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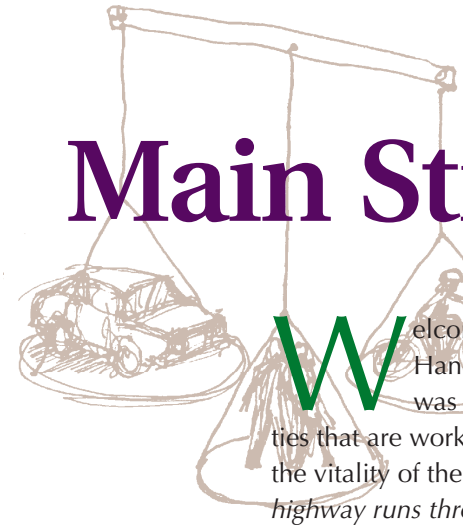

Chapter 1

Main Street as Highway

Welcome to the Main Street Handbook! This handbook was designed for communities that are working together to enhance the vitality of their *main street… when a highway runs through it.*

When main street also serves as a state highway, communities are faced with significant challenges. The biggest challenge is to strike a balance between the needs of pedestrians, shoppers, employees, business owners, and residents with the needs of through traffic—both auto and freight—to move safely and efficiently over longer distances.

Main streets that are also state highways are found throughout Oregon: from small, rural ranch downtowns to segments of large cities. Some of these main streets have kept their historic character, with a classic, small town, "Mayberry USA" appearance that is typified by a mix of uses and multi-story buildings fronting a wide sidewalk. Other main streets may have lost much of their historic appearance to strip development, parking lots, and expansion of multi-lane highways.

Whatever the character of your main street, this handbook recognizes that good highways and main streets are both critical to the health of the state's communities. It describes the many tools available to identify the problems and figure out good solutions for *main street…when a highway runs through it.*

Main Street as Highway

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Highways show two faces, much like Janus, the ancient Roman god of passage and beginnings. One face seeks speed and mobility, the other wants comfort, beauty, and community. As guardian of roadways, Janus represented the transition and balance between countryside and city, between past and future, and between war and peace.

On our modern roadways, Janus' balance sometimes seems absent. The pedestrian often feels in conflict with the motorist, although every motorist becomes a pedestrian at some point! Nowhere is this more evident than where highways run through downtowns. When the main street is also the highway, the street that has been the heart and social center of our city for generations must also support the passage of thousands of cars and trucks every day.

As a complement to the Oregon Highway Design Manual, this handbook seeks to bring peaceful coexistence to the dual personas of downtown and highway. It proposes ways to design our main streets that make use of our natural inclination to drive as quickly or slowly as the roadway itself suggests. Its goal is to make main street a place that is attractive and that works from many points of view: pedestrian safety and activity, smooth traffic flow, economic vigor, and high quality of life.

At the Heart

Main street is more than just the buildings which line it. The street records human endeavors through time: the progression of architectural styles, types of businesses, social changes, and the evolution of street design. As planner Allan Jacobs notes, streets are made for "symbolic, ceremonial, social and political roles, not just those of movement and access."

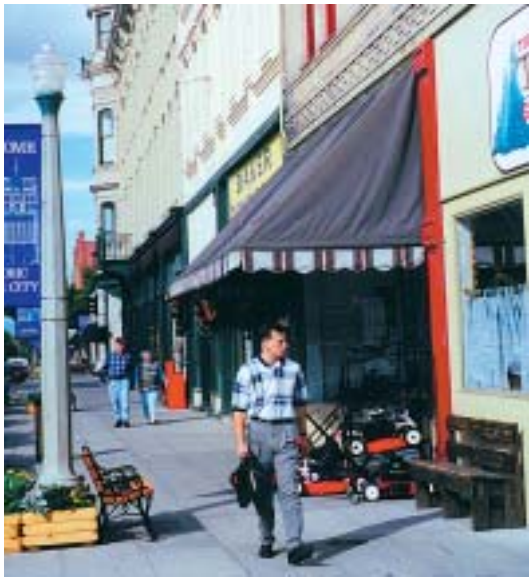
As many people told us during the creation of this handbook, main street is the heart of the community. It has history and character. Main street provides the focus of civic life and is recognized by the community as the town center. It often has historical value as the oldest part of a town and is frequently the central business district. It is an interesting and inviting place to walk. It is economically important to the area. More and more, the main street is what attracts people and businesses to a town.

Main streets are usually several blocks in length and width, with compact, mixed-use development, and buildings spaced close together and close to the street. Main streets have short blocks, are interconnected with local street networks, boast sidewalks wide enough for pedestrians to walk side by side, and usually include on-street parking. Main streets, by tradition and design, are pedestrian friendly.

When a community has what is often called a sense of place, that sense of place is found on main street. Many communities are realizing that they have lost their sense of place. Whatever the causes—economic recession, changes in land use patterns (particularly strip development and large indoor shopping malls), and sometimes, inappropriate highway modifications—these communities are working hard to recapture their sense of place.

"Main Street is where you have parades."
–Focus Group Participant, April 1999

Many places, seeing what has happened to their neighbors, are working hard to keep downtown vital. Other towns are actively developing new or expanded main streets. This handbook provides communities with guidance on what makes a good main street, particularly when it is also a highway.



Main street caters to pedestrians.

Then and Now

accessibility: **The ability to reach goods, activities, and destinations. *Travel time* and *expense* determine the quality of access. Accessibility depends on both individual factors (wealth, physical ability, age) and community factors (land use patterns, transit quality, walking conditions, road capacity, telecommunications).**

mobility: **The ability to move about, which is *one way* to gain access to a destination. Mobility may be accomplished by vehicle (bus, automobile, bicycle) or by walking. Increased mobility does not imply better access because it may result in longer *travel time* and *expense*.**

The typical main street started out as the center of town on the most important—and sometimes only—road. As the town grew, the street grew with it. The original main street may now be just several blocks among miles of development.

At first main street provided ***access*** through proximity. Everything was where you needed it: city hall, the post office, groceries, bank, doctor, shops, tavern, restaurants, and entertainment. Many people lived downtown. Although the original main street may have served a large surrounding area of ranches or farms, the emphasis of the street was on providing pedestrian and vehicle access to services and businesses within the town. One-stop shopping for daily needs is still a great advantage of many main streets.

With changing development patterns to accommodate or attract motorists, there was a shift from providing access to ***mobility***. This is what highways over the last 40 years or so have stressed. On many state highways, emphasizing mobility between and through towns over access within a town has resulted in the decline of important main street values. On state highways that are also main streets, we now recognize that mobility and access must be balanced.

Most western main streets started out with a 60 to 100 foot wide right-of-way, the space needed to turn around a horse and wagon. The public right-of-way was shared by everyone, and wide sidewalks were constructed, usually of boards, so people didn't have to walk in the mud.

Many of today's main streets have not just 2 lanes but often 3, 4 and 5 in the same right-of-way. Sometimes there is a pair of one-way streets, called a "couplet," to accommodate higher traffic volumes than the original streets were intended to handle.

Photos used with permission of Oregon Historical Society.

Albany Main Street in 1920 and today.

There are 240 incorporated cities in Oregon and many unincorporated communities… and several hundred main streets. Oregon had 25 miles of paved roads in 1914. By 1930 there were 2,600 miles. Today there are 6,800 miles of highways and many more city and county roads. About 650 miles of highways are in urban areas and 60 of those are main streets (Source: ODOT).

Reclaiming Main Street

The heavy traffic of today's highways does not mean that main street has to sacrifice the qualities that bring people to it. Many deplorable conditions—traffic noise, collisions, poor walking environment, and loss of business—have happened in part due to:

- An emphasis on mobility over accessibility, which can result in higher speeds than are appropriate to the main street environment (for example, streets that appear very wide during off-peak hours).
- A drifting away from the classic street design principles such as wide sidewalks and placing buildings correctly in relation to the street.
- A lack of knowledge or understanding about how to apply certain techniques that slow traffic, often referred to as "traffic calming," to major streets.
- Changes in zoning and land use have led to commercial development outside of the city core, typified by strip development and discount "big box" stores that can draw business away from downtown.

This handbook provides tools and ideas for reclaiming the main street qualities of the highway by making the street look good and work well.

These tools provide ways to restore highways and connecting streets to their intended function, which is to provide both mobility and accessibility, but in differing combinations.

The techniques included in this handbook can help to:

- Encourage drivers to drive at the desired speed.
- Improve the aesthetic appearance of the street.
- Enhance the street environment, particularly for pedestrians.
- Minimize conflicts between highway users: pedestrians, bicyclists, transit, freight carriers, and motorists.
- Encourage through traffic to stay on the highway.
- Provide other routes for local traffic.
- Increase the economic vitality of a community.

Reclaiming main street can improve the quality of life in the heart of the community—the real purpose of this handbook.

WHAT'S NEXT

Chapter 2: Working Together **gives the background you'll need to get involved.**

Chapter 3: Recipe for Success **explores typical issues and how to approach them.**

Chapter 4: Ingredients **details the individual measures that, in the proper mix, will get main street back on its feet.**

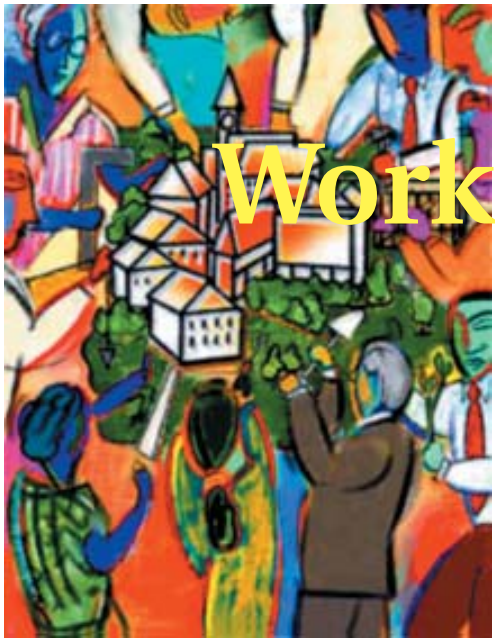
Chapter 5: Paying for It **gives you some ideas for creative financing.**

Chapter 6: Examples **discusses some real and hypothetical main streets.**

Chapter 7: Appendix **includes a Glossary, Resources, and Index.**

Don't know what a word means?

Refer to the Glossary in the Appendix.



Chapter 2
Working Together

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"We are confronted by insurmountable opportunities." –Pogo

Successful main street projects need state and local governments and community stakeholders to work together, collaborate in planning and decision making, and share responsibility for construction and maintenance.

There are many different private interests and government agencies involved in building and maintaining main street. Any time a change is proposed, everyone affected needs to be consulted.

Possible players include:

- The public that uses main street.
- Residents in the downtown and along main street.
- The business and building owners in the downtown and along main street.
- Chamber of Commerce.
- Downtown Association.
- City (police, fire, ambulance, garbage collection, utilities, public works, snow plowing, maintenance, parks, schools, and libraries as appropriate).
- County (if unincorporated or if County funds or services used).
- Oregon Department of Transportation.
- State Historic Preservation Office.
- U.S. Postal Service (if mail delivery is affected).
- Federal Highway Administration (if Federal funds are used).

Critical tools to encourage collaboration include a community's downtown plan and Transportation System Plan, as well as the city codes and ordinances that shape development. Strong agency coordination needs to be balanced with public involvement.

When it is finally decided to go ahead with a project, the implementation becomes a challenge. Once the project is built, it is important to measure success in meaningful ways.

Scores of policies and guidelines at all levels of government affect main street projects. Key documents are described in the Glossary.

ACRONYMS

ACT: Area Commission on Transportation
ODOT: Oregon Department of Transportation
OTC: Oregon Transportation Commission
STA: Special Transportation Area
STIP: State Transportation Improvement Program
TSP: Transportation System Plan

For definitions of these and other terms, refer to the Glossary in the Appendix.

Measuring Success

The final step in the process of a main street project is also the one to start with—how to measure its success. What is wanted from a project to improve a downtown? The components of what will be judged successful should be used as the project goals.

Traditionally, highway projects have been judged based on several factors:

- On-time and in-budget.
- Miles of new pavement.
- Level of service for motor vehicles.
- Crash reduction.
- Minimization of litigation.
- Special project goals.
- Satisfaction surveys (businesses, pedestrians, motorists).

However, these goals don't necessarily give a good indication of how well a project supports a town's main street which is more concerned with access and local activities. For main street projects, some suggested factors that can be measured quickly include:

- Targeted speeds met.
- Smooth traffic flow (fewer delays at intersections).
- Improved comfort in crossing the highway, for both pedestrians and motorists (delays and wait time for pedestrians, turning movements for motorists, and reduction in crash frequency or severity).

Community support for a main street can be exhibited in many ways that are difficult to measure, such as a feeling of pride and enhanced community identity. Other measures of successful planning include the amount of participation, a willingness to fund elements of the project such as landscaping and maintenance, and commitment to associated projects such as parallel city streets and access management.

Over the long-term, main street projects can be considered successful if they result in:

- More people on the street, especially children.
- An increase in walking and bicycling.
- Lower crime, particularly vandalism.
- An increase in private reinvestment.
- Economic vitality, which could be measured by a decrease in the vacancy rate, a more diverse business mix, extended hours that stores are open, and a rise in real estate values.

"Children are like the canaries in the coal mine: an indicator species of urban health. Children are small and vulnerable and need to be protected. If a city lacks children... such a place presents an environment uncomfortable, noisy, and dangerous."
–Seattle developer David Sucher

"Drop in on a conversation at a transportation planning meeting-one attended mainly by transportation planners and engineers. You'll probably hear plenty about LOS and TIPs, VMT and EIS. But what may get lost in all the acronyms and all the details is that planning our transportation system is ultimately about trying to improve our ***QOL—our quality of life.***

"While all of these evaluation tools are important, none capture just how transportation is affecting ordinary people in their everyday lives. Some of these impacts can be difficult to measure. But it is important to begin the search for the quality-of-life equivalents of the engineers' level-of-service, so that everyone can join in the discussion about our transportation future."
–Barbara McCann, Surface Transportation Policy Project

Process

Keep your head up, your eyes and ears open, and talk to everyone!

See also:

Agency contacts are listed in the Appendix under *Resources*.

When main streets are also high ways, they are managed by ODOT, and any proposed changes to the street must be reviewed and accepted by ODOT before they're implemented. Long before a highway project comes to a main street, the government agencies and the community must sit down to communicate and plan. If enough coordination doesn't happen, the result can be discontent from all concerned.

The discontent is avoidable. While ODOT has relatively formal procedures for planning, funding, scoping, designing, and building highway projects, the key to making sure local main street interests are considered is simple: Keep your head up, your eyes and ears open, and talk to everyone!

However, there is more to successful main streets than just paying attention. The communities that are best positioned to take advantage of funding and other opportunities are those that have done their homework. This means creating a dynamic and very public vision of what the community wants the main street to be—and committing to that vision. It also means continuously promoting the vision to decision-makers at all levels.

Establish and maintain close contact with local ODOT representatives so that any projects that might affect the downtown are known and discussed well ahead of formal scoping (where project components and costs are identified). Make sure everyone understands your city's willingness to work as a team member from the earliest planning stages.

Get the top management on-board and in basic agreement to the project goals and design. The most important ODOT people to keep in touch with are the region and area managers, federal aid specialist, planners, and project managers.

There are several planning steps that every community can take to make sure that this vision is created and expressed in a way that is accessible to citizens and agencies alike.

RIGHT NOW → *Get main street into current projects and planning.*

VISION → *Create written & visual plan with projects.*

TRANSPORTATION PLAN → *Include main street vision in formal plan.*

CODES & STANDARDS → *Adopt supporting development codes & standards.*

CONTACTS → *Maintain agency communications.*

STIP → *Get projects included in State Transportation Improvement Program*

MEASURE SUCCESS → *Compare results to goals.*

Right Now

Make sure that on-going projects and planning include the community's main street values. When public projects get scoped, including ODOT or local road improvements, make sure they address main street needs. "Right now" actions to keep in mind include:

- Form a downtown association.
- Have a community forum to discuss downtown issues.
- Include the Chamber of Commerce in discussions about the downtown's future.
- Make main street a Council or Planning Commission priority in its annual goal setting.
- Invite speakers from organizations such as the Oregon Downtown Development Association to talk about downtowns future.
- Look at public street and building projects scheduled for the next 5 years and see if they help main street.
- Canvas local businesses and residents about needs and quick fixes such as striping crosswalks or parking spaces.
- Review any ODOT projects in the State Transportation Improvement Program (STIP) that would affect downtown.

Create a Downtown Vision

The vision expresses the real meaning of the downtown to the community's culture, history, and self-image. It includes specific designs and projects to help the city take advantage of funding or other opportunities (such as ODOT highway projects).

Although every community's vision will be unique, the successful ones:

- Identify the real problems (see Chapter 3).

Creating a vision for main street.

- Quantify the needs, if possible.
- Clearly define the downtown area and scope.
- Evaluate alternatives (see Chapter 4).
- Gain support for the best alternative.
- Identify short and long-term strategies.

If the vision is well-established in the community, it will remain alive as staff and elected officials change over time. There will be room for the vision to change and evolve, but the downtown vision should be clear and unshakable.

Creating a vision for downtown and incorporating it into the community culture is not easy or simple. It takes many hours of discussion, meetings, public forums, design workshops, and decision-making.

Visions created in as public and inclusive a manner as possible have the best chance of success. Often, professional help is needed. This can include expert advice on economic development, downtown revitalization, design, engineering, public involvement, and other topics.

The vision is expressed in a concrete form, such as a Downtown Enhancement or Design Plan (for example, the Downtown Design Plan created for the City of La Grande in 1999). The Plan should be formally adopted by the city in their comprehensive plan and tied to its Transportation System Plan.

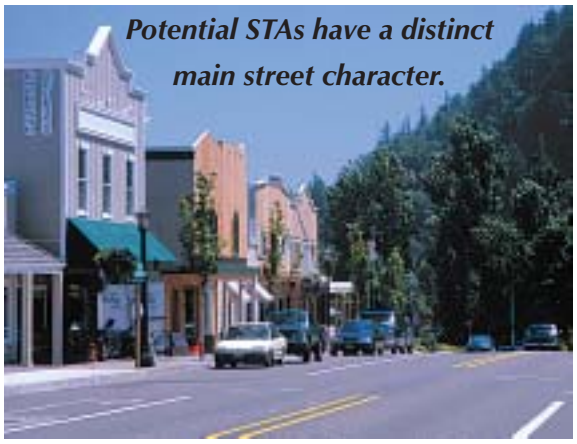
Transportation System Plans and Corridor Plans

The city or county's Transportation System Plan (TSP) describes future needs and usually lists projects, assigns priorities, and generally identifies funding options. Make sure that the TSP includes clearly stated policies and goals for the downtown and main street. If the downtown includes a state highway that the community wishes to manage as a main street, it may be appropriate to work with ODOT to designate the street as a Special Transportation Area, as discussed below.

Also, many state highways have corridor plans that include highway segments in cities. The TSP and the corridor plan are the primary documents in which main street projects should be addressed.

Special Transportation Areas

A Special Transportation Area (STA) is a highway segment designation outlined in the *Oregon Highway Plan*. The STA designation is ODOT's way of formally recognizing certain segments of state highways as main streets where through traffic movement will be balanced with the needs for local access and circulation.



Potential STAs have a distinct main street character.

It allows ODOT to use highway designs and mobility standards that are different from other highway designations.

The STA designation is appropriate in areas that already have a distinct main street character—where there is compact, urban development with buildings spaced close together and oriented to the street, and a mix of land uses. The STA designation requires development of a management plan, which is adopted jointly by Oregon Transportation Commission (OTC) and by the community as part of the local TSP.

In the past, many of the design treatments described in this handbook have been applied to state highways without STA designation. Adoption of the *Oregon Highway Plan* and subsequent development of guidelines have clarified the benefits of this option. Without an STA designation, decisions on the appropriateness of each design treatment must be made on a case-by-case basis—often requiring a design exception process. Designation of an STA is the best way to reach agreement with ODOT that a certain stretch of highway should be treated as a main street.

An STA designation is *required* if a community wants to change the highway mobility or access management standards described in the *Oregon Highway Plan*. An STA designation *may be needed* to implement other measures that could conflict with accommodating through traffic, such as reducing speeds or providing on-street parking.

The management plan that implements the STA will typically be prepared as either part of or as an amendment to a community's TSP. An STA management plan typically includes the following elements:

- Goals and objectives reflecting the community's vision for its main street.

- Clearly defined boundaries for the STA.
- Design standards, including mobility standards, signal locations, and street treatment.
- Strategies for addressing freight and through traffic.
- Parking strategies addressing on- and off-street and shared parking.
- Planning provisions that result in compact, pedestrian-friendly development.
- Provisions for a network of local streets that provides pedestrian, bicycle, transit, and motor vehicle routes.
- Access management standards for the STA itself and areas immediately contiguous to the STA.
- Identification of maintenance and operational strategies.

Some communities may have plan and ordinance provisions already in place that accomplish most or all of what is required in an STA management plan. Where this is the case, little additional work may be needed to designate an STA. Contact your city or county planning staff and the ODOT regional manager in your area for more information.

Benefits of the STA Designation

The STA designation is a way for communities to get clear agreement from ODOT to manage the state highway as a main street. These features can include wider sidewalks, adding or retaining on street parking, adding curb extensions, adding street trees, and other measures.

There are several reasons for pursuing an STA designation:

- It gets ODOT approval about how the highway should be managed up front. Without a plan, approval of main street elements will require case-by-case review and approval. The STA designation sends the message to everyone involved that "the primary objective of managing highway facilities in the STA is to provide access to community activities, businesses, and residences, and to accommodate pedestrian movement along and across the highway." (*1999 Oregon Highway Plan*)
- It prescribes greater flexibility for state highway standards.
- It changes ODOT mobility and access management standards applied to that segment of the state highway.
- It may help a community's main street projects qualify for funding, like Immediate Opportunity Funds, Local Street Funding, Oregon Community Development funding, and Federal Transportation Enhancement Funding. State funding programs are emphasizing downtown redevelopment.
- It provides certainty for property owners and local officials about how the highway will be managed. It allows businesses and local governments to make planning and investment decisions along main street, knowing that any future highway improvements will support, not detract from main street development.

See Chapter 5 for funding options.

Designating an STA can help to preserve downtown qualities, manage the highway, and support funding requests.

Codes and Standards

Local codes and standards can encourage good main street design (e.g.., how buildings are oriented to the street, where the off-street parking is located, access and parking management, wide sidewalks, etc.). Ideas for good downtown development will fail if they are not allowed because of outdated, inappropriate, or incomplete ordinances. Even worse is the slow degradation of downtown from counterproductive parking requirements, setbacks, sign standards, etc.

Building codes require certain items, such as modern plumbing and roofs that don't leak. But it is possible to have a new or remodeled building meet these demands and still fit in with the scale and texture of downtown. Design guidelines for setbacks, roof lines, proportion of windows to walls, building materials, signs, and other basics can make sure that a new building adds to downtown.

See Building Area: Design and Land Use in Chapter 4 for for more development code issues.

Examples of good development codes for downtown are available in the *Smart Development Code Handbook* (1997) published by the Transportation and Growth Management (TGM) Program. The handbook describes common obstacles to good development and provides guidance in determining whether local codes and standards encourage or impede smart development. The TGM *Model Development Code and User's Guide for Small Cities* (1999) provides examples of specific code language.

Participate in the STIP

Projects usually originate from ODOT's transportation management systems, transportation system plans, or corridor plans through cities, counties, Area Commissions on Transportation (ACTs), or local groups (such as downtown associations).

Once a transportation need has been identified, in a TSP or corridor plan or by ODOT, the first step towards getting the project implemented is to determine its relative priority among all the other identified needs. As may be expected, identified projects far outweigh available funds. The process of assigning priorities is most successful when started at the local government or ACT level and advanced upwards through ODOT to the Oregon Transportation Commission.

Projects are entered into the draft State Transportation Improvement Program (STIP) as priority and revenues allow. During the open public input period between the draft STIP and the final approved STIP, projects identified in the draft may be changed due to public input or issues determined during project scoping.

The project scope is documented in a **prospectus,** which**:**

- describes the project's nature and limits,
- estimates the costs of construction and right-of-way purchase,
- identifies environmental, land use, and funding issues, and
- is used to obtain the necessary approvals to begin work.

It is very important that the prospectus clearly communicates the specific goals and objectives of the project. The prospectus for any project being developed for the STIP is available from ODOT for review by local agencies and the public.

The key to success is to start off with a project that is scoped properly and then detailed properly in the prospectus. Note that there are portions of a project, such as some street furniture, that may not be funded by ODOT; other sources of funding must be identified in the early stages of planning.

There are two major project types in the STIP: modernization and preservation. Modernization projects are roadway changes built to accommodate existing traffic and projected traffic growth. Typical modernization projects include:

- Addition of lanes.
- New alignments.
- Grade separations (over- and underpasses).
- Intersection changes.

Preservation projects are meant to add useful life to the road without increasing capacity. Typical preservation projects include paving with only minor safety improvements.

Over the last several years, the funding in the STIP has reflected ODOT's focus on preserving existing roads and improving safety before adding new facilities. Fortunately for cities interested in improving their downtowns, preservation and safety are both issues that have a direct effect on main street.

The Oregon Transportation Commission adopted a major improvements policy in the *Oregon Highway Plan* to maintain highway performance and improve safety by improving system efficiency and management before adding capacity. The priorities are to:

1. Protect the existing system.
2. Improve efficiency and capacity of existing highway facilities.
3. Add capacity to the existing system.
4. Add new facilities to the system.

The STIP is for a 4-year period, with a 2-year overlap (for example, 2002-2005). Public hearings on the proposed STIP content are held during the spring before the actual funding year, and are adopted by the Oregon Transportation Commission in the fall of the same year. Revenue forecasts for the STIP are initiated about 2 years before the actual project period.

Since the content of the STIP is influenced by public and local government input, it is critical for cities to maintain contact with local ODOT representatives, particularly the region and area managers. State policy encourages citizens, businesses and groups to have input into decisions that affect state highways (per Policy 2D in the *Oregon Highway Plan*).

STIP projects are usually years in the making, so cities and individuals need to make the effort to keep locally important projects alive. In times of funding shortfalls, the projects that have long-term champions are the ones that get funded.

Follow-Through

Do not relax after a project is added to the STIP. Keep in touch with the project manager during the design phases to learn how the main street objectives are being addressed. If ODOT highway design **exceptions** are needed because of nonstandard elements (such as on-street parking less than 8 ft wide), make sure that these have approval. Sometimes a project may be assigned a new manager, in which case it is wise to go through the history of the project with them because they may not be aware of the original discussions and community objectives. During project construction, check with the project manager on progress and any issues that may come up—some design decisions are necessarily made in the field and you want to make sure they are consistent with the project's objectives. Finally, do a walk-through of the completed project and congratulate the manager and team on a job well done! END

See Chapter 6 for other examples.

EXAMPLE

Many downtown projects, such as Heppner (described in the case studies in Chapter 6), have been initiated by ODOT preservation overlay projects, which are listed in the STIP. Because Heppner had an existing plan for its downtown, the city was able to work with ODOT to expand the project scope beyond a simple pavement overlay, and was able to leverage additional funds for other downtown improvements.

Chapter 3
Recipe for Success

Great chefs understand that there are many ways to make spaghetti, and dozens of ingredients from which to choose. However, as much as you might like garlic, it will not be outstanding spaghetti if the chef only uses one ingredient—a balanced mix of quality components works best. The important thing is to start with a clear idea of how you want the dish to taste, and which ingredients will get you there.

In the same way, every main street is unique. There is no single best design, but successful projects usually:

- Start with a clear **vision** of what is to be accomplished.
- **Balance** the travel modes.
- Make the **best** of what there is to work with.
- Reflect local **history**.

When you get right down to it, the vision is the hardest part, especially when it may be something different from what we've become accustomed to. It is human nature to stick with the familiar. However, this can lead to both boring dinners and bad main streets.

This chapter will give you the framework to start envisioning what you want to accomplish. This is done in two parts. First, we discuss the basic elements that make up a street. Next, the typical problems that can afflict a main street are outlined along with possible solutions—what mix of ingredients might be used. Chapter 4 describes each ingredient in detail.

Note: You may notice some repetition in this and other sections of the handbook. Similar to a good recipe, these bits of information lean on each other, and many ideas, goals, and ingredients work better together than alone.

Recipe for Success

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The Structure of the Street

To make the right decisions for main street, it helps to have an overall understanding of how a street works. We can start by looking at the street from three angles: length, width, and height. On a successful main street, all of these dimensions need to be considered at a human scale.

After we understand how the main street is supposed to work, we will look at each of the primary traffic issues: safety, security, comfort, speed, crossing, access, and congestion.

Human Scale

Although the world is large, we perceive it piece by piece. In street design, details count. Things look different close up walking at 2 mph than they do from behind a windshield at 30 mph. Everything seen and experienced from the sidewalk—building fronts, signs, lighting, open space—should be designed for human interaction at a pedestrian's perspective.

Likewise, the view of main street from the windshield should be designed for 20 mph or less. Features typically found on higher speed highways—buildings and trees set back from the road, tall signs to attract motorists, generic surroundings stripped of detail—aren't compatible with main street.

Parking lots surrounding buildings and highly car-oriented uses like gas stations or drive-ins distort the human scale of the street by making things too far apart. The pedestrian wants interesting things to look at close at hand, such as windows, display cases, sidewalk cafes, and most of all, other people. Without human scale, the pedestrian will feel unwelcome and go elsewhere. Parking lots also create conflict points at their entrances and exits (see *Driveways* in Chapter 4).

Human-scale signs are generally shorter on main street.

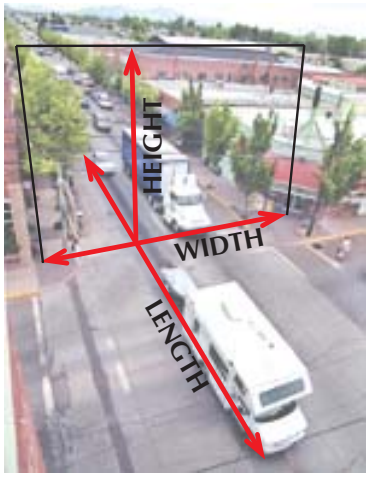
Street Zones

A main street can be considered from 3 perspectives: length, width, and height.

