6.0 ENVIRONMENTAL CONSIDERATIONS

The City of Fort Collins continues in its goal to be a steward to the environment. Both at the government and community level, there is a great sensitivity to the footprint that Fort Collins puts on its local environment. An overall goal is to maintain or improve environmental conditions, while having an efficient multi-modal transportation system. Achieving this goal will require a commitment to mitigate the adverse environmental impacts of transportation projects, development and use interdisciplinary teams from diverse City departments and advisory boards in transportation planning and project design, and consideration of environmental relationships throughout the transportation planning process.

Another idea that is at the forefront of consideration for environmental resources is context-sensitive design/solutions. Agencies like the Federal Highway Administration (FHWA) and the State Departments of Transportation are developing policies and procedures for integrating the local surroundings into the design of transportation projects. The City should continue its policy to first avoid, then minimize, then if necessary, mitigate any environmental impacts related to transportation projects as one aspect of providing context sensitive solutions. Other considerations include the community setting or character and a focus on public involvement in the planning process in developing a solution that fits its surroundings.

6.1 ENVIRONMENTAL IMPACT APPROACH

Transportation projects, like many other infrastructure improvements have the potential of adverse impacts on the environment. While the desire is to avoid these impacts whenever possible, some times avoidance is not possible. The challenge is to balance the need to provide necessary infrastructure and the resulting impact on the environment. The City should plan to address environmental impacts through a hierarchical approach that includes:

1. Avoiding the impact altogether by locating transportation projects in such a way as to limit the potential for environmental harm
2. If avoidance is not possible, minimizing impacts by limiting the degree or magnitude of a harmful action, including changes in operations or maintenance after the project is constructed
3. Mitigating the impacts by repairing, rehabilitating, or restoring the affected environment or by providing substitute environment or natural resources either at the project site or in a different location

This approach needs to be followed to provide the balance between maintaining the environmental resources that are important while developing the transportation system that meets the communities' needs. Mitigation measures are often defined by the specific state or federal agency with jurisdiction over the resource, but the City should be an active participant in developing mitigation strategies. The City should also strive to maintain positive relationships with these agencies to provide the right balance between developing infrastructure and protecting the environment.

6.2 INTERDISCIPLINARY COOPERATION

Because Fort Collins' residents place a high priority on a diverse set of environmental values, the City needs to implement an interdisciplinary approach to transportation planning and design. For example, a hypothetical transportation project that involved a new bridge crossing over a river could simultaneously involve transportation demand, floodplain management, water quality, wetland protection, rare species, noise, and aesthetic issues.

An interdisciplinary team with specialists from Transportation, Stormwater, Natural Resources, and Planning (and perhaps others) should be involved in evaluating the potential adverse effects of the project considering tradeoffs among resources, and developing creative alternatives to address issues. Several City departments already collaborate to some degree on many projects, but the protocols are not in place to clearly define the process of when the collaboration should take place to provide the maximum benefit for all disciplines involved. The City should consider developing a protocol to establish the type and size of project where an interdisciplinary team would be necessary. These protocols should also address membership on the team and the how the team will provide input into the project. This team is not intended to make developing a project more difficult, but should provide for better planning earlier in the project to eliminate delays as the project becomes more defined. Many agencies use milestones in their planning and design processes to bring in an interdisciplinary team to make sure the project is moving in the right direction from all of the different perspectives. This could be achieved by evaluating all transportation projects through a review process similar to that currently used to evaluate development proposals.

Finally, environmental issues need to be considered throughout the transportation planning process. The earlier in the transportation planning process that environmental concerns are identified, the easier it will be to identify options for mitigating adverse impacts. Certain options may only be possible if the environmental relationships are considered early in the process at the system master planning level. Other options may only be implemented in later stages of transportation planning, for example, during specific project design. Regardless of whether interdisciplinary cooperation is initiated at the system or project level, such an approach would provide a benefit in implementing projects of all types, not only transportation.

