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MOBILITY FOR EVERYONE

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Road Diet Guide

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The following IDD shall be used as a guiding document when Road Diets are being considered as an alternative during the project scoping phase, during an alignment study and/or once a Road Diet is selected as the preferred alternative or when a Road Diet is part of a routine/maintenance restriping project. The guide serves as an effective tool to aid NMDOT PDE's, design teams and management in the use of Road Diets as a proven safety countermeasure by providing guidance on how to balance operation, safety and livability considerations.

New Mexico Department of Transportation, in coordination with the Federal Highway Administration - New Mexico Division

Road Diet Guide

An Every Day Counts Initiative

November 2016

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1. INTRODUCTION

Road Diets, or a reallocation of roadway space, are a changing of the cross section of a roadway in order to achieve potential benefits, such as safety, increased multimodal accommodation, or to better accommodate left-turning vehicles, in addition to numerous other potential benefits. Road Diets most often involve restriping a four-lane undivided road to a three-lane road with two through lanes and a two-way left-tum lane (TWLTL), though the same concept can be applied to converting a six-lane undivided road to a five-lane road, for example. The extra roadway width can be used to create bicycle lanes, supply on-street parking, widen sidewalks, provide opportunities for landscaped or pedestrian refuge medians, or widen vehicular lanes (in select cases). This guide provides direction as to why the New Mexico Department of Transportation (NMDOT) may consider a Road Diet; how to analyze whether a specific street is a good candidate for a Road Diet; best practices for Road Diet implementation, including extensive public involvement; and potential factors for project evaluation.

In 2014, the Federal Highway Administration (FHWA) Safety Program released its *Road Diet Informational Guide*, which should be considered a resource for any NMDOT staff considering a Road Diet for a particular roadway. While this guide does repeat some information from the FHWA guide, it also provides a New Mexico-specific context, as well as references specific to NMDOT. These resources should be used in conjunction with one another to design the best outcome for a roadway and community.

In 2015 an Every Day Counts Initiative for Road Diets was initiated by FHWA-Headquarters, FHWA-New Mexico Division Office and NMDOT with committee members drawn from Planning, Maintenance, Construction, and Design. Their charge was to develop a policy and begin the process of institutionalizing Road Diets as a design tool at NMDOT. In 2016 a FHWA-supported Peer Exchange was held in Albuquerque in which representatives from seven other states in various stages of Road Diet policy development and implementation shared their processes and experiences with NMDOT traffic engineers, planners, project development engineers, consultants and MPO members. A follow-up meeting was held to refine and incorporate this information into this guidance document.

Agencies may utilize Road Diets in either a proactive manner—they seek out roadways with particular conditions and asses them for conversion—or they may use Road Diets as one of numerous alternatives while evaluating a forthcoming project. Further, Road Diets may be simple restriping as part of a maintenance project, or they may be integrated into the design for a reconstruction project. In general, the use of Road Diets is envisioned for low speed facilities (less than 50 mph) and in incorporated areas where safety and livability benefits would be realized. Regardless of why an agency may be considering a Road Diet at a particular location, there are numerous factors to consider prior to recommending the installation of a Road Diet. The sections below outline a number of reasons why a Road Diet may be considered, and then offer guidance as to how to analyze whether a Road Diet would be beneficial in a particular location.

This guide is primarily intended for internal use within NMDOT, and for use by other transportation partners assessing NMDOT-owned or maintained facilities, including Metropolitan Planning Organizations (MPOs), Regional Transportation Planning Organizations (RTPOs), tribal governments, local governments, and the transportation planning and engineering consulting communities. It is written for a professional audience, familiar with transportation planning and engineering, thus assuming a basic fluency with transportation concepts and infrastructure.

This guide will serve as a narrative complement to the Road Diet Design Directive.

2. WHY CONSIDER A ROAD DIET?

There are many potential reasons why NMDOT may consider a Road Diet in a particular location. Most often, NMDOT becomes aware of some aspect of the roadway that is no longer best serving the neighboring community and/or traveling public. The issue may be easily measurable (e.g. speeding, crash data), it may be more qualitative (e.g. the community would prefer roadway cross-section that promotes livability[1] goals), or a roadway may have excessive capacity. The alphabetized list below represents the diversity of reasons why a Road Diet should be considered, but the list is not exhaustive, as each community is unique and may have other reasons that warrant consideration of a Road Diet. These are scoping considerations and should be addressed in the project's Scoping Report, prepared by the Project Development Engineer (PDE) in the Regional Design Centers, so they are documented and considered if designing a Road Diet project. They may also be considered in the Location Studies Procedure (LSP) Phase 1A and 1B (detailed evaluation of alternatives), project scoping, as a recommendation coming from a Road Safety Audit (RSA), or a part of a maintenance project design decision. District Traffic Engineers can also be instrumental in project decisions leading to Road Diets.

Access management often works in tandem with a Road Diet. Access should always be analyzed as part of any Road Diet project in order to maximize the safety of all users along the corridor. Positive effects of a Road Diet on a corridor in need of access management may include: a reduction/consolidation of unnecessary driveways, encouragement of permitting previously unauthorized driveways, or safety benefits as the addition of a TWLTL can provide storage space and refuge for left-turning vehicles. The inclusion of medians in a Road Diet can also limit access to certain driveways, if needed for safety. NMDOT PDEs should consult with the District Traffic Engineer to evaluate access management in a corridor.