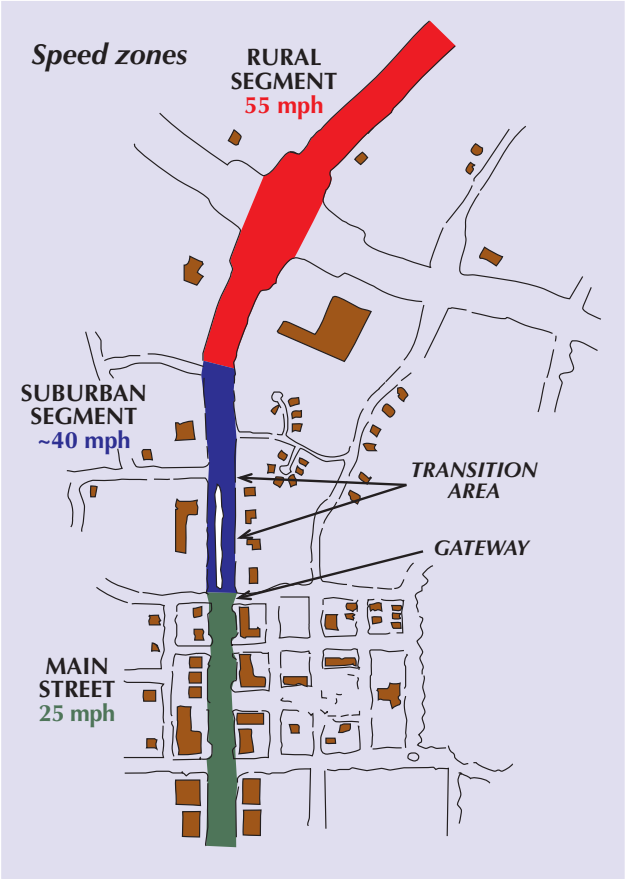
Length

A length of highway has different purposes depending on the area of the state and the adjacent land uses. A given highway may change function as it traverses urban, suburban, and rural areas. Oregon has many highway classifications (refer to the *Glossary* in the Appendix).

The most important length characteristic of a main street is that it is relatively **short** compared to the overall highway length. A main street is typically the downtown, central business district or community center, and might be only 4–8 blocks long. Main streets are usually located on an urban arterial with a posted travel speed of 25 mph, frequent street connections, and on-street parking. For good main street planning, local access and pedestrian travel needs to be given preference over through travel.



Street zones



See also:

Building Area and Transitions

in Chapter 4

Because main street is short, the highway leading into main street is very important. Drivers who have been traveling on a relatively high-speed section of highway need a **transition area** in which to slow to main street speed. Some of the designs that work on main street can also be used in the transition area to prepare drivers for what lies ahead. Sometimes, an obvious "gateway" into downtown—perhaps a park or roundabout—can reinforce the transition.

Width

The width or "cross-section" of a street includes not only the public space where the pavement and sidewalks are located, but also the front of the buildings on private property. The cross-section varies tremendously from place to place and has a lot to do with how the street looks and works.

The cross-section of main street can be thought of as having 3 zones: the roadway, sidewalk area, and building area. The roadway, along with the sidewalk area, are within the public right-of-way. Building areas are typically the interface between public and private property, except where the building or adjacent property is publicly owned.

The **roadway** is the paved portion of the right-of-way primarily used by cars and bicycles. It consists of travel lanes and often parking lanes, medians, and bike lanes. Crosswalks for pedestrians are also part of the roadway. When there are many trucks, the roadway generally needs to have wider lanes, wider turns, and better pavement.

Bicyclists travel along the pavement edges in either a lane shared with motorists, on a shoulder, or in a designated bike lane. There may be car parking between where bicyclists travel and the sidewalk area.

There may not be enough roadway width for all the desired uses and some tough decisions will need to be made. ODOT's design exception process is used by the Roadway Manager to help sort out the priorities. In many rural cities, there is ample width, which may actually be part of the problem because it allows the roadway to be wider than needed for the desired speed.

The **sidewalk area** is the portion of the right-of-way primarily devoted to pedestrians. Besides being a place to walk, the sidewalk area also includes planter strips, trees, benches, cafe tables, transit shelters,

awnings, and lighting. Poles, signing, and driveways also take up some of the space.

The width of right-of-way devoted to the sidewalk area is one indication of how much priority is given to pedestrians and transit. Main streets will have many more pedestrians than other highways. Transit use is also a consideration in many communities. Urban designers have found that main streets work best when the sidewalk area including landscaping is at least 12 ft wide. At least 6 ft of the sidewalk area needs to be clear of obstructions (see *Sidewalks* in Chapter 4).

The **building area** is where the public right-of-way and property (private or public) meet. It includes building fronts (see figure above) with their walls, doors, foyers, windows, and signs. Outdoor eating areas, courtyards, arcades and parking lots may extend this public area into the private property. Although it lies outside the right-of-way, the building area is critical to how the street works, especially the height and the sidewalk access. The appearance and function of the area is determined by the building design and land use. For example, local codes may require buildings to face the sidewalk with plenty of windows and displays, and off-street parking, if any, to be behind or to the side of the building.

Design Exception

See *Terms* on page 19

See also:

Roadway Area

Sidewalk Area

and

Building Area

ingredients

in Chapter 4

Height

So far, we have discussed horizontal infrastructure: the roadway, sidewalk area, and building area. Vertical infrastructure consists of public buildings, open spaces, trees, and utilities.

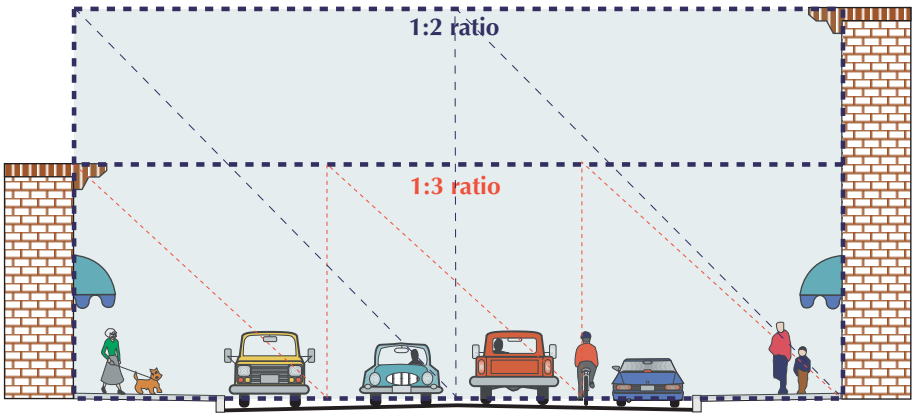
Buildings and trees bring a feeling of enclosure to the highway, which contributes to the main street's sense of place. Architects see a street as public space defined by vertical surfaces, much as a room is defined by its walls. High quality vertical features are extremely important to the pedestrian environment because they are the focus of human perception. Vertical surfaces such as building fronts and trees close to the street encourage drivers to slow down.

Open spaces, such as parking lots in front of buildings, vacant lots, and unlandscaped parks interrupt the vertical plane. This can be intentional when there is a landmark in the background that should be visible, such as a civic building.

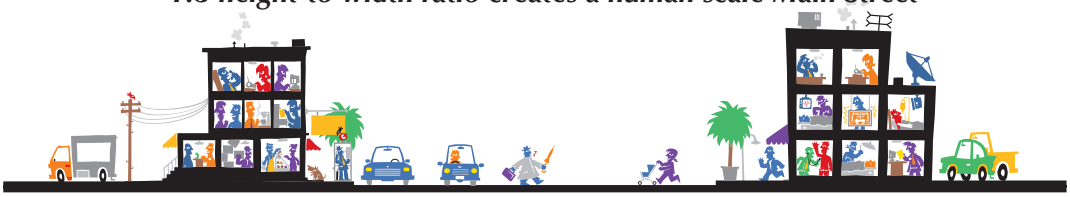
Architects refer to the **height-to-width ratio** of the street. The width is measured horizontally between opposing building fronts (or trees), and the height is measured from the sidewalk to the building eaves (or tree tops). Architects have found that the most human scale is achieved when the ratio is between 1:2 and 1:3.

For example, a successful main street 80 ft wide would have buildings about 35 ft tall (2 to 3 stories) which are next to the sidewalks. It is no coincidence that the

Human scale height-to-width ratios fall between 1:3 and 1:2 as measured from the building fronts or large trees if present.



1:3 height-to-width ratio creates a human scale Main Street



1:7 height-to-width ratio creates a scale uncomfortable for pedestrians

width-to-height ratio of the space inside many malls has the same proportions: the pedestrian streets are about 35 ft wide and the shop fronts (floor to ceiling) are about 15 ft high.

Above and below the street level are utilities of many kinds. Street designers need to make sure the utilities can do their job and are accessible for maintenance, and yet are unobtrusive and do not pose a danger to travelers. In addition, lighting and signing needs to be human scale and not intrude on the travel paths of either vehicles or pedestrians.

Street trees are an important vertical component of a main street. Street trees in a downtown area offer an ideal transition between building architecture and the roadway. When mature, street trees can create a canopy over the sidewalk and adjacent parking area. Trees provide summer shade, seasonal interest, protection from winter winds, and can be draped with a screen of night lights. A large canopy encloses and softens the street, which encourages lower speeds. Street trees need to be tall enough to provide shade without substantially blocking storefront signs.

The 3 photos above illustrate how buildings, trees, and utilities can contribute or detract from the vertical streetscape.

Refer to the *TGM Model Smart Development Code for Small Cities* for recommended main street development codes.

Identify the Real Problem

It feels like there's something wrong with main street. But what is the problem? Maybe there are only a few pedestrians, and you believe that this situation would be improved by installing a traffic signal to make it easier to cross the street. However, a traffic signal may cause other problems. Sometimes a community will seize upon a specific solution, when perhaps the best thing to do is take a step back and get a better understanding of the real problem.

What is at the heart of the problem? Is main street unsafe? How is it unsafe? Are there too many cars, or is the problem really that they are going too fast? Are there too many driveway cuts? Are there missing sidewalks?

This section of the handbook describes the issues most often raised about main streets. It discusses the importance of identifying the real problems so that effective fixes can be found.

Once the problems are well defined, move on to **Chapter 4**, which describes solutions (or "ingredients") in detail.

Although this Handbook focuses on the physical problems of main street, other factors such as socio-economic policies and land use planning also contribute to the success of a main street.

Land use is discussed under Building Area in Chapter 4.

TYPICAL MAIN STREET CONCERNS

Safety
- Can't walk to stores.
- Can't turn left safely.
- Bikes use the sidewalks.

Security
- Downtown doesn't feel safe.
- There is too much graffiti.

Comfort
- Noisy.
- Unsightly.
- Nowhere for kids or the elderly.

Speed
- Traffic exceeds posted speed.
- Drivers don't slow down.

Crossing
- Stop sign or signal wanted.
- Crosswalks aren't marked.
- Kids can't cross safely.

Access
- Not enough parking.
- Delivery trucks block street.
- Median not acceptable to businesses.
- Downtown not accessible to the disabled.

Congestion
- Too much traffic and delay.
- Highway doesn't meet performance standards.
- Too many trucks.
- Cut-through traffic in neighborhoods.

TERMS

ADA: Americans with Disabilities Act

Arterial: A road normally designated to carry traffic through an area rather than to local destinations.

Basic rule: A state law requiring vehicles to be driven at a speed appropriate for the conditions.

Bikeway: Any of various facilities for bicycle travel (shared roadway, bike lane, etc.).

Canopy: The cover created by the upper branches of trees.

Conflict: A collision or near collision which requires evasive action, generally between a vehicle and another vehicle or pedestrian.

Design Exception: An ODOT procedure for using highway designs that deviate from the adopted standard in the Highway Design Manual.

Gateway: Something that marks the entrance to downtown.

Planter strip: A strip of right-of-way for trees and scrubs, usually between the sidewalk and roadway.

Right-of-way (ROW): A strip of public land between private properties that typically includes the roadway and sidewalks.

Roadway: The paved portion of the highway, not including the sidewalk.

Also refer to the Glossary in the Appendix.

Safety

When someone says "the street isn't safe," what do they really mean? Are there too many crashes? Are people driving too fast? Are intersections threatening? Safety—both real and perceived—is one of the most important aspects of the highway. Designing a safe main street means recognizing the limitations and expectations of all its users.

A starting point is to provide the basic facilities for each user: wide sidewalks and frequent crossings for pedestrians; on-street bikeways and frequent racks for bicyclists; and a clear, direct travelway with convenient parking for motorists.

Good design improves safety through:

- **Increased awareness** of other street users—such as high visibility crosswalks, curb extensions, and refuge islands.
- **Reduced conflicts**—such as bikeways, channelization, medians, and driveway restrictions.
- **Lower speed**—traffic calming such as narrower lanes, trees, and tight corners.

There are many design factors that influence safety, and the judgement of a transportation professional is usually needed to select and design appropriate facilities.

However, the transportation professional needs to recognize that the *perception* of safety can be as important as actual data. For example, a road with no history of vehicle-pedestrian collisions does not necessarily mean that it's a safe roadway for people to walk along—it may mean that there are no sidewalks and that's why there are very few pedestrians!

If a design improves the quality of life along the highway without creating a hazardous situation for any user, then it is worth considering, with or without speed and collision data.

Urban streets need to serve all users as well as possible, but **pedestrians are the priority** when safety and space allocation must be balanced between modes. For example, in constrained rights-of-way it may be necessary to balance increased motor vehicle congestion with the need for wide sidewalks.

The measures described in Chapter 4 have proven their value through experience. Where studies are known, they are mentioned. Mostly, this handbook points out how particular ingredients are known to improve a street's quality and safety by increasing awareness, reducing conflicts, and lowering speed.

Typical statement: *"My grandmother can't walk to the store."*

Possible problems: *Sidewalks absent, poorly maintained, or do not meet needs of the elderly (uneven surface, no ramps, etc.).*

Potential ingredients: *Basic sidewalk improvements and maintenance.*

Typical statement: *"It's scary to turn left on the highway."*

Possible problems: *Misuse of continuous center turn lane, too many driveways, multiple lanes to cross, and high speeds.*

Potential ingredients: *Raised median, channelization, driveway management, traffic controls, and fewer travel lanes.*

Typical statement: *"How can we get the bikes off of the sidewalks?"*

Possible problems: *Riders on sidewalk because of poor street facilities or because they want to go in the opposite direction and can't cross the street easily.*

Potential ingredients: *Bikeways and frequent, short crossings.*

See also these related problems:

Crossing

Access

Speed

Security

People must feel secure and unthreatened for main street to be successful. People will stay away from a street that feels scary. Part of a feeling of security is the safety of the street, discussed above. Another important part of security is the perception that you are not isolated on the street.

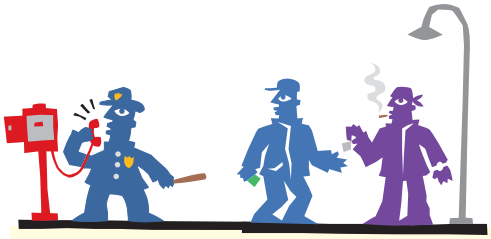
"Do not protect yourself by a fence, but rather by your friends."
–Czeck proverb

This feeling of security is created through **surveillance** and **ownership**. Surveillance doesn't mean hanging a security camera on every corner—although some cities have done that—it means that there are enough people on the street during most hours to make you feel that someone will see you if something bad happens (or if you do something bad!). A lively main street with a diversity of people walking, working, shopping, and living downtown may reduce actual crime (especially vandalism) and increase perceived safety.

EXAMPLES

In **Bend, Oregon**, the downtown association worked with young people to build, install, landscape, and maintain large concrete planters. As a result of this new sense of ownership by young people who had not previously felt welcome in downtown, vandalism (particularly graffiti) has decreased markedly.

In some cities, downtown merchants agree to leave shop lights on until a set hour. Combined with street and pedestrian lighting, this practice adds an extra element of security to main street. An added benefit is that people can window shop after closing time.



Typical problem: *"The downtown isn't safe after dark."*

Possible issues: *Lack of good public spaces, too few people, poor lighting, and poor maintenance.*

Potential ingredients: *Maintenance, street furniture (lighting, etc.), and evening activities.*

Physically, a sense of security is created through adequate lighting, removal of overgrown vegetation and other "hiding places," readily available telephones, buildings set close to the sidewalk, and frequent shops and windows. It doesn't hurt to have the police department located downtown, either!

Ownership is a related principle. When the community is proud of its downtown, everyone who owns a business or works and shops on main street feels ownership. When the sense of ownership is strong, the street is well-maintained, and bad behavior is not tolerated.

The ownership principle can be used to decrease vandalism. What this means in street design is the creation of spaces where people are present and can observe each other, and where they have enough sense of ownership of the street that they will take some action when trouble happens.

To be sure, creating a feeling of security demands a great deal of energy and resources. Urban safety issues are complex and go far beyond the physical—however, good design can greatly decrease the impacts of these problems on main street.

Comfort

Comfort is related to security, but goes a step further. Many factors contribute to a sense of comfort on main street:

- Is downtown attractive and interesting?
- Is it lively but not too noisy?
- If I get tired, will there be someplace to sit?
- Is there a restroom that I can find and safely use?
- Can I find a parking space within walking distance of my destination?
- Is there shade?
- Are the sidewalks clear of snow, ice, and puddles?
- Are there places to get something to eat and watch the crowds?
- If I see someone I know, can I stand and chat without blocking the sidewalk?
- Can I bring my dog?
- Will my wheelchair roll easily on the sidewalk surface?

All of these questions relate to good main street design. The truly important design factors in a successful main street are a strong identity, interesting things to look at, quality materials, and comfortable surroundings.

Typical statement: *"It's so noisy on main street that you can't hold a conversation."*

Possible problems: *High speeds, too much traffic, and no sidewalk buffer.*

Potential ingredients: *Curb extensions, planting strip and trees, on-street parking, and an alternate route for through traffic.*

Typical statement: *"We want our town to look nicer."*

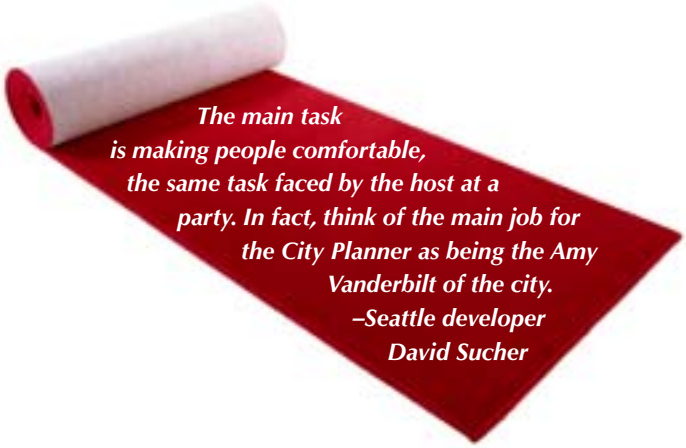
Possible problems: *Too much asphalt, too few trees, deteriorating surfaces, empty spaces, and unattractive buildings.*

Potential ingredients: *Maintenance, historic preservation, wide sidewalks, vacant lot redevelopment, and landscaping.*

Typical statement: *"There's nowhere for my grandfather to sit."*

Possible problems: *No benches or other street furniture.*

Potential ingredients: *Wide sidewalks, street furniture, and pocket parks.*



NOISE

Traffic noise is a major irritation near highways. Overall noise on the sidewalk increases with traffic speed, volume, stops, the portion of large vehicles, proximity, and reflecting surfaces. At low speeds most noise comes from engines, drivetrains, and brakes; as speed increases, wind, tire, and road noise contribute. Large trees can help dampen sound.

Many studies conclude that noise and accompanying vibration are a significant highway cost. Dropping speeds from 35 mph to 25 mph could cut these impacts by over half in a downtown. (Source: Transportation Research Record 1559, 1997.)

Speed

Speed is one of the most talked about highway issues and most highway design is closely related to it, but it is surprisingly difficult to understand. The differences between posted speed, design speed, and running speed are hard to grasp, especially as they relate to low-speed pedestrian areas. The Basic Rule also complicates the issue.

In a nutshell, the speed of a street segment can be defined as follows:

Posted speed — The maximum speed considered prudent to drive considering land use and other factors. Some posted speeds are set by statute and others are set by the State Speed Board.

Design speed — The maximum safe speed that can be driven in free-flowing traffic and good weather. The design speed has a direct effect on the cost, safety, and capacity of the roadway.

Running speed — The average speed at which most vehicles travel in a given section of highway.

Basic Rule — The appropriate speed for the conditions.

Typical statement: *"Traffic goes too fast through our downtown. How can we slow it down?"*

Possible problems: *Main street looks like a highway and offers little reason to slow down; design speed too high.*

Potential ingredients: *Various measures to calm traffic and improve appearance of streetscape.*

Typical statement: *"Motorists drive into town like they're still on the open highway."*

Possible problems: *Abrupt change of speed zones with inadequate transition area.*

Potential ingredients: *Extend traffic calming to transition area and create a gateway.*

Design speed should consider how easily and safely the pedestrian can cross.

When speeds on a highway through town are higher than posted, one reason may be that the street gives few visual clues that drivers should slow down. The design of a highway that is a main street needs to reflect the change in land use, pedestrian activity, and expected motorist behavior. The scene at left is in a downtown on a state highway, although the design looks otherwise.

SPEED ZONES

State statutes specify the following designated speeds (1997 ORS 811.105):

- alleys ..... 15 mph
- **business districts**, school zones when children are present..... 20 mph
- residential districts, public parks, ocean shores ..... 25 mph
- rural highways, urban interstate highways, trucks on rural interstate highways ..... 55 mph
- autos on rural interstates ..... 65 mph

A **business district** is a "territory contiguous to a highway when 50 percent or more of the frontage thereon for a distance of 600 ft or more on one side, or 300 ft or more on both sides, is occupied by buildings used for business." (1997 ORS 801.170)

Posted speeds override these standards, and the **Basic Rule** overrides posted speeds. The Basic Rule means that you must drive the appropriate speed for the conditions. For example, ice or snow might reduce the speed to below the posted limit.

The Oregon Department of Transportation is responsible for establishing **speed zones** on all public roads. Cities and counties may appeal speed zoning recommendations to the **Speed Zone Review Panel**.

Posted speeds different from the statutes are usually determined by an engineering investigation which includes many factors. The **85th percentile** speed, which is the speed at or below which 85 percent of the vehicles are traveling, may be used as a benchmark but with allowances for different cultural, physical and functional factors, including the needs of pedestrians and residents.

There is more to life than increasing its speed.
–Mahatma Gandhi

There are several approaches to resolving the speed issue: **slow** the traffic through physical and psychological means, **smooth** out the traffic flow, and create **transition** zones in the streetscape.

Slow down

Motorists typically drive at a speed they perceive as safe. This is partially related to the road design, especially available or perceived lane width, curves in the road, corner radii, and stopping sight distance. Reducing traffic speeds can also be aided by physical constraints on the roadway such as curb extensions and medians that make the road look narrower. On-street parking and short blocks also help hold down speed by creating "friction."

When it is not appropriate to reduce actual lane or roadway width, on freight routes for instance, a calming effect can be accomplished by creating an illusion of less space through paint on the pavement, or by adding tall trees and street furniture.

See also:

Pavement Markings

Transitions

Street Furniture

in Chapter 4

If the street is attractive, drivers have a reason to slow down.

The driver's focus at different speeds.

A low speed allows drivers to be more aware of their surroundings and to have time to react to other highway users.

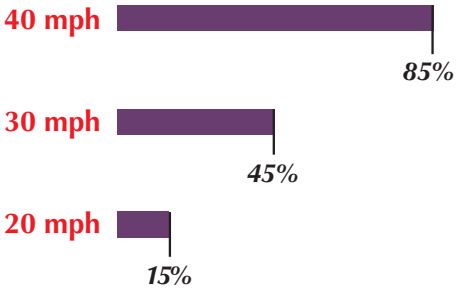
The photos show how a driver's focus changes as their speed increases. The setting is a typical downtown in a small Oregon city. Shops and on-street parking line both sides of this 2-lane couplet. The highway is built to "full standard" because of the ample right-of-way.

At the posted speed of 30 mph, many drivers have a difficult time seeing bicyclists and pedestrians, and stopping distance is nearly twice that of 20 mph.

To safely accommodate all users, this highway needs substantial design changes that tell the driver that this is not the open highway it was a few blocks before.

A good start would be wide planting strips with trees to narrow the roadway. A bike lane could be striped. Intersections could be narrowed even further with curb extensions.

When a person is struck by a motor vehicle, they have the following chances of death according to *Killing Speed and Saving Lives*, UK Department of Transportation:



At 40 mph the driver's focus is on the roadway in the distance.

At 30 mph the driver begins to see things at the road edges in the background.

At 20 mph the foreground comes into focus.

At 15 mph the driver easily sees that this is a place where pedestrians and bicyclists are present.

Good design also includes an attractive streetscape that makes drivers want to slow down. In particular, visible outdoor cafés and other sidewalk activities beckon the motorist to enjoy the surroundings.

Smooth out

Speeding and general traffic operation can often be addressed by smoothing out the traffic flow. Slow, steady traffic conditions are safer and can handle more cars than erratic, stop-and-go conditions. There are several proven ways to smooth out traffic:

- Synchronize a series of signals at a low speed with short, fixed-length cycles.
- Shift driveway accesses so that there are fewer than one or two driveways per block; combine driveways or shift them to side streets.
- Convert 4-lane streets to 3 lanes (2 travel lanes with a center turn lane) where there are large numbers of left turns; 3 lanes can work better than 4 because turning cars can wait without blocking a through lane.
- At an intersection close to the beginning of main street, install a modern roundabout (a slow-speed intersection treatment where entering motorists yield to those already in the intersection) to compel drivers to slow down.

Transition

The boundaries of a good downtown are easy to identify. As you travel along a successful main street, the pavement width and sidewalk width, building types, and landscaping change to provide a clear transition into the downtown. This clues the motorist to slow down and expect pedestrians, cars pulling out from parking, and someplace pleasant to stop. There are several ways to reinforce the proper message:

- Add a gateway: make the entrance to the downtown look special with curbs, a landscaped median, fountain, monument marker, a welcome sign, public art, or banners announcing events.
- Add other visual cues that make the driver aware that they are entering an area of intense human activity such as planters, landscaping, ornamental lighting, flags, benches, and other street furniture. These send a clear message that people are present. Strong vertical elements near the curb line such as trees also visually narrow the street.
- Widen the sidewalks and make the highway look narrower. In smaller communities, moving from a rural highway section with shoulders and driveways to an urban section with curbs, sidewalks, and on-street parking is a strong visual cue.
- Construct a modern roundabout with an attractive center island.
- Long-term, encourage redevelopment of off-street parking to bring buildings closer to the street.
- Emphasize access management at the entrances to downtown by adding medians and combining driveways.

These features are not necessarily expensive but do require community vision and commitment. As the city grows, the main street can be expanded into the properly designed transition area.

"Be not afraid of going slowly, be afraid only of standing still."
–Chinese proverb

See also:

***Transitions* in Chapter 4**

LIABILITY

At some point in the effort to reduce traffic speeds, someone may question the potential liability of introducing traffic calming onto a highway. This has not proven to be a problem on urban streets. In 1997, the Institute of Transportation Engineers surveyed 68 agencies responsible for about 900 traffic calming projects and found that only 6 lawsuits out of 1,500 filed against these agencies involved traffic calming, and only 2 of the suits were successful.

Experience confirms that the potential benefits of traffic calming far outweigh the potential liability. Lawsuits can be minimized in the same way as other aspects of highway design:

- Clear policy.
- Good process that involves the public and documents the need.
- Appropriate design based on established goals.
- Consideration of users, especially the young, elderly, and disabled.
- Clear and consistent signing and marking.
- Proper maintenance.

If in doubt about a particular project, consult legal counsel and other agencies that have implemented similar designs.

Crossing

Highways are important transportation links, but they can also be significant barriers, especially to pedestrians. Busy urban highways reduce pedestrian travel and disrupt access, which can have a chilling effect on main street businesses. Antidotes are reducing traffic speed (discussed above), shifting trucks to more suitable routes (discussed below), managing vehicle access (discussed below), and increasing pedestrian crossing opportunities.

The priority in main street intersection design is to make all users feel safe and comfortable. Many urban intersections, including main streets, have complex traffic patterns and designs unsuitable to pedestrians and bicyclists. The blind, in particular, are often faced with long crossings that are hard to follow, have poorly placed ramps, have signals and traffic phases that cannot be heard, and that put obstacles in their path. The combination has proven lethal, with a disproportionate rate of blind, visually impaired, young, and old pedestrians being killed or injured when crossing streets.

Good signalized intersection design include traffic phases that are understandable to the disabled and ample pedestrian crossing time. Pedestrians want to be in the street no longer than necessary, so crossing distances need to be kept short by keeping lanes no wider than necessary, eliminating unnecessary lanes, aligning intersections at 90 degrees, and using tight corners and curb extensions. On multiple-lane streets, medians and refuge islands can also be used to shorten crossings.

See also:

***Speed* and *Access* in this Chapter, and**

***Traffic Controls, Enforcement, Median,* and *Curb Extension* in Chapter 4.**

Typical statement: *"We need a stop sign (or signal) at this intersection."*

Possible problems: *High speeds, difficulty crossing or turning on highway, and collisions.*

Potential ingredients: *Traffic controls if warranted, corner radius reduction, curb extensions, median, lane width reduction, travel lane removal, and other speed-reduction measures.*

Typical statement: *"The agencies won't mark the crosswalks; they say it's too dangerous."*

Possible problems: *Inadequate sight distance, poor crosswalk visibility, and long crossing distance.*

Potential ingredients: *Curb extensions, median, refuge islands, and high-visibility crosswalks.*

We can't put a signal at every corner, but we can calm traffic, reduce conflicts, and make the pedestrian more visible.

Most intersections in the heart of downtown, with or without signals, need to have marked crosswalks. Combined with curb extensions, medians, illumination, and signage, marked crosswalks can improve the visibility of pedestrian crossings. Crosswalks send the message to motorists that they are encroaching on a pedestrian area.

Over the years, some transportation planners have expressed concern that marked crosswalks could create a false sense of security for the pedestrian. This concern may be valid where travel speeds are high and pedestrian numbers low, such as the highway transition areas into downtown. However, this is not the situation in a downtown, if travel speeds are appropriate and there are enough visual cues to tell the motorist to expect pedestrians. Where pedestrian safety and security are lacking, strong design and enforcement may solve the problem. Well-designed crossings provide real security for pedestrians, especially children who have incomplete traffic awareness and skills.