6.3 ENVIRONMENTAL RELATIONSHIPS

Fort Collins is in an area that has several environmental resources that help to define the community. Understanding these resources and their relationship with the transportation system is an important aspect of providing a balance between what can be at times considered competing needs. Resources like air quality, water quality, open space/natural areas, stream corridor/wetlands, protected species, noise, and aesthetic values are all important considerations when planning and designing transportation projects. Transportation projects have the potential for both positive and negative impacts on the community values defined in the *City Plan*. Recognizing this potential is the first step, but developing policies to avoid, minimize, and then mitigate these impacts while balancing the need for infrastructure is the challenge.

6.3.1 Air Quality

Fort Collins continues its concern about air quality and the potential health and environmental impacts associated with air pollution, such as detrimental effects on human health, water quality, visibility, wildlife, and vegetation. Clean air and the associated benefits to health and environment are important to the community and because mobile sources are the most significant contributors to air pollution, there are air quality goals in place that address the transportation system.

The City's *Air Quality Plan* reflects community interest in preserving air quality by addressing the need to manage traffic growth so that it does not outpace technological improvements in tailpipe emissions. Based on this interest, the *Air Quality Strategic Plan* states three objectives related to transportation including:

- Reduce growth rate in vehicle miles traveled (VMT)
- Reduce average tailpipe emissions on a per-mile basis
- Avoid total vehicle emissions from increasing after the year 2000

The *Air Quality Plan* also recognizes a trade-off between system-level and project-level impacts by stating in the policy that any action that increases short-term or localized emissions can be justified, if it is demonstrated that long-term or area-wide emissions are decreased by the action.

City Plan also includes some specific goals related to air quality. These goals state:

- Our community will continually improve Fort Collins' air quality as the City grows by applying strong, comprehensive policies and strategies to address the following issues: emissions from vehicles, commerce/industry, and wood burning, visual air quality, certain indoor air pollutants, and greenhouse gases.
- Our community's transportation system will improve air quality, manage traffic congestion, and support efficient land use.

Other related plans that have specific goals related to transportation and air quality include the *Congestion Management Plan* and the *North Front Range Transportation Demand Management (TDM) Plan.* The *Congestion Management Plan* establishes the objectives to reduce the VMT growth rate to match the population growth rate and to maintain the per-capita VMT at the 1990 level. The *North Front Range TDM Plan* establishes a 10 percent reduction in drive-alone trips by the year 2015 as a regional objective.

One aspect of the *City Plan* vision is that VMT would grow no faster than population. However, the current situation in Fort Collins is no different than nationally: VMT is growing much faster than population. Even so, air quality has improved in recent years, because federally mandated improvements in vehicle technology have resulted in a reduction in tailpipe air pollution emissions. Locally, this has caused a gradual improvement in some, but not all, types of air pollution even though VMT has steadily increased. *City Plan* retains a vision to reduce the

growth rate of VMT because that is the key to meeting land use, transportation, and air quality goals. Measurements of VMT and other parameters may be used to trigger a change in policy or procedures. This is discussed in more detail in Chapter 2.

In recent years, federally mandated improvements in vehicle technology have resulted in a reduction in tailpipe air pollution emissions. This has caused a gradual improvement in regional air quality even though traffic has steadily increased. According to industry air quality models, this trend is expected to continue based on continually improving technologies even with increasing VMT. The fact that air quality is expected to increase due to improved technology does not change the goal of reducing VMT in the City.

Transportation projects impact air quality directly and indirectly through motor vehicle emissions of pollutants into the air supply. These pollutants have both documented and suspected implications for human health and the environment.

Motor vehicles emit carbon monoxide (CO), hydrocarbons, (HC), nitrogen oxides (NOx) carbon dioxides (CO_2), particulate matter (PM10 and PM2.5), and air toxins. Hydrocarbons and nitrogenoxides further combine to form ozone (03) and motor vehicles contribute to increased levels of particulate matter in the air by kicking up street sand and debris.

