, the traffic environments of dense urban areas appear to be safer than the lower-volume environments of the suburbs. The reason is that many fewer miles are driven on a per capita basis, and the driving that is done is at lower speeds that are less likely to produce fatal crashes. Second, at least in dense urban areas, less- ‘forgiving’ design treatments —such as narrow lanes, traffic-calming measures, and street trees close to the roadway—appear to enhance a roadway’s safety performance when compared to more conventional roadway designs. The reason for this apparent anomaly may be that less-forgiving designs provide drivers with clear information on safe and appropriate operating speeds” (Ewing and Dumbaugh 2009, 347).

Children and older people have different safety needs than younger and middle-aged adults. Children are still learning to be good pedestrians and safety is important for them and their parents.
Older people tend to move more slowly. These have environmental implications.

Example: Ding (2011) systematically reviewed 103 papers (focused in North America) on neighborhood environmental factors related to physical activity among children and adolescents. “The most supported correlates for children were walkability, traffic speed/volume, access/proximity to recreation facilities, land-use mix, and residential density. The most supported correlates for adolescents were land-use mix and residential density” (Ding 2011, 442).

Example: In a summary of the literature on the travel-related needs, abilities, and preferences of older adults, Dumbaugh concludes (2008, 23), “Most of the safety problems experienced by older pedestrians can be attributed to three principal factors. First, conventional traffic control practices result in pedestrian intervals that are inadequate for older pedestrians. Second, even where pedestrian intervals are adequately timed, permitted left and right turns during the pedestrian phase result in pedestrians being struck by a vehicle while in the crosswalk. Finally, both issues are strongly related to a third and overarching safety issue, which is that roadways are generally designed for speeds that are too high to safely accommodate either older pedestrians or older motorists.”

Safety from Crime
Crimes are carried out by people, not places, but after many years of debate it is clear that some places provide more supports for crime than others. The literature in this area focused on crimes in public places or from public places (such as robbers entering houses from streets) rather than crimes that occur largely in private spaces such as domestic violence.

A well-maintained environment may be able to improve fear of crime, and possibly also reduce actual crime rates1. Environments perceived as safe is important to walkability2. But not all findings are consistent and this is unsurprising given the multitude of factors that affect both crime and perceived crime including socioeconomic factors (poverty, homelessness), visual cues (disorder, incivilities), maintenance issues (rundown buildings, vacant lots), and media reports.

Lorenc et al (2012, 758) provide a theoretical model of how the built environment relates to both crime and fear of crime, as well as health and wellbeing, based on an iterative review of the literature on health, environments and crime (Figure 1).

Crime behavior and the built environment are thought to influence each other. For example, vandalism is more likely to take place in a vacant lot with low-lighting.

Likewise, a fear of crime can affect mental health, and already existing mental health issues (e.g. anxiety) can increase a fear of crime.

In contrast, the built environment impacts the fear of crime and health, but not vice versa. However, as can be seen in the diagram, built environment factors—housing, public space, neighborhood and community—are a very small part of the picture of crime and antisocial behaviors.

Figure 1 illustrates how the relationship between people, the environment, and safety is very complex.

Roads designed for high-speed and high traffic volume are more deadly.
Vulnerable Groups

Traffic Safety

Children, older people, those in low- and middle-income countries, and pedestrians, cyclists, and motorcyclists, are among the most vulnerable to road injuries and fatalities.

According to the World Health Organization, “Children pedestrians, cyclists and older people are among the most vulnerable of road users” (WHO 2014). Also, “91% of the world’s fatalities on the roads occur in low-income and middle-income countries, even though these countries have approximately half of the world’s vehicles” (WHO 2013). Finally, “Half of those dying on the world’s roads are ‘vulnerable road users’: pedestrians, cyclists and motorcyclists” (WHO 2013).

Safety from Crime

Women (and girls) are the more vulnerable to rape and domestic violence (but this area is beyond the scope of this research synthesis) (UNODC 2011, 12).

Men (especially young males) are the most vulnerable to homicide (outside of intimate partner/family related homicide).