Some pedestrians will want to cross at **mid-block locations**. To increase pedestrian crossing opportunities and safety, several approaches can be considered:

- Assist safe crossings between signals with **signal timing** that creates gaps in traffic. This allows the pedestrian to identify when it is safe to cross at any point on the street. It works best where traffic is moderate, speeds are low, the street is not too wide, and people tend to cross randomly.
- At mid-block locations with many pedestrians (apartment complexes, senior citizen centers, schools, parks, shopping areas, libraries, hospitals and other public or institutional uses), use **curb extensions, median refuge islands**, and **high-visibility crosswalks**. This creates preferred crossing points that most pedestrians will use if they are convenient and close to destinations. This approach will also improve safety by reducing conflicts and providing more crossing opportunities for the disabled.

A lack of good crossings creates a sense of insecurity.

Access

Vehicle access to main street destinations is provided by on-street parking, driveways, and side streets. Pedestrian access is provided by sidewalks and other walkways. Access for the disabled takes many forms but is primarily concerned with providing good surfaces and building entrances for the mobility-impaired, and predictable routes free of obstacles for the vision-impaired.

Too much access can be a bad thing. Just as buildings have just a few entrances for security and efficiency, parking lots must also have well-defined driveways designed for safe ingress and egress and efficient circulation.

In most downtown situations, vehicle access is well served by on-street parking and by parking at the rear of the building reached by a side street. This shifts the turns from mid-block to intersections where they are more predictable and safer. Drive-throughs are not appropriate in downtown. Deliveries need to be provided through alleys and side streets where they will not disrupt the highway.

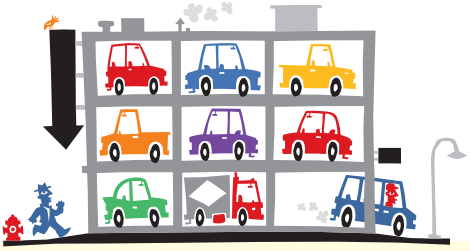
Too many access points also put pedestrians at greater risk, and driveway cuts can make it difficult to meet ADA standards.

Too many uncontrolled accesses to a highway create conflicts with through traffic, which results in high collision rates. The more lanes to turn across, the more danger—wide, 5-lane highways are particularly prone to collisions.

Too many access points also decrease crossing opportunities. When a gap is created in the traffic stream, motorists entering the road downstream fill the gap. Pedestrians seeking refuge in a center turn lane are unprotected. One access management tool that benefits both capacity and pedestrians is a well-designed raised median.

See also:

***Crossing* in this chapter and *Driveways* in Chapter 4.**



Typical statement: *"There's not enough parking downtown."*

Possible problems: *Parking hard to find, poor walking conditions, and lack of pedestrian destinations.*

Potential ingredients: *Signing, various pedestrian improvements, and parking management.*

Typical statement: *"Those big delivery trucks block the road."*

Possible problems: *Inadequate loading zones, inappropriate delivery times, and poor parking management.*

Potential ingredients: *Develop downtown circulation plan with an adequate local street network, and a delivery and trash pickup plan.*

Typical statement: *"We can't have a median, it'll kill our business!"*

Possible problems: *Poor site access, long blocks, and car-oriented businesses.*

Ingredients: *Driveway management and local street network.*

Typical statement: *"It's really difficult to go anywhere in my wheelchair."*

Possible problems: *Sidewalks and crossings need upgrading or maintenance.*

Potential ingredients: *Wide, well-designed walkways and maintenance.*

To provide optimum circulation, access, and crossing opportunities, an ideal downtown block length is between 200 and 400 feet. Communities with incomplete street grids or longer blocks can provide more street and pedestrian connections by improving undeveloped rights-of-way, improving alleys, and redeveloping large blocks with new streets, walkways, or alleyway connections.

Access for people with various impairments—mobility, sight, hearing, reasoning—is another important design responsibility. The Americans with Disabilities Act (ADA) requires that transportation facilities accommodate the disabled.

ODOT walkway standards meet or exceed minimum ADA requirements, and projects must use the Standard Drawings developed by ODOT and the American Public Works Association (APWA) to construct sidewalks, curb cuts, and driveways. However, there is still room for improvement, such as predictable signal phasing (the blind cannot distinguish the complicated and variable traffic patterns of many signalized intersections).

One way to address parking problems is to manage the supply.

See also:

Local Street Network

in Chapter 4

Sidewalk design can be more challenging than roadway design.

Congestion

Congestion is usually at the top of the complaint list for highways and main street. However, congestion is a slippery thing. In most places, congestion means delay for motorists and other road users, but only peaks once or twice a day.

It is undesirable to build all of our highways for the worst possible congestion because it can result in roads that are unnecessarily wide and expensive and that encourage low-value trips. We need to look carefully at what we're trying to

EXAMPLE

In some places, congestion only occurs when there is a holiday weekend or a big event, as in Sisters, Oregon. As the planning director of that city says, "Most days you could bowl on the state highway without fear, but around a dozen times a year, it can take 20 minutes to travel 6 blocks."

To cope with predictable congestion, the city and ODOT agreed to sign temporary detours around main street on parallel arterials for peak congestion periods.

Typical statement: *"There's too much traffic downtown."*

Possible problems: *Overreliance on highway for local traffic, inadequate access, and unattractive street.*

Potential ingredients: *Local street network and various sidewalk area improvements.*

Typical statement: *"The highway is failing to reach its designated mobility standard."*

Possible problems: *Lack of alternate routes and inefficient use of existing routes.*

Potential ingredients: *Local street network, transit, secondary route, couplet, bypass, and traffic controls.*

Typical statement: *"If only there was some way to get the big trucks out of downtown—they're so noisy and smelly!"*

Possible problems: *Few alternatives for local traffic, sidewalks too narrow, and uncoordinated signal timing.*

Potential ingredients: *Truck route around downtown, wider sidewalks, buffer for sidewalk, and improved signal timing.*

Typical statement: *"Cars cut through our neighborhood to avoid the highway."*

Possible problems: *Delay at main street intersections and overbuilt local streets.*

Potential ingredients: *Traffic controls and improved local street network.*

accomplish. The overall function of the highway needs to be considered, as well as the type of traffic that's being held up by congestion.

Some congestion can be a good thing for downtowns. It slows traffic down, giving people a chance to look at things and maybe decide to stop. Most of the world's great streets are very crowded—people may complain, but they still go there because it's where things are happening. "Nobody goes there anymore; it's too crowded," Yogi Berra quipped.

However, if most of the traffic is through, or long-distance travel, regular and severe congestion can contribute to a decline in the downtown's health. When this happens, it is typical to look at increasing the capacity of the highway to solve the problem. However, actions such as removing on-street parking, widening the street, or adding travel lanes can be detrimental to main street.

Communities need to first make sure that the whole street system is functioning well. A well-developed street system offers alternate arterial or collector routes for local travel. Well-crafted transportation and land use plans encourage local trips by foot, bicycle, and transit. Care must be taken to not divert highway traffic onto unsuitable residential streets; it may be necessary to implement an area-wide traffic-calming program to prevent unwanted cut-through traffic.

The *Oregon Highway Plan* requires that existing facilities be protected, made more efficient, and improved before any new facilities are built. Only as a last resort, when congestion becomes unmanageable and all other alternatives have been exhausted, is it time to examine the potential for a truck route or bypass. END

CONGESTION COSTS

From an economic perspective, congestion is a significant cost primarily imposed by individual drivers on other road users and on the community. Every mile driven in urban peak conditions costs about $0.17 in delay, stress, vehicle wear, noise, and air pollution.

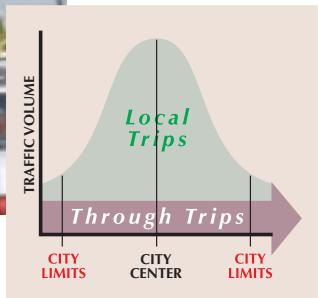
Main street design can help avoid congestion by providing reasons for drivers to walk, such as attractive buildings, comfortable surroundings, easy crossings, a variety of destinations within walking distance, good bicycling and transit connections, and clear routes to parking.

Also, attractive surroundings can reduce drivers' perceived delay (the amount of time a driver estimates that it takes to get somewhere).

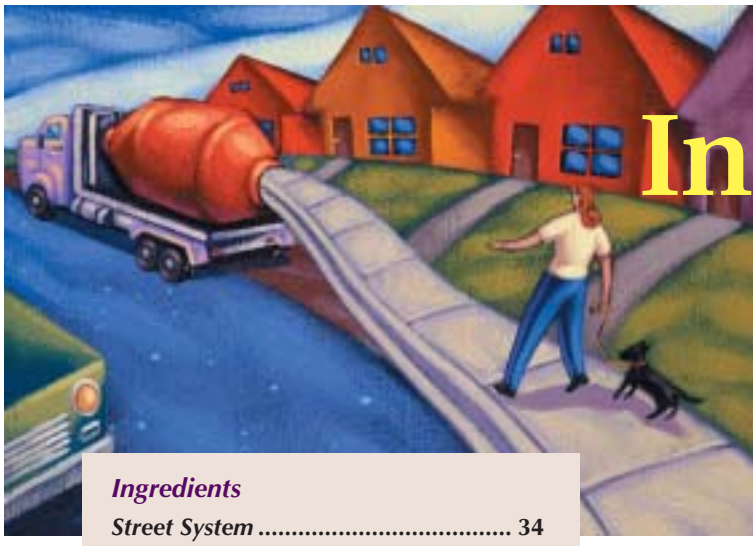
Source: *Transportation Cost Analysis*, Victoria Transport Policy Institute, April 1999.

See also:

***Street System* in Chapter 4**



Most main street traffic is local.



Chapter 4

Ingredients

The previous chapter looked at main street issues from a planning perspective—what needs to be considered and accomplished for every project. This chapter looks at specific designs that can be used in combination on main street projects.

First, the overall **street system** should be considered. Many basic problems on *main street* can best be addressed by making changes to *other* streets.

Next, this chapter addresses the many potential design and land use elements—the ingredients—that are needed to make a vital, successful, "flavorful" main street. The ingredients are organized by area: the **roadway area**, the **sidewalk area**, and the **building area**. Finally, some of the **other ingredients** that can support the design and land use elements are discussed. The ingredients in each section organized alphbetically (not by order of importance). Each main street will be unique.

TERMS

Building area: The property adjacent to the highway but outside the right-of-way which contains the buildings, parks, and other land uses.

Roadway area: The paved portion of the highway primarily used by vehicles.

Sidewalk area: The portion of the highway dedicated to the sidewalks, planting strip, and other nonvehicular uses.

Also refer to the Glossary in the Appendix.

Ingredients

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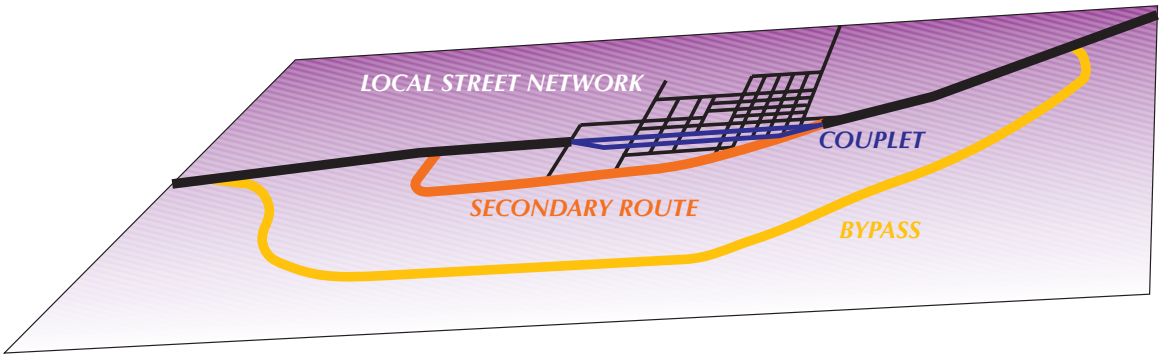
Street System

A community's street system has to work together as a whole. If the other major and minor streets don't work well, the main street will also perform poorly because it will be asked to do too much. Conversely, if the main street is an obstacle to travel, the traffic will spill over into the other streets and degrade the entire system.

As discussed previously, the main street itself should be as well-managed as possible through such techniques as access control, especially of private driveways, and "operational improvements" such as adjusting the signal timing. However, if main street is being asked to do more than it should, the surrounding street system should be improved, if possible, before considering widening the highway. Some of the alternatives include improving the local street network grid, developing a secondary route for through traffic, converting parallel streets into a one-way couplet, and building a bypass. A community should be sure that these issues are addressed in the local Transportation System Plan or Corridor Plan.

Four system alternatives to help main street.



TERMS

Bypass: Highway for through traffic that avoids the downtown.

Couplet: Two one-way streets that handle traffic in opposite directions.

Grid: Street network with generally straight streets and many square intersections.

Local street: Smaller street serving local destinations rather than through traffic.

Secondary Route: A parallel road to main street suitable for through traffic.

Street network: A web of interconnecting streets of all types.

Also refer to the Glossary in the Appendix.

Local Street Network

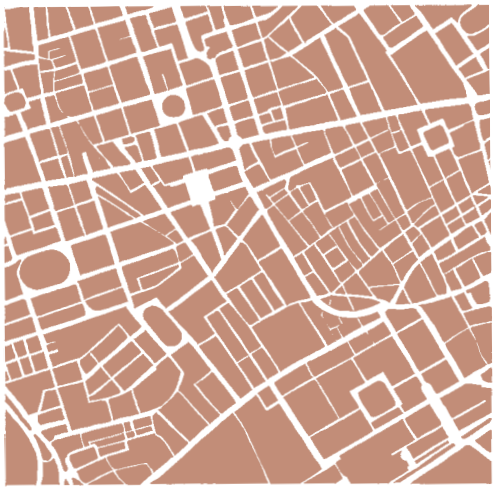
A functional main street depends on short blocks and many connecting streets. It is rare to see blocks longer than 400 ft on traditional main streets. Some older cities have blocks as short as 200 ft. Short blocks are desirable because:

- Main street is the city center that should be connected by direct routes to all neighborhoods.
- Traffic on the main street can access businesses and side-street parking easily.
- Side streets provide on-street parking so that lots can be used for buildings rather than off-street parking.
- Local traffic can use side streets for most trips, using main street only for destinations on the highway.
- Shorter blocks encourage more pedestrian movement.
- Pedestrians have frequent opportunities to cross streets.
- There are more corner lots which are desirable for businesses and which provide greater flexibility in site planning.
- Corners give life to the street and interest to buildings.

It is rarely practical to cut new streets through existing lots, but there may be opportunities. Look for undeveloped public rights-of-way, unnecessarily large parking lots, and old industrial areas that are being redeveloped.

In any case, make sure the *existing* side streets are functional and complement the main street with on-street parking, sidewalks, trees, and all the other aspects of a good street.

The street network above has relatively few intersections, which concentrates local traffic on a few major streets and highways. The network below has about twice as many intersections, which allows local trips to avoid the highways.



Improve Local Street Network

Use To: *Divert local trips off of highway and increase system capacity.*

Good News: *Improves local circulation and provides more on-street parking.*

Bad News: *New road construction is expensive and may require purchasing right-of-way.*

Secondary Route for Through Traffic

What is the role of the main street in the larger community? Is main street the only through route or are there other existing or potential roads that can be used by through or local traffic? You may find that you can route some of the traffic, especially trucks, onto a parallel street. This will distribute the traffic on more streets and relieve main street of having to carry the full load.

Look for these potential characteristics in a parallel route:

- Minimal out-of-direction travel; travel time should be faster, or at least no slower, than the main street.
- Few interruptions (stop signs, active railroads, etc.).
- Good intersections where the parallel route leaves and rejoins the highway.
- Adequate width, geometry and structure for the anticipated traffic.
- Suitable adjacent land uses.
- Good, clear signage.

Sometimes existing roads can be modified without too much difficulty by widening a few blocks and upgrading intersections. If these improvements are planned anyway, it may be a matter of moving them ahead of other projects.

Create Second Through Route

Use To: *Divert some through trips around main street.*

Good News: *Removes some trucks from main street and speeds their travel.*

Bad News: *Depends on having a fairly direct route that can be improved.*

Couplet (2 one-way streets)

A couplet is two streets acting as one: traffic flows one-way on both streets but in opposite directions. The two streets are usually a block apart and stretch through the downtown. Once outside the downtown, the couplet rejoins to form a normal two-way street.

Couplets are fairly common because they are an easy way to increase highway capacity. They have an added benefit for pedestrians who need only look in one direction when crossing the street. However, this benefit may be offset by higher vehicle speed on one-way streets and the risk of cars in the far lane not seeing or failing to stop for a crossing pedestrian. Also, merchants along a proposed couplet sometimes resist the one-way travel for fear that half the traffic will miss their stores.

Two-way streets tend to have lower traffic speeds because the opposing lanes create a sense of friction which causes drivers to slow down. If there is extra width (above standard) when 2-way streets are made into one-way couplets, speed increases can be counteracted by adding bike lanes, on-street parking, wider sidewalks, street trees, and curb extensions.

Drivers can be confused by one-way streets and bicyclists object to the out-of-direction travel. A large grid of one-way streets can be frustrating to all users. Ample signing, good intersection design at the beginning and end, and frequent parking opportunities are particularly important with couplets. If a couplet proves unsuccessful, the streets can always be returned to two-way operation.

It is particularly important to involve residents and business owners when planning secondary routes, couplets and bypasses.

Make Parallel Streets One-Way

Use To: *Increase capacity of main street.*

Good News: *Relatively inexpensive and has some advantages to pedestrians.*

Bad News: *Tends to increase speed and has some disadvantages for all users.*

Bypass

See also:

***Congestion* in Chapter 3**

The idea of a bypass often comes up in discussions where there is heavy traffic on main street. It's often seen as the one big solution to get through traffic out of downtown. However, in many cases traffic studies have shown that most of the trips on main street are local and may not be attracted to a bypass.

In the right circumstances and if properly designed, a bypass can help divert some traffic, but it is not a cure-all and experience shows that bypasses have mixed results.

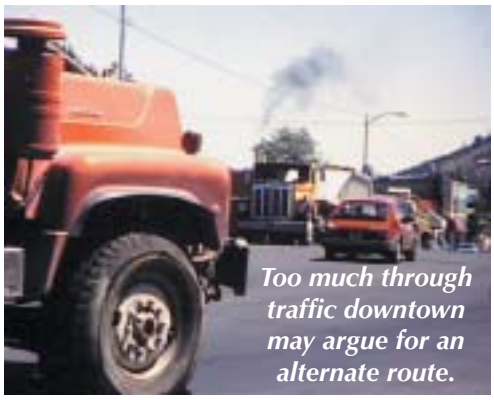
Bypasses are very expensive and generate much debate. The controversy that goes on while the community discusses a bypass may detract from other issues. If approved, people often think the problem will be solved and they don't need to support other improvements to main street.

Also, if a bypass removes too much traffic, the economic vitality of the main street can suffer. The long-term tendency is for commercial land development to occur where there is the most traffic. In addition, when the state highway is routed to a bypass, the local jurisdiction usually assumes responsibility for the existing roadway; this can add considerably to a community's operation and maintenance costs.

For most transportation problems, common sense tells us that we choose the simplest and most economical solution rather than the most complex and expensive. Approach the issue of bypasses with great caution. Consider them only when all other solutions have been tried and failed. The conditions under which a bypass may work include:

- Heavy through traffic volumes overload even a well-designed street system.
- The highway is designated part of the freight system.
- Air and noise pollution from the stop-and-go traffic is a significant problem.
- A new route for the bypass is logical and will attract through traffic.
- Access to the bypass is limited.
- Environmental consequences are acceptable.

Even when these conditions exist, it may still be physically, financially, or politically impractical to build a new highway. With or without a bypass, upgrading the existing street system and making sure new development supports main street are still essential.



Too much through traffic downtown may argue for an alternate route.

Bypass Main Street

Use To: *Divert most through trips around main street.*

Good News: *Gets traffic off of main street.*

Bad News: *Very expensive and can harm main street if not well planned.*

Roadway Area Design

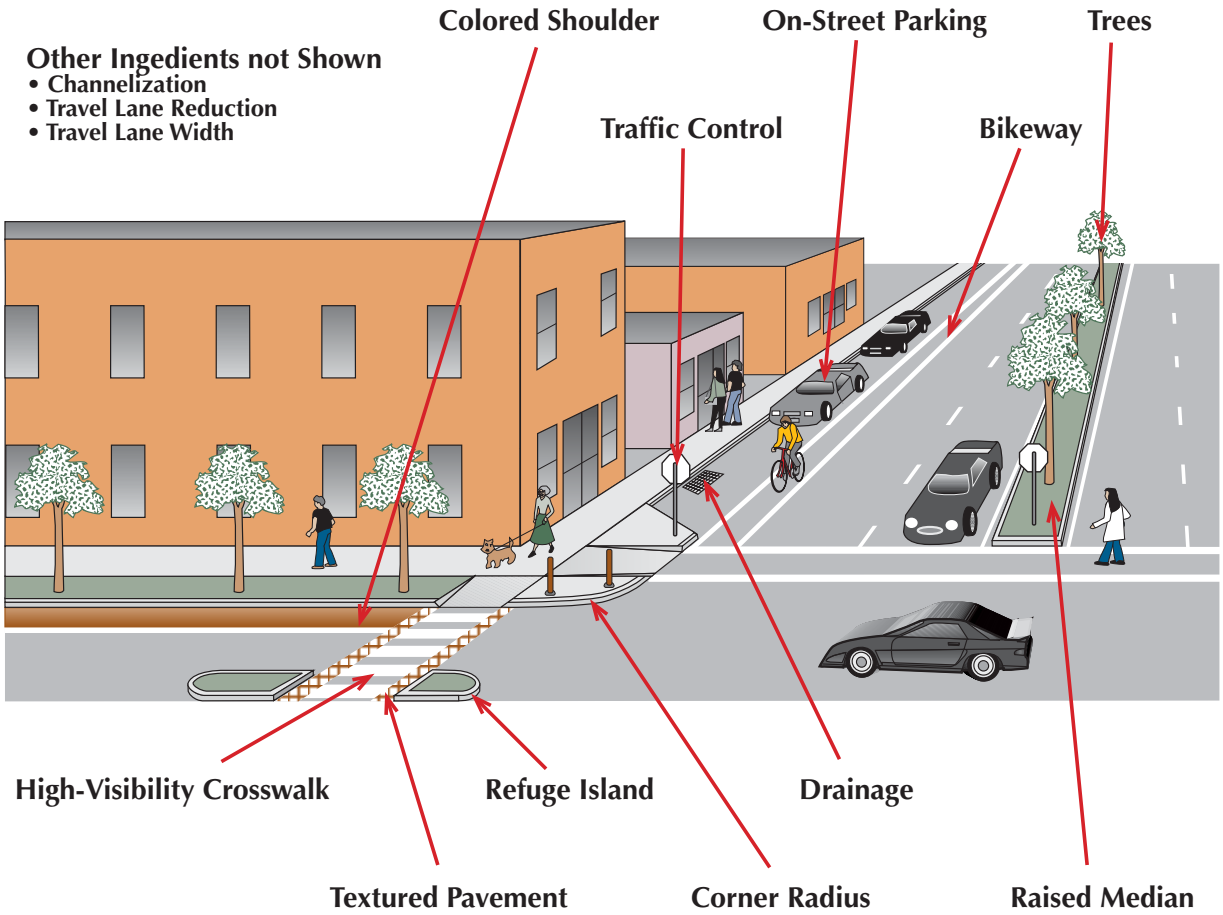
The following design features for main streets are listed alphabetically. These are the ingredients for your project. Just as in cooking, the same ingredients can yield vastly different results depending on how you combine them and in what portions. There are few hard rules and creativity is part of the mix. As always, keep your goals in mind before throwing in ingredients.

The figure below shows various designs at the junction of two main streets.

Designs *NOT* recommended

Several common roadway design elements give priority to the moving vehicle at the expense of the pedestrian and are not normally used on a main street. These traffic priority devices include:

- **Free right-turn lane which widens the intersection crossing distance and eliminates the window of stopped traffic.**
- **Left-turn stacking lane which eliminates the median as a refuge in the center of a wide street.**
- **Speed-change lane which widens the street by an additional lane at the point of pedestrian crossing.**



Bikeways

Facilities for bicycles, such as bike lanes or paved shoulders, are normally provided on urban highways. These are typically 6 ft (1.8 m) wide.

Main streets need to provide safe travel and access for bicyclists as well as motorists and pedestrians. Where there's enough right-of-way, this can be done through striping of bike lanes. Bike lanes are 5–6 ft wide.

See also:

Bicycle Parking* under *Street Furniture

In fact, where right-of-way is very wide, a striped bike lane can help better define travel lanes and help calm traffic. However, on most main streets, right-of-way is limited and there is often insufficient room to accommodate bike lanes along with other important main street features, particularly sidewalks and on-street parking.

Where right-of-way is inadequate to accommodate a bike lane, other treatments to accommodate cyclists can be used. If speeds are very low—25 mph or less—cyclists can share a regular travel lane with cars. Where speeds are above 25 mph, or traffic volumes are high, a wider outside lane should be considered. However, this treatment needs to be used carefully to assure that it does not actually encourage traffic to go faster through downtown. Keeping motor vehicle speeds low, as well as providing incentives such as convenient bicycle parking, will enable most bicyclists to ride main street with comfort.

Some approaches don't work well. For example, having cyclists use sidewalks creates conflicts between cyclists and pedestrians and a safety hazard. (For this reason many cities prohibit bicycle riding on sidewalks in downtown areas.) Similarly, directing bicycles to side streets isn't effective. Although parallel routes should be encouraged, cyclists, like motorists and pedestrians, consider main street a destination.

The exact facility depends on several factors including speed, traffic volume, truck volume, bicycle use, available right-of-way, and on-street parking. The *Oregon Bicycle and Pedestrian Plan* discusses the many options and trade-offs.

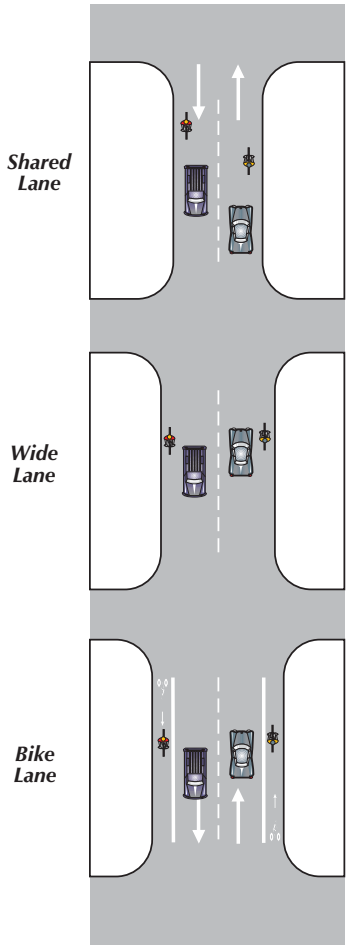
However they are accommodated, bicyclists are encouraged to use a good main street. Their presence indicates that the street works well, they help calm traffic by setting the pace for other vehicles, and bicycling allows nondrivers to access main street destinations.

Add Space for Bicyclists

Use To: *Improve bicycle travel.*

Good News: *Relatively inexpensive where there is available right-of-way, increases access, and helps calm traffic.*

Bad News: *Requires roadway width.*



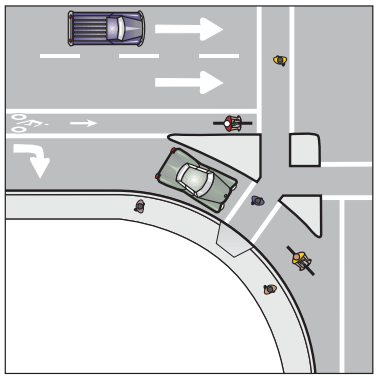
Channelization

Channelization is an engineering term that means movements are physically controlled through the use of curbs, islands, plastic posts, or painted markings. A common form of channelization is the left- or right-turn lane. A variation is the right-turn channel, often called a "slip lane." Slip lanes are typically provided on intersections where right-turn movements are very high.

Slip lanes can have both advantages and disadvantages for the main street. With proper attention to sight angle and curvature, a slip lane can help to separate conflicts between turning and through vehicles, between trucks and cars, and between vehicles and pedestrians. Typically, slip lanes mean a wider street, and can encourage higher speed turns; both of these characteristics can be intimidating to pedestrians. Unless there is a separate signal for the slip lane, the pedestrian often has to wait for a motorist to yield and then wait again at the regular intersection. Also, the nonstandard corner geometry is extremely difficult for the blind to negotiate. For these reasons, slip lanes need to be avoided on main streets.

On the other hand, where the volume of turning vehicles at an intersection or driveway is so high that removing slower turning vehicles from the traffic flow is a critical safety need, an island can be provided for pedestrians to break up the crossing distance. The curb cuts need to have very clear tactile markings. Where there are signals, crosswalks normally have pedestrian phases on all segments.

Left-turn lanes have the same general advantages and disadvantages as slip lanes. Additional disadvantages to pedestrians are that a left-turn lane can hide a pedestrian from through traffic, and a median, if it exists, is partially consumed by the turn lane.



A slip lane is sometimes used to facilitate turns.

See also:

Refuge Islands

Slip lanes require pedestrians to change direction and to wait longer but can help reduce conflicts with turning vehicles.

Channelize Traffic

Use To: *Increase capacity of main street.*

Good News: *Reduces vehicle conflicts with other vehicles.*

Bad News: *Increases vehicle conflicts with pedestrians and disadvantages the blind.*

See also:

Curb Extension

Corner Radius

What engineers call the "corner curb radius" is the sharpness of the corner. On most older traditional main streets, the corners are often very sharp, with a small corner radius; this is one of the most effective tools for controlling speed. A vehicle turning a corner has to clear the curb, and the sharper the corner, the slower the vehicle must go.