Air pollutants may induce mild reactions in humans, such as headaches, sore throats or slowed reflexes, or they may have more severe effects, such as reduced or impaired lung function, aggravation of respiratory conditions, or increased risk of cancer. Air pollutants may have a number of direct and indirect impacts on the environment. These include the contamination of water supplies and stream corridors, the contamination of habitat and the resulting impact on vegetation and wildlife, and decreased visibility (the “brown cloud”).

When evaluating the impacts of transportation projects on air quality, it is important to distinguish between transportation system impacts and specific transportation project impacts. In the long-term, it is important for Fort Collins to evaluate transportation impacts on air quality at the system level rather than the project level. The reasons for this are three-fold:

1. The goal of reducing VMT growth must be met at the system level. The transportation system should support a land development pattern that reduces the need for vehicle travel, and should provide alternatives to vehicle travel. If the combined land use and transportation systems are effective in meeting VMT growth reduction goals, then the issue no longer needs to be addressed at the project level.
2. Key decisions are made early on in the planning process that often determine the outcome of a project long before it reaches the detailed project planning level. This often makes it impossible to impact the system at the project planning level, let alone to change the nature of the project itself.
3. Air pollutants do not only impact a localized area surrounding a particular facility, but they also impact the entire air shed. Meeting long-term air quality goals will require coordinated efforts involving the entire transportation system. It in conceivable that, in

order to meet the system objectives for air quality, it will be necessary to construct a project which, when evaluated on its own, has detrimental impact on air quality.

The one conceivable exception to planning at the system level would be a scenario in which there was reason to believe that a particular project could eliminate high concentrations of a particular pollutant at a certain location.

Traditionally, street capacity and efficiency improvements have been viewed as beneficial for air quality because they may reduce carbon monoxide emissions on a per mile basis in the short term by improving traffic flow. These improvements, however, lead to increased levels of other pollutants, such as particulate matter. Furthermore, once the additional capacity reaches a congested level in the long-term, the short-term benefit of reduced carbon monoxide emissions disappears entirely. Over the long-term, investments in the alternative travel mode systems will help to prevent total vehicle emissions from increasing by providing options to the single occupant vehicle and encouraging more efficient travel. However, it is difficult to attribute any significant air quality benefit on a project-by-project basis, since the system must be in place to some degree before an alternative mode of travel is a viable option.

A significant trade-off is related to the acceptable level of service Fort Collins recognizes and accepts in high activity areas such as commercial corridors and mixed-use districts. As the *Level of Service Manual* indicates, successful destination areas usually experience lower than accepted levels of service. This occurs because the transportation system capacity of successful commercial areas eventually exceeds the traffic capacity of the streets that serve them. Standards for vehicular circulation within densely developed areas such as the core city (Downtown) and other activity centers should be set to favor access over mobility. At such locations, alternative means of getting around (e.g. walking, transit, and bicycling) become important. Designing these activity centers to encourage pedestrian, bicycle, and transit use not only promotes transportation options, but often enhances the character of the activity centers. Potential design features include widened sidewalks, bike lanes and path, bike racks, locating transit stops close to the area, street lighting, landscaping, pedestrian signals, and pedestrian friendly intersections.

It is important that these issues be initially addressed at a system-wide level to achieve citywide objectives for maintaining air quality within the entire Fort Collins air shed. Projects that conform to overall transportation plans will not normally require additional analysis at the project level. However, in cases where it is suspected that a particular project may create or perpetuate a hot spot by exceeding federal or local standards for a particular pollutant, project level analysis should be considered.

6.3.2 Water Quality

Water quality encompasses all forms of water resources, including drinking water, surface water, groundwater, and wastewater treatment. This does not include stream corridors and wetlands as these larger ecosystems are addressed separately. The Fort Collins community is concerned with water quality and the potential impacts that poor water quality may have on human and environmental health.

City Plan includes a specific goal related to water quality. This goal states:

- Our community will maintain high standards for ensuring clean water quality.