Example: According to the UNODC global study on homicide (2011), “Women may make up the majority of victims of intimate partner/family-related homicide, but the bigger picture reveals that men are those most often involved in homicide in general, accounting for some 80 per cent of homicide victims and perpetrators”
Children are especially vulnerable to negative mental health impacts of neighborhood violence (Ellen et al. 2001 391, 394, 397).

Older people, especially, have more limited outdoor physical activity when they have fear of crime.

While there are many potential health effects of crime on vulnerable groups—from stress to death—reduction of outdoor physical activity is one of the major immediate problems. Systematic reviews of multiple articles on the issue of safety and environments find that older people, especially, have more limited physical activity outside when they have a fear of crime. Women, low-income people, and certain ethnic groups are also more likely to limit physical activity due to fear of crime, but less so than older persons. When the old people belong to another vulnerable group, such as women, low-income people, or certain ethnic groups, they may be more vulnerable (Foster and Giles-Corti, 2008; Lorenc et al. 2012).

China

Traffic Safety
Road traffic injuries (mostly among pedestrians and cyclists) is one of the leading causes of injury deaths in China, and rates are increasing.

Example: Wang et al. (2008) used national Chinese databases (Ministry of Health vital registration, Disease Surveillance Points) to study rates of injury-related fatalities in China. The authors found that traffic-related fatalities increased 81% from 1987 to 2006, associated with rapid motorization, and that most traffic-related injuries were among cyclists and pedestrians. From 2002–2006, traffic related injuries were found to account for 32–35% of all injury deaths, the biggest cause of death among all injury categories.

Safety from Crime
Older Chinese people do a great deal of recreational walking, possibly due in part to low crime levels.

Example: Cerin et al. (2013) conducted environmental audits of 32 neighborhoods in Hong Kong with surveys (n=484) to study environmental attributes and leisure-time physical activity of Chinese urban elders. They find, “The level of recreational walking in the examined elders was much higher than that in Western samples, possibly due to traditional views on the benefits of physical activity, low crime levels, and high accessibility of facilities and pedestrian infrastructure" (Cerin et al., 2012b)."
Things for Certain (or semi-Certain)

Traffic Safety (Pedestrians and Cyclists)

Vehicles traveling at lower speeds are better for everyone’s safety and higher speeds are worse for walkability and cycling.

Example: Ewing and Dumbaugh (2009) reviewed over 120 articles, mostly from the past 15 years, on the relationship between the built environment and safety (with emphasis on the United States). They found that driving at lower speeds is less likely to produce fatal crashes (Ewing and Dumbaugh 2009, 347).

How the built environment is designed affects drivers’ speed. See Ewing and Dumbagh (2009, 347).

Crosswalk markings on busy roads benefit from a signal or stop sign to protect the safety of pedestrians from oncoming traffic. Unmarked crossings - those without a signal or stop - may provide a false sense of security.

Example: In a case-control study of 282 case sites and 564 control sites in six cities in Washington and California, United States, Kopesell et al. (2002, 2136) found that, “Crosswalk markings appear associated with increased risk of pedestrian–motor vehicle collision to older pedestrians at sites where no signal or stop sign is present to halt traffic. After adjusting for pedestrian flow, vehicle flow, crossing length, and signalization, risk of a pedestrian–motor vehicle collision was 2.1–fold greater (95% confidence interval, 1.1–4.0) at sites with a marked crosswalk. Almost all of the excess risk was due to 3.6–fold (95% confidence interval, 1.7–7.9) higher risk associated with marked crosswalks at sites with no traffic signal or stop sign.”

Crime or Fear of Crime

Fear of crime reduces outdoor physical activity for older persons (and perception of safety promotes walking).

Example: Wang and Lee (2010) conducted a survey of 114 older adults to determine what site and neighborhood environments promoted walking among older adults. They found, “Multivariate analyses identified positive correlates of walking at the site level including yard landscaping and corner-lots, and neighborhood-level correlates including walking destinations, safety from crime, and sidewalks” (Wang and Lee 2010, 1268).