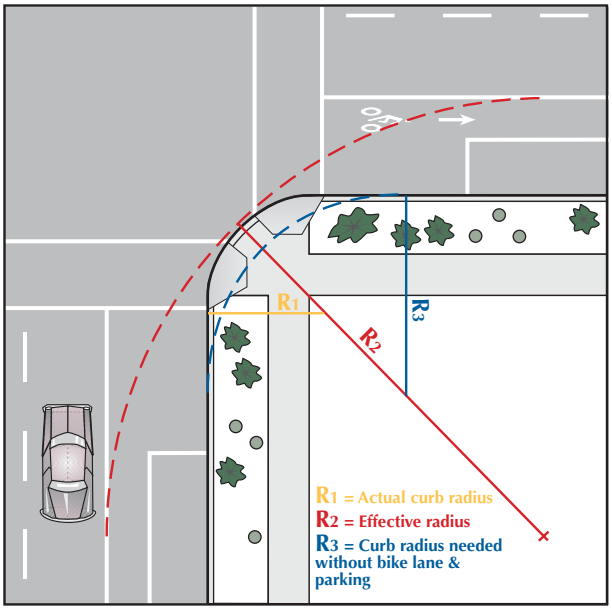
Pedestrians rely on intersections to cross roadways. At the same time, by adding left- and right-turn lanes and large turning radii, intersections are often the widest parts of the street. A wide street increases the pedestrian's threshold gap for crossing, thereby degrading mobility. The distance pedestrians must cross is an important consideration in design; every corner is unique.

For curb radii on arterial streets, the Green Book (see Glossary) recommends 25 ft (7.5 m) or more at minor cross streets, 30 ft (9 m) or more at major cross streets, 40 ft (12 m) or more where large truck combinations and buses turn frequently, and that "radii dimensions should be coordinated with crosswalk distances or special designs to make crosswalks safe for all pedestrians." It stresses that "adequate radii for vehicles must be balanced against the needs of pedestrians and the difficulty of acquiring additional right-of-way or corner setbacks."

Rather than use a circular radius at large-radius corners (40 ft or more), alternative designs include symmetrical compound curves, asymmetrical compound curves, or simple radius curves with tapers. These designs better fit the paths of turning vehicles and improve operations.

At an intersection where there is a parking lane or bike lane on either street, the extra width serves to increase the turning radius by 6–14 ft (1.8–4.2 m) so that the actual curb radius can be reduced. Where main street intersects lesser streets, the turning radius is based on the expected vehicle type making the turn. On one-way streets, 2 of the 4 corners can have very small radii since turns are not allowed.

As with all main street design, it is important to remember that every corner is unique and needs to be designed individually.



On-street parking & bike lane permit a tighter corner.

Reduce Corner Radius

Use To: *Shorten and align pedestrian crossings; reduce vehicle turning speed; improve pedestrian visibility.*

Good News: *Greatly improves pedestrian convenience and safety.*

Bad News: *May not work where large vehicles must turn.*

Crosswalk

Legal crosswalks exist on all legs of all intersections, including T-intersections, except where closed by ordinance and appropriately signed. Crosswalks may be marked or unmarked. Marked crosswalks alert motorists that they are approaching a high pedestrian area, assuming that they can see the markings. Some crosswalks also have signs and even flashing beacons to attract attention. Curb extensions and refuge islands also help alert the motorist to crosswalks.

Flexibility in Highway Design notes that two parallel painted lines are generally not enough of a distinguishing marking for crosswalks. Often motorists confuse these lines with the stopping line and pull right up into the crosswalk. At a minimum, a ladder pattern type of striping or painting inside the crosswalk area is recommended to improve visibility. Colored crosswalks can also help visibility. A stop bar may also help discourage motorists from stopping in the crosswalk.

Lighting is also important for crosswalks. The crosswalk needs to be well-lit from above. Some communities are also considering the use of embedded lighting to make the crosswalk highly visible at night.

Marked crosswalks are standard on main street intersections.

A short crossing distance is imperative for slow pedestrians.

Two parallel lines may not be seen by motorists.

See also:

Corner Radius

Curb Extension

Median

Refuge Island

Textured Pavement

Traffic Controls

Provide Crosswalks

Use To: *Improve pedestrian crossing opportunities and comfort.*

Good News: *Helps identify preferred crossing locations and get the attention of drivers.*

Bad News: *Needs to be visible and works best with other measures to improve crossings and slow traffic.*

Median

See also:

Driveways

Refuge Island

Wide streets—four or more lanes—generally need a raised median to lessen the amount of continuous asphalt. Medians provide a physical separation between travel lanes, a refuge area for pedestrians, a space for attractive landscaping, and a place to store snow when needed.

Raised medians reduce conflicts between pedestrians and vehicles because they allow pedestrians to cross only one direction of traffic at a time. Also, there is less continuous exposure for the pedestrian because it takes less time to cross one or two lanes of traffic than two or four. Pedestrian crossing times on an unsignalized, multilane street without a median are up to 10 times longer than they are with a median (*National Cooperative Highway Research Program,* Report 294A, June 1987).

Where raised medians are used for access management, they need to be constructed so they also provide a pedestrian refuge.

Where it is not possible to provide a continuous raised median, island refuges can be created at and between intersections and other accesses. These are typically located across from high pedestrian generators such as schools, park entrances, libraries, and parking lots.

In most instances, the width of the raised median is the width of the center turn-lane, minus the necessary shy distance (for the desired speed) on each side. Where street width is limited, even a 4-ft median can be beneficial.

Ideally, raised medians are constructed with a smooth, traversable surface, such as concrete or brick pavers. If a median is also landscaped, the plants need to be spaced far enough apart to allow passage by pedestrians. Low-growing plants will allow pedestrians to be seen by motorists.

On the 5-lane urban highways that often lead into a downtown, installing a raised median in place of a continuous center left-turn lane has the effect of reducing shy distance on one side. Reducing the shy distance from 6 to 4 ft typically results in a speed drop of about 0.4 mph; going from 6 to 2-ft shy distance drops the speed by about 0.9 mph (*Highway Capacity Manual*, Transportation Research Board, 1994).

Speed studies on city streets show even greater reductions of nearly 2 mph for raised medians alone and 5 mph when used with curb extensions (*Anne Arundel County, Maryland*).

Although raised medians have an initial construction cost and any landscaping will require maintenance, long-term costs compared to paving are roughly equivalent.

Landscaped median in Sweet Home has breaks for pedestrians.

Construct Raised Median

Use To: *Improve overall street appearance and operation, including slowing traffic.*

Good News: *Benefits all users, especially pedestrians.*

Bad News: *Takes up width; may complicate drainage.*

On-Street Parking

On-street parking is normal, necessary, and expected in most downtown business areas, including main streets. Parking next to the sidewalk helps establish building orientation to the street, which is so important to main street vitality.

Businesses often insist that parking must be available adjacent to their building, which holds true only when the pedestrian experience is unpleasant. On main street, walking is designed to be positive, and intentionally walking several blocks is presumed to be acceptable and even pleasurable. On-street parking provides a hope of parking close to the destination which is all most people need.

Parking studies frequently reveal that downtowns do not have severe parking space deficiencies; rather, spaces are not being managed well. For example, employees may be tempted to park close to work, but those spaces would be better for short-term customer parking. Time limitation, meters, and ticketing, as well as incentives for employees to use other commute options or to park in city-owned lots are all part of a parking management program.

Where parking turnover is high, on-street parking tends to slow traffic speed because cars are frequently maneuvering in and out of spaces. The degree of traffic calming depends on how well the parking is utilized and managed. Interruptions such as driveways and fire hydrants, plus lane width also affect traffic calming.

On-street parking also buffers the sidewalk from traffic but may reduce visibility of pedestrians crossing the street; for this reason, curb extensions are recommended where there is on-street parking. Curb extensions also reinforce the calming effect of on-street parking by narrowing the appearance of the street when many of the parking spaces are empty.

While the primary purpose of a street is to transport people and goods, on-street parking is often cited as an advantage for pedestrians, primarily as a buffer. Yet on-street parking also uses space that could be used for wider sidewalks or bike lanes.

There are many possible parking configurations, but the most common are parallel and angled. Only parallel parking is allowed on state highways, with any other type requiring a design exception from ODOT.

It is a good idea to direct large vehicles, such as motor homes and long pickups, to side streets or parking lots that can accommodate them.

See also:

Curb Extension

Parallel Parking

Parallel parking on one side of the street requires at least 7 ft (2.1 m) of roadway width (ODOT's standard is 8 ft or 2.4 m). A wide outside travel lane of 14 ft (4.3 m) is also desirable to provide clearance for opening doors and for bicycles. Where right-of-way width permits, a bike lane can be provided between the travel and parking lanes.

For additional information on parking, read *The Parking Handbook for Small Communities* (Edwards, ITE, 1994).

Angled Parking

Angled (aka diagonal) parking is sometimes used on wide streets to create more parking spaces, but takes up about 19 ft (5.8 m) of roadway width per side. Angled parking also causes conflicts with cars and bicycles, since drivers backing out have poor visibility of oncoming vehicles and parked vehicles (especially long pickups and tall sport utility vehicles) obscure other vehicles backing out.

These factors have resulted in ODOT's position that angled parking on a new or improved highway is discouraged, and requires a Design Exception. Changing angled parking to parallel parking can provide space for bicycle lanes, medians, and wider sidewalks.

Provide On-Street Parking

Use To: *Orient access to the street and sidewalk.*

Good News: *Improves car access, slows traffic, and buffers sidewalk from travel lane; works well with curb extensions.*

Bad News: *Takes up width; discouraged on highways.*

Pavement Markings

Lines or legends can be placed on a roadway surface for regulating, guiding, or warning traffic. This useful tool is often underutilized because the required maintenance is beyond the resources of the state or local road departments.

At the very least, crosswalk and bike lane markings need to be highly visible; reapply them once or twice a year, or use thermoplastic tape.

In special cases, a "PED XING" or "SCHOOL XING" pavement marking and a sign before a crosswalk may be appropriate as determined by ODOT.

Although street signs are usually posted, it is not always easy for pedestrians to see them. Street names and other markings on sidewalk can help orient the person walking.

Markings can be fun (above) or functional (below).

Employ Pavement Markings

Use To: *Guide traffic and designate special areas.*

Good News: *Inexpensive compared to curbs and channelized lanes.*

Bad News: *Less effective than physical barriers and require maintenance.*

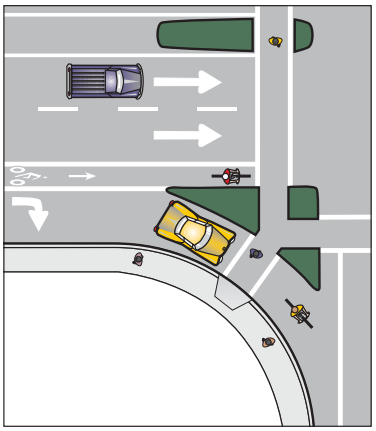
Refuge Island

At wide intersections with large corners, there is often a triangular area between a through lane and a turn lane unused by motor vehicle traffic. This triangle is often easy to see because there is less pavement wear and debris where vehicles don't go. Placing a raised island in this area benefits pedestrians by:

- Allowing pedestrians to cross fewer lanes at a time, and to judge conflicts separately.
- Providing a refuge so that slower pedestrians can wait for a break in the traffic stream.
- Reducing the total crossing distance (which provides signal timing benefits).
- Providing an opportunity to place easily accessible pedestrian push-buttons.

Islands must be large enough to provide refuge for several pedestrians waiting at once. For wheelchair accessibility, it is preferable to provide at-grade cuts rather than ramps. Poles must be mounted away from curb cuts and out of the pedestrian path. Drainage from and around the island must be carefully designed.

An island can also be provided in the middle of an intersection as a short median section. Ideally, the island will be at least 8 ft (2.4 m) wide; ODOT's minimum for a median is 6 ft (1.8 m) which is just long enough for a single bicycle (not a tandem) or a person pushing a stroller to wait. A median island may preclude a left-turn lane and is not typically used at places where there are many left turns.



Refuge islands help pedestrians cross wide streets.

See also:

Channelization

Construct Refuge Island

Use To: *Break up long crosswalks into shorter segments.*

Good News: *Slows traffic and highlights crosswalk.*

Bad News: *May complicate drainage and snow removal, take up width, and interfere with turning trucks.*

Signing

Although most main street designs are self-explanatory, there is a need to keep people informed about what is expected of them in what may be unfamiliar surroundings. Most roadway signing and pavement markings are explained in the *Manual on Uniform Traffic Control Devices* (MUTCD) and by ODOT's Traffic Management Section which governs their use. Size, color, placement, and even the type of sign support are highly standardized.

Temporary Signing

Temporary traffic calming or diversions may be appropriate to deal with intermittent and predictable problems. See the example of the City of Sisters, Oregon in Appendix A.

Permanent Signing

There are hundreds of approved signs described in the MUTCD and sometimes it seems as if they are all on one street! Some signs orient people to where they are or need to go. Other traffic signs include speed limit, stop, yield, and warning signs.

Warning and Regulatory Signs

Well-designed roads make it clear to users how to proceed, and require very little signing. An overabundance of warning and regulatory signs indicates design deficiencies.

The attention of drivers, bicyclists, and pedestrians needs to be on the road and other users, not on an uproar of signs. Oversigning is ineffective, distracts drivers, clutters the streetscape, creates compliance problems, and wastes resources.

Motorists tend to obey signs that reinforce what they are experiencing and to ignore signs that don't. In a summary of studies from 23 states, compliance with a posted speed of 25 mph on collector streets was only 17%. Similar observations have been made on arterial streets in many Oregon communities where speeding is always near the top of citizen complaints. If the purpose of a speed zone is to reduce speed, it must be supported by corresponding street designs that slow traffic safely, and by enforcement where necessary.

The traffic calming measures discussed in this handbook generally don't need or rely on advance signs to advise motorists of their location. None of the measures represent a hazard to motorists operating their vehicles at appropriate speeds.

Some crosswalks, such as at the edges of downtown, may benefit from advance warning signs, pedestrian crossing signs at the crossing itself, and regulatory signs at intersections. Use these signs sparingly, because excessive signage leads to signs being missed or ignored; a traffic study will probably be needed to tell if signs are appropriate.

Temporary sign for highway traffic through Sisters, Oregon.

Employ Temporary Signing

Use To: *Inform people of special conditions.*

Good News: *Inexpensive.*

Bad News: *Problems must be predictable and able to be handled for a brief time.*

Pedestrian Crossing signs are sometimes used at locations where a crossing is not normally encountered. This is usually at mid-block locations, where the adjacent land use is likely to generate a fairly high number of crossings.

Informational Signs

Information signs can be used to:

- Explain signal synchronization in advance of a series of signals. Clearly indicate the ideal travel speed (i.e., 20 mph).
- Give directions to parking and other destinations at the gateways to main street.
- Provide differential directional signs for motorists and for pedestrians.

For motorists, signs are normally large, mounted fairly high, and indicate destinations relatively far away; they may not adequately serve pedestrians.

For pedestrians, standard signs and markings have not been developed. In general, signs need to be lower, smaller, and in the pedestrians line of sight. Distances given in measurements meaningful to pedestrians such as blocks or average walking time are more useful. Examples of key destinations are libraries, schools, museums, entertainment centers, and shopping districts. On one-way streets, street signs that face both ways can be read by foot traffic from both directions.

To avoid adding clutter to the existing street signs, cluster signs together on one post, placed in strategic locations. Kiosks, "finger posts," and building corners are also good locations for pedestrian-oriented signs. The best signs are unobtrusive, easy to read, aesthetic, and placed in such a way that they are visible to pedestrians and not to motorists.

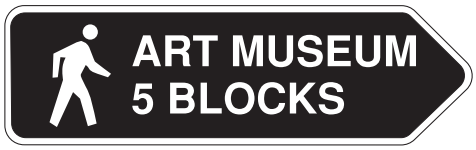
Sign W11-2 may be used in advance of crossings or in areas of high pedestrian use

To add interest in the downtown and to provide pedestrians with useful information, signs can:

- List the stores, perhaps on a map, at a central gathering place.
- Tell about historic structures and local landmarks.
- Identify special plants and natural features.
- Recognize people who have donated energy and resources to making main street work.

Sign W11A-2 is used only at crosswalks

Since no standards have yet been developed in Oregon for pedestrian-only signs, please consult with ODOT and work together to ensure that size, lettering and placement are mutually beneficial. The following example can be used as a starting point:



Employ Permanent Signing

Use To: *Inform or warn drivers, bicyclists, and pedestrians.*

Good News: *Inexpensive; informational signs help orient visitors.*

Bad News: *Warning signs tend to have limited effectiveness; too many signs clutter the streetscape.*

Textured Crosswalk and Pavement

See also:

Channelization

Textured crossings, such as nonslip bricks or pavers, may raise a driver's awareness through increased noise and vibration. Their use may increase the effectiveness of other measures such as curb extensions and medians.

Colored pavers may increase the visibility of the crosswalk, although pavers and bricks typically darken with age and may need to be cleaned periodically and supplemented with crosswalk lines. Pavers are more expensive to maintain than painted crosswalks, since pavers must be replaced periodically and sometimes settle (this is partially offset by the reduced paving area).

Texturing has no effect on speed unless combined with other measures such as curb extensions and curb radius reduction.

Because texturing may create traction or stability problems for some users (seniors, the disabled, wheelchairs, and bicycles), consider texturing the crosswalk edges or the street before the crosswalk and leaving the crosswalk smooth.

Pavers can help mark crosswalks.

Create Pavement Texture

Use To: *Highlight crosswalk or intersection.*

Good News: *Attractive; complements curb extensions.*

Bad News: *Complicates repaving; may cause traction problems for some users; does not slow traffic; may increase noise; fades with age.*

Traffic Controls

People sometimes request a stop sign or signal, thinking it will solve problems at an intersection, when the situation would be better addressed with another type of control or a completely different solution.

The most common types of traffic control at highway intersections are 2-way stops, 4-way (also called all-way) stops, and signals. Yield signs and modern roundabouts are a less common alternative to stop signs and signals. Special pedestrian signals are used in specific situations.

Each type of intersection control has its advantages and disadvantages. Each has specific criteria that must be met, called warrants in the MUTCD (see Glossary), before it can be installed. Whether or not these warrants are met can be determined by a traffic study of the intersection.

Stop sign

The most common intersection control is the 2-way stop: the traffic on the highway is unimpeded while the traffic on the side street must stop. When used simply to slow traffic, stop signs are ineffective. The experience of numerous cities is that stop signs result in no change in average speed or in a speed increase as drivers try to make up time between stops. However, when used according to safety warrants, stop signs can reduce collision rates.

As part of the main street strategy, look at the street network that supports the main street and evaluate if some routes and intersections might be improved by traffic controls such as stop signs.

At about 1200-1300 vehicles per hour (vph) entering the intersection from all directions, side-street traffic has to wait a very long time and drivers start asking for a signal.

Where movements are relatively balanced on all approaches to the intersection, a 4-way stop control functions well up to about 1800 vph, but this would be an unlikely situation on a highway where most of the traffic is on the main street. Putting a stop sign on most highways would generally cause unacceptable delays.

Yield sign

There are specific warrants in the MUTCD for installing yield signs. They are not used on highways in the direction of through traffic, although intersecting streets may be appropriate in certain circumstances.

The trouble with yield signs is that motorists tend to yield more to other motor vehicles and pay less attention to pedestrians and bicyclists, so yield situations need to be reinforced with good street designs. Compatible designs that can improve operation and safety include curb extensions, raised median islands, horizontal deflection (such as at roundabouts), and pavement markings (such as crosswalks).

Install Stop or Yield Sign

Use To: *Promote orderly traffic flow at moderate volumes.*

Good News: *Simple and inexpensive.*

Bad News: *Must meet warrants; limited applications; does not slow traffic.*

Signal

A 2-phase signal (one phase for the main street and one for the cross street) with single-lane approaches can handle up to about 2400 vph under ideal conditions and outperforms an all-way stop above about 1100 vph. However, signals are inefficient with left turns.

Addition of left-turn lanes and a third phase to protect left turns on the highway accommodates up to about 3000 vph but may result in increased delay, long lines of cars waiting for the signal to turn green, and increased crossing distance for all users.

One way to improve the performance of a series of signals is by synchronizing them. Traffic signals are timed to accommodate smooth motor vehicle flows at a desired speed. However, for proper traffic operation, the timing is typically set at a higher speed than bicycling and walking speeds (10–20 mph and 2–3 mph, respectively). Because of this, signal timing can create difficulties for bicyclists trying to maintain a constant speed to take advantage of their momentum. The situation is even more frustrating to pedestrians, who often can only walk one or two blocks at a time, stopping at nearly every light.

SIGNAL WARRANTS

Traffic signal warrants as defined in the Manual on Uniform Traffic Control Devices for Streets and Highways. At least one of the following warrants must be met to install a signal:

1. **Minimum Vehicular Volume**
2. **Interruption of Continuous Traffic**
3. **Minimum Pedestrian Volume**
4. **School Crossings**
5. **Progressive Movement**
6. **Accident Experience**
7. **Systems**
8. **Combination of Warrants**
9. **Four Hour Volumes**
10. **Peak Hour Delay**
11. **Peak Hour Volume**

In downtowns, signal timing needs to take into account the convenience of bicyclists and pedestrians. For example, the traffic signals in downtown Portland are timed for speeds of 12–16 mph, allowing bicyclists to ride with traffic.

Rather than force pedestrians to activate the walk light by pushing a button, downtown signals normally include pedestrian phases in every cycle. There are other details of signal timing that can be adjusted for pedestrians and bicyclists (refer to *Oregon Bicycle and Pedestrian Plan*).

Signalized intersections may be the preferred pedestrian crossing points at peak traffic hours; at other times, crossing opportunities close to signalized intersections benefit from a "platooning" effect, as traffic signals create gaps in traffic.

Pedestrian Signal

A pedestrian activated signal may be warranted where the expected number of people needing to cross a roadway at a particular location is significant, particularly at the outside edges of downtown. Anticipated use must be high enough (there are specific warrants) for motorists to get used to stopping frequently for a red light (a light that is rarely activated may be unnoticed when in use). Pedestrian signals are not typically needed within a downtown core. Refer to the MUTCD for pedestrian signal warrants.

Sight-distance must be adequate to ensure that motorists will see the light in time to stop. Warning signs may need to be installed on the approaching roadway.

Pedestrian signals may be combined with curb extensions, raised medians and refuges for increased pedestrian safety and comfort.

Install Traffic Signal

Use To: *Promote orderly traffic flow at high volumes.*

Good News: *Handles through movements well; reduces some types of crashes; provides some security for pedestrians.*

Bad News: *Must meet warrants; increases some types of crashes; expensive; usually requires adding storage lanes at intersections; delays all users; needs poles.*

Transitions

In many ways, the transition from open highway to downtown is as important as the downtown itself in calming traffic. The transition warns motorists that they are about to enter a new kind of roadway where slower speeds are required. Where main street is only a few blocks long, it may be tempting to maintain the higher travel speed of the open highway, especially since drivers tend to underestimate their speed after encountering a reduced-speed zone (*Synthesis of Safety Research Related to Speed and Speed Limits*, FHWA-RD-98-154, July 1998).

The transition area may be residential or less dense commercial development, and almost always includes sidewalks. Other appropriate transition treatments are roundabout intersections, bike lanes, shoulder treatments, medians, and landscape strips. Another transition element that can be very effective is a gateway treatment, such as a sign, special landscaping, or a piece of art work, located at the edge of the core main street.

Colored Shoulders

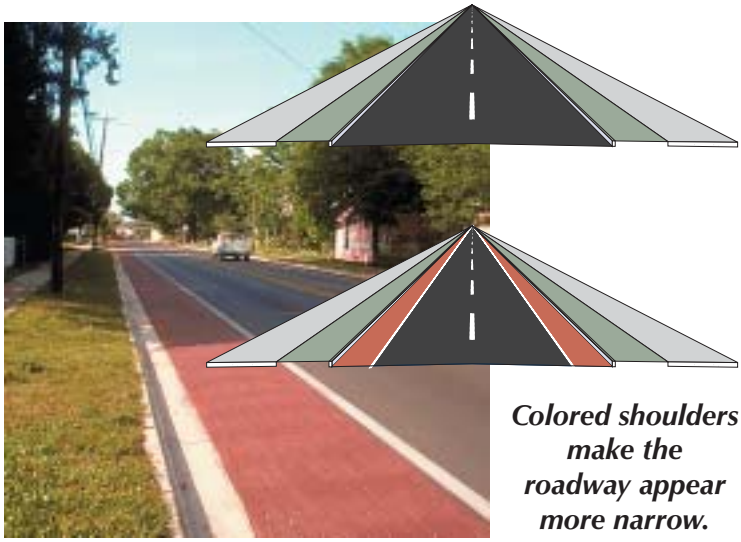
Colored shoulders are a particularly good treatment for gateways and transition areas into the downtown. Drivers see only the travel lanes as available road space, so the roadway appears narrower than it is when the shoulders are a different color.

Painting the road surface is expensive; lower-cost methods include:

- Paving travel lanes with concrete and bike lanes with asphalt, or the reverse.
- Slurry-sealing or chip-sealing the roadway and not the bike lanes.
- Incorporating dyes into concrete or asphalt.

Colored bike lanes can be used even on higher speed arterials because the actual roadway width available to motor vehicles is unchanged.

Colored shoulders and bike lanes also help reinforce the separation created by a shoulder or bike lane stripe. The shy distance around raised medians or the medians themselves can also be colored to visually narrow the travel lane.



Colored shoulders make the roadway appear more narrow.

Gateway

A gateway identifies the beginning or end of a distinct place. It gives a sense of welcome and transition, and helps to orient people. Gateways are located at the entrance to the core downtown or to distinct districts.

See also:

***Street Zones* in Chapter 3**

A banner is a common gateway element.

See also:

Drainage

Maintenance

Travel Lane Width

Trees & Landscaping

Although district identification signs, a list of local businesses, banners, and other non-traffic signs that welcome visitors to the downtown are helpful in establishing identity, a true gateway is a combination of architecture, landscaping, fountains, and other special features that say, "you have arrived and we welcome you."

Planting Strip

Planting strips are not usually found in the downtown core because the space is used by sidewalks and on-street parking. However, where the downtown blends into the surrounding residential areas or where pedestrian traffic is not as heavy, tree wells and planters can be replaced by planting or landscape strips.

Large trees and planters enhance the streetscape and announce a change in the highway environment.

Sidewalks separated from the roadway with a planting strip can create a more pleasant environment for pedestrians. Besides creating a buffer from the noise and splash of moving vehicles, planting strips provide:

- Room for street furniture such as signs, bicycle racks, trash cans, utility and signal poles, mailboxes, parking meters, fire hydrants, etc.
- Room for landscaping and shade trees, increasing the appeal of a the street and pedestrians' comfort.
- A better environment for wheelchair users, as sidewalks may be kept at a constant grade without dipping at every driveway.
- The opportunity to line up sidewalks, curb cuts and crosswalks at intersections.
- When wide enough, a place for a motor vehicle to wait out of the stream of traffic while yielding to a pedestrian in a driveway or alley.
- Better absorption of runoff water, decreasing overall drainage requirements.
- A place to store snow removal during the winter.
- Room to expand the sidewalk when downtown growth creates the need.

Planting strips need to be at least 5 ft (1.2 m) wide. Planting strips are used where the space is not needed for the sidewalk or on-street parking.

On some main streets with mixed land uses, some of which need wide sidewalks and some that don't, a planting strip on selected blocks may work. Where constraints, such as a building, preclude the use of the same width throughout a block, the planting strip can be interrupted and resume where the constraint ends. Where there is not enough room for a planting strip, tree wells and planters can be used.

When there is both a planting strip and on-street parking, consider constructing a narrow strip of about 16 inches of a hard surface (pavers or concrete, for example) between the curb and planting strip so that a person getting out of the car has a place to step. It is these small details that make the main street a pleasure to visit.

Establish Transition Area

Use To: *Slow traffic before main street and welcome visitors to downtown.*

Good News: *Enhances main street identity and helps calm traffic.*

Bad News: *Requires a plan for a series of traffic calming measures.*

Roundabout

Modern roundabouts are a design alternative to traffic signals or stop signs at arterial intersections. They are particularly effective at slowing traffic into a district such as a downtown. Under the right circumstances, they can improve vehicle flow and overall safety (including for pedestrians), reduce lane requirements, calm traffic speed, and offer an attractive entry point into a downtown.

One of the major advantages of roundabouts is the reduced need for travel lanes, as traffic is constantly moving (signals create stop-and-go conditions for motor vehicles so that extra travel lanes are needed to handle capacity at intersections). This provides more space for other uses such as wide sidewalks and planting strips.

A single-lane "modern" roundabout (as contrasted with a multilane, high-speed circle or rotary) usually operates at less delay than the other intersection alteratives, up to about 2000 vph.

There is much flexibility inherent in roundabout design. ODOT has criteria for judging the suitability of a roundabout. It is especially important that the roundabout be designed for low speeds and include splitter islands and marked crosswalks.

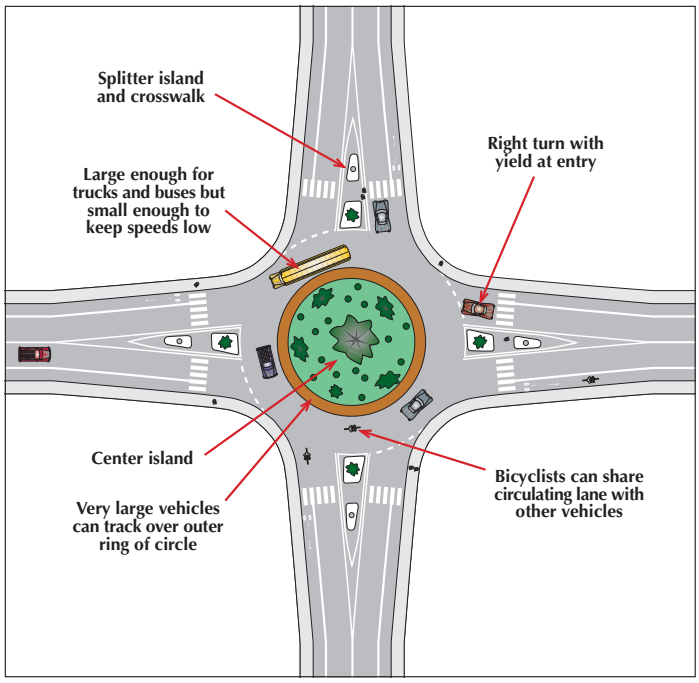
Install Roundabout

Use To: *Promote orderly traffic flow at moderate to high volumes; designate gateway.*

Good News: *Handles turning traffic well; reduces overall crash rate significantly; reduces speed; attractive; reduces need for storage lanes.*

Bad News: *Can be difficult to fit into existing downtown intersections; vision impaired pedestrians prefer signals.*

A roundabout can provide excellent traffic control at many intersections and may be especially suitable for the gateway to main street.