Transportation projects may impact water quality either through the direct impacts of construction or through the indirect impacts of motor vehicle traffic that use the facility. Also, increases in paved areas relative to vegetative buffer areas impact water quality by affecting stormwater flows. Construction impacts include the destruction of water resources through construction of a transportation project, sediment deposition in various water supplies, and the disruption in drainage patterns and surface flows.

Indirect impacts to water quality result from the run-off from roads and parking lots that carry petroleum-based products and toxins such as heavy metals into all forms of water resources. Impacts to water quality also result from air pollutants caused by vehicular traffic, some portions of which ultimately settle in a stream corridor or other water body. Projects that encourage increased vehicular traffic may have a long-term impact on water quality. In addition, the increase in paved area and corresponding decrease in vegetative buffer areas can indirectly impact water quality and stormwater flow characteristics.

Air and water quality changes that result from transportation projects may also impact the missions of other City departments. For example, if water quality in the Cache La Poudre River declines as a result of additional parking lot runoff and increased traffic, the wastewater treatment plants could be required to treat wastewater at a higher level to compensate. The Stormwater Department may need to resize storm sewers to carry additional volume and take new measures to protect stormwater quality, like additional water quality ponds. In terms of drinking water, water quality changes can affect the ability of water treatment plants to treat the water and meet the standards to protect human health.

Measures designed to reduce VMT and improve air quality will have a corresponding benefit on water quality. In addition, designing transportation projects in such a way as to mitigate the increase in impervious areas and chemical pollution from vehicles can help resolve both the direct and indirect impacts to water quality which result from transportation projects. It is important that these issues be initially addressed at a system-wide level to achieve citywide objectives for water quality. At the project level, the City should make preliminary assessments of whether or not further analysis is required due to the potential impacts that the project may have on water quality.

6.3.3 Open Space/Natural Areas

Fort Collins values the preservation of open lands to maintain habitat essential to the conservation of plants, animals, and their associated ecosystems and to enrich the lives of citizens by providing opportunities for education, scientific research, nature interpretation, art, fishing, wildlife observation, hiking and other activities.

The *City of Fort Collins Natural Area Policy Plan (NAPP)* was adopted in 1992 as an element of the Comprehensive Plan, and the *Natural Areas Program* is currently being developed. The NAPP is currently being updated. This document forms the foundation of the City's position and approach to natural areas including open lands, wildlife, stream corridors, wetlands and listed

species. The goals, objectives, and policies of the *NAPP, Natural Areas Program,* and *City Plan* documents provide the official directions of the City of Fort Collins regarding natural areas.

The mission of the *Natural Areas Program* is "to protect and enhance lands with existing or potential natural areas values, lands that serve as community separators, and lands with scenic values. Protection of natural habitats and features is the highest priority, while providing opportunities for education and passive recreation for the Fort Collins community."

The objectives of the *NAPP* are:

- To identify and evaluate important natural areas within the Urban Growth Area (since renamed Growth Management Area [GMA]) and regionally with regard to their ecological significance, sensitivity to impact, and need for conservation
- To recognize the interrelationships among natural areas and define areas that function as systems, have common characteristics or needs, and provide common opportunities
- To recognize natural areas as important resources and to understand the contribution they make to the protection of health, safety, and environmental quality, and to the enhancement of the quality of life for the citizens of Fort Collins
- To review and revise existing City goals, objectives, and policies to guide future programs for the protection, conservation, enhancement, and management of natural areas within Fort Collins
- To recommend alternative strategies and actions to implement the policy recommendations to achieve established goals

City Plan goals include:

- Our community will have an integrated system of publicly-owned natural areas to protect the integrity of important conservation sites, protect corridors between natural areas and preserve outstanding examples of our diverse natural heritage.
- Development will be integrated into the natural landscape by directing it away from sensitive natural areas and by applying innovative planning, design, and management practices such as buffering and mitigation when such development occurs in close proximity to sensitive natural areas.
- The City will continue to develop effective partnerships with the County, other governmental organizations, and the private sector for the protection and preservation of important natural areas.
- Parks and natural areas will be connected, where appropriate, by pedestrian and bicycle trails, easements, or by greenbelts such as streams, drainageways, and irrigation ditches.