Economic development-driven initiatives, such as the MainStreet, Frontier Community or Arts and Cultural District[2] projects, may trigger a Road Diet project. Communities designated as MainStreet, Frontier or Arts and Cultural Districts typically receive grants to create master plans. Other communities not affiliated with this program may also undertake similar local economic development efforts. These efforts may trigger consideration of Road Diets, as bicycle, pedestrian and streetscape infrastructure is often associated with increased economic return along the corridors where these facilities are installed. Additionally, MainStreet/Frontier Community/Arts and Cultural District planning processes, as well as other economic development planning efforts, give local residents and business owners an opportunity to envision a preferred future for their downtown/business corridors, which typically include NMDOT-owned roadways. Therefore, these plans often articulate specific community desires for NMDOT-owned corridors, including bicycle and pedestrian infrastructure, which NMDOT can add or refine via a Road Diet. NMDOT PDEs should include these groups in their design development stakeholder meetings and should contact NMDOT's Asset Management and Planning Division Director for information on which communities work with these programs or have other economic development initiatives. NMDOT has a pending Memorandum of Understanding with New Mexico MainStreet, and the Cultural Affairs Department's Historic Preservation Division, to collaborate on projects in communities where NMDOT facilities, historic properties, or MainStreet/Frontier Community/Arts and Cultural District overlap.

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[1] Former USDOT Secretary Ray LaHood said "livability means being able to take your kids to school, go to work, see a doctor, drop by the grocery or Post Office, go out to dinner and a movie, and play with your kids at the park – all without having to get in your car," (https://www.transportation.gov/livability).
[2] The MainStreet, Frontier Community, and Arts and Cultural District programs are administered by the New Mexico Economic Development Department: http://nmmainstreet.org/.

Local planning documents, particularly comprehensive plans, may include a number of factors that trigger a Road Diet. Some references may be specific—calling for pedestrian or bicycle facilities to complete a network or for reduced speeds along an NMDOT-owned roadway—and others may demonstrate the existing or latent demand of the area for pedestrian or bicycle facilities. As local plans ideally define local land uses (both current and future), such as corridors zoned for commercial or residential development, or a designated school site, they can demonstrate existing or latent demand. Local planning documents should reflect input from both community members and elected officials. Each MPO/RTPO is assigned a Planning Liaison from the NMDOT Statewide Planning Bureau who can assist a PDE with the evaluation of local planning documents.

Maintenance projects may present an opportunity to implement a Road Diet, as many Road Diet projects are simply a restriping of the existing facility. When planning for a maintenance project, the District Maintenance Engineer should discuss these triggers with the local/tribal government and the NM Planning Liaison to determine whether that location would benefit from a Road Diet. Changing the cross section of a roadway as part of a maintenance project may bring slight delay to the project, so the maintenance schedule should be adjusted accordingly. The District Maintenance Engineer and the District Traffic Engineer may also work with the District Public Information Officer (PIO) to initiate public involvement with the local community and stakeholders to discuss the triggers and potential for a Road Diet.

Pedestrian and bicycle demand may necessitate a Road Diet. If a particular corridor is used by bicyclists and pedestrians, regardless of the presence of facilities or a high level of accommodation, NMDOT may need to reconsider the design of a corridor and reallocate roadway space to non-motorized users to accommodate the existing demand. Providing pedestrian and bicycle facilities as demand presents itself may prevent future crashes. Alternatively, the land use and roadway context may demonstrate latent demand, meaning that people would walk or bike if safe facilities were available, NMDOT's Bicycle, Pedestrian, Equestrian Coordinator (in the Statewide Planning Bureau) can assist a PDE with this analysis.

Safety/Crash data may demonstrate a need for a reallocation of roadway space. For example, if a roadway is designed with four through-lanes, and there is a high rate of rear-end, sideswipe, or broadside type crashes, a four-to-three lane Road Diet will help reduce these crashes, as Road Diets are a proven safety counter measure for these crash types. Alternatively, if a four-lane corridor goes through a school zone or has high pedestrian volumes, but few if any protected crossings, a four-to-three Road Diet would offer a safer pedestrian environment through the inclusion of median refuges, a reduction of through-lane crossings, and a reduction in vehicular travel speeds. Further, in locations with high numbers of serious injury or fatal crashes, Road Diets may reduce the severity of the crash type, helping NMDOT meet the performance measures as outlined in the Strategic Highway Safety Plan (SHSP). Lastly, Road Safety Audits (RSAs) may recommend Road Diets along particular roadways with safety issues. The Highway Safety Improvement Program (HSIP) Coordinator can work with a PDE to assess the safety needs of particular corridors, as well as the status of any RSAs or safety projects. The HSIP Coordinator, applicable District, RSA consultant, and/or MPO/RTPO will need to work together to define and assess corridor safety needs.

Speeding is a trigger for implementing a Road Diet. Matching the design speed with the target speed will likely increase compliance with the speed limit, and thus provide an overall increase in safety and a reduction in crash severity. Target speed is the speed at which vehicles should operate on a thoroughfare in a specific context, consistent with the level of multimodal activity generated by adjacent land uses to provide both mobility for motor vehicles and a safe environment for pedestrians and bicyclists. The target speed may or may not necessarily be the posted speed. The posted speed is the maximum speed established by regulation. Design speed is the speed selected to determine the various geometric features of the roadway. Road Diets often reduce the design speed of a corridor by narrowing vehicular lanes, adding concrete medians which confine the visual space of the roadway, increasing multimodal use, or inducing minor congestion. Additionally, Road Diets can reduce the speed differential between cars travelling in the same direction when eliminating passing opportunities because the speed differential is then defined by the speed of the lead vehicle. This speed reduction reduces the severity of crashes when they do occur, and allows cross-traffic to better judge the vehicular speeds and resulting gaps when crossing the corridor. Speeding can be identified as a concern for a roadway if a speed study indicates that a high number of motorists drive 5 miles per hour (mph), or more, above the posted speed limit. District Traffic Engineers are a PDE's primary resource for understanding speeding concerns along a roadway.