Travel Lane Removal

Reducing the number of travel lanes, particularly from 4 to 3 (2 travel lanes with a center turn lane), is a proven way to decrease speeds, smooth traffic flow, and reduce crashes. Up to 18,000 ADT (average daily traffic) can normally be accommodated on 3-lane roads, with even more in some situations.

Motorists on 4-lane highways, often seeing an empty lane in their direction, tend to drive faster than they should. They also seek to match the speed of other drivers, so that the fastest vehicles tend to set prevailing speeds.

During peak volumes, when more turning movements occur, motorists drive close to one another, preventing motorists behind them from seeing ahead. Last-second lane swapping to get around turning vehicles leads to side-swipe and rear-end crashes.

Head-on collisions also occur when left-turning drivers try to turn across both oncoming lanes, only to discover too late that a car in the second lane was temporarily screened from view.

Pedestrians and bicyclists have difficulty finding gaps across 4 and 5 lanes, which discourages walking (and transit use) and promotes dangerous wrong-way bicycle riding. Even when a car in one lane stops for crossing pedestrians, cars in the adjacent lane may not stop, which has contributed to many pedestrian fatalities.

Converting the street down to 3 and even 2 lanes can correct these problems. On main street highway segments, the width formerly used for a travel lane can be used for bike lanes, parking lanes, or wider sidewalks. If a center lane is part of the design, it can be used for pedestrian refuge islands. And by narrowing the highway in the commercial core, it is easier for customers to cross the highway to other businesses.

Removing lanes may result in congestion at key intersections which can often be remedied by incorporating turn lanes, improved signal timing, or roundabouts. Improving alternate routes and street connectivity may also allow main street to undergo a lane reduction. When looking at a lane reduction, consider access for emergency vehicles during congested periods.

Examples of Oregon highway main streets that have been converted from 4 to 3 lanes can be found in Prineville and Baker City.

Reduce Number of Travel Lanes

Use To: *Reclaim width for other uses.*

Good News: *Improves appearance, safety for all users, and balance.*

Bad News: *Peak traffic congestion may require improvements at intersections or on other streets.*

Travel Lane Width

Actual

Narrow cross-sections can effectively reduce speeds, as most drivers adjust their speed to the available lane width. Narrow streets also reduce roadway construction and maintenance costs.

On main streets, truck use is a big consideration. Trucks may be up to 8.5 ft wide and 48 ft long with a single trailer, 75 ft with a double trailer. ODOT standards for lane widths are:

- 12 ft (3.6 m): Designated freight routes or other highways that carry at least 250 4-axle trucks per day.
- 11 ft (3.3 m): May be used on non-freight routes that carry less than 250 4-axle trucks per day at less than 40 mph (60 km/h).

On highways, ODOT prefers the full width of 12 ft unless there is a specific reason to go to a narrower lane. There are many "exception" conditions that require ODOT approval.

The speed reduction achieved from a narrow lane depends on many factors and is best measured in the field. Even when it has little effect by itself, a narrow lane reinforces other speed management measures by sending a consistent message to drivers.

Perceived

Where the 12 ft width is needed but speed reduction is a goal, techniques that change the perceived width can be explored.

Because of the way we see, there are various ways to make drivers believe that the roadway is narrower than it is, which may result in people driving more slowly:

- Street trees can transform the appearance of highways and may complement business uses. The branching pattern of appropriate species of street trees will not block driver's views of shops and signs of modest height. Their canopies can create a feeling of a street edge, which helps calm traffic.
- By bringing buildings closer to the roadway edge, the highway feels more constricted. Buildings close to the sidewalk also improve the pedestrian environment.
- Where there are shoulders or bike lanes, contrasting colored shoulders create the illusion of a more narrow travel lane. Relatively low-cost ways to accomplish this include paving travel lanes with asphalt and bike lanes with concrete, or the reverse, and incorporating dyes into concrete or asphalt.
- Adding on-street parking, curb extensions, and medians make the travelway feel constricted even when there is ample width.

See also:

Curb Extensions

Transitions

Trees & Landscaping

Reducing lane width can be both real (adding bike lanes and a median) and perceived (planting tall trees).

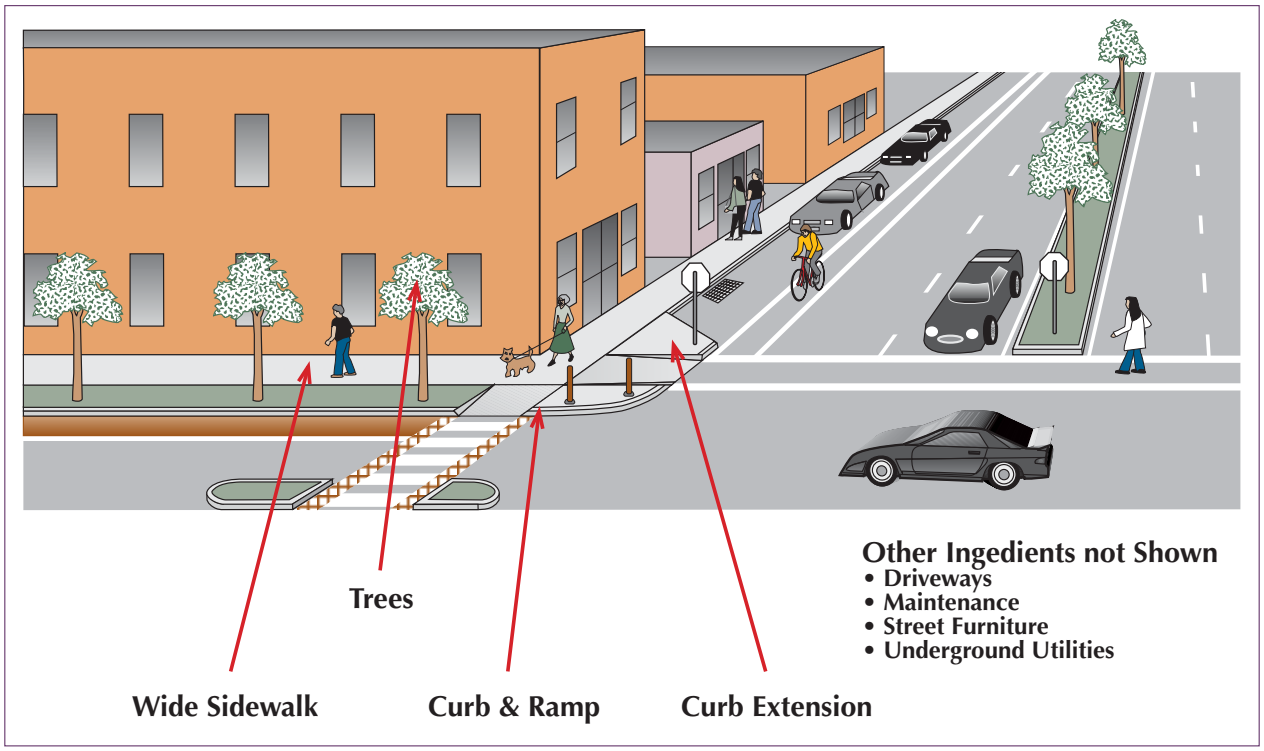
Reduce Travel Lane Width

Use To: *Slow traffic and reclaim width for other uses.*

Good News: *Actual narrowing reduces crossing distance and supports other measures. Perceived narrowing can slow speeds somewhat without actually reducing width.*

Bad News: *Actually reducing width is more effective but requires Exceptions from ODOT.*

Sidewalk Area Design



Main street has many uses besides transportation.

Curb Extension

Also known as "bulbs, bulb-outs, neckdowns, flares or chokers," curb extensions shorten pedestrian crossing distances, improve their visibility to motorists, and widen the sidewalk right where space is most needed for ramps, signal poles, street furniture, and a waiting area.

Curb extensions are recommended at all intersections in downtown where on-street parking is allowed. To work the best, curb extensions are designed to make the crossing width as narrow as possible. Space needs to be provided for existing or planned bike lanes as appropriate. Make sure that the extension is at least as wide as the parking lane so that pedestrians are visible to motorists and not hidden behind cars.

Reducing pedestrian crossing distance at signalized intersections improves signal timing if the pedestrian phase controls the signal. The usual speed used for calculating pedestrian crossing time is 4 ft (1.2 m) per second. The time saved is substantial when two corners can be treated with curb extensions.

Non-signalized intersections also benefit from curb extensions by increasing the visibility of pedestrians to motorists, as well as reducing the time pedestrians are in a crosswalk.

By themselves, curb extensions can be expected to lower vehicle speeds by around 0.5-1 mph. Larger reductions may occur when curb extensions are used with raised medians and textured crosswalks.

Curb extensions need to be carefully designed to drain properly, to avoid ice, leaf and road debris buildup, and to allow street sweepers to hug the curb.

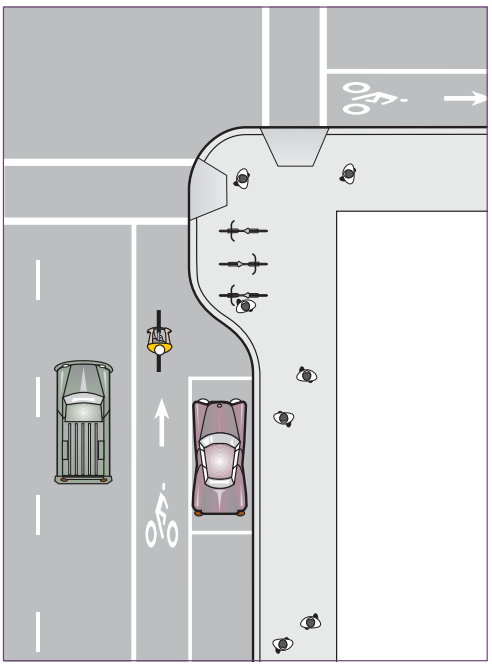
In areas of regular snowfall, curb extensions need to be marked with signs or other objects visible to plow operators.

Every curb extension is unique to fit the geometry and drainage needs of the site.

At corners where large vehicles (trucks, buses, emergency vehicles, etc.) are expected to turn frequently, special care must be taken to design the curb extensions to accommodate this movement.

As a relatively modern feature, curb extensions need to be designed to compliment the historic character of a downtown. If an area is designated or has the potential to be designated as historic by the National Register of Historic Places, consult the State Historic Preservation Office during the planning phase of the project.

A curb extension can help make a mid-block crosswalk more visible (note the yellow marker to alert sweeper and plow operators).



Besides shortening crossing distance, the curb extension provides a place for bike racks and other street furniture.

DRAINAGE

Poorly handled stormwater runoff and snow melting can pollute streams, undermine the pavement, make crosswalks impassable to pedestrians, and cause cars to swerve around puddles or to spray water onto sidewalks. Providing good drainage represents 10% to 20% of street construction costs. Like traffic systems, drainage systems do not need to be overbuilt by designing for the worst-case scenario.

Curb extensions, raised medians, and other traffic calming measures may affect drainage. The design must be sensitive to runoff, ponding, and ice buildup. For example, catch basins are located on the uphill side of curb extensions on a grade. A covered channel in the extension may allow water to drain in some situations.

Planting strips and landscaped medians can help absorb stormwater runoff. Curbs, gutters, catch basins, and drain grates need to be carefully designed for bicyclists and for ease of maintenance. Refer to the *Oregon Bicycle and Pedestrian Plan*.

Construct Curb Extensions

Use To: *Shorten crossing distance, improve pedestrian visibility, and slow traffic.*

Good News: *Effective and improves sidewalk operation.*

Bad News: *Moderately expensive, especially when drainage is difficult; may not fit character of historic districts.*

Driveways

Many uncontrolled driveways on a busy street increase vehicle conflicts (see figure below), hinder traffic flow, and interrupt the sidewalk. They may also decrease opportunities for pedestrians to cross the street because gaps in traffic are filled by motorists entering the road from driveways. Also, pedestrians seeking refuge in a center turn lane are unprotected. Finally, excessively wide driveways allow faster turns and result in more exposure to pedestrians.

Restricting driveways, one of many access management tools, can be one of the most important improvements for pedestrian and bicycle safety, and for general street function.

Limiting or closing driveways may be an unpopular idea to landowners who have become accustomed to unlimited access. However, both highway capacity and safety can be improved. This is usually done by limiting driveway movements (e.g., right-in/right-out only) or by closing driveways and shifting property access to shared driveways or side streets.

Any new access onto a state highway must be approved by ODOT, and will need to conform with the requirements of the *Oregon Highway Plan*.

See also:

Medians

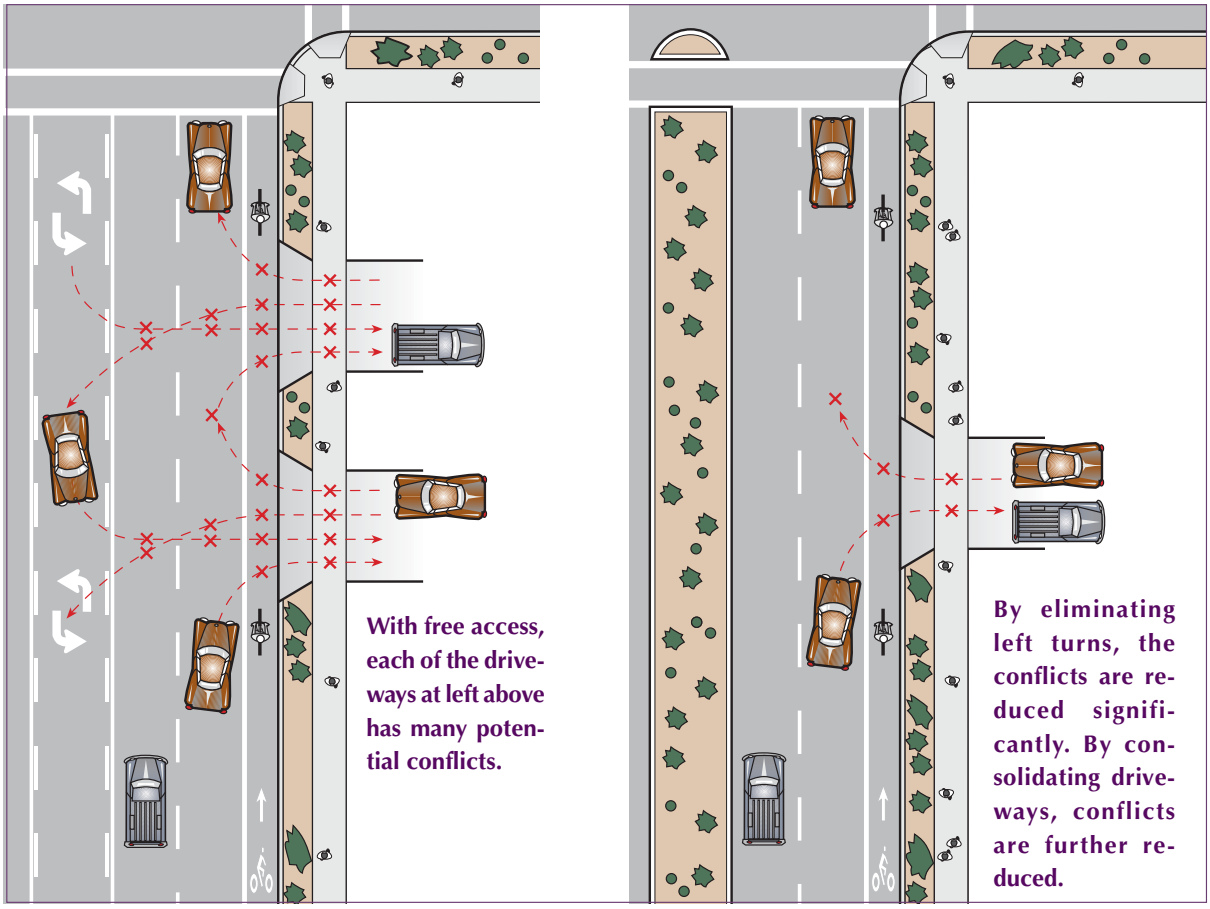
Restrict Driveways

Use To: *Improve pedestrian safety and general highway operation.*

Good News: *Effective.*

Bad News: *Not popular with automobile-oriented businesses.*

Driveway conflicts contribute to unsafe sidewalks and roads.



Maintenance

Maintenance can be one of the trickiest issues to address with main street projects. Communities may resist installing medians or landscaping because of maintenance costs. In most communities, an intergovernmental agreement describes who sweeps the street, freshens the paint, and removes the snow. Other issues to be worked out at the local level are garbage pickup, sidewalk maintenance, landscaping, and street furniture maintenance and repair. In some communities, the downtown association shares costs with the city or county and park district.

See also:

Curb Extension

Drainage

Trees & Landscaping

Walkways

Without regular maintenance, trash and debris collect on sidewalks and concrete falls apart. Surface deterioration can be both unpleasant and unsafe. Regular maintenance protects the community's investment in walkways.

Where people congregate, their beloved pets come along. It seems like a little thing, but a station for dog waste (with a garbage can and free plastic bags) makes main street more inviting for everyone and increases peer pressure to clean up after pets.

Striping

Signs and pavement markings are easy to see when they are new. Over time, signs may fall into disrepair and markings may become hard to see, especially at night. It is important to keep the lane lines visible, especially if there is a bike lane.

Signs and pavement markings need to be kept in a readable condition, especially those directed at motorists. Pedestrians and bicyclists rely on motorists observing the signs and legends that regulate their movements. Examples include STOP signs, stop bars, lane lines, etc. Maintenance programs need to:

- Inspect signs and legends regularly, including reflectivity at night.
- Replace defective signs quickly.
- Retrace legends, crosswalks and other pavement markings in the spring; in high-use areas or where studded tires are common, these may require another paint application in the fall.

Increase Maintenance Operations

Use To: *Improve main street environment and safety.*

Good News: *Shows pride and a healthy street.*

Bad News: *Requires on-going commitment and funding.*

Landscaping

Landscaping requires maintenance to keep plants in good condition, trim vegetation and remove debris. Vegetation encroaching into bikeways or walkways is both a nuisance and a safety problem. Roots need to be controlled to prevent them from heaving the sidewalk. Adequate clearances and sight-distances need to be maintained at driveways and intersections. Pedestrians and bicyclists must be visible to approaching motorists, rather than hidden by overgrown shrubs or low-hanging branches, which can also obscure signs.

Local ordinances can ensure that vegetation on private property is regularly maintained. Some jurisdictions require adjacent land owners to control vegetation, or else maintenance personnel perform the work and bill the property owner.

The key to quality landscaping is in choosing the appropriate materials and maintenance. Property owners must participate in both aspects. What drives the success is the shared social expectation that taking care of the streetscape is the responsible thing to do. And it shows that the property owner cares about the community.

Sidewalks

The preferred sidewalk width in a downtown is 12 ft (3.6 m), at least 6 ft of which must be clear of obstructions. This width allows pairs of pedestrians to walk side by side, or to pass each other comfortably. It generally provides enough width for window shopping, some street furniture, and places for people to stop. More width is desirable to accommodate bus shelters, sidewalk cafés, and other outdoor retail.

Where it can be justified and all other measures have been examined (such as narrowing or eliminating medians, bike lanes, parking lanes, or travel lanes), the sidewalk width can be reduced to as narrow as 8 ft (2.4 m). In general, however, the rule is: the wider the sidewalk, the more pleasant the pedestrian experience.

Ample sidewalk width is needed for a variety of activities.

SIDEWALK WIDTHS

Each sidewalk activity takes up at least this much width:

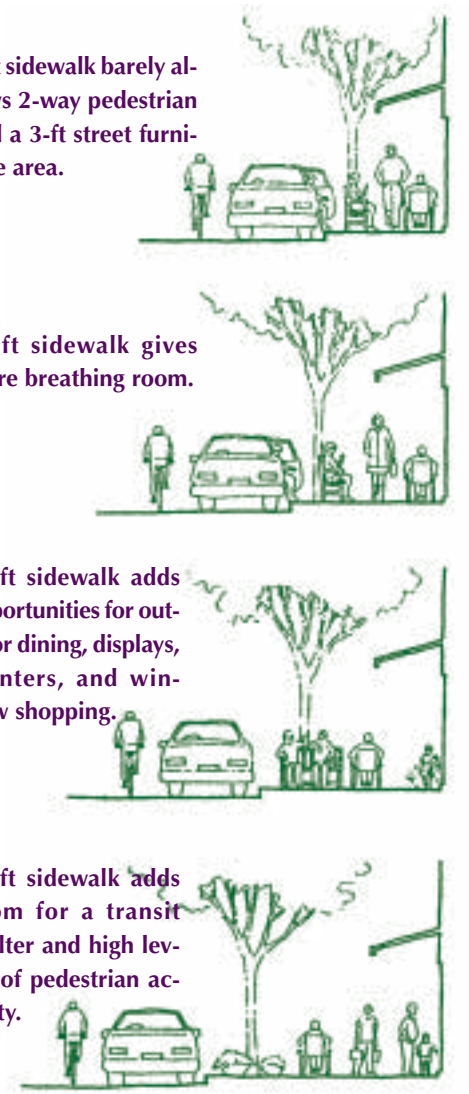
8 ft	**Transit shelter or ADA platform**
5 ft	**Transit stop with bench**
5 ft	**2-way pedestrian traffic**
5 ft	**Wheelchair turning area**
5 ft	**Planting strip (3 ft minimum)**
5 ft	**Outdoor dining tables**
3 ft	**Bench**
3 ft	**Window shopping**
2 ft	**Miscellaneous street furniture**
2 ft	**Shy distance form walls, poles, etc.**

Construct Wide Sidewalks

Use To: *Improve pedestrian environment.*

Good News: *Creates essential public space for many activities.*

Bad News: *Requires width wanted by other uses.*



Street Furniture

Seating

We all need to rest, especially as we get older, and to sit while we talk, eat lunch, or simply reflect on the day. Every block of a main street needs places to sit, such as benches, low walls, planter edges, or wide steps. Sidewalk seating at cafes may also be encouraged, and seating can provide a variety of views—some prefer to watch people, others to look at the storefronts.

Lighting

Many pedestrian crossings are not well lit, making them less safe. Providing illumination or improving existing lighting can increase nighttime safety at many locations, especially at mid-block crossings, which are often not expected by motorists.

Lighting for sidewalks needs to be lower, pedestrian scale, and more closely spaced than conventional "cobra head" street lights. Special light standards can help identify the downtown.

Sun and Shade

As architect and philosopher Buckminster Fuller said, civilization with its technology and tools is simply a way of modulating and tuning the elements—earth, air, fire, and water. A welcoming main street shields pedestrians from the heat with trees and from the wind and rain with awnings. Benches and gathering places need to be carefully designed and placed to catch the sun when the days are cold and block it when the days are hot.

Transit Shelter

Where a bus pullout is needed at an intersection, a far-side location is preferred. This avoids conflicts between passengers boarding or exiting a bus and pedestrians and bicyclists moving through the area. A curb extension helps pedestrians cross the road, prevents motorists from entering the bus pullout area, and reduces conflicts with bicyclists.

On streets with parking, near-side bus stops also benefit from curb extensions, allowing passengers to board or dismount the bus directly without stepping onto the street. This also makes it easier to meet disability requirements (the bus pulls up right next to the curb), provides more waiting area for passengers, does not use as many parking spaces as a pull-in, and is quicker and more convenient for the bus.

An awning on the building facade protects the pedestrian from sun and rain, helps give definition to the sidewalk area, and makes window shopping more pleasant.

Most transit users will have to cross the road to access a transit stop on one leg of their trip. Cooperation between public transit agencies and transportation designers is essential to ensure safe pedestrian crossings.

Transit stops have special design requirements to accommodate large buses and the disabled without blocking the sidewalk. Refer to guidelines from your transit provider or ODOT's *Transit Manual*.

Rest Rooms

Public toilets need to be a high priority for a friendly downtown. Restrooms need to be open during the hours that the street is used, and signed for easy identification.

Cleanliness

Trash receptacles (garbage bins) are essential for a clean street because they silently remind people that the place for trash is in the bin not on the sidewalk. Make sure that trash pickup is frequent enough so that garbage doesn't overflow.

Bicycle Parking

Bicycle racks are important to encourage cyclists and to reduce pedestrian obstacles caused by cyclists chaining their bikes to other objects.

Phones

Public phones, properly sheltered from the noise and elements, are both a convenience and a safety measure.

Miscellaneous Street Furniture

There are many other kinds of street furniture, including drinking fountains, newspaper racks, clocks, kiosks, recycling bins, tree grates, public art, and advertising boards. These elements add flavor to the downtown, make the walk more interesting, and increase social activity.

If not well managed, street furniture will clutter the sidewalk and become a nuisance. Make sure there is at least a 5-ft clear space on the sidewalk (more in high use areas) and that the community will commit to maintain and clean the furniture.

Install Street Furniture

Use To: *Support public activities and improve pedestrian comfort.*

Good News: *Helps bring life to main street.*

Bad News: *Requires sufficiently wide sidewalks, initial investment, and on-going maintenance.*

Trees & Landscaping

Trees do much more than add an attractive canopy over the street. They create comfortable spaces, soften the lighting, cool in the summer, block wind in the winter, and absorb pollutants. They also give the main street a distinctive identity and provide seasonal interest.

See also:

Maintenance

Planting Strip

Quality landscaping that is close to the highway or on medians can increase the driver's awareness of the immediate environment and alter behavior, resulting in slower speeds and a safer street. Although a row of trees doesn't actually impede drivers, it does have a pronounced psychological effect by making the road appear narrower and by inviting the driver to linger.

Large trees and planters enhance the sidewalk area.

Small trees and sparse landscaping are less effective.

Even parking lots can be made more pleasant with trees and hedges to soften the edges and break up the large expanse of empty space. Most parking lots have leftover spaces where cars can't fit but a tree could.

When reconstructing a street or building, it is usually worth a great deal of effort to save existing trees. If time is money, then older trees are very valuable. A 4-inch diameter tree can be planted for $300, including maintenance for the first 5 years when it is most vulnerable. But at the end of 5 years that tree can add a $1,000 or more to the property value. Trees last a long time and some are not considered mature until they are over 50 years old.

Street trees in a downtown area offer an ideal transition between building architecture and the street. When mature, street trees should create a canopy over the sidewalk and adjacent parking area.

Tree wells ideally measure at least 4 ft by 4 ft and are surrounded by 4 ft of dry-set pavers or similar tree grate, although smaller wells can work if space is constrained. This provides necessary root aeration and potential for surface water collection. Tree species need to be chosen for the climate. Trees that don't tend to heave the sidewalk are preferred, and root barriers may be installed to prevent this from happening.

Protect trees from damage by car doors by setting them back at least 4 ft from the roadway or spacing them between parking stalls.

Space trees so that mature tree canopy diameters grow within 10 ft of one another to improve shade and better reduce speeds; typical spacing should be from 25 to 50 ft. Tree locations need to be evaluated on a site-by-site basis to ensure that clear vehicle sight lines are not compromised. Building accessways must not be

blocked and visual sight lines into building store fronts need to be considered. Different species of trees heighten seasonal color interest, accent various streetscapes or features, and complement the building architecture.

Cities can gain the economies of scale by planting blocks at a time. One tree in front of one building is fine but the real impact is when an entire street is transformed.

Large trees and quality landscaping add value to adjacent property, buffer the sidewalk area from traffic, and help reduce speeds.

"Given a limited budget, the most effective expenditure of funds to improve a street would probably be on trees."
–Planner Allan B. Jacobs

Plant Trees & Landscaping

Use To: *Improve main street environment.*

Good News: *Attractive, can be used on any type of highway, and helps reduce traffic speed.*

Bad News: *Requires sufficiently wide sidewalks, initial investment, and on-going maintenance.*

Utilities

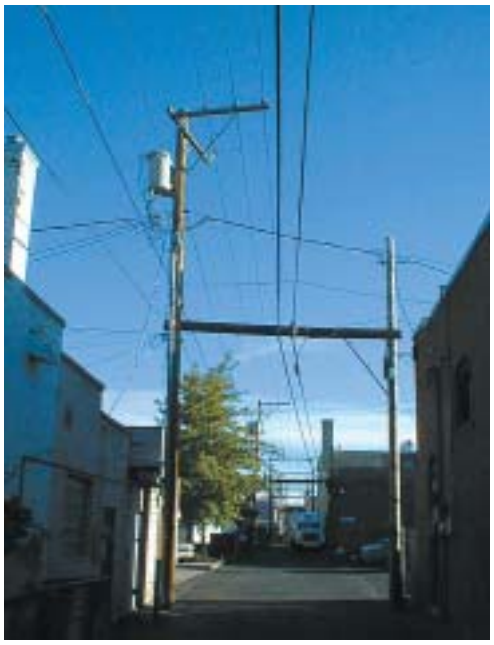
Utilities need to be placed well out of the pedestrian area of the sidewalk. Moving utilities underground removes the clutter of poles and wires that accumulate over time from many separate projects and take up valuable space. For example, the space is often needed to meet disability access needs.

The design of sidewalks, planting strips, medians, and other street elements must allow for service access to underground utilities. The potential damage that tree roots can cause may require root barriers or other measures.

Where putting utilities underground is not feasible, it may be possible to consolidate them on fewer poles or move them to alleys.

Utility lines can be buried under a paver strip, freeing up the sidewalk for other uses.

This sidewalk was compromised with poles in the pedestrian path. The signal controller box is a hazard, especially to those with impaired vision.



Utility lines can be moved to alleys where the clutter is not so obvious.

Put Utilities Underground

Use To: *Free up sidewalk space and improve overall appearance.*

Good News: *Attractive and can be done on any type of highway.*

Bad News: *Expensive.*

Building Area: Design and Land Use

This handbook focuses on the parts of main street that are in the public right-of-way: the sidewalk and roadway areas. However, building design and appropriate land use zoning are critical to the success of a main street. After all, the stores, services, residences, and other uses are the heart and soul of main street.

Without the framework of attractive buildings and a mix of uses, even the best street and sidewalk design will not be successful in supporting a lively and economically viable main street. Building design includes architectural elements that have to do with aesthetics and historical appropriateness, which will be specific to each community, as well as basic building principals such as proper orientation to the street.

Building Setbacks and Orientation

In many zoning districts, both commercial and residential, buildings are intentionally setback from the street. However, good downtown buildings, with few exceptions, face the street and are located at the property line. In other words, there is little space between the front of the building and the sidewalk. The front entrance faces the main street and is usually emphasized by the building's architecture.