Transportation projects may directly impact the supply and integrity of open lands. New roads have the greatest potential for impact. These projects may involve the division of open lands by street corridors, potentially degrading wildlife habitat and migration corridors and reducing the

opportunity for human recreation. The short-term impacts of single street projects may result in habitat loss and diminished populations of some wildlife species and may increase the potential for collision between vehicles and wildlife. The long-term impacts of continually dividing open lands with street corridors could be cumulative, resulting over time in diminished wildlife populations and reduction in the integrity and diversity of the ecosystem.

Street capacity projects that cross open lands may offer some air quality benefits by providing more direct travel and thereby reducing VMT. However, this benefit may be negated in the long-term by encouraging more dispersed land use patterns. If increasing the directness of travel reduces travel times, homes can be located farther from jobs and jobs can be located farther from the city center. Street efficiency projects or capacity projects that use existing alignments but require additional Right-of-Way (ROW) from open lands to add width for additional vehicular or alternative mode travel will not have as great an impact as projects on new alignment, since they do not dissect intact parcels of open lands.

Bike and pedestrian projects that cross open lands may have some long-term benefits by improving the alternative mode system and increasing options to vehicular travel (with the associated benefits to air and water quality), by exposing people to the pleasant aspects of bicycle and pedestrian travel and by increasing human appreciation for open lands. Bike and pedestrian paths should be located to minimize disturbance to sensitive wildlife species and habitats.

It is important that these issues be initially addressed at a system-wide level to achieve City-wide objectives for open lands and wildlife. At the project level, the City should make preliminary assessments of whether or not further analysis is required due to the potential impacts that the project may have on open lands and wildlife.

6.3.4 Stream Corridors and Wetlands

Stream corridors and wetlands are valued resources within Fort Collins. They provide for a variety of ecological values and functions, including wildlife habitat and movement corridors, flood flow conveyance, water quality, open space, fisheries, and recreation.

City Plan goals and policies related to stream corridors and wetlands are included in the Open Lands and Wildlife section of the document. These goals include:

- Our community will actively protect, manage and enhance the Poudre River, the foothills, natural stream corridors, and other waterways as natural habitat, and accessible recreational areas.
- Comprehensive policies and guidelines will be applied to manage existing and proposed development adjacent to the Poudre River and other streams and water bodies, to minimize impacts on, and restore, the riparian ecology, and to minimize hazardous conditions associated with flooding.
- The City will utilize any opportunities to develop public access along stream and irrigation ditch corridors for providing additional trail linkages throughout our community.

Transportation projects may have direct impact on stream corridors, flood conveyance, and wetlands as well as the indirect impacts from air and water pollution. Transportation capacity projects on new alignments that cross stream corridors or wetlands have the greatest potential for impact since they will disturb what may be critical flood capacity, wildlife habitat, and a fragile ecosystem.

The City will need to make some decisions from a system level perspective as to how transportation projects will be allowed to impact stream corridors and wetlands. Since stream corridors and wetlands retain their value to the extent they are left intact, it is crucial to determine when, if and how transportation projects will be allowed to impact or break up these resources. If the City, for example, were to determine that it would never build a bridge across certain stream corridors or build streets along stream corridors, this decision would have a profound impact on land use, system mobility, and other planning processes.

Transportation project impacts on stream corridors and wetlands should be evaluated early in the transportation planning process with the goal of avoiding or minimizing disturbance. Impact considerations should include both direct and indirect impacts as well as short-term and long-term impacts. A range of alternatives to the proposed project should always be considered, particularly when the area to be affected has extraordinary resource values. Projects will need to be planned, designed, and constructed so as to comply with federal regulations and guidelines.

It is important that these issues be initially addressed at a system-wide level to achieve City-wide objectives for the protection of stream corridors and wetlands. At the project level, the City should make preliminary assessments of whether or not further analysis is required due to the potential impacts that the project may have on stream corridors and wetlands.