2.1 PROBLEMS POTENTIALLY CORRECTABLE BY ROAD DIET IMPLEMENTATION

Category	Problem	Rationale
Operational	Delays associated with left-turning traffic	Separating left-turning traffic from through movements has been shown to reduce delays at signalized intersections.
	Excess capacity resulting in speeding and inefficient use of the roadway	Livability benefits through addition of bike lanes, parking, wider sidewalks, median refuges, buffers, transit stops, reduced maintenance
	Bicycle operational delay due to shared lane with vehicles or sidewalk use	Potential for including a bike lane eliminates such delays.
Safety	Rear-end crashes with left-turning traffic due to speed discrepancies	Removing stopped vehicles attempting to turn left from the through-lane could reduce rear-end crashes
	Sideswipe crashes due to lane changes	Eliminating the need to change lanes reduces sideswipe crashes
	Left-turn crashes	Eliminating the negative offset between opposing left-turn vehicles and increasing available sight distance can reduce left-turn crashes Reducing decision/conflict points for left-turning vehicles from unsignalized side streets
	Broadside crashes	Reducing the number of lanes to cross/conflict points, and providing center lane as refuge if needed
	Bicycle and pedestrian crashes	Bicycle lanes separate bicycles from motor vehicle traffic; pedestrians have fewer lanes to cross and can use a refuge area, if provided
Livability	Bicycle and pedestrian accommodation due to lack of facilities	Opportunity to provide appropriate or required facilities, increasing accessibility to non-motorized users; for pedestrians, opportunity to install median refuge islands

Category	Problem	Rationale
	Aesthetics	Provisions can be made for traversable medians and other treatments
	Traffic calming	Potential for more uniform speeds, as the lead vehicle controls the speed and reduces the percentage of aggressive driving and excessive speeding; opportunity to encourage pedestrian activity
Adapted from Kentucky Transportation Center's Guidelines for Road Diet Conversions		

3. EVALUATION OF ROAD DIET CANDIDATES

After the NMDOT District or PDE decides to consider a Road Diet on a particular roadway, the design team must next evaluate that candidate site to determine whether the Road Diet is a valid option. Identification of a facility for Road Diet consideration may originate in the RTPO/MPO Transportation Improvement Program (TIP)/State Transportation Improvement Program (STIP) development process resulting from tribal and local governments working with the Districts or may arise from a RSA.

This section includes a number of evaluation techniques, but design teams must also be prepared to use multi-disciplinary judgment (i.e. engineering, planning, environmental, etc.) to evaluate whether a certain roadway should undergo a Road Diet. Since many Road Diet triggers are qualitative in nature, the evaluation is not always straightforward and must be multi-disciplinary. Per the National Environmental Policy Act (NEPA) practices for Categorical Exclusions and Environmental Assessments (which the majority of NMDOT projects fall under), as well as the LSP, a Road Diet may be the only alternative considered. Typically, they may be considered through a RSA or through a routine maintenance restriping or resurfacing project.

The list below provides typical considerations for NMDOT when evaluating candidate sites. This list is not exhaustive and not all considerations apply to every project. The design team must assess each project to decide which considerations apply, and whether more should be added. Further, these factors may also influence specific design elements of a Road Diet project after NMDOT deems it a feasible project.

- Access management, both existing and desired;
- Adjacent and nearby land uses;
- Built environmental impacts, including cultural resource issues (historic structures), noise impacts/vibrations, landscaping, aesthetics;
- Crash data, including numbers of crashes and crash type for all modes;
- Current and potential cross sectional elements, including: number of vehicular lanes, bicycle lanes, parking, sidewalks, buffers;
- Freight volume and movements in corridor;
- Functional classification of roadway;
- Intersection performance, including analysis of inclusion of roundabouts rather than signalized intersections;

- Left-turn movements on candidate street;
- Livability—a metric defined by quality of life in public spaces, including the presence of infrastructure allowing people of all ages and abilities to walk, bike, or use transit in order to access services in their community;
- Maintenance;
- Natural environmental impacts, including cohesion of plant/wildlife corridors, drainage, landscaping;
- On-street parking, including evaluation of tandem/paired parking[3];
- Operations analysis of traffic volumes, flow and capacity of the candidate corridor;
- Operations analysis of traffic volumes, flow and capacity on potential overflow corridors;
- Pedestrian volume and movement in corridor, including frequency and location of crossings (formal and informal);
- Perceived safety issues for all users of the roadway, including all modes;
- Predictive crash data based upon Highway Safety Manual for all modes;
- Presence of slow moving traffic along the corridor, such as mail delivery or sanitation services;
- Presence, location and number of bus stops, both transit and school;
- Right of way, existing and potential acquisitions;
- Social environmental impacts related to social cohesion;
- Traffic speeds and whether traffic calming measures may mitigate aggressive driving; and
- Travel time (including delay) analysis of candidate corridor and potential overflow corridors.