Example: Foster and Giles-Corti (2008) conducted a systematic review (41 included articles) of the relationship between the built environment, neighborhood crime and constrained physical activity. The articles reviewed were mostly conducted in Europe and United States, but also included several from Australia and one article from Canada. They conclude (2008, 243) that, “To date there is insufficient evidence to conclude that crime-related safety influences PA [physical activity]. Nonetheless, the results presented suggest that, particularly for women and older adults, crime-related safety may constrain PA.”

Fear of crime is not necessarily connected to actual crime rates.

Example: Lorenc et al. (2012) conducted a systematic review and analysis of crime, fear of crime, environment and mental health, including mapping theories and causal pathways. “Fear of crime may be substantially influenced by physical environmental factors, such as neglected and run-down environments; its relation to the social environment is less clear” (Lorenc et al. 2012, 762). Of course their model showed the role of many other factors including media.

Older people have a greater fear of crime than people in other age groups.

Example: In Lorenc et al.’s systematic review and analysis (2012, 762) they propose, “The elderly are usually among the most cautious group, who often perceive a higher fear of crime. It may give us insights into how to improve their wellbeing by reducing their fear, because fear of crime is ‘substantially influenced by physical environmental factors’.”

Whether or not traffic safety or crime are actual problems, older people value higher levels of safety.
Example: Plouffe and Kalache (2010) did a major case study analysis in cities around the world to examine features of age-friendly cities. In 33 cities researchers conducted focus groups, surveying persons aged 60 and older (n=1485), caregivers (n=250) and service providers (n=515). They found, “Physical accessibility, service proximity, security, affordability, and inclusiveness were important characteristics everywhere” (Plouffe and Kalache 2010, 733).

Example: The AARP Public Policy Institute’s (PPI) recent report “What is Livable? Community Preferences of Older Adults” (2014) is based on a nationwide survey of more than 4,500 older adults (50 years or older). The survey found that while the vast majority of people (94 percent) felt safe getting around their community during the day, non-drivers, people with disabilities, and those with lower incomes were more likely to feel unsafe getting around their community during the day or night. Personal safety was also more a concern for family caregivers (Harrell et al. 2014, 9). Only 59% of those surveyed felt that their neighborhood was pedestrian friendly (Harrell et al. 2014, 9), and enhancing transportation and safety were among the changes recommended to improve the neighborhood (Harrell et al. 2014, 37).

Older people may be more susceptible to mental health effects and physical activity inhibition, due to their susceptibility to fear of crime.

Example: In Wilson-Genderson and Pruchno’s (2013) examination of the effects of neighborhood violence and perceptions of neighborhood safety on depressive symptoms of older adults, they found older people are more susceptible to depression in areas with neighborhood violence or perceptions of being unsafe.

**Things up in the Air**

**Traffic Safety (Pedestrians and Cyclists)**

Do safe environments lead to more walking and cycling? Or do more walking and cycling lead to safer environments?

There is some good evidence that there is some safety in numbers for non-motorized modes. However, it is hard to determine why this is the case. For example, it could be that safer environments leads to more walking and cycling (rather than the opposite), or that a large travel mode shift, with both much lower numbers of motor vehicles and simultaneously higher pedestrians and cyclists is key.

Example: Jacobsen (2003) examined the relationship between the numbers of pedestrians and cyclists and the frequency of crashes with motorists, using data sets from over a hundred different cities and towns across the United States and Europe. Jacobsen found, “The likelihood that a given person walking or bicycling will be struck by a motorist varies inversely with the amount of walking or bicycling. This pattern is consistent across communities of varying size, from specific intersections to cities and countries, and across time periods” (Jacobsen 2003, 205).

Example: Likewise, Robinson (2005) studied the relationship between numbers of cyclists in Australian states (aggregated 1980s and early 1990s data). She found, “If cycling doubles, the risk per kilometer falls by about 34%; conversely, if cycling halves, the risk per kilometer will be about 52% higher” (Robinson 2005, 47).