6.3.5 Protected Species

Protected species are plant and animal species that are listed as endangered, threatened or species of concern by federal or state agencies. The *NAPP* found that several local natural areas support populations of plant and animals that are endangered, threatened, or of special concern at the state or federal level. Many of the goals and policies shown in the previous section on stream corridors and wetlands are applicable to protected listed species, as they involve the protection of habitats and ecosystems which support listed species.

Transportation projects may have either direct or indirect impacts on listed species. Direct impacts may result from construction activities that destroy the species' habitat or the species itself. If the City carefully documents the presence of protected species in a project area, this type of impact should never occur unwittingly. Indirect impacts may result from the dissolution or break-up of a habitat that then impacts another species closely connected with the listed species. This type of impact is more difficult to prevent because the complex relationships that exist among species in an ecosystem are often poorly understood.

Impacts to protected species are typically more project specific issues than system-wide issues. If a protected species is found in the project area, a decision will have to be made as to whether or not it is possible to avoid or mitigate the impact. If it is not possible to avoid or mitigate the impact, the City will have to determine how to respond within the framework of the federal,

state, and city laws that govern the issue. Typically surveys will need to be conducted to verify the presence of species and the quality and quantity of the habitat. Based on the survey results, the City would determine whether or not further analysis is required and what mitigation measures should be considered. A possible mitigation measure that has been implemented successfully in other areas of Colorado is wildlife grade separations. These have proven effective in reducing accidents with wildlife crossing streets.

6.3.6 Noise

Noise caused by vehicular transportation is seen as detrimental to quality of life for a number of reasons. These reasons include the disruption of peace and tranquility otherwise found in residential neighborhoods, the negative impact on property values associated with noise, and the negative impacts to health, such as nervous and physiological disorders.

Although noise impacts are usually considered in terms of the absolute noise level as indicated on a noise meter, many citizens cite relative noise impacts. For example, the noise made by recreational trail users may negatively impact nearby residents at noise levels well below the limits in the City Code. The 1977 *Goals and Objectives* identified the need to eliminate the harmful effects of noise. The 1979 *Land Use Policy Plan* recommended adopting federal and state noise regulations.

City Plan has a principle and policy related to noise.

- Principle ENV-6: Community noise standards should be adopted and enforced that are unambiguous (specific method to determine compliance), enforceable, (easy to determine compliance and prove non-compliance), scientific (employ accepted and consistent measurement techniques), realistic (balance the physiological and subjective aspects of noise perception with the need for enforcement), and discerning (recognize that intermittent is more annoying than steady-state noise, and that nighttime noise is more annoying than daytime noise).
- Policy ENV-6.1: New Policy Development. Comprehensive policies will be developed to guide the implementation of programs and regulations to prevent noise pollution.

The City Code specifies maximum permissible noise levels based on the zoning classification of the land use receiving the noise. The City Code also holds the City harmless from traffic noise emanating from the public right of way.

In view of the concerns expressed by residents about transportation-related noise, it appears the City lacks sufficient policy basis to protect against transportation levels by moving transportation facilities closer to people. Transportation projects may increase the level of traffic moving through a given area. Transportation projects may also increase noise by changing the characteristics of traffic or streets. The changes could include forcing traffic to stop and start by introducing a traffic signal or stop sign, or by raising the elevation of streets that allows the noise to travel to areas it previously might not have reached. Noise levels are also higher when the speed of the traffic is increased due to increased tire and engine noise.

Those participating in discussions regarding the mitigation of noise resulting from transportation projects need to recognize that, once the noise has been created, it is extremely difficult and costly to mitigate its impacts. Often, mitigating the impact of noise for one community only sends the problem to another. A number of attempts have been made around the country to construct sound walls with the intent of shielding one community from the noise generated by a busy street. Because noise travels as a wave, sometimes the effect is "bouncing" the noise somewhere else.

As stated in the City Plan principle and policy, the City needs to develop policies to implement programs that reduce noise pollution.