Windows and entrances right along the sidewalk are critical elements for a comfortable pedestrian environment. A continuous row of buildings with windows and entrances along the street creates an interesting and secure walking environment. People will often walk longer distances if their route takes them along visually interesting buildings (see Building Façade below.)

If there is any space between the building front and the sidewalk, a well designed pedestrian-oriented space will include a clearly marked walkway, plantings, seating, or other features that extend the public space to the building.

As discussed below, under Off-Street Parking, it is almost always a detriment in downtown areas to locate parking off-street between the building front and the street. Setting buildings back or allowing parking between the building entrance and sidewalk creates empty space downtown. A gap between buildings, such as a parking lot, creates a "no man's land" with little visual interest.

See also:

***Human Scale* and *Street Zones* in Chapter 3**

Building Façade—Avoiding Blank Walls

Visually interesting buildings are critical to downtown. Blank walls are boring and unfriendly. Windows are the best treatment, especially for building fronts, since

Good downtown buildings:

- **Face the main street.**
- **Are located at the front property line.**
- **Have street-level entrances.**
- **Provide a sense of enclosure and proportion to the street.**
- **Include windows and display cases that invite window-shopping (no blank façades).**

they enhance security with "eyes on the street" and encourage window-shopping. Also appropriate are displays, secondary entries, balconies, color, texture, and landscaping.

If side or back walls are visible to passing pedestrians and motorists, the addition of windows, displays, murals, and secondary entrances create a more welcoming face to prospective customers. Where security is a concern, such as on walls facing an alley, the façade can be enhanced with false windows and other architectural features. It is particularly important for corner buildings to provide windows on the side street walls, since the side streets are often where people park.

Building Height

See also:

On-Street Parking* in this Chapter under *Roadway Area Design

The historic image of main street includes buildings that are two to three stories tall, forming an unbroken wall of buildings along the block. Often the upper stories of these buildings include offices or living space above the retail on the ground floor, a mix of uses that adds to the vitality of main street (see Mix of Uses below.)

As discussed in Chapter 3, building heights have a strong influence on the feeling of the downtown. Architects agree that the best building height to street ratio is around 1:2 to 1:3. This provides a pleasant sense of enclosure to the street. If the main street is the community's living room, as it is sometimes described, then the buildings are the walls. However, building height is less effective at creating a sense of space when the building front is not located at the property line. In such cases, a row of large trees can help enclose the street.

Even if all the buildings on your main street do not already include taller buildings, revisions to local zoning and development codes can encourage new buildings to add to the community's vision for main street.

LaGrande, Oregon exhibits good building design.

Off-Street Parking

A discussion of building orientation usually brings up the issue of off-street parking, since businesses tend to orient themselves to their parking areas. In general, it is poor main street design to have off-street parking between the store and the street. Even with side or rear off-street parking, a good downtown building has its main orientation to the street, not the parking area.

If off-street parking is provided at the sides of the building, landscaping and street furniture can improve the lot's appearance from the street. Very visible pedestrian connections between the parking area and the street need to be provided.

In downtown areas, businesses can develop shared parking agreements, rather than parking lots that are exclusive to one building. Often, parking management, (e.g., better enforcement of on street parking limits and development of shared parking agreements) can limit the need for paving of additional parking lots (see On-Street Parking under Roadway Area Design).

Mix of Uses

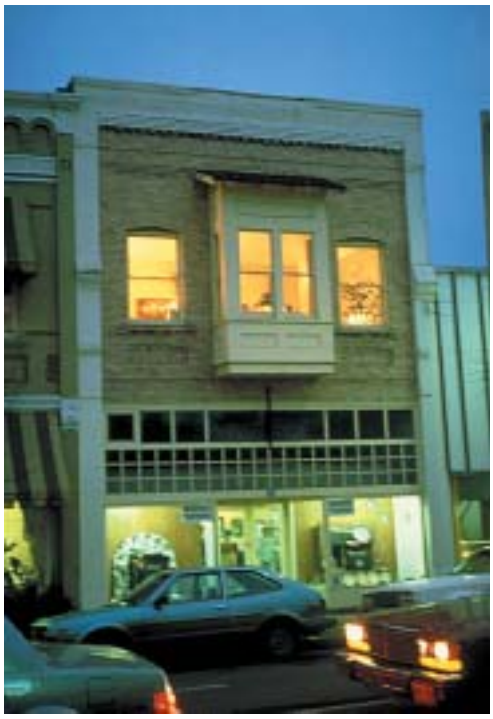
Beyond the attractive building fronts, it's the land uses that really determine the viability of main street. Two essential ingredients for a downtown are variety (mix of uses) and activity.

The most successful downtowns allow and encourage a rich mix of land uses: shops, restaurants, offices, public buildings (post office, library, city hall), entertainment, residences, public spaces (parks and plazas), and even some light industry.

Many downtown districts on main street are located just a few blocks from residential neighborhoods. In Baker City, the tremendously successful downtown revitalization has been supported by the proximity to well established neighborhoods. People value their ability to walk to the post office, the pharmacy and the local café for a visit with neighbors. Other downtown areas have encouraged mixed use (retail and housing) in the same building. Such "vertical mixed use" adds a round-the-clock vitality to main street.

However, there are some land uses that are usually inappropriate for a downtown. These include drive-through businesses, heavy industry and other uses that need numerous freight deliveries, warehouses, and "big box" styled businesses that require large parking lots.

Both design and land use can be strongly influenced by code and ordinance. Many cities have a downtown zone where certain land uses are not allowed, as well as downtown architectural standards that encourage appropriate building location and design.



This McMinnville building contains both retail and housing, adding vitality to main street.

Public Spaces, Plazas, and Activity Centers

Empty lots and barren parking lots on the main street create a gap that is unpleasant to pedestrians and uninteresting to motorists. As Seattle developer David Sucher puts it: "Blankness seems to be an innate human horror."

Empty lots provide many opportunities to improve the street:

- Building in-fill (move some parking on-street).
- Outdoor dining.
- Pocket park, garden, or interactive fountain.
- Skateboard park or playground to bring children to downtown.
- Pedestrian shortcut (it's probably used for that anyway).

Things pedestrians like:

Storefronts

Porches

Walls with windows

Landscaped yards

Things pedestrians don't like:

Garage doors

Blank walls

Open parking lots

Unbuffered parking structures

Under-building parking

Open service areas

- Public restroom.
- Staging area for exhibits and Saturday markets.

For example, a vacant lot in downtown Pendleton has been redeveloped into a small park. The park includes an attractive historical mural, appropriately rustic western furniture for shade and picnics, as well as play equipment that invites youngsters.

Downtowns that have experienced a period of decline often have larger, vacant buildings that Kent Robertson calls "white elephants." As he recently wrote: "The symbolic effect of [the vacant building] can be overwhelming, as it destroys any semblance of vital street life in the immediate area." (*APA Journal*, Summer 1999). Sometimes these buildings can be redeveloped into a number of small offices and shops, without destroying the historical integrity and identity of the structure.

For example, in downtown Bend, the J.C. Penney's went out of business in the early 1980s. However, the large and historic building was successfully recreated during the downtown's redevelopment into street level shops and upstairs offices. In spite of housing some 20 different businesses, the structure is still known to locals as "the old Penney's building."

The kind of attention to historical appropriateness demonstrated by these two examples is essential to main street success. When vacant lots or buildings are redeveloped, they need to maintain context with the existing character of the downtown.

People of all ages love water.

A small park is a good use for an undeveloped lot

An active downtown needs public restrooms.

Other Ingredients

Enforcement

Most of the measures described in this handbook influence traffic through physical means, such as raised medians and landscaping, and are largely self-enforcing.

Design, however, is not a substitute for enforcement of traffic laws. For example, many drivers do not know that crosswalks exist at unmarked intersections and that they violate the law by not yielding to pedestrians at these locations.

Lack of enforcement also leads to lax behavior. For example, if there is no penalty for parking on a sidewalk, then people will begin to consider that behavior acceptable.

Other measures that attempt to regulate behavior, such as speed zones and crosswalks, require at least some enforcement to achieve their goals. There is often the need for intense initial enforcement followed by ongoing efforts when compliance inevitably declines.

Enforcement can be costly, and it is almost never possible to provide at all required times. Consequently, measures which rely primarily on enforcement are not as effective as self-enforcing designs. New techniques such as photo-radar and cameras at signals have shown promise as deterrents, but these approaches work best to reinforce good road design, not as the primary solution to enforcement problems.

Non-Highway Designs to Support Main Street

There are several designs commonly used on minor streets and driveways that, although they are generally inappropriate on highways, can be part of an overall strategy to improve the surrounding street network that supports main street.

Speed humps, raised crosswalks, and raised intersections allow vehicles to travel at 30 mph (50 km/h) or less with minimal discomfort, but driving over the hump at higher speeds will rock the vehicle. They can be used in a pedestrian area in combination with textured and colored pavement so that crosswalks are more visible and motorists learn to expect pedestrians. Avoid these designs on designated emergency response routes and where the grade exceeds about 8%.

Extending the concrete sidewalk across the intersection—in effect, treating the street as if it were a driveway—can be an effective way to slow traffic and draw attention to the sidewalk. The sidewalk can be kept at grade or dropped, just like at driveways, but is more effective if it is designed like a raised crosswalk. Sidewalk extensions are standard on alleys but can also be used where local streets meet main street. END

Enforce the Traffic Laws

Use To: *Make people more aware of the laws and persuade them to comply.*

Good News: *Gets people attention.*

Bad News: *Expensive and on-going effort.*

Expand Efforts to Side Streets

Use To: *Support improvements on main street.*

Good News: *More things can be done on off-highway streets.*

Bad News: *Local funding usually needed.*

Chapter 5

Paying for It

Paying for It

Local Revenue Sources ... 74
Grants & Loans 76

See also:

Agency contacts are listed in the Appendix under *Resources*.

We know that we want a downtown that is safe, beautiful, economically vibrant, and an object of pride for the whole community. We've discussed how to define our shortcomings, and a variety of design and planning solutions to make the highway into the main street of our vision. Now, how do we pay for it?

Many cities throughout the world, United States, and Northwest have gone through this same process. Funds are always limited, and projects compete with each other. With good planning, a long-term vision, strong community and agency support, and a willingness to share costs, many fine projects can get built.

Often, the key funding source is the creativity and inventiveness of the community itself. For example, some communities recognize the importance of pedestrians to the main street's health and set aside a percentage of the room tax for sidewalk improvements.

These investments pay for themselves many times over in improved access, personal mobility, social vitality, and economic strength for the downtown. This chapter describes some ways to fund main street projects on highways.

TERMS

BID: Business Improvement District
EID: Economic Improvement District
LID: Local Improvement District
ODF: Oregon Department of Forestry
OECDD: Oregon Economic and Community Development Department
OTIB: Oregon Transportation Infrastructure Bank
SCA: Special Small City Allotment
SDC: System Development Charge
SPWF: Special Public Works Fund
STA: Special Transportation Area
STF: Special Transportation Fund
STIP: State Transportation Improvement Program
SUPI: Small-Scale Urban Highway Pedestrian Improvement
TEA-21: Transportation Enhancement Act for the 21st Century
TGM: Transportation/Growth Management
TIF: Tax Increment Financing
TSP: Transportation System Plan

Also refer to the Glossary in the Appendix.

Local Revenue Sources

Property Taxes

Property taxes are typically the primary revenue source for local governments to upgrade public infrastructure. However, property taxes go into general fund operations and are not used in most Oregon cities for street improvements or maintenance (these are more typically funded out of gas taxes, discussed below). Dependence on property taxes has changed with the passage of several ballot initiatives during the 1990s. In general, these measures limit property tax rates for purposes other than payment of certain voter-approved general obligation indebtedness.

Gas Tax Revenues

In Oregon, the state collects gas taxes, vehicle registration fees, overweight and overheight fines, and truck taxes and returns a portion of the revenues to cities and counties. Oregon cities typically use their state gas tax allocation to fund street construction and maintenance. However, these funds can be used to make any transportation-related improvements only within the public right-of-way, including sidewalks, intersection upgrades for pedestrians, and bicycle lanes.

State statute (ORS 366.514) requires that if there is a need for walkways or bikeways, then the governing jurisdiction shall expend a reasonable amount of the gas tax revenues to construct the needed facilities. The statute also requires that sidewalks be built when new streets are constructed or existing streets are reconstructed.

System Development Charges

System Development Charges (SDCs) are becoming an increasingly popular way to fund public works infrastructure needed for new development. The objective of SDCs is to allocate portions of the costs associated with capital improvements to the developments that will increase demand on transportation, sewer, or other public systems. Although SDCs have proven an effective tool in funding items like road widening or intersection upgrades triggered by the increases in traffic linked to a certain new development, they are not usually used to make general infrastructure improvements.

Local Improvement Districts

Oregon Statutes allow the creation of several different kinds of local funding districts to finance different kinds of improvements to main streets. Some of these districts can fund capital improvement projects like sidewalk enhancements, while others support smaller projects and program activities.

The following is a brief description of specific district types and what kinds of improvement they can fund. Each of these mechanisms is limited to a specific area or district where the taxpayers are the primary beneficiaries of the improvements. Each process must be improved by the community's City Council.

A **Local Improvement District** (LID) is a funding mechanism for local capital improvements such as sidewalks, streets, or bikeways. The assessment formula for an LID can be based on the linear frontage of property, trip generation, or other similar criteria. Individual property owners typically have the option of paying the assessment in cash or applying for assessment financing through the city.

An **Urban Renewal District** is funded by Tax Increment Financing (TIF). Within an Urban Renewal District boundary, property taxes are collected at a rate that is frozen at the time of creation. Increases in the property taxes create the increment financing and are earmarked for special capital improvement projects within the district. Urban Renewal Districts are long term, typically lasting from 20–30 years.

An **Economic Improvement District** (EID) is a funding mechanism where the assessments are based on property assessment values or are a simple fee on property. EIDs cannot fund capital improvement projects, but they generally fund smaller projects and programs that can complement larger downtown improvements. EIDs are limited to a five-year duration and can be renewed.

A **Business Improvement District** (BID) works much the same as an EID, except that the assessments are paid by business owners rather than property owners. BIDs cannot pay for capital improvements, but may fund smaller projects and programs that support other downtown improvements. A BID can have a time limit, or can be perpetual.

Grants & Loans

There are a variety of State and Federal grant and loan programs available, most with specific requirements relating to economic development or specific transportation issues. Most programs require a match from the local jurisdiction as a condition of approval. Grant and loan programs cannot be considered a secure long-term funding source because they are highly competitive and subject to change.

Most of the programs available for transportation projects are funded and administered through ODOT or the Oregon Economic and Community Development Department (OECDD). Some programs which may be appropriate for main street projects are described below.

Transportation/Growth Management Program

The Transportation and Growth Management Program (TGM) promotes urban planning and design that results in compact development and pedestrian, bicycle, and transit-friendly options for local communities.

Initiated in 1993, TGM is a joint effort of two state agencies: the Oregon Department of Transportation and the Department of Land Conservation and Development. TGM supports local governments in their efforts to manage growth and provides a variety of grants and technical assistance programs. Program services are provided in the following four areas.

Grants to Local Governments: Each biennium, approximately $6.7 million is allocated by the legislature for grants to local governments. Grant assistance is available in three categories:

1. Implementing the Transportation Panning Rule by preparing Transportation System Plans and developing ordinances and appropriate street design standards.
2. Planning for land use and transportation alternatives such as downtown redevelopment planning and designation of Special Transportation Areas.
3. Coordinating and implementing urban growth management strategies including development of intergovernmental agreements and special area plans.

TGM staff are available to assist local communities with design and implementation of projects as requested.

Quick Response Teams: Specialists in planning and urban design are under contract to provide rapid response on development proposals. This service is available to developers and communities that are confronting urban design, development and regulatory problems.

"Smart Development" Code Assistance: In an effort to remove regulatory obstacles to smart development, TGM staff and consultants help local governments with planning workshops and development code language. A model small cities development code and model infill/redevelopment handbook are also available.

Smart Development:

- **Provides a mix of uses.**
- **Uses land resources efficiently.**
- **Fully utilizes urban services.**
- **Provides transportation options.**
- **Uses detailed, human-scale design.**

Outreach and Education: TGM provides ongoing outreach to local communities in order to promote the concepts of smart development. Workshops for neighborhood groups, planning commissioners and members of the business community

are available throughout the state. Publications, such as this *Main Street Handbook*, and videos are available free of charge to Oregon residents.

State Bicycle and Pedestrian Grants

ODOT's Bicycle and Pedestrian Program administers two grant programs to assist in the development of walking and bicycling improvements: local grants and Small-Scale Urban Highway Pedestrian Improvement (SUPI) programs. For both these grants, cities that have adopted plans with identified projects will be in the best position.

Cities and counties can apply for local grants for bicycle and pedestrian projects within the right-of-way of local streets. Local Grants up to $100,000 are shared 80% State/20% local. Projects that consider the needs of children, elderly, disabled, and transit users are given special consideration. There must be support for the project from local elected officials. Applications for the Local Grant program are mailed out to all Oregon jurisdictions every other year.

In the SUPI process, cities and counties help ODOT identify sections of urban highways where improvements are needed. Examples of eligible projects include:

- completing short missing sections of sidewalks,
- ADA upgrades
- crossing improvements (e.g., curb extensions, refuges, crosswalks), and
- intersection improvements (e.g., islands and realignment).

SUPI projects are located on highways that have no modernization projects scheduled for the foreseeable future. Projects that have a local funding match are typically viewed the most favorably because this indicates strong local support. Projects on highways that cost more than $100,000, require right-of-way, or have environmental impacts need to be submitted to ODOT for inclusion in the STIP.

Special Transportation Fund

The Special Transportation Fund (STF) Program maintains, develops, and improves transportation services for people with disabilities and people over 60 years of age. Financed by a two-cent tax on each pack of cigarettes sold in the state, the annual distribution of this fund is approximately $5 million. Three-quarters of these funds are distributed to mass transit and transportation districts. Where such districts do not exist, counties receive funds on a per-capita basis. The remaining funds are distributed on a discretionary basis. The STF is managed by ODOT.

Special Small City Allotment Program

The Special Small City Allotment (SCA) Program is restricted to cities with populations under 5,000. Unlike some other grant programs, no locally funded match is required for participation. Grant amounts are limited to $25,000 and must be earmarked for surface projects (drainage, curbs, sidewalks, etc.).

The program allows jurisdictions to use the grants to leverage local funds on non-surface projects if the grant is used specifically to repair the affected area. Criteria for the $1 million in total annual grant funds include traffic volume, the 5-year rate of population growth, surface wear of the road, and the time since the last SCA grant. The SCA is managed by ODOT.

Immediate Opportunity Grant Program

The Oregon Economic and Community Development Department (OECDD) and ODOT administer a program designed to assist local and regional economic development. The primary factors in determining eligible projects for the Immediate Opportunity Fund Program are improvement of public roads, inclusion of an economic development-related project of regional significance, creation or retention of primary employment, and ability to provide local funds (50/50) to match grant. The maximum amount of any grant under the program is $500,000.

Oregon Special Public Works Fund

The Special Public Works Fund (SPWF), through OECDD, distributes grant and loan assistance from the Oregon Lottery for economic development projects in communities throughout the state. To be awarded funds, a project must support businesses wishing to locate, expand, or remain in Oregon. SPWF awards can be used for improvement, expansion, and new construction of transportation facilities. The SPWF emphasizes loans to assure that funds will return to the state over time for reinvestment in other local economic development projects.

Oregon Transportation Infrastructure Bank

The Oregon Transportation Infrastructure Bank (OITB) is a project financing tool for Oregon communities to help meet need for transportation system maintenance and improvements. As a project financing tool, the OITB works much like a private bank. It provides project loans and a range of credit enhancement services to help finance eligible transportation projects. Eligible projects are projects that meet federal-aid highway criteria or meet the definition of a transit capital project.

Eligible agencies are cities, counties, port districts, other special districts, state agencies, tribal governments, and private entities. The benefits include faster project completion, savings on maintenance costs by replacing worn facilities sooner, advancing high-priority TEA-21 federal funds to eliminate the 4–6 year waiting period for grants, and advancing other projects that have future sources of funding identified. Proposed projects must meet the OTIB selection criteria, including the ability to repay the loan. The OTIB has approved loans varying in size from $170,000 to $5 million.

An application for an OTIB loan is reviewed, scored, and ranked by ODOT, and then presented to the Oregon Transportation Commission, which approves or denies the loan. For approved applications, ODOT and the applicant enter into an interagency and loan agreements to close the loan. Loan terms vary from 2 to 10 years.

The Oregon Livability Initiative: The 21st Century Community Fund

The Oregon Livability Initiative was created by Governor Kitzhaber to encourage job creation in rural Oregon through investments in housing, transportation, water, and sewer. The initiative seeks to revitalize downtowns and main streets, reduce sprawl and traffic congestion, reward development of affordable housing, and rebuild rural and distressed economies.

The Oregon Livability Initiative includes the 21st Century Community Fund, which leverages existing revenues from both the Oregon Lottery and transportation funds to invest in affordable housing, transportation, water, sewer and main streets. This fund specifically targets rural and economically distressed communities, providing funding for passenger rail and connecting buses, elderly and disable transit services, access and right-of-way purchases, and improvements to the local street network.

The 21st Community Fund has been allocated as follows for the 1999-2001 biennium for transportation-related project:

- Passenger Rail & Connecting Buses, $10 million state general fund.
- Elderly & Disabled Transit Service, $9 million state general fund and $10 million federal funds (TEA-21), leveraging $6-10 million of DHR funds.
- Access/Right of Way Purchases,$20 million revenue bonds (highway fund).
- Local Street Networks, $30 million revenue bonds (highway fund).

The fund will be managed by OECDD.

The Oregon Livability Initiative also includes $25 million in revenue bonds to create a "Community Incentive Fund" administered by the Oregon Housing and Community Services Department. Flexible grants and loans will provide local governments and developers with state funds to help revitalize downtowns and community centers and put affordable housing close to jobs.

Urban Forestry Grants

The Oregon Department of Forestry's (ODF) Urban and Community Forestry Unit supports the stewardship of Oregon's urban and community forests. Part of the program's goal is to foster public awareness of the contributions urban forests make to the quality of life and the environmental and economic well-being of Oregon cities.

Through the Urban Forestry activities, on-site technical and financial assistance is available for communities, nonprofit groups, and civic organizations who want to plant and properly maintain trees within their urban areas, especially street trees. Written information on tree protection ordinances, inventories, tree care, planting, tree selection, and urban forest management are also available. Contact the ODF for more information on the Urban Forestry Program.

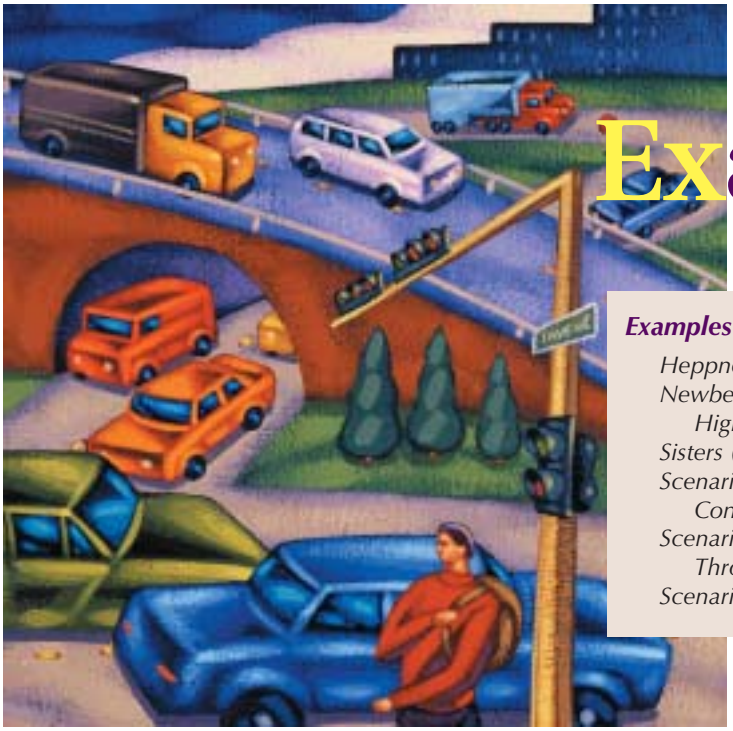
Transportation Equity Act for the 21st Century (TEA-21)

Several elements of TEA-21 can benefit main streets. The **Enhancement Program** provides federal highway funds for projects that strengthen the cultural, aesthetic, or environmental value of the transportation system. The funds are available for transportation enhancement activities specifically identified in TEA-21. Enhancement funds are available only for special or additional activities not normally required on a highway or transportation project. They cannot be used for routine or customary elements of construction and maintenance, or for required mitigation.

This federally-funded program earmarks $8 million annually for projects in Oregon. Projects must demonstrate a link to the intermodal transportation system, compatibility with approved plans, and local financial support. A 10.27% local match is required. Each proposed project is evaluated against all other proposed projects in its region.

Other elements of TEA-21 that could potentially be used for main street projects include the **Congestion Mitigation Air Quality Improvement Program** (funding for air quality non-attainment and maintenance areas, such as intersection and signal projects that improve traffic flow), and the **Transit Enhancement Program** which reserves a portion of public-transit funding for improvements such as pedestrian and bicycle access to transit.

In Oregon, TEA-21 funds are managed by ODOT. END



Chapter 6

Examples

Examples

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Scenario 1: Traditional Downtown with Constrained Right-of-Way 89
Scenario 2: Couplet with Heavy Through Traffic 91
Scenario 3: 5-Lane Highway 93

Three projects in Oregon were examined for the handbook. These projects—Heppner, Newberg and Sisters—covered a range of issues and responses. The case studies are summarized in this chapter.

Also, three hypothetical scenarios were added to help you envision how to apply the contents of this handbook to an actual street. The representations are fictional but give many aspects of typical situations found throughout Oregon. For comparison, we've chosen examples that show a range of existing conditions from a narrow traditional downtown to a more ample couplet created from two-way streets. Your main street, of course, will be unique.

The **first scenario** shows a traditional downtown located on a highway. It is an old street, with limited right-of-way and a number of historic buildings. It is also an important regional travel route, with a fair number of trucks. The town itself is a tourist destination. Speeds are low most of the time, but congestion is high on holiday weekends and when there is a special event. Parking is on-street but limited. The downtown is generally healthy, but the community is worried that traffic speeds are compromising its livability.

The **second scenario** shows a couplet on a highway of statewide importance through a smaller town. Many large trucks pass through town every day. Because the couplet was created by rerouting existing two-way streets, the right-of-way is ample. However, there are many driveways, building density is low, and traffic speeds typically exceed the posted limit of 25 mph. There are vacant storefronts and few buildings of historical interest. The community would like to make its main street a more attractive, vibrant place.

The **third scenario** shows a 5-lane highway in a downtown area that is mainly strip development.

Case Study 1

Heppner, Oregon

Pop. 1,500

Main St.

Highway Heppner Highway (Main Street in Heppner), OR-74 and OR-207 (junction in town)

Classification Regional Highway (OR-207), District Highway (OR-74)

Lanes 2 lanes

Length 0.5 mi

Width Unknown; 12-ft sidewalks.

Traffic Volume 1997 ADT

- 5,200 north of OR 206/207 junction (downtown)
- 6,000 peak in October
- 9% trucks (3+ axles)

Speed 25 mph

Parking On-street angled parking.

Adjacent Development Downtown core with stores, offices and apartments.

Intersections The project included 7 intersections. There were no signals.

Issues The highway was due for major maintenance: the pavement was in poor condition, the crown height was excessive from many overlays, drainage had failed, and the sidewalks were deteriorated. The City had developed a downtown strategic plan in 1991 which called for improvements to the sidewalks, landscaping, lighting, and general downtown appearance intended to retain a 50's feel.

Even with the existing 12-foot sidewalks, the wide right-of-way made crossing the street difficult and curb extensions were considered. At the same time as the street was being improved, an apartment building on Main Street was being renovated into senior housing. When the highway was scheduled for reconstruction in 1997, the City pushed to have other improvements done at the same time.

Actions Taken The City and ODOT, aggressively working together, pursued funding for the elements of the downtown improvements. ODOT did the roadway as part of scheduled modernization. The sidewalks including new curb extensions, pavers and irrigation were financed by enhancement funds. Trees came from an urban forestry grant. Individuals donated landscaping and benches, some of which were made by high school students. The electric company moved poles and wires underground.

The street was resurfaced one lane at a time so that traffic could get through.

Key Design Features

Complete makeover of the street in 1997, including:

✔ Pavement resurfaced.

✔ Angled parking retained.

✔ Central intersection constructed of concrete with inlaid and painted city logo.

✔ Sidewalks reconstructed with curb extensions.

✔ Utilities put underground (under paver strips).

✔ Irrigation (including water meters) and landscaping added.

✔ Lighting and street furniture added.

✔ A kiosk and small park were also added as part of another project.

Cost

- Reconstruct 0.5 mi of street: $1,292,000
- Replace 0.4 mi of sidewalks: $136,000
- Total project with enhancements: about $2,300,000

Lessons Learned

The project, although a resounding success, was not without problems. Given its scope and complexity, that was not surprising. Strong city leadership, business support, and extensive public involvement helped overcome obstacles, including:

- Public resistance once the project got started despite many meetings.
- Sometimes rocky relations between ODOT, the City, contractors and subcontractors.
- A major campaign to retain angled parking which is discouraged on state highways.
- Difficulty with old building entrances not matching up with the new sidewalks which caused ADA problems.
- Cost of putting city logo at intersection.

Overall, the citizens have been very happy with the results, although not everything turned out as expected:

- New sign poles for handicapped spaces and other purposes clutter the sidewalk and seem higher than necessary.
- The joint between the concrete intersection and asphalt paving is not holding up well.
- There have been some complaints that the angled parking is not angled enough and that the curb extensions are difficult to negotiate.

In summary, Heppner showed that an ambitious project can be accomplished with a vision for the main street, strong local support, coordination between agencies, good timing, and persistence.

Curb extension (top) & mid-block crossing (bottom)

Contacts

Renee Devin, Heppner City Treasurer, 541-676-9618

Tom Carman, ODOT Federal Aid Specialist, 541-567-1423

Case Study 2

Newberg, Oregon

Pop. 17,355

Hancock St.

First St. at River St.