All these elements need to be considered in the larger roadway context. These considerations often may present trade-offs or synergies. For example, if a roadway presents a significant safety issue at four lanes and has high traffic volumes, but the right-of-way is constrained, NMDOT may choose to implement a three-lane Road Diet in order to reduce crashes even thought it might increase travel times, thus presenting a trade-off between safety and operations. Alternatively, NMDOT may elect to install a four-to-three lane Road Diet in order to reduce vehicular crashes on a low volume road, and they may include bicycle lanes and pedestrian refuge islands in the final design, thus increasing safety for all users with no impact on vehicular travel time, thus creating synergistic benefits. Given this complexity, all elements of a roadway need to be considered in the larger context and decisions may often involve the application of multi-disciplinary judgment rather than clear yes/no alternatives.

See Appendix I for NMDOT's Road Diet Decision Matrix, which illustrates a number of these considerations and their relationships to one another, as well as serves as an alternatives analysis tool consistent with NMDOT's LSP. The Decision Matrix also can be completed by the design team and then shared with the public as a transparent source of NMDOT's analysis.

NMDOT must consider all potential impacts for each potential Road Diet project. Operations, safety and livability impacts require a detailed analysis, as explained in the sections below.

3.1 OPERATIONAL PERFORMANCE

The level of effort for operations analysis on a candidate roadway is highly influenced by the Average Annual Daily Traffic (AADT) for that roadway. For four-lane roadways with less than 10,000 AADT, Road Diets should have

[3] See p. 35 "On-Street Parking," *Road Diet Informational Guide*, U.S. Department of Transportation, Federal Highway Administration, November 2014.

virtually no impact on the roadway's operations, as the roadway has excessive capacity. For roadways with more than 10,000 AADT, an in-depth operations analysis is needed to assess the impact of a Road Diet on the operations of the candidate road, as well as the potential overflow facilities.

Similarly, for six-lane roadways a Road Diet may also be appropriate, which would entail reducing the roadway to five lanes—four through-lanes and one center TWLTL. If NMDOT is considering this reconfiguration on a six lane roadway, the candidate corridor should be assessed according to the considerations outlined in this guide.

In-depth operations analyses and modeling should include, at a minimum, analysis of roadway volumes, flows, travel time, speed, and capacity, along the candidate corridor, intersections, and potential overflow corridors. Left-turn movements as related to existing and potential access should also be analyzed to best understand operations along the corridor. Using Geographic Information Systems (GIS), NMDOT should also analyze the current and future land uses in conjunction with traffic modeling to provide a more comprehensive context.

Prior to the implementation of a Road Diet, it is recommended that a capacity analysis be completed for the major signalized intersections on the corridor to ensure that they would operate acceptably with a revised lane configuration. Analysis based on Highway Capacity Manual (HCM) methodologies is sufficient to check intersection capacities. For special cases, such as closely spaced intersections, coordinated signal systems, or corridors with at-grade rail crossings, micro-simulation is recommended to adequately evaluate arrival patterns and queue formation and dissipation.

Operational topics are reviewed in the Appendix III document 'Operational Considerations Table' which is also part of the Road Diet Design Directive.

Operations analyses should also include an evaluation of the inclusion of roundabouts rather than signalized intersections. Roundabouts and Road Diets experience a number of co-benefits. On certain roadways, roundabouts may increase intersection capacity, as they offer continuous flow for traffic. Further, the reduction of a four-lane road to a three-lane road would mean that intersections would only need a one-lane roundabout, rather than a two-lane. One-lane roundabouts use less right-of-way, are easier for drivers to navigate, and are easier to design than two-lane ones. Roundabouts are preferable to signalized intersections when feasible, as they are safer.[4]

The operational consistency of a corridor also should be analyzed as part of the operations performance. Operational consistency refers to the potential for more uniform speeds along the corridor, elimination of unbalanced speeds by travel lanes, and potential speed reductions (i.e. Road Diet as traffic calming) after the Road Diet conversion.

While a Road Diet may have a substantial impact on the operations of certain candidate roadways, NMDOT still may pursue a Road Diet if there are a number of other considerations that would be positively impacted by the installation of the Road Diet. This is particularly true for safety considerations.

3.2 SAFETY PERFORMANCE

[4] Roundabouts are listed as a proven safety countermeasure on the Federal Highway Administration's Office of Safety website: http://safety.fhwa.dot.gov/provencountermeasures/fhwa_sa_12_005.cfm.

Road Diets are considered a "proven safety countermeasure" by the Federal Highway Administration's Office of Safety—meaning that an analysis of before and after crash data, in locations where three-lane Road Diets are installed, demonstrates a reduction in the number of fatal or serious injuries, compared to a four-lane cross section.[5] National research produced a crash modification factor of 0.71 due to the introduction of a continuous left-tum lane on a roadway indicating a 29 percent reduction in crashes.[6]

While Road Diets can be effective in addressing crash problems, a safety analysis using engineering judgment and the Highway Safety Manual (HSM) should be completed to determine the type of crashes on the corridor and ensure that they are correctable by the implementation of a Road Diet. The HSM provides a quantitative, technical approach to safety analysis, and allows for the user to evaluate safety alongside other transportation performance measures, such as traffic operations. The HSM provides a predictive method—allowing the user to predict the increased safety along a corridor if certain infrastructure is installed.

The following crash types are common types that may be addressed by a Road Diet.