6.3.7 Aesthetic Values

Aesthetic values play an important role in determining whether or not Fort Collins' urban environment is perceived as comfortable and enjoyable. Aesthetic values are derived from many aspects of Fort Collins' surroundings, including the mountain backdrop, landscaping, the design and character of streets and neighborhoods, mature vegetation along streets, and community landmarks.

City Plan goals and policies related to aesthetic values include:

- Our community's streets and walkways will be planned, built and maintained as attractive public spaces.
- Tree-lined streets and boulevards throughout the City, with inviting, landscaped walkways, parkways and attractive medians, will add to the image of Fort Collins as a safe, comfortable community.
- Various types of streets will provide for many different aspects of an urban environment, from traffic and parking, to furnished sitting areas and greenery.
- Downtown will maintain its unique streetscape, and other parts of town will continue to develop their own trademark characteristics and landmarks.
- Historic buildings and districts will be preserved and protected.
- Commercial and industrial buildings will reflect a high standard of architectural quality, interest and character, including the provision of pedestrian amenities and spaces. The design of building will reflect the neighborhood and not solely a corporate prototype, formula or image.

Transportation projects may have a variety of both positive and negative impacts on aesthetic values. As the most defining public spaces that determine whether or not the urban environment is comfortable and enjoyable, streets play a critical role in shaping the community and providing aesthetic value.

Decision making criteria regarding aesthetic values will need to be drawn from overall City goals and objectives. Aesthetic impacts should be considered in all levels of project design. City staff

should make preliminary assessments of whether or not project level analysis is required due to the potential aesthetic impacts that the project may have on the surroundings.

6.4 CONTEXT SENSITIVE DESIGN/SOLUTIONS

Many transportation agencies are recognizing the need to address equally safety, mobility, and the preservation of scenic, aesthetic, historic, environmental, and other community values. Different concepts have been introduced over time to reflect the desire to balance these needs. The current industry term that is used to characterize this process is called Context Sensitive Design (CSD) or Context Sensitive Solutions (CSS). Agencies like FHWA have developed specific guidelines that provide parameters for including CSS in the design process. These ideas are detailed in the National Cooperative Highway Research Report (NCHRP) Report 480 – *A Guide to Best Practices for Achieving Context Sensitive Solutions*. Concepts from this report are summarized to provide some guidance for how Fort Collins can incorporate CSS into the design of transportation systems.

One of the first aspects to recognize is that CSS is much more than aesthetic treatments. It includes:

- An open, inclusive planning and design process
- Full integration of environmental studies with engineering
- Meaningful public involvement
- Creative, innovative design solutions
- Demonstrated understanding of safety related to highway geometry

It is also important to remember that CSS applies throughout the entire project development process. CSS is an on-going process to first understand the character and issues that need to be considered and then keeping these factors in mind throughout the design process. It is also important to understand that every project has a context whether a bridge, scenic highway urban arterial, rural highway, state route through a small town, or a transit facility in a downtown area.

Three guiding principles have been identified to define CSS. They include:

- Address the transportation need – provide a safe, effective, financially feasible, and implementable solution
- Be an asset to the community – develop a solution that is accepted by the stakeholders and adds lasting value to the community
- Be compatible with the natural and built environment – provide a solution that can be implemented with minimal impacts that is aesthetically appropriate

While the guiding principles provide a bigger picture perspective, the real challenge is implementation at the project level. The NCHRP Report 480 identifies four critical success factors for successful implementation.

1. Providing for Effective Decision-Making and Implementation
   To provide an effective decision-making and implementation process, several questions need to be answered. These include:

   - Where are the key decision points?
   - Who will make each decision?
   - Who will make recommendations for each decision?
   - Who will be consulted on each decision?
   - How will recommendations and comments be transmitted to decision-makers?