Highway Pacific Highway, OR-99W (First Street/Hancock Street couplet)

Classification Statewide Highway

Lanes Couplet with 3 lanes eastbound (First Street) and 2 lanes westbound (Hancock Street)

Length 2.4 mi total (2 projects), about 0.45 mi on First Street.

Width 60-ft right-of-way; 5-ft sidewalks.

Traffic Volume 1997 ADT

- 37,900 at Main Street (OR 219)
- 41,300 peak in August
- 5% trucks (3+ axles)

Speed 25 mph posted downtown, 35–45 outside downtown core.

Parking On-street parallel parking on both sides of each street.

Adjacent Development Downtown core with stores, offices, civic buildings and some residences.

Intersections The complete project includes about 26 intersections, including intersections with 3 other state highways. The downtown improvements on First Street (Main Street to Meridian Street) include 7 intersections with 2 new signals.

Issues There are 2 related projects in downtown Newberg, one on First Street (eastbound leg of OR-99W until River Street where OR-99W becomes 2-way) and the other on Hancock Street (westbound leg of OR-99W) and the 2-way section of First Street.

These projects are the outcome of a planning effort begun several years earlier for the OR-99W corridor through Newberg. Issues identified were:

- Very poor pavement conditions.
- Severe traffic congestion along OR-99W and in downtown Newberg.
- Large numbers of long distance commuters using the highway (6,000 daily weekday round trips to Portland).
- Heavy recreational traffic on Fridays and weekends going to the coast.
- Extensive local access directly on highway.
- No alternate routes of sufficient length and capacity.
- Difficulty crossing and turning onto the highway.
- Poor pedestrian and bicycle conditions caused by speeding traffic and the multiple travel lanes.

Difficult crossing of First St. couplet.

- Above average crash rate.
- Traffic noise.
- General disruption of the downtown environment and business by traffic.

A previous study examined a potential tollway around Newberg and nearby Dundee, the cities most affected by through traffic on the highway. Many other transportation-related planning and project development activities were under way about the same time. These included ODOT's *OR-99W/18 Corridor Study, Dundee's Transportation System Plan*, and several growth management studies. In addition to these broad-based transportation system planning efforts, specific projects such as OR-99W (Brutscher to Main) and North Road in Newberg were also considered.

A range of alternatives were identified:

- No action beyond scheduled maintenance.
- Capacity increases to OR-99W through added lanes, intersection improvements, and access management.
- Pedestrians enhancements to the downtown core including wider sidewalks, street trees, high-visibility crosswalks, curb extensions, and pedestrian-scale lighting.
- Coordinated transportation system management and demand management to improve the efficiency of the existing facility and reduce travel demand.
- Interurban rail.
- A southern bypass tollway around Newberg and Dundee.
- A regional bypass.

The 2 bypasses and a combination of the other strategies were explored. No clear consensus about the best alternative emerged. Public comments reflected the complex tradeoffs between satisfying transportation needs, enhancing community livability, protecting the environment, and the regional nature of the problem.

Actions Taken

The First Street signals, curb extensions and bike lane were included in the State Transportation Improvement Program for 1998 and were completed in 1999.

The OR-99W project mentioned above (later called Everest to Main) was pursued through an Environmental Assessment and is in the State Transportation Improvement Program and will be started in 2000. The project includes reconstructing the roadway, adding a third travel lane and a bike lane to Hancock Street by removing parking on one side, adding off-street parking, straightening curves at the east end of Hancock to improve traffic flow, adding 2 signals to correspond with those on First Street, and constructing curb extensions at corners where parking will remain. None of the other proposed pedestrian improvements (wider sidewalks, landscaping, etc.) were incorporated.

Completed curb extension and bike lane.

Some sidewalk gaps on the 2-way segment of First Street will be filled. Proposed medians and landscape strips were not incorporated.

The various transportation management strategies failed to gain enough support and were not implemented. The bypass alternatives were dropped due to funding constraints.

Key Design Features

On First Street, 2 new traffic signals will be added (4 signals total in 7 blocks), 3 intersections will receive curb extensions, and a bike lane will be added. The 3 existing travel lanes and on-street parking on both sides will be retained.

On Hancock Street, 2 new traffic signals will be added (4 signals total in 7 blocks), a travel lane will be added (3 total) by removing parking on the north side, off-street parking lots will be developed, intersections will receive curb extensions on one side, a bike lane will be added, and street will be realigned where it turns onto River Street to join First Street.

Cost

Newberg Signals (Install various signals & improvements): $842,000

Everest St.–Main St. (Construct a left-turn lane and additional southbound lane): $7,087,000

Lessons Learned

This experience points to the need for a strong local vision to counteract the pressure of a major highway through the city's downtown core. After much planning and public involvement, no long-term strategy or consensus was reached. The resulting projects will improve the pavement condition, crossing opportunities and bicycle access but the overall downtown environment and the failing highway will need to be revisited.

Part of the difficulty in forming a strategy was the long planning process during which ODOT policies changed in regards to access management, multimodalism, and the American with Disabilities Act.

Unfortunately, the curb extensions on First Street encountered unexpected difficulties. Many years of pavement overlays were hiding old trolly tracks which prevented the pavement from being lowered sufficiently to easily accommodate curb extensions. The construction crew had to improvise the drainage with slotted channels and gutter lines. As a result, the curb extensions were more work than planned.

Contacts

Ron Clay, ODOT Region 2, District 3, Project Manager, 503-986-2691

Michael Morris, ODOT Project Team Leader, 503-986-2682.

Case Study 3

Sisters, Oregon

Pop. 850

Highway	McKenzie-Bend Highway, U.S. 20 (Cascade Street)
Classification	Statewide Highway
Lanes	2 lanes
Length	0.7 mi
Width	60-ft right-of-way on Cascade Street, 80 ft on Hood Street and Main Street; 6-ft sidewalks.
Traffic Volume	1997 ADT • 7,100 east of McKenzie Highway (Cascade Street) • 10,000 peak in July • 11% trucks (3+ axles)
Speed	25 mph posted
Parking	On-street parallel parking on Cascade Street, mostly angled parking elsewhere in downtown.
Adjacent Development	Downtown core with stores and offices.
Intersections	About 12 intersections; no signals or stops on Cascade Street.
Issues	Traffic is highly seasonal on OR-20 through Sisters, with the peak summer traffic being 2.5 times the winter traffic. There are 13 holidays and special events that bring many tourists to downtown. With on-street parking in the downtown and heavy pedestrian traffic during peak periods, as well as significant truck traffic, the highway experiences extreme delays 8 to 11 times a year. Traffic is generally tolerable the remainder of the time. When the City expressed concern over the periodic traffic jams, ODOT examined possible solutions. Since on-street parking is essential to the downtown, additional lanes could not be added. The primary alternative to improve traffic flow was a couplet; this seemed a good possibility with some relatively minor side-street improvements, but the idea generated controversy in the community and was eventually dropped. Traffic signals were also discussed.
Actions Taken	The solution chosen was to improve local circulation and parking, and to encourage traffic to use Main and Hood Streets during identifiable peaks. Businesses and residents were kept informed throughout the process. Hood Street one block south of Cascade Street was extended about 0.2 mi to the west which allows local traffic to bypass a section of the highway. Parking bays and curb extensions were installed on several side streets to provide dispersed parking throughout the city. Finally, temporary active signs of the type used by ODOT to alert motorists to special road conditions are set up to inform drivers of the parallel side streets to the highway; without the signs, they might not know of these alternate routes. This has proven to be very successful as businesses

have reported record sales during signage days. Evidently, the dispersed traffic and decreased congestion encourages people to stop and shop.

Key Design Features

✓ Added 0.2 mi of new street to enhance connectivity.

✓ Improved side-street parking and pedestrian access.

✓ Adopted active signing for peak travel days to inform drivers of route choices.

Cost

Unavailable.

Lessons Learned

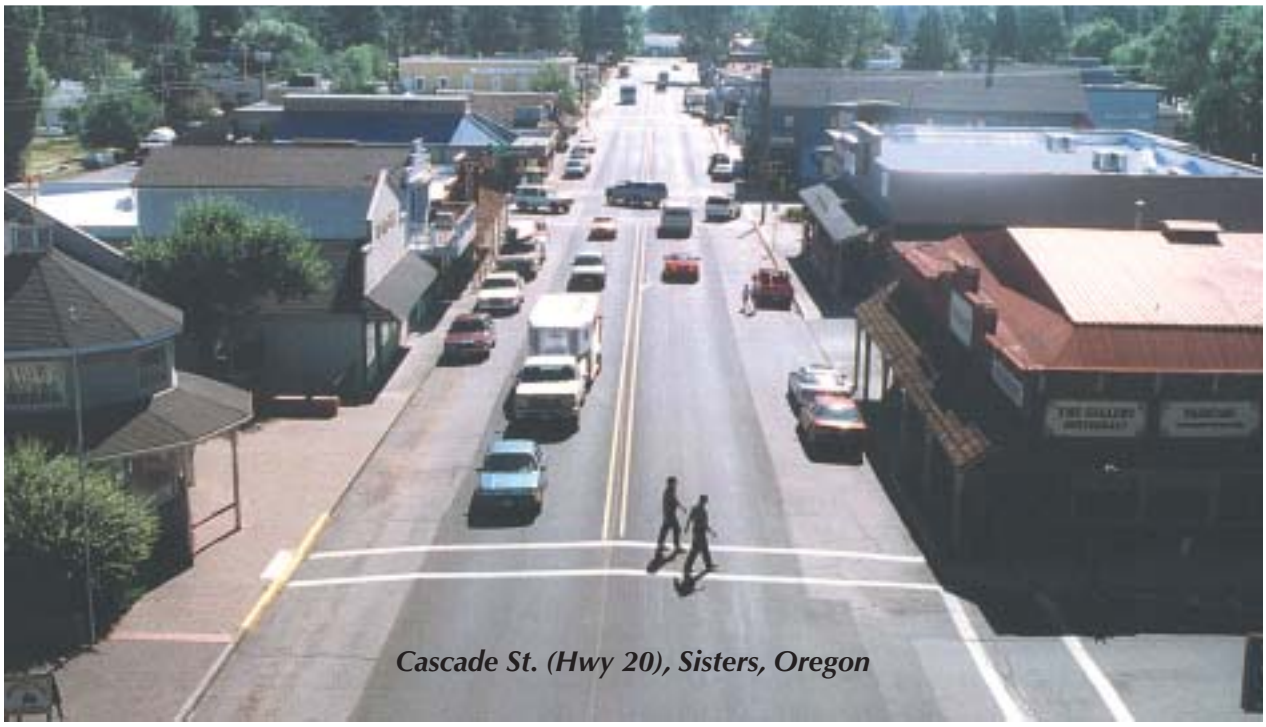
Sister's experience demonstrates that several simple solutions may be all that is needed to deal with peak traffic demands. A key ingredient was public support and confidence in the City's efforts to solve traffic problems.

Contact

Neil Thompson, Planner, City of Sisters, neilth@outlawnet.com, 541-549-6022.

Active, temporary signing ▶

◀ ***Parking & pedestrian improvements on side street***



Cascade St. (Hwy 20), Sisters, Oregon

Scenario 1

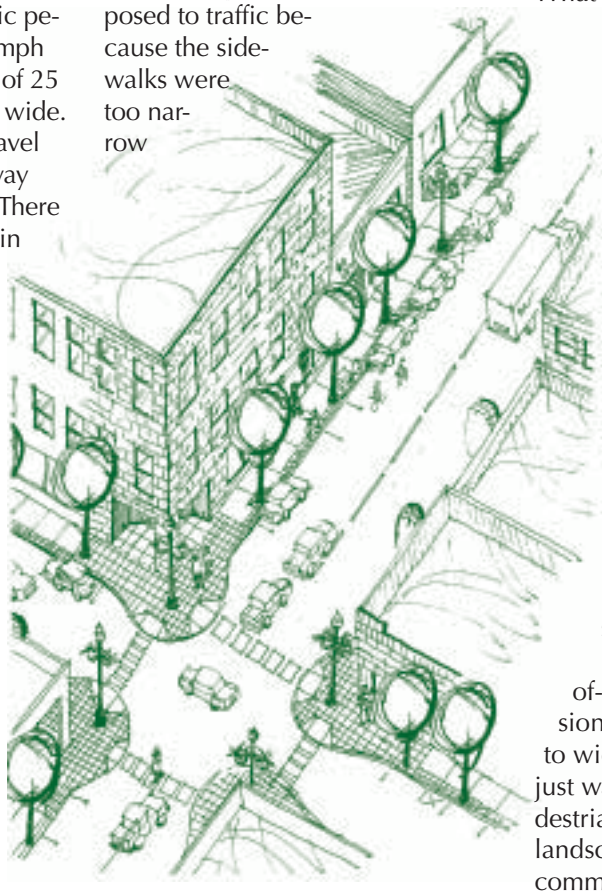
Traditional Downtown

The example of a traditional downtown is located in a fast-growing community of around 30,000. The commercial area is about 10 blocks long. The highway has moderate traffic levels (10,000 average daily trips), except on peak holiday weekends, and is designated as a highway of regional importance. Except at peak traffic periods, speeds were about 10 mph higher than the posted speed of 25 mph. The sidewalks were 8 ft wide. The highway had two 14-ft travel lanes within a 60-ft right-of-way with 8-ft wide parking lanes. There are a couple of traffic signals in the downtown, but they are several blocks apart. Buildings in the downtown are generally located at the front property line, and several of these are historic and 3–4 stories tall. There is a good diversity of commercial and service uses.

The problems?

The most common complaints were about "traffic" and not enough parking. When questioned more closely, the "traffic" concern expressed by citizens wasn't that there were too many vehicles, but that they were going too fast. This made it harder for pedestrians to cross the street, particularly because their visibility was limited by the on-street parking.

The "traffic" concern also turned out to be partly caused by noise, particularly from trucks shifting gears and braking at the town's two signals. It appeared upon examination that noise was accentuated by the tall buildings set relatively close to the street. Although it's generally desirable to have buildings set close to the property line in downtown, the sidewalk area in this downtown was too narrow relative to the building height and roadway area. Most of the noise complaints were from pedestrians, who felt exposed to traffic because the sidewalks were too narrow



to include any buffering such as street furniture and landscaping.

Excessive speed also exacerbated parking concerns by making getting in and out of on-street parking spaces intimidating. In addition, bicycles were not accommodated on the main street—there was not enough right-of-way for a bike lane, but speeds were too high for cyclists to mix with traffic.

So, it turns out that for this main street the central problem was traffic went too fast and the sidewalks were too narrow.

The Ingredients

What was the best solution for this community's problem of excessive speed? The first thing that the community decided to do was improve pedestrian conditions. This included adding curb extensions at all the corners in the downtown core, to shorten the crossing distances and increase the visibility of pedestrians waiting to cross. Curb extensions also have a traffic calming effect. Trees were placed in the extensions to preserve sidewalk width and to get them closer to the roadway so that motorists would feel that the street was narrower.

Because of the limited right-of-way, the most difficult decision the community made was to widen the sidewalks. Eight feet just wasn't wide enough for pedestrians, street furniture, and landscaping, especially since the community wanted to encourage street activities such as cafes (the total sidewalk width was only about 25% of the 60-ft right-of-way).

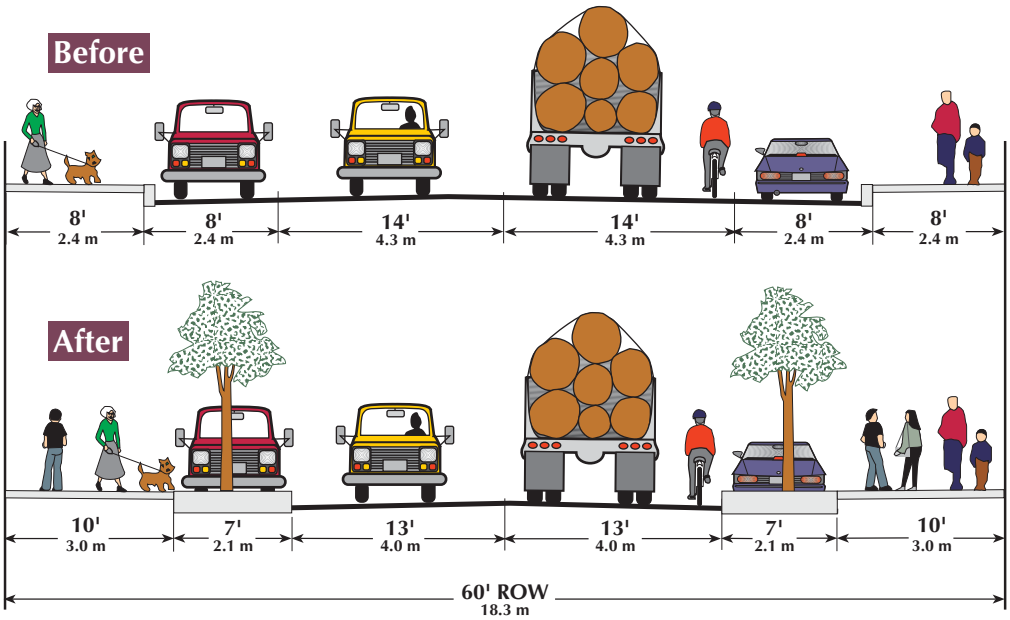
After looking at several alternatives in their downtown visioning exercise, the community decided that a 10-ft sidewalk was needed, based on the existing buildings, a 1-ft shy distance from the building

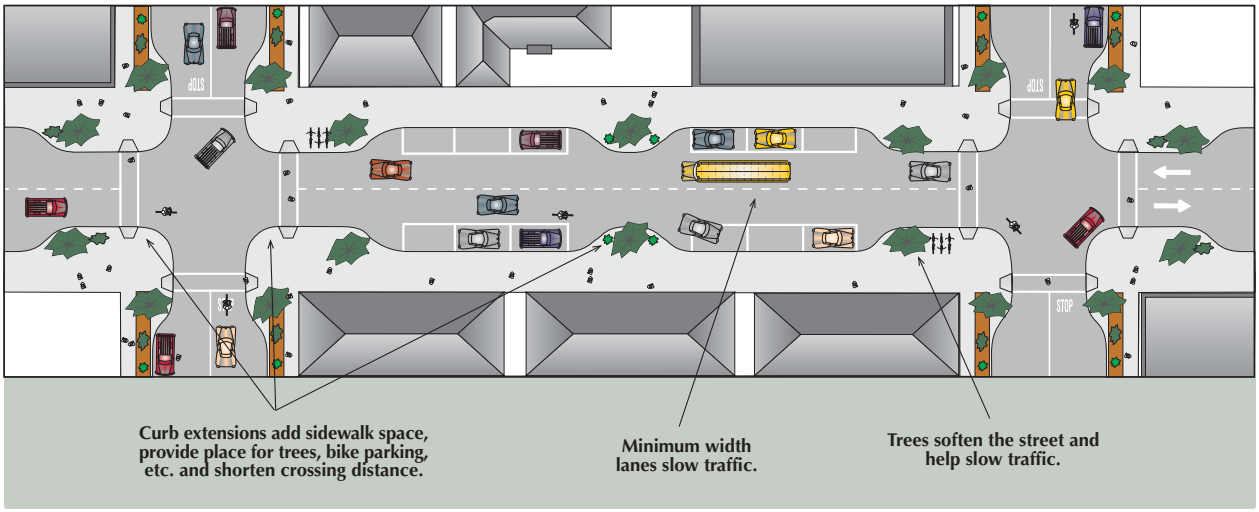
front, a 5-ft clear passage area, and a 4-ft street furniture and landscape area. The 10-ft width required no exception from ODOT because it is the standard minimum for downtown sidewalks. (This increased the total sidewalk width to about 35% of the 60-ft right-of-way.)

An exception from ODOT was required to narrow the combined parking lane and travel lane to 20 ft in each direction for the remaining 40 ft of right-of-way. Because the speeds were reduced, bicyclists could more easily share the travel lane with cars. A study showed that the narrower parking and travel lane will continue to provide sufficient capacity for the projected traffic, and would be consistent with the community's desires for lower speeds through the town.

Paying for It

ODOT had scheduled a preservation overlay for the main street in the STIP. The city requested an expansion of the project scope to include sidewalk widening and landscaping. Both of these improvements had been identified in the city's downtown plan. The ODOT Federal Aid Specialist and the city worked together to obtain funds from several sources, including the SUPI program for the sidewalk widening and the State Urban Forestry Program for street trees. Street furniture was selected and provided by the downtown association. The local electricity provider agreed to underground the utilities along the downtown. The city signed an intergovernmental agreement with ODOT to maintain the landscaping and sidewalk areas.





Traditional downtown with parking bays and curb extensions.

Scenario 2

Couplet

The couplet is in an agricultural community of around 10,000. The highway is of Statewide Importance, with high traffic levels (20,000 average daily trips) and over 5% large trucks. The commercial area is around 8 blocks long, on both legs of the couplet, with an interrupted grid of local streets on 400–600 ft blocks. Most businesses are set back from the roadway with parking in front. There is one signalized intersection in the center of town. There are two travel lanes and on-street parking in a 75-ft right-of-way.

The problems?

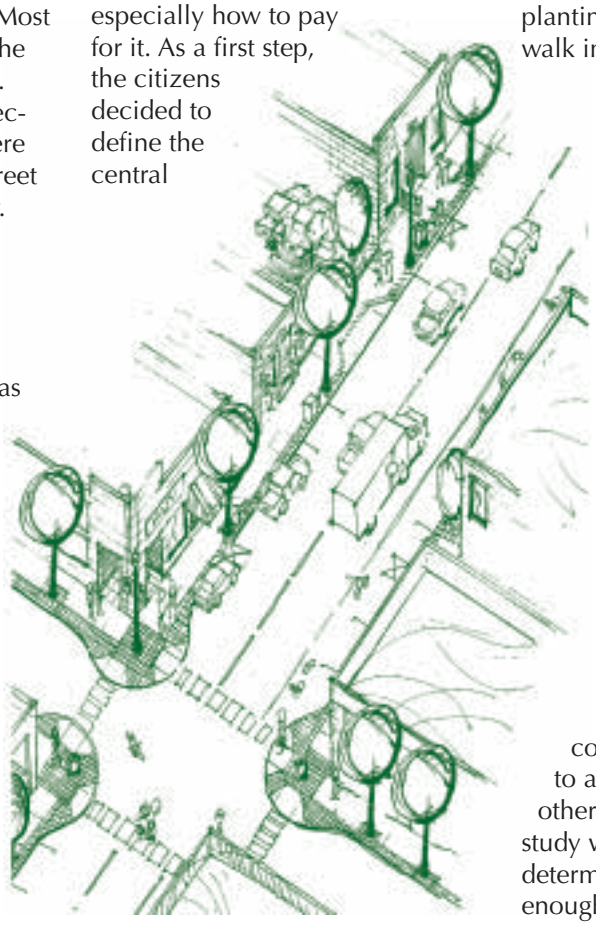
In this town, traffic was really going too fast for a downtown area. From a speed study, it was determined that the average motorist exceeded the posted speed by 10–15 mph. There was a higher than average collision rate, partly because there were many driveways, some of which stretched along the entire lot frontage.

It was very difficult for pedestrians to cross the highway except at the signalized intersection, which has a pedestrian phase activated by a push button. The sidewalk was only 6 ft wide, and segments were missing. In spite of a school being located one block off of the couplet, there were no facilities for bicycles.

In addition, the Chamber of Commerce despaired that the downtown was unattractive and lacked a "sense of place." There were few reasons for motorists passing through to stop. There were no street trees, benches, or other amenities.

The Ingredients

In spite of many citizens expressing concern, there was little consensus about what to do, and especially how to pay for it. As a first step, the citizens decided to define the central business district with a downtown plan. A plan was created that identified the central business district (CBD) as a smaller area of 4 blocks on each leg of the couplet. Within this CBD, the focus was on calming traffic and improving pedestrian conditions. Because there was ample right-of-way, all improvements were developed to full ODOT standards although it was understood that this would limit the effectiveness of traffic calming.



Curb extensions were added to all corners to the depth of the parking lane. Sidewalks were widened to 10 ft plus a 4.5-ft planting strip (or 14.5 ft of sidewalk in front of certain shops that wanted room for outdoor seating), and missing sidewalk segments built. Colored pavers were added to the edges of the sidewalks as an accent and to allow access to utilities and street trees were added to planting wells within the sidewalk. Benches, lighting, and waste receptacles were added. A bike lane was added to each leg of the couplet. The city is also working to close or combine private driveway accesses so that there are a maximum of two per block.

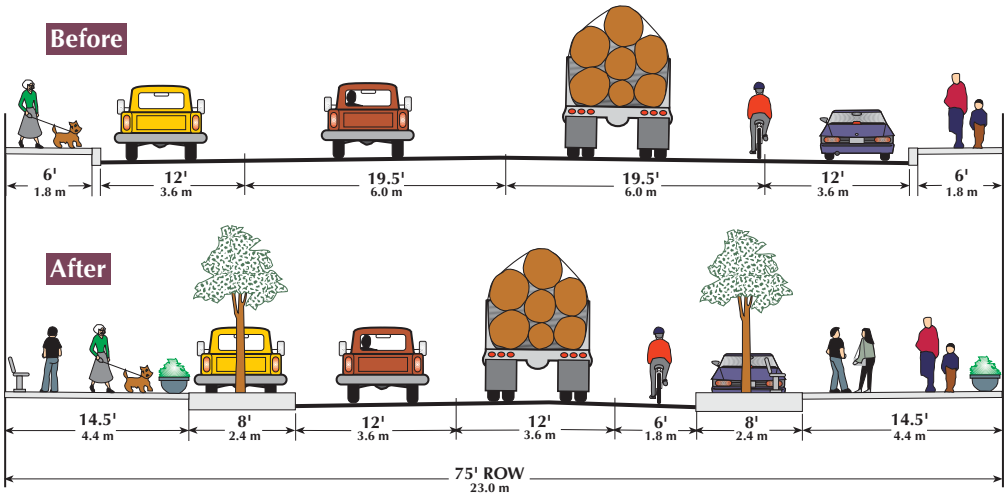
One alternative that was considered and rejected was to add more traffic signals to other intersections. After a traffic study was conducted, it was determined that there was not enough side street traffic, pedestrian traffic, or collisions to warrant a signal (most collisions were occurring at mid-block because of lack of access management).

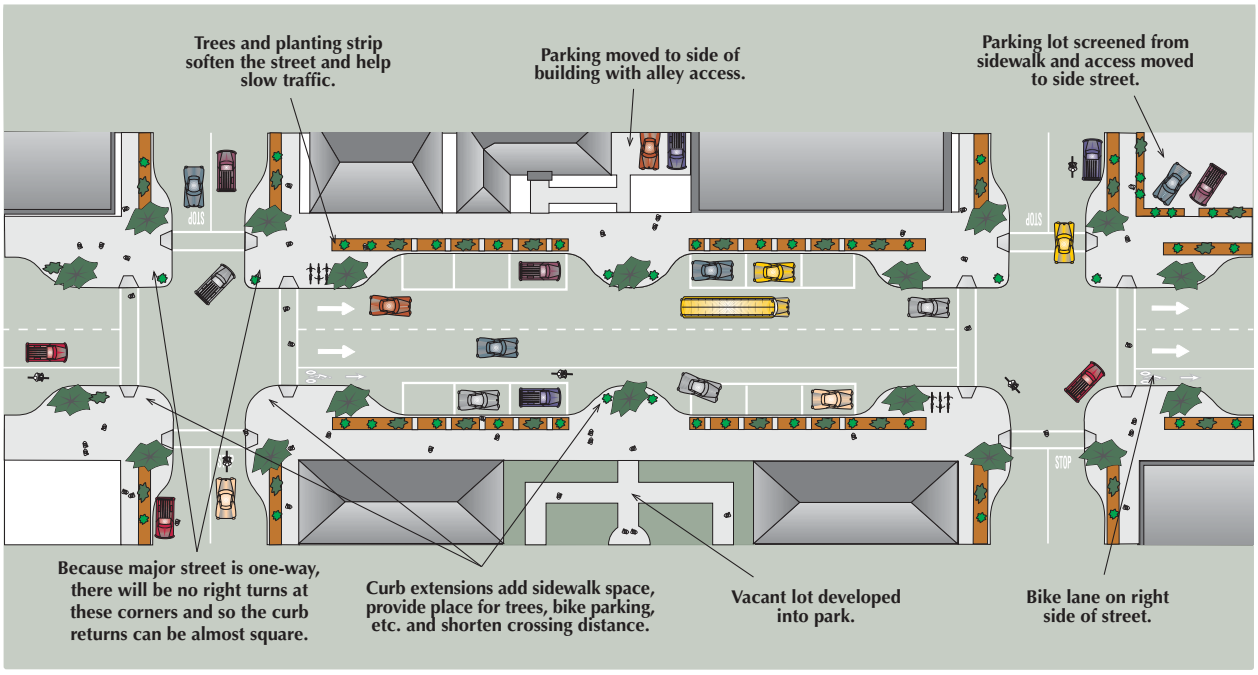
As part of the planning process, the citizens recognized the need to include some long-term goals that would help create the sense of place. One of these goals was to develop gateways to the central

business district with medians, sidewalks, and landscaping. This would help identify a transition from less developed areas into the CBD. It was also a long-term goal to improve the local street grid to provide alternative routes for local trips. As part of its vision, the plan would encourage businesses to move off-street parking to the sides or rear of businesses in the CBD, redevelop off-street parking areas with buildings to improve the street-front environment, and redevelop vacant lots with buildings or green spaces.

Paying for It

This project was almost entirely built by Federal Transportation Enhancement funds, matched by the city. The project included pedestrian and bicycle enhancements, as well as street beautification. Some additional landscaping was funded by citizens, who bought trees and dedicated them with a small imprinted brick laid into the pavement. The Park District signed an intergovernmental agreement with ODOT to maintain the street trees; the local downtown association contributes and maintains seasonal plantings and takes care of street furniture. The city pays for garbage pickup. A longtime resident recently left the city money specifically for a fountain in the downtown area.





Couplet with wide sidewalks, parking bays, curb extensions, and bike lane.

Scenario 3

5-Lane Highway

Portions of some state highways have been built or widened to 5 lanes, mainly with the goal of accommodating large traffic volumes while permitting direct business access. This example of a 5-lane highway is located on a highway of statewide importance through a mid-sized city of around 40,000 people. The highway carries an average of 30,000 trips per day with over 5% large freight trucks. The posted speed is 35 mph along the 6 blocks of downtown main street. The right-of-way is 80 ft. There is no on-street parking. Sidewalks are 6 ft wide and curb-tight. The center turn lane was 16 ft wide, plus 2 travel lanes in each direction.