Angle crashes: Angle crashes, also referred to as broadside or "t-bone" crashes, occur when a vehicle is hit at a right angle to its direction of travel. Road Diets reduce the likelihood of angle crashes for both left-turning vehicles, as well as cross-traffic vehicles. This is due to the reduction in the number of lanes that must be crossed, as well as the increased sight distance for turning and cross-traffic. Sight distance is increased with Road Diet configurations because the through-traffic is aligned in one lane, making gaps easier to see; inside through-lane vehicles are not blocking the visibility of the outside through-lanes; and the configuration reduces or eliminates the speed differential between through lanes moving in the same direction. The enhanced sight distance and reduction of visual obstructions is particularly beneficial to older drivers who are more likely to have visual impairments, though it benefits all drivers. Further, the TWLTL provides refuge for the left-turning vehicle, thus reducing pressure on the driver to depart the through-lane as quickly as possible, which can lead to high-risk turning movements.

Pedestrian and bicycle crashes: Road Diets improve pedestrian safety by reducing the number of travel lanes one must cross and by increasing sight distance. Road Diets may also include median refuges at pedestrian crossings, allowing more protection for a pedestrian crossing the street. Road Diets also may improve bicyclist safety by providing them with dedicated space in which to travel. In addition to the separation of uses, the signed, dedicated space also alerts motorists to the potential presence of bicyclists.

Rear-end crashes: Rear end crashes can result from vehicles traveling in the inside through lane behind a stopping or stopped left-turning vehicle. A Road Diet reduces these types of crashes by removing the stopped left-turning vehicle from the through lane. Road Diets are anticipated to reduce rear-end crashes on roadways with high volumes of left-turn traffic; however, increased congestion resulting from the lane reduction could increase rear-end crashes.

Sideswipe crashes: Sideswipe crashes can result from vehicles changing lanes to avoid delays behind a left-turning vehicle in the inside through lane. These types of crashes can occur at mid-block access points and major intersections. Road Diets eliminate these types of crashes by removing the turning vehicle from the through lane.

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[5] http://safety.fhwa.dot.gov/road_diets/ .

[6] "Evaluation of Lane Reduction 'Road Diet' Measures on Crashes," Turner-Fairbank Highway Research Center, Federal Highway Administration, U.S. Department of Transportation, June 2010: http://www.fhwa.dot.gov/publications/research/safety/10053/.

Sideswipes can also occur between vehicles traveling on the two-way left-turn lane and those attempting to enter it, but these crashes are not a frequent occurrence as prior research and case studies indicate.

3.3 LIVABILITY PERFORMANCE

As described earlier in this document, the livability of a community, a general quality of life metric, refers to a resident's potential—regardless of age or ability—to comfortably move within their community to access services (schools, grocery stores, parks, entertainment, etc.) without needing a motor vehicle. As a result, there are additional elements beyond operations and safety that should be considered when a design team evaluates a potential Road Diet project. The following list identifies some of these elements and provides a brief overview of their potential implications. This analysis is primarily qualitative in nature, and should be presented in written form. It can be incorporated into the Project Evaluation Report, Scoping Report, and/or Phase A/B Report, as is appropriate to the project.

Bicycle facilities: Through the presence of exclusive bicycle lanes or wider (striped) shoulders, Road Diets generally improve bicycle facilities. Bicyclists also benefit from other effects of Road Diets, such as traffic calming. As with pedestrian facilities, bicycle facilities should be evaluated in terms of existing and latent demand, as well as local or state planning documents which may display a preferred network of bicycle facilities. Both the presence and type of bicycle facility should be evaluated, as some locations may require different facility types. For example, on a rural cross section, a striped shoulder is likely sufficient. Within a town, however, a dedicated bike lane may be the preferred option for bicyclists.

Community benefit: A Road Diet project may facilitate implementation of community goals, as outlined in adopted local and/or regional plans for transportation, land use, economic development, or other areas.

Economic vitality: Reduced speeds encourage pedestrian and bicycle traffic and create a pedestrian friendly environment, which also provides increased economic opportunities. Road Diets may also have potential positive impacts on number of on-street parking spaces, as through-lanes may be converted to parking lanes in some Road Diet projects. Further, the New Mexico MainStreet Program, encourages the creation of walkable and bikeable communities as part of economic development strategies in its MainStreet, Frontier Community, and Arts and Cultural District programs.

Environmental conditions: Road Diets can provide preserved and improved environmental conditions throughout project limits by potentially reducing pavement area and treating water run-off, which benefits biological community cohesion. They may also increase the number of people using other transportation modes to access services, thus decreasing the number of vehicles on the road, and therefore reducing ambient noise and improving air quality.

Pedestrian facilities: Road Diets can increase pedestrian comfort and safety by reducing the number of lanes to cross, providing a median refuge, and reducing the speeds and speed differential in the travel lanes. Road Diets may also include a buffer zone between the pedestrian facilities and vehicular lanes, ideally between the sidewalk and curb, or in cases where the curb is not being rebuilt, through the addition of a bicycle lane or wider (striped) shoulder. Pedestrian facilities should be evaluated in terms of existing and latent demand.

Public health: Road Diets often support public health goals because they include pedestrian and/or bicycle facilities (which improve pedestrian and bicycling network connectivity), and reduce speeds and crashes. Road Diets can result in safer walking and biking opportunities for people of all ages and abilities, thus increasing the amount of physical activity residents are able to integrate into their daily lives.

