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STREET CONNECTIVITY

Description:

Connecting land uses, neighborhoods, and districts through a well-planned, inter-connected road network provides manifold benefits to seniors. Citing Professional Traffic Engineer, James Daisa, authors Handy, Paterson, and Butler[1] define street connectivity as ". . . a system of streets with multiple routes and connections serving the same origins and destinations . . . . An area with high connectivity has multiple points of access around its perimeter as well as a dense system of parallel routes and cross-connections within the areas . . . . The connectivity of the street network has important implications for travel choices, emergency access, and, more generally, quality of life." Connectivity is also an element of the Complete Streets framework (see *Complete Streets* in the *Resource Manual*).

Street connectivity was the rule in most late 19th and early 20th century communities. A gridded system of streets with regular access and exit points offered several travel options for drivers, thus dispersing traffic and avoiding congestion and bottle-necks. This system complemented the more prevalent compact, mixed-use built environment of the time.

After World War II, however, connectivity gradually became the exception. Instead, suburban communities were planned and built on a hierarchical system of roadways—partly as a rejection of the urban neighborhood form from which many families fled, and partly to accommodate the proliferation of automobile travel and ownership. The hierarchical system functioned (or not) like this: wide, local neighborhood roads connected isolated subdivisions (many dominated by cul-de-sacs and dead-ends) to a limited number of neighborhood collector streets; these collector streets delivered cars to minor and major arterials, usually at a limited number of access points; and these arterials then connected to freeways and highways. The system also included wide, winding neighborhood roads with no sidewalks, which made pedestrian, bicycle, and transit travel nearly impossible.

In its earlier stages, this system functioned well. But as the suburbs became more crowded, traffic problems worsened—bottlenecks at peak hours (and throughout the day, in some instances) became commonplace, and traffic congestion on arterials increased. Drivers stuck in traffic had no, or limited, alternative routes.

This approach to street design and traffic management was bolstered by the Institute of Transportation Engineers (ITE) manual, which set road standards that most municipalities simply adopted in full. The ITE manual, for example, recommended minimum street widths of 32-34 feet, and rights-of-way of 60 feet. Additionally, the Federal Highway Administration set neighborhood design standards based on this system of roadway design as a condition of eligibility for the long-term, low-interest mortgages that allowed many families to afford

suburban homes. Cul-de-sacs were treated by these authorities as the most desirable street layout for suburban communities.[2]

This road system accommodated the market for housing at the time—the American Dream of a large house on a large lot, secluded from other homes and buildings (this housing preference still dominates the home-buying market). This system reduced through-traffic, thus providing the privacy and isolation sought by families leaving the cities; and cul-de-sacs were seen as the safest environment for raising children. The downside was increased traffic congestion, decreased walkability/bikability, limited or no transit options, and complete reliance on the automobile.

But times are changing; many land use and transportation planning professionals are advocating for a more inter-connected street design system that promotes walking, biking, transit, slower car speeds, and greater quality-of-life. As a sign of the times, the ITE teamed up with the Congress for the New Urbanism and Smart Growth America to develop pedestrian- and neighborhood-friendly street and streetscape designs.[3] And, the American Society of Civil Engineers, the Urban Land Institute, and the National Association of Home Builders have worked together to promote integrated land use and transportation planning to create more livable communities.

References:

[1] Susan Handy, Robert Paterson, and Kent Butler (2003), *Planning for Street Connectivity: Getting from Here to There*, pp. iii and iv. Chicago, IL: American Planning Association.

[2] Michael Southworth and Eran Ben-Joseph (June 27, 2003), *Streets and the Shaping of Towns and Cities,* p. 84. Washington, DC: Island Press.

[3] Institute of Transportation Engineers (January, 2005), *Context-Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities.* Washington, DC: Institute of Transportation Engineers. Electronic version: http://www.ite.org/css/.

Benefits:

- Connecting land uses, neighborhoods, and districts through a well-planned, inter-connected road network provides multiple benefits to older adults, families, and people with disabilities, as well as the overall community:
  - A more active and social community life, increasing communication and connections among residents of all ages and cultures and, thereby, strengthening a community's social capital and its community identity;
  - Safer, more direct, and more varied routes to destinations;
  - Mobility alternatives to the car, thereby saving energy costs;
  - Traffic-calming and traffic safety, thereby reducing accidents;
  - More access points for emergency vehicles; and
  - A greater "sense of place."

Impediments or barriers to development or implementation:

- Wholesale adoption of a street-connectivity framework may not be supported by all community residents, or may not adequately respond to the needs of all relevant stakeholders. For example, residents who still prefer the privacy and less traffic associated with non-connected residential street systems may resist efforts for greater street connectivity. This emphasizes the need for community-wide discussions to identify the areas of the community in which street-connectivity principles will benefit residents and those areas that should remain the same.