Example: Elvik (2009) conducted an exploratory modeling analysis of the expected number of accidents based on numbers of motorists, numbers of pedestrians and cyclists, and coefficient values for pedestrian and cyclist accidents. The author tested the hypothesis that if a large mode shift occurs (from motor vehicles to walking or cycling) that the total number of accidents would be reduced. Elvik found, “For very large transfer of trips from motor vehicles to walking or cycling, a reduction of the total number of accidents is indeed possible. This shows that the high injury rate for pedestrians and cyclists in the current transport system
does not necessarily imply that encouraging walking or cycling rather than driving will lead to more accidents” (Elvik 2009, 849).

Example: In a critical review of the “safety in numbers” literature (44 articles mainly from the past 10 years), Bhatia and Wier (2011) argue, “At present, ‘Safety in Numbers’ reflects an unsubstantiated inference from the non-linear statistical associate between pedestrian volumes and rates or numbers of pedestrian collisions. Assuming a causal chain leads from numbers to more beneficial driver behavior, as is currently popular, is premature. This association may merit more research on underlying behavioral and environmental explanatory mechanisms; however, translating this association to policy appears unjustified based on existing evidence, potentially harmful, and possibly unethical” (Bhatia and Wier 2011, 239).

Example: Similarly, Wegman et al. (2012) reviewed 51 international articles, mostly since 2002, on how to make more cycling good for road safety. They argue, “Therefore, Jacobsen’s conclusion may be wrong if we simply add numbers of cyclists to the system without adding safety quality, that is to say, risk reducing measures…expectancy/awareness is one important factor, but the other one is safe conditions for cyclists, and it is not evident yet which of these two—or perhaps another factor—has resulted and will result in lower risks” (Wegman et al. 2012, 27). Based on their review they conclude, “When the number of cyclists increases, the number of fatalities may increase, but will not necessarily do so, and the outcome is dependent on specific conditions” (Wegman et al. 2012, 19).

Safety from Crime

The built environment can be a factor in reducing crime or fear of crime, but it is not clear how big a factor.

Example: Cozens et al. (2005) reviewed the evidence on crime prevention through environmental design (CPTED). They found the following: “In the light of the recent reviews of place-based crime prevention and the systematic reviews of lighting, CCTV [closed captioned television], target hardening and SBD [secured by design] the research supporting the effectiveness of CPTED is clearly accumulating” (Cozens et al. 2005, 343, citations removed). Further, studies which do not support CPTED (of which there are many) tend to report that design factors were less effective than other variables, rather than reporting no effectiveness whatsoever” (Cozens et al. 2005, 343).

Example: Lorenc et al. (2012), reviewed theories and causal pathways of crime and health, by conducting a literature review and synthesis of over 130 articles. They conclude, “Crime may be influenced by the physical environment, although limited robust evidence is available. Fear of crime appears to have a modest adverse effect on wellbeing, and on health behaviors such as physical activity. Fear of crime may be substantially influenced by physical environmental factors, such as neglected and run-down environments; its relation to the social environment is less clear. The concept of fear of crime is unclear, and the validity of many commonly used quantitative measures is widely questioned; it appears to be only loosely related to crime” (Lorenc et al. 2012, 762).

It is unclear whether higher crime or perceptions of crime decreases physical activity in demographic groups other than older people.

Example: In Foster and Giles-Corti’s (2008) systematic review of the relationship between the built environment, neighborhood crime and constrained physical activity they find, “To date there is insufficient evidence to conclude that crime-related safety influences PA [physical activity]. Nonetheless, the results presented suggest that, particularly for women and older adults, crime-related safety may constrain PA” (Foster and Giles-Corti 2008, 249).

Implications

In these HAPI Research Briefs we aimed to find implications for planning and design at roughly the neighborhood level. These could include quantifiable standards, more qualitative but yet evidence-supported insights, and other good practices. Not every topic has a full complement of these implications.
Standards and Insights

Traffic Safety

Table 1. Examples of traffic safety strategies for automobile-based transportation systems.