Transit operations: Road Diets can have both positive and negative impacts on transit operations, thus requiring close coordination between the design team and any transit providers. While Road Diets may require that buses stop in the through lane, this condition can be reduced or eliminated by integrating the bus stop along the curb with the removal of on-street parking, for example. Road Diets can also often present an opportunity to create bus pull-outs at specified locations. Transit agencies should carefully consider their stop locations as part of this process, and take advantage of Road Diet projects as an opportunity to relocate stops, if needed.

4. IMPLEMENTATION OF ROAD DIETS

If a Road Diet is selected as the preferred alternative for a roadway, or a roadway is identified for a simple conversion (i.e. as part of a maintenance restriping project), there are a number of best practices from around the country that should be considered as part of implementation. The primary components of implementation are public involvement, including other agency stakeholders, and design elements. The sections below outline some of the most important considerations for implementation of a Road Diet.

Effective support on multiple levels is key to the successful implementation of road diets. This support is needed on a local community and political level, the project management level, and at upper levels of NMDOT.

4.1 PUBLIC INVOLVEMENT

Comprehensive public involvement is necessary to the successful implementation of Road Diet projects. Indications from other DOTs and transportation agencies are that often more effort and funding goes to engaging the public, integrating their input, and educating users, than may be spent in constructing the actual Road Diet itself. Early identification of stakeholders, including neighborhood residents and businesses, and all users of the facility, is important to ensure inclusive public involvement throughout project development.

Any anticipated increase in vehicular travel time delays on the candidate roadway, or potential overflow facilities, should be clearly communicated to the stakeholders, as well as the anticipated safety and livability benefits for all users, including pedestrians and bicyclists. Visualizations can help explain proposed solutions, and in some instances, demonstration projects could be considered on a trial basis to address hesitant communities for whom immediate benefits may not be obvious. NMDOT's Road Diet Decision Matrix (see Appendix I), as completed by the design team, is a primary tool to assist in demonstrating the benefit of a Road Diet to a community. This is also part of the Design Directive.

For pavement maintenance projects where a restriping of the roadway to a Road Diet cross-section will occur, the District Traffic Engineer must coordinate with the District Maintenance Engineer on the District's annual maintenance plan to identify corridors that qualify for a Road Diet and then work with the public and the local entity to discuss whether a Road Diet is appropriate for that corridor. This Road Diet Guide can be used to assess candidate corridors.

Beyond stakeholder involvement, NMDOT should utilize their PIOs—both at the General Office and the Districts—to share information on the benefits of Road Diets. FHWA has readily available materials regarding the safety and livability benefits of Road Diets that the PIOs can distribute to media outlets, and in response to other inquiries.

These materials are in Appendix IV of this Guide. As NMDOT implements Road Diets around the state, the PIOs should prepare New Mexico-specific materials that reflect community feedback and the post-implementation evaluation reports (see Section 5).

4.2 ROAD DIET DESIGN CONSIDERATIONS

For cost-effectiveness and natural resource conservation, Road Diet projects can be designed and constructed by simply re-striping the roadway and re-using the existing pavement width, curbs and gutters. A context-sensitive solutions (CSS)[7] design approach is recommended for Road Diet projects. Though every project is unique, design solutions for Road Diet project alternatives need to:

- Provide a safe and efficient transportation corridor for motor vehicles, buses, bicycles and pedestrians;
- Balance the needs of the transportation system with the interests of the surrounding community and the environment;
- Create a transportation facility that is an asset to the community; and
- Safely integrate lane transitions from the adjoining cross-section into the Road Diet cross-section. This transition could result in a capacity and safety concern if not designed properly.

When designing a Road Diet, the design team should refer to the most recent design guidance including:

- *Road Diet Informational Guide*, U.S. Department of Transportation, Federal Highway Administration, November 2014. Guide contains chapter on design, including potential cross sections, parking considerations, and guidance in designing transitions to fewer lanes.
- *NMDOT Design Manual*, latest edition. Includes references to major design guides, such as the American Association of State Highway and Transportation Officials (AASHTO) Geometric Design of Highways and Streets ("The Green Book"), the Manual on Uniform Traffic Control Devices (MUTCD), as well as it includes NMDOT's ADA design standards.
- Bicycle:
  - *Guide for the Development of Bicycle Facilities*, American Association of State Highway and Transportation Officials (AASHTO), latest edition.
  - *Urban Bikeway Design Guide*, National Association of City Transportation Officials (NACTO), latest edition.
- Pedestrian:
  - *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach*, Institute of Transportation Engineers, latest edition.
  - *Guide for the Planning, Design, and Operation of Pedestrian Facilities*, American Association of State Highway and Transportation Officials (AASHTO), latest edition.
  - *Urban Street Design Guide*, National Association of City Transportation Officials (NACTO), latest edition.
- *A Guide to Best Practices for Achieving Context Sensitive Solutions,* National Cooperative Highway Research Program (NCHRP), Report 480.

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[7] For more on CSS, visit http://contextsensitivesolutions.org/.

- *Quantifying the Benefits of Context Sensitive Solutions,* National Cooperative Highway Research Program (NCHRP), Report 642.
- *Highway Safety Manual*, American Association of State Highway and Transportation Officials (AASHTO), latest edition.
- *Highway Capacity Manual*, Transportation Research Board (TRB), latest edition.
- *State Access Management Manual,* 18.31.6 New Mexico Administrative Code.