- Street-connectivity often induces more neighborhood through-traffic, which may be undesirable. This can be minimized by including traffic-calming strategies (see Traffic Calming section in the Resource Manual) can result in slower, calmer traffic, or even deter through-traffic, because such measures eliminate the driver-convenience of cutting through neighborhoods.

Emergency access/response – benefits *and* impediments:

- Both the conventional, disconnected road system *and* the inter-connected approach embodied in the Complete Streets approach have benefits and shortcomings for emergency vehicle access and response times. Because emergency services are such an important part of a community, planning efforts should actively consult and engage fire and emergency professionals to strike a workable balance between the two interests:
  - Generally, emergency responders prefer greater connectivity because it provides greater, quicker and more direct access to an incident. The Raleigh, NC, Transportation and Planning Department studied fire and Emergency Management System efficiencies in three different area neighborhood types: (1) older, traditional, gridded development; (2) neighborhoods built in the 1970s and 1980s with limited connectivity and few dead-ends; and (3) developments from the late 1980s and 1990s with very limited connections and many cul-de-sacs and dead-ends. According to the City of Raleigh Department of Transportation, "In all cases, the analysis showed far greater service efficiencies for those older neighborhoods with greater street connectivity. Even when discounting the density of development in these areas, the raw acreage covered in each case confirmed the greater efficiency in fire response coverage for areas with better street connectivity."[4]
  - At the same time, emergency responders prefer wider streets for increased vehicle mobility. Wide roads with no curbs and wide turning radii can better accommodate large emergency response vehicles, such as fire trucks. But research shows that these roads result in more accidents. In addition, cul-de-sacs and dead-ends present dangers for emergency response services—the first vehicle in may be blocked in by subsequent vehicles; subsequent vehicles may be prevented from getting closer to the incident; and, if a single access point is blocked, no alternative routes exist.

Reference:

[4] Susan Handy, Robert Paterson, and Kent Butler (2003), *Planning for Street Connectivity: Getting from Here to There*, p. 56. Chicago, IL: American Planning Association.

Resource—examples and ordinances:

- *Green Streets for Omaha*, City of Omaha, NE, RDG Planning and Design, February, 2007.

- Division of Planning (March, 2009), *Street Connectivity: Zoning and Subdivision Model Ordinance.* Frankford, KY: Kentucky Transportation Cabinet (the state agency charged with overseeing the highway, rail, and aviation infrastructure). http://transportation.ky.gov/Congestion-Toolbox/Documents/KYTC%20Street%20Connectivity%20Model%20Ordinance.pdf.

- *Street Connectivity*, New Jersey State Department of Transportation: http://www.state.nj.us/transportation/works/studies/rt57/pdf/StreetConnectivity..pdf.

- *Emergency Response and Street Design*, Congress for the New urbanism: www.cnu.org/emergencyresponse.

- *Westfield Connections: The Westfield Community Planning & Design Initiative,* Village of Westfield, New York: www.villageofwestfield.org/WestfieldConnections081004.htm.

Resource—written and web:

- Tom Kloster, James Daisa, and and Rich Ledbetter (1997?), *Linking Land Use and Transportation Through Street Design*, a Metro-Portland, Oregon, Planning Street Design Study: http://onlinepubs.trb.org/Onlinepubs/circulars/ec019/Ec019_b4.pdf.

- Susan Handy (2003), *Planning for Street Connectivity: Getting from Here to There.* Chicago, IL: American Planning Association

- Michael Southworth and Eran Ben-Joseph (1996), *Streets and the Shaping of Towns and Cities.* Columbus, Ohio: McGraw Hill Publishers.

- *Roadway Connectivity: Creating More Connected Roadway and Pathway Networks*, Victoria Transport Policy Institute, Victoria, BC, CA: www.vtpi.org/tdm/tdm116.htm.

- *Context-Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities.* American Society of Civil Engineers, Urban Land Institute, and the National Association of Home Builders.

- *Interconnected Street Systems*, City of Raleigh, NC, Department of Transportation, accessible at www.raleigh-nc.org/planning/interconnected.htm.

- Dan Burden and Paul Zykofsky (December, 2000), *Emergency Response, Traffic Calming and Traditional Neighborhood Streets.* Sacramento, CA: Center for Livable Communities: available on-line: http://www.lgc.org/freepub/docs/community_design/guides/emergency_response_manual_2001.pdf.

- Local Government Commission, Sacramento, CA: http://www.lgc.org/issues/communitydesign.html.

- *Walkable Streets and the Fire Department*, Center for Livable Communities: http://www.lgc.org/issues/communitydesign.html.

- Reid Ewing, et al (August, 2007), *Skinny Streets and Fire Trucks*, Urban Land Institute.

- *Emergency Response and Street Design*, Congress for the New urbanism: www.cnu.org/emergencyresponse.