   Once these questions have been answered, the next step is to establish a structured decision-making process. The process should specify technical milestones and related opportunities for public involvement, ensure dialogue with stakeholders that affect decisions, and integrate public involvement with overall project management. Often in traditional project development processes, addressing project challenges are put off until later in the process. This typically results in bigger issues later on in the process, more reluctance to look at other opportunities, and more resistance from opposing interests. As part of this aspect of the CSS process, embracing the challenges at the outset and dealing with them positively eliminates the potential for bigger issues later on in the project development process. It is important to note that although the process is more inclusive, it does not mean that Fort Collins relinquishes its ownership of the project. The City still has the final say in the decision-making process.

2. Reflecting Community Values
   The CSS process involves a collaborative, interdisciplinary approach where citizens and agencies are part of the planning and design team. Recent trends are moving towards meaningful public involvement techniques where people are involved in the process rather than the agency making the decisions and explaining it to the public at the end of the process. Some keys to success include a strong, credible presence by the project team, listening to issues with a willingness to consider compromises on policies and solutions, and translating visions and values to tangible components of the solution. Some tools and techniques that can be used to assist in the process include stakeholder working groups, citizen advisory committees, charrettes and project workshops, and community surveys. There are many other ideas that may be used, but the intent is to evaluate the project and interests and provide a way for them to be involved in the process.

3. Achieving Environmental Sensitivity
   Many people think that sensitivity to environmental issues is what CSS is, but it is really only one aspect of the approach. The old approach to looking at environmental issues

was to develop engineering alternatives, evaluate them, and then look at the environmental issues that need to be addressed. As one of the key aspects of CSS, integrating traffic and environmental issues into the development and evaluation of alternatives is crucial in developing a solution that balances the needs of the transportation system with the environment. In this case the term environment not only means resources like air, noise, wetlands, wildlife, but also the physical environment like the adjacent neighborhoods, community character, and overall city goals. This new integrated approach has developed the need for additional tools that can be used to evaluate impacts. Some of these tools include visual simulations, project renderings, Geographical Information System (GIS) analysis, aesthetic design guidelines, and air quality and noise modeling. The key is that the development and analysis of alternatives considers the specific traffic and environmental issues specific to the project.

4. Ensuring Safe and Feasible Solutions
   Many opponents of CSS think that the compromises that are made result in less safe and efficient transportation facilities. The real intent of CSS is to provide a flexible design process. This flexibility recognizes that many standards engineers use are actually guidelines that have some room for interpretation. Considerations like design speed, desirable level of service, and the design vehicle used are decisions that have implications on the design. Closely evaluating options in regards to these and other assumptions allows the potential for flexibility.

   Safety is always one of the main considerations in designing transportation facilities. Many times though, engineers may look at a tree-lined street and say that it is substandard. While the road may be substandard from a pure design perspective, what if the road is a collector street that carries a small amount of traffic? The question then becomes, is it worth taking out all of the trees to get the appropriate shoulder if it ruins the character of the neighborhood that is adjacent to the street. To address these types of issues, FHWA and other agencies are developing additional guidance for safety standards that allow for more flexibility. These should also be considered as resources the City could use in its design and planning process.

   Some of the keys to success for ensuring safe and feasible solutions include:

   - Understanding the project purpose and need
   - Recognizing flexibility in design criteria and the basis for the criteria
   - Being creative in problem solving and
   - Closely evaluating safety in the context of the project

CSS is a process that is receiving support from many agencies and various interests. Many of the sensitive areas in Fort Collins like the neighborhoods near downtown, the Poudre River corridor, open/natural areas, and recreational areas are logical areas where some flexibility and implementation of CSS concepts would be beneficial.

The City should evaluate its planning and design processes to see if they are working towards some of the CSS principles. This may include developing an approach that the City will use to incorporate CSS concepts into project development and designs. Minor modifications may be necessary and guidelines may need to be developed to provide more flexibility for the departments to work more closely together to develop solutions. Some of these solutions may include reduced lane widths, separated bicycle and pedestrian facilities, raised medians, and street lighting to name a few. Ultimately, the City needs modify its approach to projects by implementing CSS concepts that consider the balance between providing a safe and efficient transportation system without dramatically changing the surrounding environment that defines Fort Collins.