4.3 TRIAL AND TEMPORARY INSTALLATION OF ROAD DIETS

Prior to widespread implementation, or expensive reconstruction, some agencies may decide to first install Road Diets as experimental or temporary installations. If a Road Diet project results from a pavement maintenance project, and is a simple restriping, by nature it is a trial installation, as roadway striping is maintained approximately every two years. Should a community not experience safety or livability benefits from the installation of a Road Diet, NMDOT can return to the previous cross section the next time the roadway striping is maintained.

Further, using paint and temporary barriers, such as movable planters, transportation agencies are able to experiment with Road Diet configurations, allowing the public to experience the altered roadway and the agency to analyze its operations and safety, prior to investing in more expensive, permanent construction, or even restriping. Temporary installations are generally low-cost, and assist with building public support for the project. Some agencies find that extensive public outreach campaigns in conjunction with temporary installations help improve public support. Temporary installations—even if for a weekend—can be done in conjunction with street festivals or events, such as town celebrations or CiQlovia in Albuquerque[8].

NMDOT should consider trial or temporary installations if the design team and/or public is unsure whether a Road Diet is the best alternative for a particular corridor, or if a local government would like to experiment with a different roadway configuration, but the District is undecided on the effectiveness of the Road Diet. Trial installations from a maintenance restriping could be used prior to an NMDOT District undertaking a reconstruction, in order to evaluate the effectiveness of a Road Diet cross section.

5. EVALUATION OF ROAD DIETS

After a Road Diet is installed, NMDOT should compare the “before” condition to the “after” condition to determine whether the Road Diet is effective. This analysis should be documented in a formal report with photos and include a comparison of the project purpose and need to the outcomes, as well as document any additional outcomes. On-call engineering contracts may be particularly well-suited for this use, given limited resources and the often shorter terms of project-specific consultant contracts. The before/after evaluation should include both quantitative and qualitative factors, such as:

- Public feedback over the course of (at least) one year. While the public may at first be resistant to the Road Diet, their opinion may shift over time. NMDOT may also continue public education campaigns beyond the installation of the Road Diet, building more community support.

[8] http://www.abqciqlovia.org/ .

- The factors included in the Road Diet Decision Matrix. Using the Decision Matrix as a guide will ensure that those evaluation criteria are reviewed as part of the before/after report. Both traffic and safety analyses should include at least two year's-worth of data after project implementation.
- Other metrics as needed to effectively reflect the project's impact, whether positive or negative, expected or unexpected.

When evaluating the safety and crash data in before/after reports, NMDOT may not be able to compile the most recent after-condition crash data in a timely matter, as it takes NMDOT one to two years to process and finalize crash data. As an alternative, the after condition can be evaluated using the predictive methods in the Highway Safety Manual, observations, anecdotal data from local police, or preliminary data, if available.

Completed before/after reports can be used for future public engagement and as educational documents for other Road Diet projects.

Chapter 5 of the FHWA Road Diet Information Guide focuses on the evaluation of Road Diets, and is a useful reference when compiling the evaluation report.

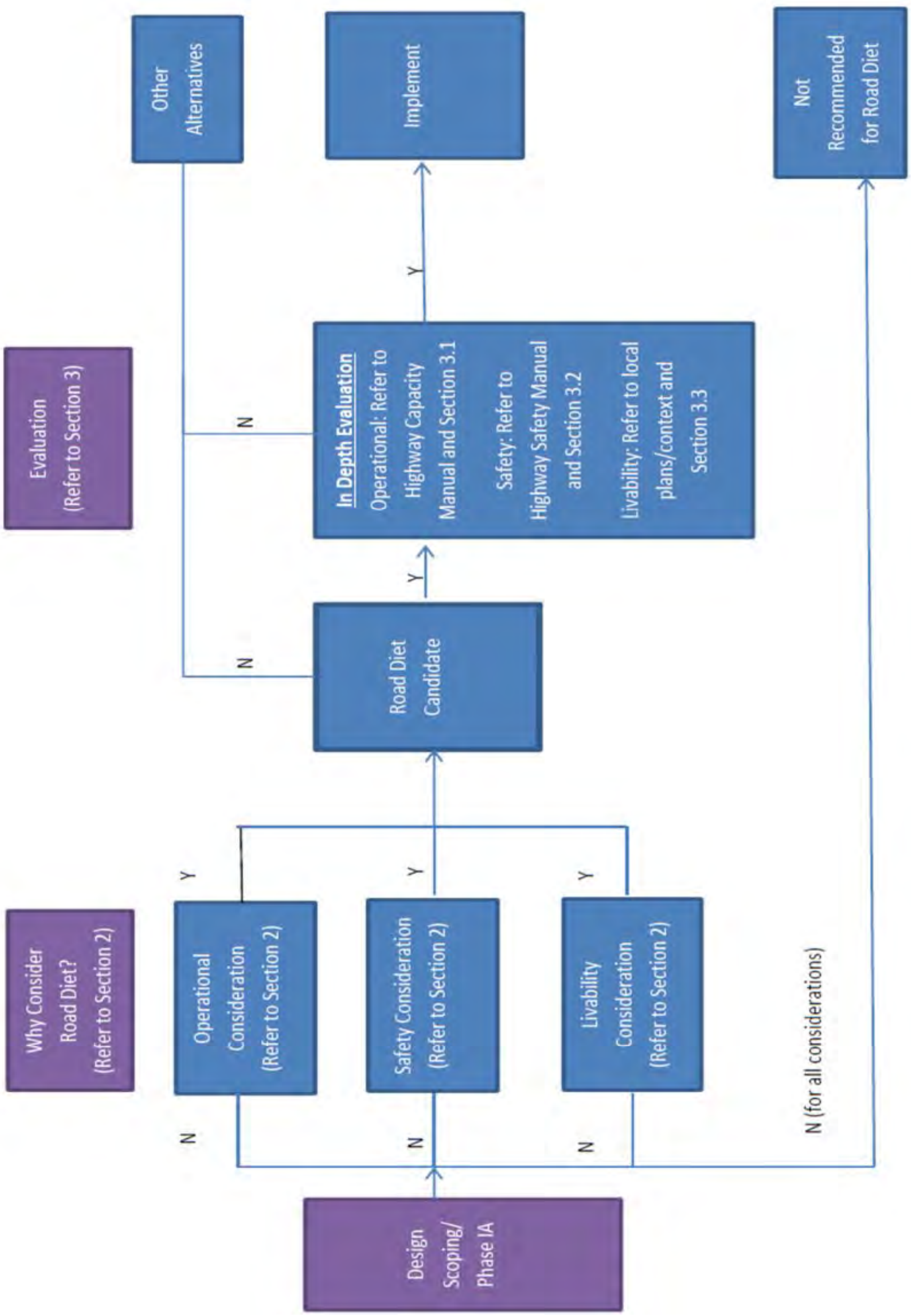
As NMDOT implements and evaluates Road Diets, design guidance and policies may change. Therefore, this guide is intended to be a living document that can be amended to incorporate changes in design and policy, based upon experience documented in evaluation reports or other departmental initiatives.