The uses along the highway are almost all commercial, with parking out front. Each business has its own access, some of which are wider than 40 ft. Several businesses are car-oriented (a couple of fast food drive-through restaurants and a gas station/convenience store), but the oldest part of downtown has a post office and a library on opposite sides of the street. There are no traffic signals in the town.

There have been a significantly higher than average number of serious collisions along the 5-lane section over the last 5 years, and a pedestrian was killed two years ago. A shopping mall recently opened at one end of town, and the downtown has seen a decline in business since then.

A Transportation System Plan (TSP) was completed but the community did not support it, so it has not been adopted. However, a corridor plan has been completed and adopted that includes this section of highway.

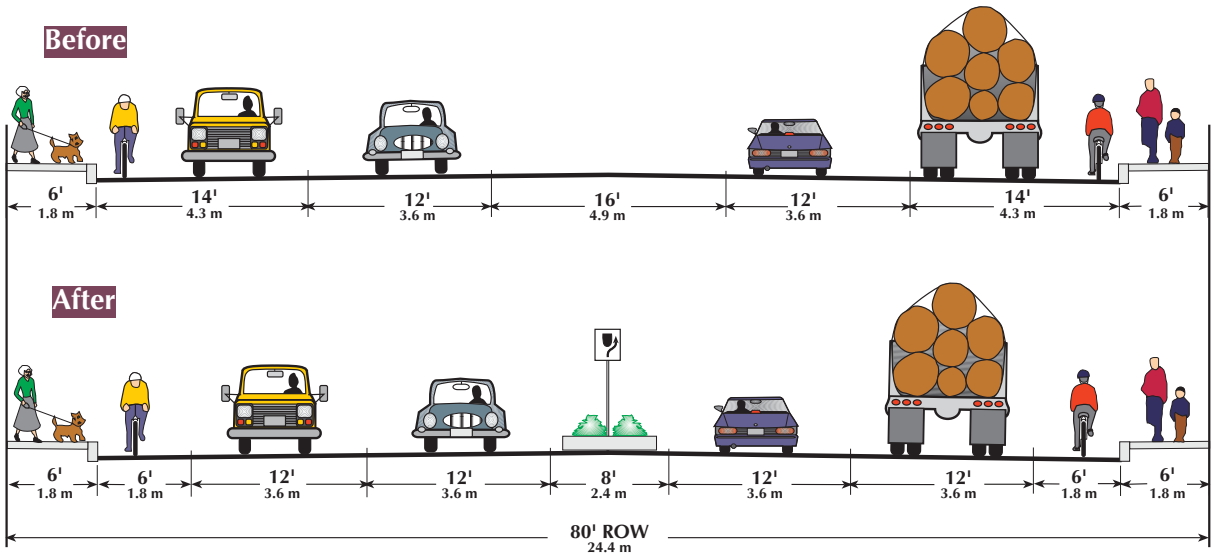
The problems?

The central concern of this community was safety. Many accidents appeared to be associated with vehicles turning left in and out of driveways. The local police said that many motorists use the center turn lane for passing. It also appeared that left turns across the two lanes of traffic generated some of the collisions. Speeding was apparently not a serious problem. From a speed study, the average motorist did not exceed the 35 mph speed limit.

The community was also worried about pedestrian safety; particularly where pedestrians were crossing from the post office to the library. Although there was a pedestrian warning sign and a marked crosswalk, motorists rarely stopped, and there was always uncertainty about whether motorists in the adjacent lane would also stop. In fact, this is how the pedestrian was killed two years ago.

The Ingredients

Two alternatives to solve the safety concern were identified in the corridor plan and discussed by ODOT and the community. The first of these was to restripe the street as 3 lanes, add a bike lane, and install on-street parking and



add bulbouts at intersections. This would eliminate some of the collisions caused by the left turns across two lanes. Three lanes would make it easier for pedestrians to cross, since the crossing width would be reduced. It would also eliminate the hazard of the motorist in the second lane failing to stop for pedestrians. However, because of the high volumes on this important freight and commuting route, there was concern that eliminating two lanes would result in an unacceptable loss of capacity.

Instead, the community decided to construct a center median through the most critical area, in terms of collisions and pedestrian crossings—around 4 blocks. The median provided access management to limit left turns and a pedestrian refuge. In addition, the median only needed to be 6 ft wide, so the remaining roadway width could be redistributed to create bike lanes. As well as providing for bicycles, the bike lanes provided some buffer for pedestrians on the fairly narrow, curb-tight sidewalks.

The transition areas where the median and bike lanes began and ended occurred at intersections where the change in lane configuration could be accommodated. In the future, the adjacent highway segments may be restriped for bike lanes instead of the wide outside lane.

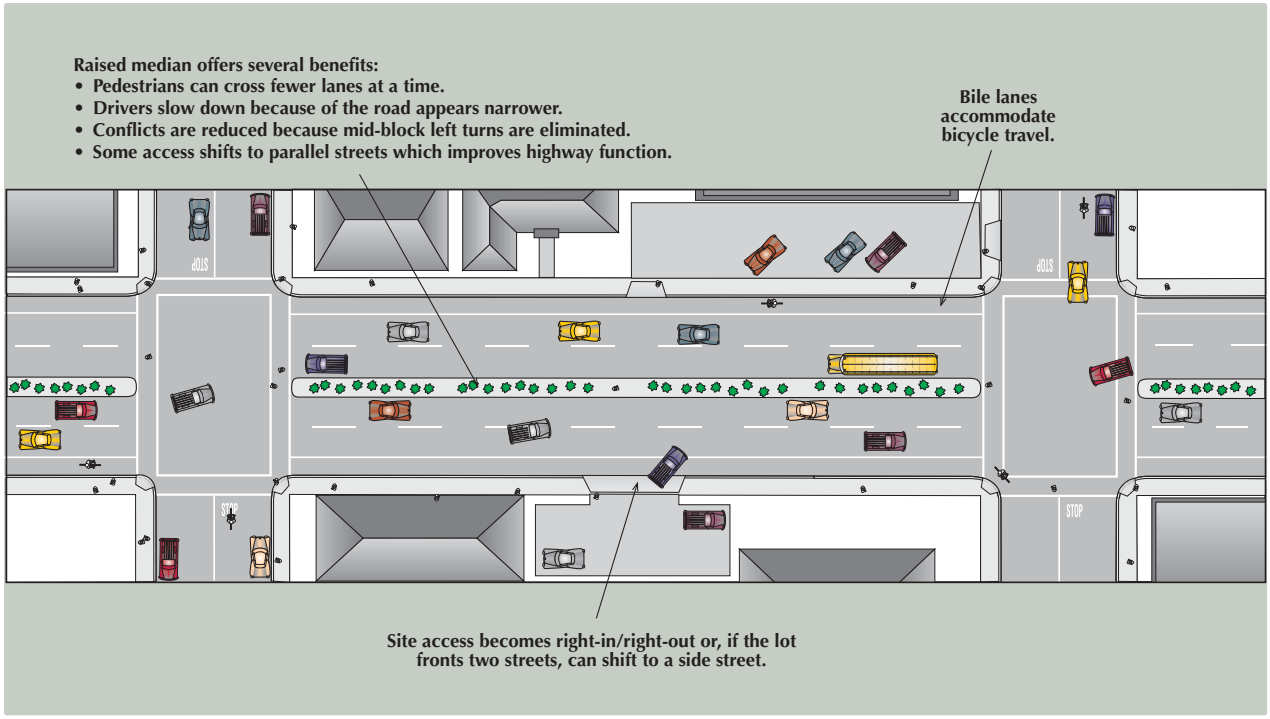
The discussions about the median generated new community interest in creating a long-term downtown plan. A number of merchants felt that widening sidewalks, adding landscaping and on-street parking on the side streets, and encouraging infill to bring buildings closer to the property line would help to bring the downtown back to life.

Paying for It

There was a measurable safety concern in this community, which ODOT had been aware of for several years. The median was identified as a potential solution in the highway corridor plan. The project was placed on the STIP and completed by ODOT the following year. The community asked for landscaping on the median; ODOT agreed to include low-water using native shrubs. The community committed to maintaining the landscaping.

Since the median was constructed, the collision rate appears to have been reduced, and pedestrians report that crossing the highway is somewhat easier.

The community is discussing obtaining a TGM grant for the long-term downtown plan and updating the TSP. END



5-lane highway with median and bike lanes.

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Chapter 7
Appendix

Glossary

AASHTO: American Association of State Highway and Transportation Officials. See also: Green Book.

Access Management: Measures regulating access to the highway from streets and driveways. Main streets generally feature short blocks with many street connections and few driveways, since most parking is on-street. Refer to the Oregon Highway Plan for access standards. See also: Deviation.

Area Commission on Transportation (ACT): A body chartered by the Oregon Transportation Commission (OTC) and composed of local transportation representatives, elected officials, and business representations of 2–4 counties. ACTs propose and comment on policy set by the OTC, propose programs and projects, and provide citizens and officials with a link to the OTC.

Americans with Disabilities Act (ADA): Civil rights legislation passed in 1990. ADA influences street design as described in the ADA Accessibility Guidelines (ADAAG). Most relevant aspects of ADA are discussed in the Oregon Bicycle and Pedestrian Plan.

Alignment: Geometric arrangement of the highway including width, slope, curvature, etc.

APWA: American Public Works Association.

Arterial: A road designated to carry traffic through an area rather than to local destinations.

Average Daily Traffic (ADT): The measurement of the average number of vehicles passing a certain point each day, usually given as a total for both directions. Traffic during the peak hour is normally about one-tenth of the ADT.

Balanced Use: The combination of land uses within an area, such as a downtown, such that residents do not need to leave the area on a daily basis.

Basic Rule: A state statute (ORS 811.100) that requires vehicles to be driven at speeds "reasonable and prudent" for the conditions (traffic, highway surface and width, intersection hazards, weather, visibility, etc.).

BID: Business Improvement District.

Bike Lane: A portion of a roadway which has been designated by striping and pavement markings for the preferential or exclusive use of bicyclists.

Bikeway: The appropriate design treatment for bicyclists, based primarily on motor vehicle traffic volumes and speeds. Main street bikeway types include the shared roadway, wide lane, shoulder bikeway, and bike lane.

Capacity: The number of vehicles that can travel past a given point on a sustained basis. Vehicle capacity responds to 3 factors: the number of travel lanes, the degree of connectivity, and generated traffic. In urban conditions, lane capacity ranges from 600 to 900 vehicles per hour.

Center Turn Lane: See: Continuous Two-Way Left-Turn Lane.

Central Business District (CBD): A traditional downtown area usually characterized by established businesses fronting the street, a concentration of public buildings, sidewalks, slow traffic speeds, on-street parking, and a compact grid street system. Main street usually runs through the CBD.

Channelization: The separation of vehicle and pedestrian movements at an intersection into defined paths through the use of islands.

Collector: A street designated to carry traffic between local streets and arterials, or from local street to local street.

Community: A sustainable human habitat which is complete and compact. The smallest community is a neighborhood.

Continuous Two-Way Left-Turn Lane (CTWLTL): A traversable median that is designed to accommodate left-turn egress movements from opposite directions. Aka center turn lane and two-way left-turn lane (TWLTL).

Corner Radius: See: Intersection Curb Radius.

Corridor Plan: A transportation plan for an entire length of highway which may include many different classifications. Corridor plans are coordinated with the cities and other jurisdictions through which the highway passes.

Couplet: Two one-way streets that handle traffic in the opposite directions. Couplets are typically created by converting existing two-way streets

Glossary (cont'd)

Cross-Section: Diagrammatic presentation of a highway profile at right angles to the centerline at a given location.

Crosswalk: Portion of a roadway designated for pedestrian crossing, marked or unmarked. Unmarked crosswalks are the natural extension of the shoulder, curb line, or sidewalk.

Deviation: A departure from an access management standard. See: Access Management.

Department of Land Conservation and Development (DLCD): State agency that assists cities and counties in applying Oregon's land use laws, and aids in assuring compliance with Oregon's Statewide goals and guidelines.

Design Exception: A deviation from the Highway Design Manual standards that must be approved by the Roadway Manager.

EID: Economic Improvement District.

Enclosure: One of the physical attributes of streets and open spaces that contributes to a sense of place. Enclosure is adjusted primarily by building setback and height, and by trees. See also: Vertical Plane.

Expressway: A highway that provides for safe and efficient high speed and high volume traffic with limited access. A main street is never an expressway.

Federal Highway Administration (FHWA): Federal agency which oversees and funds highway-related activities that affect the national interest.

Flexibility in Highway Design: A 1997 publication by AASHTO and the FHWA to accompany the Green Book. It shows engineers and managers how sensitivity to local needs can result in better projects.

Frontage Road: A road designated and designed to serve local traffic parallel and adjacent to a highway.

Gateway: An highly varied urban element which marks the entrance of a district. Gateways are useful for orientation within the city. See also: Transition Area.

Grade: A measure of the steepness of a roadway, bikeway, or walkway, expressed in a ratio of vertical rise per horizontal distance, usually in percent; e.g., a 5% grade equals 5 m of rise over a 100 m horizontal distance.

Grade Separation: The vertical separation of conflicting travelways with a structure, such as a pedestrian bridge over the highway.

Green Book: AASHTO's "A Policy on Geometric Design of Highways and Streets" which provides guidelines (not standards) for roadway design. The Green Book emphasizes joint use of transportation corridors by pedestrians, cyclists, and public transit vehicles, and encourages flexibile designs tailored to particular situations. In Oregon, the Green Book is modified by the Highway Design Manual. See also: Flexibility in Highway Design.

Grid Pattern: A web of intersecting streets, which is rectilinear in its alignment and orthogonal at its intersections. See: Street Network.

Highway: A general term denoting a public way for purposes of travel, including the entire area within the right-of-way. See sidebar on next page for specific highway classifications used in Oregon.

Human Scale: Site and building design elements that are dimensionally less than those intended to accommodate automobile traffic, flow and buffering.

Intersection Curb Radius: The curved edge of a thoroughfare at an intersection, measured at the edge of the travel lanes (excluding the parking and bike lanes). Aka corner radius and curb return radius.

Land Conservation and Development Commission (LCDC): A group of citizen volunteers appointed by the Governor to direct the Department of Land Conservation and Development.

Land Use: The type of activity that the land is used for. On a main street, common land uses are commercial, office, residential, light industrial, and public (library, city hall, etc.).

Level of Service (LOS): The condition of traffic flow or delay expressed as a range from LOS "A" which represents unimpeded flow to LOS "F" which represents severe congestion. LOS was replaced by "mobility" in the 1999 Oregon Highway Plan.

Local Street: A street designated to provide access to and from local residences or businesses.

Median: The portion of the roadway which separates opposing traffic streams.

Mobility: In planning terms, mobility is the ordinary movement of the population by any means, including by direct travel or by means which reduce the need to travel such as proximity of destinations and teleworking. In highway terms, mobility is defined as the movement of vehicles.

Mobility Standard: ODOT has established performance goals for different highway classifications to aid in planning, design, and management. Motor vehicle mobility is determined by volume-to-capacity ratio. Refer to the Oregon Highway Plan for mobility standards. See: Volume-to-Capacity Ratio.

Mode (or Modal): A means of moving people or goods. Modes such as rail, transit, carpooling, walking, and bicycling that provide transportation alternatives to single-occupancy automobiles are sometimes called "alternative modes."

Modernization: Highway projects that accommodate existing traffic or projected traffic growth by adding capacity. See: Preservation.

Glossary (cont'd)

MUTCD: Manual on Uniform Traffic Control Devices for Streets and Highways published by the Federal Highway Administration, 1988; a national standard for the design, application and placement of traffic control devices including traffic signals, signs, and pavement markings. Discussion of pedestrian needs is limited.

National Highway System (NHS): A system of statewide and interstate highways and intermodal connectors meeting federal criteria (approximately 155,000 miles total), designated by Congress in the National Highway System Designation Act of 1995.

National Register of Historic Places (NRHP): See: SHPO.

Oregon Administrative Rule (OAR): A rule written by a government agency intended to clarify the intent of an adopted law.

Oregon Bicycle and Pedestrian Plan: As adopted June 14, 1995, establishes bicycle and pedestrian policies and implementation strategies for ODOT, presents detailed design, maintenance and safety information, and provides facility design standards. The Bicycle and Pedestrian Plan covers many main street issues such as speed reduction, lane widths, medians, crossings, and intersections. The plan stresses good roadway design that takes into account the needs of all users.

Oregon Department of Transportation (ODOT): The agency entrusted with moving people and products by all modes to enhance the state's economy and livability.

Oregon Highway Design Manual (HDM): In draft as of October 1999; final Manual is expected to be published in early 2000. The Manual will assist designers in selecting the appropriate standards for a highway project. In particular, it expands the discussion of urban highway design to include traditional downtowns and central business districts. The intent within these areas is to provide a pedestrian, bicycle, and transit friendly environment.

Oregon Highway Plan (OHP): As adopted March 18, 1999, establishes policies and implementation strategies for Oregon highways, including those that are also main streets. The highway plan strikes a balance between local accessibility and through movement of people and goods. It establishes highway classifications as a tool to sort out investment priorities for highway projects. Designations for downtown commercial areas stress pedestrian access. Segment classifications are set by ODOT in collaboration with the affected cities and counties. See also: Special Transportation Area.

Oregon Revised Statute (ORS): A law that governs the state of Oregon, as proposed by the legislature and signed by the Governor.

Oregon Highway Classifications

(*could be a main street)

Categories

Interstate: Links major cities and other states.
***Statewide:** Links major destinations not on Interstate.
***Regional:** Links regional centers.
***District:** Links county and city areas.
***Local Interest:** Generally local arterials with little through traffic.

Sub-Categories

Freeway: High-speed, high-volume, controlled access.
Expressway: High-speed, high-volume, limited access.
***Urban Arterial:** High-volume urban street; many potential land uses; further subdivided into Urban Fringe/Suburban, Developed, and Traditional Downtown/Central Business District.

Land Use Designations

***Special Transportation Area:** Traditional downtown or central business district; low-speed, on-street parking, many street connections, and few driveways; often pedestrian oriented.
Commercial Center: Large commercial, mixed-use development (400,000+ ft^2) with convenient internal circulation including provisions for pedestrians, bicyclists and transit, where available. Adjacent to and linked to the highway by a road or driveway.
Urban Business Area: Highway segments where vehicular accessibility is important to continued economic viability. Accommodates automobile access. Requires plans to improve pedestrian movement, cluster new buildings in centers or nodes, and improve movement between, across, and within urban business areas.

Other Designations

***Freight System:** Long-haul truck movement a priority; has higher mobility standard.
***Lifeline Route:** Emergency route maintained for potential mass movement.
***Scenic Byway:** Exceptional scenic value that may affect design.

Oregon Transportation Plan (OTP): As adopted September 15, 1992, the OTP defines transportation goals, policies and actions for the next 40 years, and identifies a coordinated multimodal transportation system to be developed over 20 years. It gives increased emphasis to public transit, intercity bus service, railroads, bicycles and walking, and supports the development of compact, walkable communities. The OTP envisions downtown cores that are healthy central hubs for commerce within an urban region.

Parking Lane: The recommended width for parallel parking lanes along a highway is 8 ft (2.4 m), with 7 ft (2.1 m) as an exception in constrained right-of-ways.

Pavement Markings: Painted or applied lines or legends placed on a roadway surface for regulating, guiding, or warning traffic.

Glossary (cont'd)

Pavement Width: The width of vehicular pavement of a street, including moving and parking lanes but excluding planters and sidewalks. See also: Roadway.

Pavement: The impervious surface dedicated to the circulation and parking of vehicles. Sound environmental practice endeavors to minimize paved area which is considered detrimental to the watershed and increases the cost of drainage.

Peak Hour: Hour of the day with the most traffic, usually during the evening commute time but sometimes including the morning commute time or early afternoon.

Pedestrian: A person on foot, in a wheelchair, or walking a bicycle.

Pedestrian Friendly: Design qualities that make walking attractive, including places people want to go and good facilities on which to get there.

Pedestrian Scale: See Human Scale.

Planting Strip: That section of the sidewalk area which accommodates street trees and scrubs.

Preservation: Projects that rebuild or extend the service life of highways. Preservation projects add useful life to the highway without increasing capacity. See: Modernization.

Prospectus: An internal ODOT tool that defines a project in its planning stage. The prospectus describes project limits, costs and funding, environmental issues, and approvals.

Quality of Life (QOL): A measure of human well-being related to personal choice, including availability of leisure time, discretionary income, and travel options.

Raised Median: A nontraversable median where curbs are used to elevate the surface of the median above the surface of the adjacent traffic face. Pedestrians may normally cross the median but vehicles may not. See: Median.

Refuge Island: A nontraversable section of median or channelization device on which pedestrians can take refuge while crossing the highway.

Right-of-Way (ROW): The composite public area dedicated exclusively to circulation—both physical and social—including the roadway and pedestrian area.

Roadway: The paved portion of the street which is primarily occupied by vehicles, including the travel lanes and parking lanes. The roadway may also include a median and refuge islands.

Roadway Manager: The ODOT person responsible for making exceptions to the design standards.

Roundabout: An intersection design where traffic circulates around a central island rather than proceeding straight through and which has special features to reduce conflicts inherent in conventional intersections.

Secondary Route: A parallel road to main street suitable as an alternate route for through traffic, especially trucks.

Sense of Place: A highly desirable but elusive quality of a neighborhood or city, often recognized only when it is lost. An effective sense of place is created by many interdependent elements, such as: the setting, buildings, streets, meeting places, connections between important places, activities, and the presence of people.

Shared Roadway: A type of bikeway where bicyclists and motor vehicles share a travel lane.

Shoulder: The portion of a highway that is contiguous to the travel lanes provided for pedestrians (when there is no sidewalk), bicyclists, emergency use by vehicles, and for lateral support of the base and surface.

Shy Distance: The lateral (side) clearance of a walkway or vehicle travel lane as measured from the outside edge of the walkway or lane to the nearest vertical obstacle such as a building, fence, or pole.

Sidewalk: A walkway separated from the roadway with a curb, constructed of a durable, hard and smooth surface, designed for preferential or exclusive use by pedestrians.

Sidewalk Area: That portion of a street right-of-way which is dedicated to uses other than moving and parking vehicles. It includes primarily the sidewalks, plantings, and street furniture.

Sight Distance: The distance a person can see along an unobstructed line of sight.

Slip Lane: A wide-radius, right-turn channel to facilitate high volumes of turning vehicles. See: Channelization.

Small-Scale Urban Highway Pedestrian Improvement (SUPI): An ODOT program administered by the Oregon Bicycle and Pedestrian Program that helps cities and counties complete small pedestrian projects on urban highways.

Smart Development: Development that implements the state's land use and transportation goals in urban areas. It is "smart" because it: uses land efficiently; facilitates a range of transportation choices; fully utilizes existing public facilities; combines residential, commercial, and community service activities within a neighborhood to create a lively and safe environment; is designed to the scale and comfort of people; and uses locally-appropriate design to reinforce community identity and heritage.

Special Transportation Area (STA): A highway classification identified in a corridor plan or local transportation system plan. An STA is characterized by a downtown, business district, or community center on an Urban Arterial (not Expressway) with speeds no more than 25 mph (40 km/h), frequent street connections, and on-street parking.

Glossary (cont'd)

In an STA, local access and pedestrian travel is more important than through traffic movement. The STA designation allows changes from the usual highway standards within the downtown, such as shorter block lengths and higher levels of local congestion. This is balanced by strict access management on the highway outside of the downtown. STAs, as well as the other land use area designations, are applied to a specific area through the adoption of a Transportation System Plan or Corridor Plan. (Through the ODOT Exception Process, some STA design elements may be applied to an appropriate highway segment when not a designated STA.) See also: Oregon Highway Plan.

State Historic Preservation Office (SHPO): Agency primarily concerned with the preservation of historic structures and districts, such as property on, or eligible for, the National Register of Historic Places. Any use of federal highway funds in a main street project requires review by SHPO to determine if the project could have an adverse effect on historic resources.

State Transportation Improvement Program (STIP): ODOT's adopted list of major projects covering 4 years.

Street: A place of movement and activity, defined by the continuous line of buildings along its edges which have a particular scale, dimension, form, and detail unique to each street.

Street Network: A web of intersecting streets, which may be diagonal, curvilinear, or irregular in its alignment and variable at its intersections. See: Grid Pattern.

Streetscape: The combination of planters, sidewalks, street trees, and street lights.

Terminal Vista: A building, sculpture, hill, or other large object at the end of a street segment. A terminal vista tends to slow the motorist and gives the pedestrian a landmark with which to orient themselves.

TIF: Tax Increment Financing.

Threshold Gap: The distance from a pedestrian to an oncoming motor vehicle sufficient for 50% of pedestrians to choose to cross a street.

Traffic Calming: A set of techniques which serve to reduce the speed and aggressiveness of traffic. Such strategies include lane narrowing, on-street parking, sidewalk extensions into the roadway, surface variations, and visual clues on a vertical plane. Although traffic calming is often a retrofit to deal with identified problems, it is also an important aspect of new construction to prevent problems from occurring. See: Traffic Priority Device.

Traffic Control Device: Signs, signals or other fixtures, whether permanent or temporary, placed on or adjacent to a travelway by authority of a public body having jurisdiction to regulate, warn, or guide traffic.

Traffic Management: The mitigation of traffic congestion achieved by methods other than proximity of destinations, road construction, or the provision of transit. The principal methods are: transit, car-pooling, staggering of work hours, and variable rate road tolls.

Traffic Priority Device: The various techniques which assign priority to the moving vehicle at the expense of the pedestrian; having the opposite effect of traffic calming.

Traffic Volume: The number of vehicles that pass a given point for a given length of time (hour, day, year). See: Average Daily Traffic and Capacity.

Transit: The four general types of transit systems are heavy rail, light rail, buses, and trolleys. In addition, there are hybrids such as taxi fleets and rental cars.

Transit Stop: The waiting area for bus or rail. The experience of waiting is considered to be as important as any other consideration in encouraging the use of transit by those who have the choice.

Transition Area: A length of street where an obvious changes occur such as street width, building types, speed limit, or landscaping. A well-defined transition area before main street may be necessary to help slow traffic. See also: Gateway.

Transportation Demand Management (TDM): Actions which are designed to change travel behavior in order to improve performance of transportation facilities and to reduce need for additional road capacity. Methods may include but are not limited to the use of alternative modes, ride-sharing and vanpool programs, and trip-reduction ordinances.

Transportation Growth Management (TGM): A program administered by the Department of Land Conservation and Development to assist cities and counties in dealing with transportation issues.

Transportation Needs: Estimates of the movement of people and goods consistent with an acknowledged comprehensive plan and state requirements such as the TPR. Needs are typically based on projections of future travel demand resulting from a continuation of current trends as modified by policy objectives (such as avoiding principal reliance on any one mode of transportation).

Transportation Planning Rule (TRP): Oregon Administrative Rule 660-12 that establishes the relationship between transportation and land use planning. The TPR stresses that a community's land use plan amendments and zone changes that may affect a transportation facility should be consistent with the adopted function, capacity, and performance measures for the affected facility. Some of the TPR requirements that applicable to main streets include bicycle parking, bikeways and sidewalks, and safe and convenient pedestrian and bicycle access from the sidewalk,

Glossary (cont'd)

transit stops, adjacent development, and residential and neighborhood activity centers within one-half mile.

Transportation System Plan (TSP): A plan for one or more transportation facilities that are planned, developed, operated, and maintained in a coordinated manner to supply continuity of movement between modes, and within and between geographic and jurisdictional areas.

Travel Lane (aka Driving Lane): Area of roadway dedicated to vehicle movement. The recommended width for highways is 12 ft (3.6 m), with 11 or 10 ft (3.3 or 3.0 m) permitted in constrained right-of-ways under certain conditions.

Urban Arterial: A major street in an urban area. See: Arterial.

Utilities: General term for urban infrastructure, excluding transportation. Utilities include electricity, telephone, fiber-optic cable, gas, water, and sewer. While streets run within public right-of-ways, utilities run within easements which may overlap private lots.

Vehicle Miles Traveled (VMT): The average length of a vehicular trip. VMT is one measure of the effectiveness of balanced use as a measure of traffic mitigation.

Vertical Plane: The vertical aspect of a building or streetscape, as opposed to the horizontal plane, which is the plan view.

Volume-to-Capacity Ratio (V/C Ratio): A measure of roadway congestion, calculated by dividing the number of vehicles passing through a section of highway during the peak hour by the capacity of the section. See: Capacity and Congestion.

Walking Distance: The distance which may be covered by a five-minute walk at an easy pace. This is the distance that most people will walk rather than drive, providing the environment is pedestrian-friendly.

Vehicle: Any device in, upon, or by which any person or property is or may be transported or drawn upon a highway, including vehicles that are self-propelled or powered by any means.

Walkway: A transportation facility built for use by pedestrians, including persons in wheelchairs. Walkways include sidewalks, paths, and paved shoulders.

Wide Outside Lane: A wider than normal curbside travel lane that is provided for ease of bicycle operation where there is insufficient room for a bike lane or shoulder bikeway; normally 14 ft (4.2 m). END

Resources

Livable Oregon
621 SW Morrison, Suite 1300
Portland, Oregon 97205
503-222-2182
http://www.livable.org

Oregon Department of Forestry
2600 State Streen
Salem Oregon 97310
503-945-7213
http://www.odf.state.or.us

Oregon Department of Transportation
Transportation Bldg.
355 Capitol St. NE
Salem, Oregon 97301-3871
888-275-6368
http://www.odot.state.or.us

Oregon Downtown Development Association
161 High Street, SE #236 or PO Box 2912
Salem, Oregon 97308
503-587-0574
http://www.odda.org
e-mail: info@odda.org

Oregon Economic and Community Development Department
775 Summer St., NE
Salem, Oregon 97310
503-986-0123
http://170.104.101.34/DEPT.HTM

Oregon Parks and Recreation Department
State Historic Preservation Office
1115 Commercial St. NE
Salem, Oregon 97310
503-378-4168
http://arcweb.sos.state.or.us/SHPO/shpoabout.html

Transportation Growth Management Program
635 Capitol St. NE Suite 200
Salem, Oregon 97301
503-373-0050
http://www.lcd.state.or.us/issues/tgmweb

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