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road safety design¹</td>
<td>Stopping and turning (e.g. all way stops versus signals or two-way stops, protected left turns)</td>
</tr>
<tr>
<td></td>
<td>Protecting pedestrians (e.g. stop lines, safe pedestrian crossing, raised medians)</td>
</tr>
<tr>
<td></td>
<td>Reduce traffic conflicts at intersections (e.g. ramps, roundabouts)</td>
</tr>
<tr>
<td>Traffic calming and speed control²</td>
<td>Slow traffic speeds, narrow road widths, street trees close to the roadway, on-street parking, speed humps, so-called ‘Seattle’ traffic circles (but may have issues for cyclists/pedestrians)</td>
</tr>
<tr>
<td>Active transport improvements³</td>
<td>Walking and cycling infrastructure improvements, Rideshare/bikeshare programs, available sidewalks, marked crosswalks with signal/stop/flashing beacon</td>
</tr>
<tr>
<td>Smart growth development policies, mixed use⁴</td>
<td>Retail and services in community center, rather than strip developments</td>
</tr>
<tr>
<td>Road network forms⁵</td>
<td>Limited access (Dutch SRS guidelines), 3-way offset, enhance connectivity but make sure speeds and volumes stay low: short stretches ending in T-intersections</td>
</tr>
</tbody>
</table>

Source: Table design modified from Litman and Fitzroy (2014, 4)

Safety from Crime

Table 2. Strategies to promote safety from crime.⁶

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved street lighting</td>
<td>Adding or increasing street lighting in dark areas</td>
</tr>
<tr>
<td>Surveillance and alarms</td>
<td>CCTV, silent alarms (e.g. buses, parking lots, housing complexes)</td>
</tr>
<tr>
<td>Demarcating public from private space (CPTED)</td>
<td>Signage, fences, pavement treatments, landscaping</td>
</tr>
<tr>
<td>Removing visible signs of neglect (CPTED)</td>
<td>Graffiti removal, rapid repair of vandalized equipment, routine maintenance</td>
</tr>
<tr>
<td>Improving visibility to increase surveillance (CPTED)</td>
<td>Lighting, windows overlooking the street, low walls/fences, trees and shrubbery not too thick, terraced housing</td>
</tr>
<tr>
<td>Limiting points of entry to control access (CPTED)</td>
<td>Reduced routes through housing complexes, concierges and metal detectors, protective screens on buses, street barriers</td>
</tr>
<tr>
<td>Activity support</td>
<td>Activity generation, pedestrian traffic, mixed use neighborhoods</td>
</tr>
</tbody>
</table>

2. Dumbaugh 2008, 27; Ewing and Dumbaugh 2009, 347, 356; Litman and Fitzroy 2014, 4  
3. Ewing and Dumbaugh 2009, 360; Koepsell et al. 2002; Litman and Fitzroy 2014, 4  
Good Practices

Streets could be better designed to keep older people, children, and others safe.

Example: Dumbaugh proposes that traffic safety and mobility of older adults can be improved through a better planning of street network and a better community design and street design.
- “Strategy 1: Complement the arterial system with a network of lower-speed, two-lane through-routes” (Dumbaugh 2008, 27).
- “Strategy 2: Enhance the connectivity of the local street network within communities, but ensure that vehicle speeds and volumes remain low” (Dumbaugh 2008, 28).
- “Strategy 3: Balance system capacity with opportunities for protected left turns and safe pedestrian crossings” (Dumbaugh 2008, 28).
- “Strategy 4: Encourage household-serving retail and services to locate in community-oriented centers, rather than in strip developments along arterials” (Dumbaugh 2008, 29).

Simple, small-scale neighborhood interventions may reduce violent crime and promote health behaviors.

Example: Hand et al. (2012) conducted a survey of 248 older adults in Hamilton, Ontario, Canada, to determine neighborhood influences on participation in everyday activities among older adults with chronic health conditions. They suggest, “Measures to improve safety could include security cameras, funds for residents to improve their own security, or organization of community safety groups (WHO 2007)” (Hand et al. 2012, 875).

Example: Branas et al.’s 10-year long differences-in-differences analysis of health, safety, and greening vacant lots in Philadelphia examined how “before and after outcome differences among treated vacant lots were compared with matched groups of control vacant lots that were eligible but did not receive treatment” (Branas et al. 2011, 1296). The authors found (2011, 1296), “Once greened, vacant lots may reduce certain crimes and promote some aspects of health.”
Sources