A process flowchart is included in Appendix II to help the user better understand how a Road Diet candidate corridor is assessed, and how to determine whether it is feasible. This will serve as part of the Design Directive.

Road Diet Decision Matrix

Project Elements	ALTERNATIVES		
	Option A: No Build	Option B: Road Diet	Option C: [complete as needed]
	Score	Score	Score
	-2= very poor fit, -1 = slightly poor fit, 0= neutral, +1= slightly positive fit, +2= very positive fit		
Roadway Function, Operations & Environment			
1. Fits within Right of Way			
2. Matches Desired Land Use Context			
3. Integrates Context Sensitive Design Objectives			
4. Appropriately Manages Access			
5. Roadway Capacity is Appropriate for AADT			
6. Addresses Heavy Commercial Vehicles			
7. Impact on Delay on Adjacent Parallel Facilities			
Score Subtotal	0	0	0
Safety			
8. Addresses Actual Crash Data			
9. Accommodates Volume of Turning Movements			
10. Provides for Multimodal Uses			
11. Provides Shorter Pedestrian Crossings			
12. Reduces Incidents of Speeding			
13. Design Speed Matches Target Speed			
Score Subtotal	0	0	0
Community			
14. Complies with Local Plans			
15. Provides Economic Development Opportunities			
16. Public Acceptance			
17. Considers Livability			
18. Provides Adequate Parking			
19. Budget			
20. Advances Public Health Goals and Initiatives			
Score Subtotal	0	0	0
Multimodal Accommodation			
21. Meets Existing Bike/Ped Demand			
22. Meets Latent Bike/Ped Demand			
23. Complies with ADA			
24. Integrates Transit Accommodation			
Score Subtotal	0	0	0
Total	0	0	0

APPENDIX II: PROCESS FLOWCHART



Process Flowchart for Assessing Road Diet Candidates

(References are to specific sections in the NMDOT Road Diet Guide)

APPENDIX III: OPERATIONAL CONSIDERATIONS TABLE

Operational Considerations for 4 to 3 Lane Conversions		
Operational Considerations	**Criteria**	**Rationale for Implementing Road Diet**
AADT	<10,000	Candidate for Road Diet
	10,000 – 19,000	Corridor/key intersection analysis required
	>19,000	Not likely candidate for Road Diet
Driveway Spacing	12 or less per mile in each direction (Average Spacing of 440')	Candidate for Road Diet; more than this requires HSM analysis
Design Speed	<55 mph	
LOS and Travel Times	30% +TT or 2+LOS Change	HCM analysis; not likely candidate for Road Diet
	<30 TT Change Corridor LOS =D OR BETTER <LOS at critical approaches	HCM analysis
Intersection Delays	2 + LOS change in critical movements	HCM analysis
Minor Street Operations		Review HCM analysis
Railroad Crossing	Yes	Further operations analysis needed based on frequency of trains and AADT
School Route	Yes	Review for pedestrian and bicycle operation improvements

Definitions:
TT = travel time
LOS = Level of Service
HCM = Highway Capacity Manual
HSM = Highway Safety Manual

APPENDIX IV: PUBLIC INFORMATION PACKET MATERIALS

FHWA Road Diet Information Guide

http://safety.fhwa.dot.gov/road_diets/info_guide/rdig.pdf

FHWA Road Diet Flyer—What is a Road Diet?

http://safety.fhwa.dot.gov/road_diets/brochure/roaddietbrochure.pdf

FHWA Road Diet Myth Busters

http://safety.fhwa.dot.gov/road_diets/resources/pdf/roadDiet_MythBuster.pdf

FHWA Road Diet Case Studies

http://safety.fhwa.dot.gov/road_diets/case_studies/roaddiet_cs.pdf